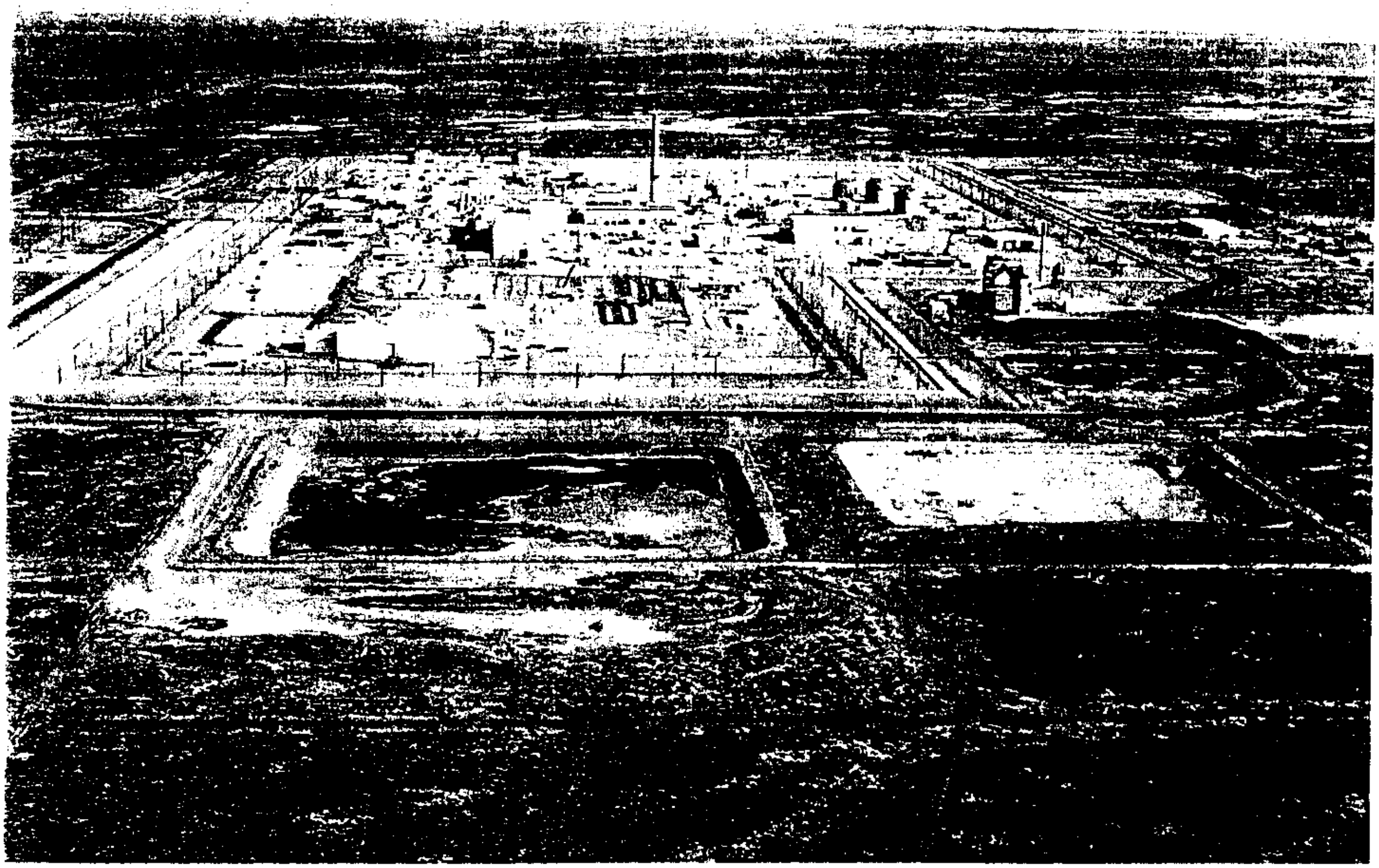
INEEL
IDAHO NATIONAL ENGINEERING & ENVIRONMENTAL LABORATORY

IDAHO DEPARTMENT OF HEALTH AND WELFARE

DIVISION OF ENVIRONMENTAL QUALITY

Final Record of Decision

Idaho Nuclear Technology and Engineering Center



Operable Unit 3-13
Idaho National Engineering and Environmental Laboratory
Idaho Falls, Idaho

DOE/ID-10660
Revision 0

Final Record of Decision
Idaho Nuclear Technology and Engineering Center

October 1999

Operable Unit 3-13
Idaho National Engineering and Environmental Laboratory
Idaho Falls, Idaho

DECLARATION OF THE RECORD OF DECISION

Site Name and Location

Idaho Nuclear Technology and Engineering Center, Waste Area Group 3
Operable Unit 3-13
Idaho National Engineering and Environmental Laboratory (CERCLIS ID 4890008952)
Idaho Falls, Idaho

Statement of Basis and Purpose

The Idaho Nuclear Technology and Engineering Center (INTEC) (formerly the Idaho Chemical Processing Plant) Waste Area Group (WAG) 3 is one of 10 Idaho National Engineering and Environmental Laboratory (INEEL) WAGs identified in the Federal Facility Agreement and Consent Order (FFA/CO) by the U.S. Department of Energy Idaho Operations Office (DOE-ID), the U.S. Environmental Protection Agency (EPA) Region 10, and the Idaho Department of Health and Welfare (IDHW). Operable Unit (OU) 3-13 is listed as the "WAG 3 Comprehensive Remedial Investigation (RI)/Feasibility Study (FS)" in the FFA/CO (DOE-ID 1991). The objective of the comprehensive RI/FS is to: (1) review previous WAG 3 investigations, (2) investigate release sites not previously evaluated, (3) determine the risks posed by individual release sites and the overall risk posed by the WAG, and (4) identify, screen, and analyze remedial alternatives for release sites where risks are determined to be greater than allowable levels.

This Record of Decision (ROD) presents the disposition of 101 identified release sites including four newly identified sites. Sixty-one release sites were determined to exhibit unacceptable risks that if not addressed may present an imminent and substantial endangerment to human health and the environment. Appropriate remedies for 55 of the sites are described in this ROD, while the remaining six sites were judged to be more appropriately managed under other OUs, WAGs, or INEEL regulatory programs. Information is provided in this ROD to support the remedial action decisions for the 55 release sites where contamination presents unacceptable risks or poses a threat, and to support the "No Action" and "No Further Action" decisions for the other 40 sites. These remedial actions are chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The selected remedial actions are also intended to satisfy the requirements of the FFA/CO. These decisions are based on the Administrative Record for WAG 3, OU 3-13.

The DOE-ID is the lead agency for the remedy decisions under Executive Order 12580. The EPA approves the decisions, and along with the IDHW, has participated in the selection of the final remedies. The IDHW concurs with the selected remedies for the WAG 3 sites of concern, the "No Action" and "No Further Action" determinations, and the sites that will be administered under other INEEL regulatory programs. The basis for decisions are made in this ROD and documented in the Administrative Record for WAG 3, OU 3-13. The DOE, EPA, and IDHW will be collectively referred to as the Agencies in this document.

Assessment of the Site

Fifty-five of the 101 identified release sites within WAG 3 have actual or threatened releases of hazardous substances that, if not addressed by implementing the response actions selected in this ROD, may present an imminent and substantial endangerment to human health and/or the environment. Six other sites are identified in this ROD that will be managed under other OUs, WAGs, or INEEL regulatory programs. The response actions selected in this ROD are designed to reduce the potential threats to human health and/or the environment to acceptable levels. The remaining 40 sites are designated as "No Action" or "No Further Action" sites. Thirty-four of these 40 sites are determined to have an acceptable risk to human health and/or the environment, under current industrial and future potential residential land use, and are designated as "No Action" sites. The six other sites are identified as "No Further Action" and may present an unacceptable risk to human health if land use changes prior to 2095 or if future construction requires excavations below the assumed 3 m (10 ft) residential basement scenario.

Description of the Selected Remedies

The WAG 3 release sites were grouped according to shared characteristics or common contaminant sources. The seven groups include: (1) Tank Farm Soils, (2) Soils Under Buildings and Structures, (3) Other Surface Soils, (4) Perched Water, (5) Snake River Plain Aquifer (SRPA), (6) Buried Gas Cylinders, and (7) SFE-20 Hot Waste Tank System. Because the release sites in each group have common characteristics or contaminants, a single remedy is selected for all release sites within each group. In addition, those sites classified as "No Further Action" sites require institutional controls to remain protective. Institutional Controls are also a part of the remedy for each of the seven groups described below. Institutional Controls will be established in accordance with the requirements set forth in the April 1999, EPA Region 10 Policy. The selected remedy for each group is described below.

Tank Farm Soils Interim Action (Group 1)

The Tank Farm Soils represent principal threat wastes due to direct radiation exposure to workers or the public; and due to potential leaching and transport of contaminants to the perched water or the SRPA, a sole source aquifer. A final remedy for the Tank Farm Soils release sites has been deferred pending further characterization and coordination of any proposed remedial actions with the Idaho High Level Waste (HLW) and Facilities Disposition (FD) Environmental Impact Statement (EIS), currently in preparation. A separate RI/FS, Proposed Plan, and ROD will be prepared for the Tank Farm Soils under OU 3-14. Interim actions were evaluated to provide protection until a final remedy is developed and implemented. The selected Tank Farm Soils Interim Action is Institutional Controls with Surface Water Control. The major components of this remedy include:

- Restrict access to control exposure to workers and prevent exposure to the public from soils at the Tank Farm until implementation of the final remedy under OU 3-14

- Accommodate a 1 in 25-year, 24-hour storm event with surface water run-on diversion channels

- Minimize precipitation infiltration by grading and surface sealing the Tank Farm Soils sufficient to divert 80% of the average annual precipitation falling on the Tank Farm Soils area

- Improve exterior building drainage to direct water away from the contaminated areas.

The Agencies believe this interim action will be protective of human health and the environment while the OU 3-14 RI/FS is being performed and a final remedy is selected. The interim action will comply with applicable or relevant and appropriate requirements (ARARs), be cost effective, and is consistent with the expected final Tank Farm remedy or the HLW&FD EIS. The Tank Farm Soils group includes one new site, CPP-96 (Tank Farm Interstitial Soils). Site CPP-96 is a consolidation of all of the previously identified Tank Farm Soils sites and the intervening interstitial soils within the site CPP-96 boundary.

Soils Under Buildings and Structures (Group 2)

The major threats posed by Soils Under Buildings and Structures release sites are direct radiation exposure to workers or the public caused by intrusion into contaminated soils and potential soil contaminant leaching and transport to perched water or the SRPA. The purpose of the selected remedy is to minimize the potential for direct exposure to contaminated soils and to prevent or reduce the leaching of contamination from the soils to the perched water or SRPA.

Until the buildings and structures above these sites are closed, and decontamination and dismantlement (D&D) occurs, it is assumed that the building or structure limits infiltration of water through the contaminated soils and prevents direct exposure to the contaminated soils. The selected deferred action remedy for Soils Under Buildings and Structures is Institutional Controls and Containment. The major components of the selected remedy include:

- Implement institutional controls, including site access restrictions, and periodic inspections of buildings or structures to ensure that infiltration is limited and exposures to contaminated soil is prevented. Access to the Group 2 sites will be restricted through the use of warning signs. Notification of this restriction will be made to the affected local county governments, ShoBan Tribal Council, General Services Administration (GSA), U.S. Bureau of Land Management (BLM), and other agencies, as necessary.

- Assess completed D&D building or structure and release site configuration to determine if they prevent radiation exposures or limit contaminant migration to the SRPA, as would be achieved through meeting the substantive requirements of Idaho Administrative Procedures Act (IDAPA) 16.01.05.008 (40 Code of Federal Regulations [CFR] 264.310). If the completed D&D configuration is assessed as inadequate for long-term protection of human health and the environment, then contaminated soils will be capped in conformance with the above referenced hazardous waste landfill closure requirements with an engineered barrier, or removed and disposed on-Site as discussed in the following section for Group 3 soils. Environmental monitoring and maintenance requirements will be included in the OU 3-13 post-ROD monitoring plan.

- The Waste Calciner Facility (WCF) has been closed under an approved Hazardous Waste Management Act (HWMA) closure plan and a post-closure monitoring and maintenance plan is required. In order to reduce the duplication of effort for monitoring and maintenance of the WCF, maintain consistency with the publicly-noticed WCF closure plan, and acknowledge the Resource Conservation and Recovery Act (RCRA)/CERCLA parity policy these requirements will be addressed under this ROD as ARARs. The WCF will be included during the CERCLA 5-year reviews with the Group 2 Soils Under Buildings and Structures sites and will address the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310). Additionally these requirements will be incorporated into the post-ROD monitoring plan for OU 3-13.

Other Surface Soils (Group 3)

The Other Surface Soils release sites are also principal threat wastes due to potential external exposure of workers or the public to radionuclide-contaminated soils. The purpose of the selected remedy is to prevent external exposure to radionuclides at these sites and to allow these sites to be released for unrestricted use in the future. The selected remedy for Other Surface Soils is Removal and Onsite Disposal in the INEEL CERCLA Disposal Facility (ICDF). Those Group 3 release sites that, prior to excavation, are identified as part of the footprint of another program's closure activity and that, to the Agencies' satisfaction, will be closed with equivalent protection to that afforded by the ICDF to groundwater and future users, will not be excavated but instead capped in place pursuant to the hazardous waste landfill closure substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310).

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.
- Construct the ICDF complex, which will include an engineered facility meeting RCRA Subtitle C, Idaho HWMA and polychlorinated biphenyl (PCB) landfill design and construction requirements. The ICDF will be located within the WAG 3 area of contamination (AOC). Design and operational requirements for the ICDF include:
    - Dispose only INEEL on-Site CERCLA wastes meeting agency-approved ICDF Waste Acceptance Criteria (WAC), to be developed during the remedial design, in the ICDF. An important objective of the WAC will be to assure that hazardous substances disposed in the ICDF will not result in exceeding groundwater quality standards in the underlying drinking water aquifer (SRPA), even if the ICDF leachate collection system were to fail after closure.
    - Design to have a total capacity of approximately 390,000 m^3 (510,000 yd^3).

- Engineer to meet IDAPA 16.01.05.008 (40 CFR 264.301) for hazardous waste, 40 CFR 761.75 for PCB, and DOE Order 435.1 for radioactive waste landfill design and operating substantive requirements.

- Locate in an area meeting hazardous waste, PCB waste, and low-level radioactive waste (LLRW) landfill siting requirements. Through a preliminary evaluation of all the relevant decision criteria, the Agencies have determined the "Study Area" for siting the ICDF to be the CPP-67 Percolation Ponds and adjacent areas to the west. However, the specific ICDF cell locations will be determined through the completion of a comprehensive geotechnical evaluation of the entire Study Area, which shall be reviewed and approved by the Agencies. Siting criteria for the location of the ICDF included:

  - Outside the 100-year flood plain

  - Outside of wetland areas

  - Not in active seismic zones

  - Not in high surface erosion areas

  - Not in an area of high historic groundwater table.

- Construct and operate an ICDF supporting complex, including a waste Storage, Sizing, Staging, and Treatment (SSST) facility, in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subparts DD, I, J, and X) and IDAPA 16.01.05.006.01 and 16.01.05.006.02 (40 CFR 262.34[a][1]). It is anticipated that this facility will consist of a storage/staging building, an evaporation surface impoundment, a waste shredder, solidification/stabilization tanks, and associated equipment. Operations at the facility will include chemical/physical treatment to prepare ICDF wastes to meet Agency-approved WAC and RCRA land disposal restrictions (LDRs).

- Use one or more remediation waste staging and storage areas to stage and handle remediation waste. Operate the storage areas in accordance with the substantive requirements of IDAPA 16.01.05.006.01 and 16.01.05.006.02 (40 CFR 262.34[a][1]).

- Manage and treat monitoring well construction and sampling wastes generated prior to construction of the ICDF and SSST (i.e., purge water, decontamination water, and drill cuttings) using remediation waste staging piles and temporary treatment units in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553 and 40 CFR 264.554). Accomplish treatment using mobile tankage and physical/chemical treatment and comply with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subpart J, BB, and CC).

- Construct and designate an evaporation pond as a Corrective Action Management Unit (CAMU) in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.552 and 40 CFR 264 Subparts K and CC) for the purpose of managing ICDF leachate and other aqueous wastes generated as a result of operating the ICDF complex.

- Operate, close, and post-close the ICDF complex in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subparts G, F, and N), and maintain site access restrictions and institutional controls throughout the post-closure period.

Perched Water (Group 4)

The INTEC Perched Water does not currently pose a direct human health and/or environmental threat. This perched water exists primarily as a result of facility water usage and subsequent discharge to percolation ponds at INTEC. It is not used as a source of drinking water and is expected to disappear when INTEC operations cease. However, perched water does pose a threat as a contaminant transport pathway to the SRPA. Contaminants already in the perched water are a potential source of SRPA contamination. The perched zone may impact SRPA groundwater quality because it is a contaminant transport pathway between contaminated surface soils and the SRPA. Although a future water supply well screened in the perched water is not capable of providing sufficient water for domestic use purposes, restrictions will be required to prevent any future attempts to use perched water after 2095 when INEEL-wide institutional controls are projected to end. A response action is necessary to minimize or eliminate the leaching and transport of contaminants from the perched water to the SRPA and to prevent future perched water use.

The selected remedy for the Perched Water is Institutional Controls with Aquifer Recharge Control. This remedy includes:

- Implement institutional controls (to include a DOE-ID Directive limiting access) to prevent perched water use while INTEC operations continue and to prevent future drilling into or through the perched zone (through noticing this restriction to local county governments, ShoBan Tribal Council, GSA, BLM, and other agencies as necessary).

- Implement remedies to control surface water recharge to perched water beneath INTEC by specifically taking the existing INTEC percolation ponds, which are estimated to contribute about 70% of the perched water recharge, out of service. Limiting infiltration to the perched water will minimize potential releases to the SRPA by reducing the volume of water available for contaminant transport. Design, construction, and operate replacement ponds outside of the INTEC perched water area following the removal of the existing INTEC percolation ponds from service. The replacement percolation ponds will be sited about 3,048 m (10,000 ft) southwest of the INTEC and will be operational on or before December 2003.

- In addition, minimize recharge to the perched water from lawn irrigation, and lining the Big Lost River segment contributing to the INTEC perched water zones, if additional infiltration controls are necessary. Implement additional infiltration controls if the recession of the Perched Water zone does not occur as predicted by the RI/FS vadose zone model within 5 years of removing the percolation ponds. If implementation of the additional infiltration controls is necessary, implement as a second phase to the Group 4 remedy.

- Measure moisture content and contaminant of concern (COC) concentration(s) in the perched water zones to determine if water contents and contaminant fluxes are decreasing as predicted. Also use these data to verify the OU 3-13 vadose zone model and determine potential impacts to the SRPA.

Snake River Plain Aquifer (Group 5)

The major human health threat posed by contaminated SRPA groundwater is exposure to radionuclides via ingestion by future groundwater users. Based on the groundwater simulations presented in the FS (DOE-ID 1997a) and FS Supplement (FSS) (DOE-ID 1998a), removal of the existing percolation ponds from service will significantly reduce the concentrations of contaminants in SRPA groundwater by 2095. Additional remedial action may be necessary to meet the groundwater maximum contaminant levels (MCLs) of 4 mRem/yr for beta particle and photon-emitting radionuclides. Remedial action for the SRPA is bounded by the contaminant plume that exceeds Idaho groundwater quality standards or the federal MCLs for I-129, H-3, and Sr-90.

An interim action is selected for the SRPA. While the remediation of contaminated SRPA groundwater outside of the current INTEC security fence is final, the final remedy for the contaminated portion of the SRPA inside of the INTEC fence line is deferred to OU 3-14. As a result of dividing the SRPA groundwater contaminant plume associated with INTEC operations into two zones, the remedial action described herein is classified as an interim action. The selected interim action remedy for the SRPA is Institutional Controls with Monitoring and Contingent Remediation. The SRPA interim action remedy includes:

- Implement institutional controls over the area of the aquifer that exceeds the MCLs for H-3, I-129, and Sr-90 (to include a DOE-ID Directive limiting access) to prevent groundwater use while INTEC operations continue, and to restrict future groundwater use (through noticing this restriction to local county governments, ShoBan Tribal Council, GSA, BLM, etc.), including site access restrictions, drilling restrictions, and maintenance during DOE operations at INTEC.

- Implement institutional controls, including land use restrictions to prevent the use of SRPA groundwater over the area of the aquifer that exceeds the MCLs for H-3, I-129, and Sr-90, until drinking water standards are met, which are projected to be achieved by 2095.

- Construct new SRPA monitoring wells outside of the current INTEC security fence to assess whether MCLs will be exceeded after 2095.

- If observed COC(s) concentrations exceed their action levels at a sustained pumping rate of at least 0.5 gpm for 24 hours, implement pump and treatment remedial action. Extract contaminated SRPA groundwater from the zone of highest contamination and treat to reduce the contaminant concentrations to meet MCLs by 2095. The action level is the modeled maximum concentration predicted in the year 2000 so that the MCL will not be exceeded in 2095 (the projected end of the institutional control period).

- It is anticipated that standard pump and chemical/physical treatment (which may include evaporation in the ICDF Complex surface impoundment) will be able to meet the aquifer restoration goal. Conduct treatability studies, which include a technical evaluation of treating the I-129 and other COCs, as part of this remedy. These studies may include evaluation of the ability to treat and selectively withdraw contaminants from the aquifer. It is estimated that these studies will not extend more than 12 months and are limited to a total cost of $2 million.

- If the treatability studies indicate the presence of sufficient quantities of I-129 and other COCs, and contaminated groundwater can be selectively extracted and cost-effectively treated to meet the drinking water MCLs outside the current INTEC security fence by 2095, then implement active remediation.

- Either return treated water to the aquifer through land recharge in accordance with the Idaho Wastewater Land Application ARARs if a recharge impoundment is used; or in accordance with National Pollutant Discharge Elimination System (NPDES)/State Pollutant Discharge Elimination System (SPDES) ARARs if the treated effluent is discharged to the Big Lost River, which recharges the aquifer downstream of the INTEC facility; or evaporate in the ICDF complex evaporation pond or equivalent.

Buried Gas Cylinders (Group 6)

The Buried Gas Cylinders pose a safety hazard to inadvertent intruders (i.e., backhoe operators or drillers). The cylinders are presumed to be pressurized and could burst during excavation. In addition, hydrofluoric acid, which may be present in the cylinders, is very corrosive, reacts violently with moisture, and can generate explosive concentrations of hydrogen gas. The selected remedy for the Buried Gas Cylinders is Removal, Treatment, and Disposal. This alternative includes:

- Remove the gas cylinders using a contractor specializing in gas cylinder removal

- Treat the cylinder contents, if necessary

- Recycle or dispose of the empty gas cylinder containers.

The Agencies may elect to pursue a contingent remedy of capping in place pursuant to the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310) if safety concerns with excavation and removal prevent implementation of the selected remedy.

SFE-20 Hot Waste Tank System (Group 7)

The major threat posed by the SFE-20 Hot Waste Tank System is leaching and transport of contaminants to the SRPA and subsequent exposure of future groundwater users to radionuclides via ingestion. The selected alternative for the SFE-20 Hot Waste Tank System is Removal, Treatment, and Disposal. This alternative includes:

- Remove and treat on-site the liquid and sludge contents of the tank.

- Excavate and remove the tank, vault, and associated structures.

- Land dispose treated waste, the tank, vault, and other debris. The preferred disposal site is the ICDF; however, if any residue or material fails to meet the ICDF WAC, an alternate suitable disposal facility will be identified during the remedial design.

- Remove and treat off-site, if wastes found in the tank are alpha-LLW (i.e., exceed 10 nCi/g transuranic [TRU] constituents [alpha emitters with an atomic number greater than 92 and a half-life exceeding 20 years]) or TRU wastes (i.e., greater than 100 nCi/g TRU).

"No Action" Sites

Ten sites were determined to be "No Action" sites with the signing of the FFA/CO. Twenty-four additional "No Action" sites have been determined in this ROD. These sites each represent less than 1×10^{-4} risk and a hazard index (HI) of less than 1 for the potential residential scenario, and could be available for current unrestricted use.

"No Further Action" Sites

Six of the 101 sites addressed in this ROD are classified as "No Further Action" sites and require only institutional controls to remain protective. These controls will ensure that the land use will remain industrial until at least 2095 at which time contaminant levels will be reduced sufficiently to be protective for residential use. Those sites with contamination at depths below traditional residential construction (i.e., 3 m [10 ft]), that do not require remedial action to safeguard the drinking water aquifer from future contaminant releases, will continue to require institutional controls to prevent excavation or drilling below 3 m (10 ft) to remain protective.

Closed and Closing RCRA/HWMA Sites

Sites being closed under RCRA/HWMA will be handled as previously described for the WCF. The WCF has been closed under an approved HWMA closure plan and a post-closure monitoring and maintenance plan is required. In order to reduce the duplication of effort for monitoring and maintenance of the WCF, maintain consistency with the publicity-noticed WCF closure plan, and acknowledge the RCRA/CERCLA parity policy, these requirements will be addressed under this ROD as ARARs. The WCF will be included during the CERCLA 5-year reviews with the Group 2 Soils Under Buildings and Structures release sites and will address the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310). Additionally these requirements will be incorporated into the post-ROD monitoring plan for OU 3-13.

Disturbances of OU 3-13 Sites

The INTEC facility is an operating facility. As such, periodic maintenance and upgrade activities will be conducted during the implementation of the remedial actions under this ROD. Prior to conducting any site disturbance activities, the Agencies will be notified to the extent of any disturbance, and will be provided a plan for their approval, including necessary corrective actions that will be performed to ensure that the remedies identified in this ROD remain operational and functional. A formal system for notification and approval of disturbances to OU 3-13 sites will be developed during the remedial design.

Sites Managed Under Other Operable Units, WAGs, or INEEL Regulatory Programs

Six of the release sites identified in WAG 3 are outside the scope of this ROD and, therefore, will be managed under other OUs, WAGs, or other INEEL regulatory programs. Site CPP-38 (asbestos in nine INTEC buildings) will be addressed by the INEEL Asbestos Management Program. Site CPP-65 (Sewage Treatment Plant Lagoons) will be addressed under the Idaho Wastewater Land Application Rules. Site CPP-66 (Steam Plant Fly Ash Pits) only presents a potential ecological risk and will be addressed under CERCLA OU 10-04, which focuses on INEEL-wide ecological risk concerns. Sites CPP-61, -81, and -82 will be further evaluated and addressed under the OU 3-14 RI/FS.

New Sites

Four new sites are identified in this ROD. Site CPP-96 (Tank Farm Interstitial Soils) is a consolidation of all of the previously identified Tank Farm release sites and the intervening interstitial soils within the site CPP-96 boundary. This site also includes three sites that were determined through the Track 2 process to be "No Action" sites. The final remedy for release site CPP-96 will be addressed in the OU 3-14 Tank Farm RI/FS along with other Group 1 sites. Release site CPP-97 (Tank Farm Soil Stockpile), CPP-98 (Tank Farm Shoring Boxes), and CPP-99 (Boxed Soil) are added to this ROD to address soil stockpiles and wood construction debris that originated from the Tank Farm upgrade and/or the building CPP-604 tunnel egress projects. These sites are included as part of the OU 3-13 Group 3 sites and will be remediated accordingly.

Statutory Determination

The selected remedy for each release site group, the "No Action" sites, and "No Further Action" sites have been determined to be protective of human health and/or the environment, to comply with federal and state regulations that are ARARs for the remedial actions, and to be cost-effective.

The selected remedies use permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedies for the Buried Gas Cylinder sites (Group 6) and the SFE-20 Hot Waste Tank System (Group 7) incorporate treatment, and the selected interim action remedy for the SRPA (Group 5) incorporates treatment if COCs in the aquifer outside the current INTEC security fence exceed action levels. However, treatment of radionuclide-contaminated soil and perched water was not found to be practicable for the other groups and, therefore, the selected remedies for the Soils Under Buildings or Structures (Group 2), Other Surface Soils (Group 3), and Perched Water (Group 4) do not satisfy the statutory preference for treatment as a principal element of the remedy. The EPA's preferred remedy for sites that pose relatively low, long-term threats, or where treatment is impracticable, is engineering controls, such as containment. The selected remedial alternatives for Soils Under Buildings or Structures (Group 2) and Perched Water (Group 4) will result in contaminants left in place at concentrations exceeding health-based concentrations for direct exposure, but the contaminants will not be available to present unacceptable risk to human health and/or the environment.

Because these remedies will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within 5 years after initiation of the remedial actions to ensure that each remedy is, or will be, protective of human health and the environment. This review will also assess the need for continued long-term environmental monitoring, administrative controls, and institutional controls at each group and "No Further Action" site. Reviews will be held no less frequently than every 5 years thereafter to ensure that the remedies continue to be protective. These periodic reviews will be discontinued when the Agencies determine that the sites no longer pose an unacceptable risk to human health and/or the environment and site access or use restrictions are no longer required.

The 5-year reviews will evaluate factors such as contaminant migration from sites where contamination has been left in place, newly discovered sites, effectiveness of institutional controls, and effectiveness of the remedial actions. For remedies incorporating institutional controls, it is assumed that institutional controls will remain effective until the year 2095. Additional institutional controls will apply to specific sites after 2095. This time period is consistent with the 100-year industrial land use assumption for the INTEC.

Sites for which "No Further Action" determinations were made, based on an industrial land use assumption through 2095, and residential thereafter, will be included in the 5-year reviews. These reviews will evaluate whether the "No Further Action" determination is still appropriate for the current and projected land uses at the time of the review.

Sites for which "No Action" determinations have been made based on no evidence of a source or release or where the risk is less than 1×10^{-4} or a HI less than 1 will not require institutional controls or 5-year reviews.

It is possible that new information will be discovered in the future during routine operations, maintenance activities, and/or D&D activities that will require additional remedial actions be taken at the sites listed in this ROD. Through the 5-year review process, the Agencies will evaluate new information to ensure that the selected remedy, including institutional controls, remain protective.

As INTEC is an operating facility, it is possible that changes in physical configuration of INTEC may uncover new sites or change the residual risk posed by those sites addressed under this ROD. Any planned disturbance at a site for which action is required under this ROD (including the "No Further Action" sites with institutional controls) will be preceded by appropriate planning documents to be submitted to and concurred on by the Agencies prior to implementation. Newly discovered sites will be subject to remedial action pursuant to the terms and conditions of the FFA/CO.

The following information is included in the decision summary section of this ROD; additional information can be found in the Administrative Record for WAG 3:

- COCs and their respective concentrations
- Baseline risks represented by the COCs
- Cleanup levels established for the COCs and the basis for the action levels
- Current and future land and groundwater use assumptions
- Land and groundwater use available at the site as a result of the remedy
- Estimated capital, operations and maintenance, and net present value costs, discount rate, and number of years over which costs are projected
- Description of alternatives
- Evaluation of the remedial action alternatives
- Decision factors that lead to selection of the remedies.

Signature Sheet

Signature sheet for the Record of Decision for Operable Unit 3-13, for the Idaho Nuclear Technology and Engineering Center, of the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare.

Chuck Clarke

Chuck Clarke, Regional Administrator
Region 10
U.S. Environmental Protection Agency

9/28/99
Date

Signature Sheet

Signature sheet for the Record of Decision for Operable Unit 3-13, for the Idaho Nuclear Technology and Engineering Center, of the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare.

C. Stephen Allred, Administrator
Division of Environmental Quality
Idaho Department of Health and Welfare

10/7/99
Date

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Beverly A Cook ______________________ 9-30-99 ______________

Beverly A. Cook, Manager
Idaho Operations Office
U.S. Department of Energy

Date

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TABLES

ACRONYMS

ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
BLM	U.S. Bureau of Land Management
CAB	Citizens Advisory Board
CFR	Code of Federal Regulations
COC	contaminant of concern
COCA	Consent Order and Compliance Agreement
COPC	contaminant of potential concern
cpm	counts per minute
CSM	conceptual site model
COPC	contaminant of potential concern
D&D	decontamination and dismantlement
DEQ	Division of Environmental Quality
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EBR	Experimental Breeder Reactor
EBSL	ecologically based screening level
EE/CA	engineering evaluation/cost analysis
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency

ERA	ecological risk assessment
ESRP	Eastern Snake River Plain
FFA/CO	Federal Facility Agreement Consent Order
FD	facilities disposition
FR	Federal Register
FS	feasibility study
FSS	feasibility study supplement
GSA	General Services Administration
HEPA	high-efficiency particulate air
HEU	Highly Enriched Uranium
HHRA	human health risk assessment
HI	hazard index
H-I	a designation for a sedimentary interbed located between the H and I basalt layers.
HLW	high-level waste
HLLW	high-level liquid waste
HQ	hazard quotient
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
ICPP	Idaho Chemical Processing Plant
IDAPA	Idaho Administrative Procedures Act
IDHW	Idaho Department of Health and Welfare
IDW	investigation derived waste
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LDR	Land Disposal Restrictions

LITCO	Lockheed Idaho Technology Company, Inc.
LLW	low-level waste
LMITCO	Lockheed Martin Idaho Technologies Company
MCL	maximum containment level
MCP	Management Control Procedure
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NPL	National Priorities List
NSR	no surface risks
NWCF	New Waste Calcining Facility
O&M	operating and maintenance
OU	operable unit
OSWER	Office of Solid Waste and Emergency Response
PCB	polychlorinated biphenyl
PEW	Process Equipment Waste
PPE	personal protective equipment
R&A	relevant and appropriate
RAO	remedial action objectives
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RfD	reference dose
RI	remedial investigation
RI/BRA	remedial investigation/baseline risk assessment
ROD	Record of Decision

RWMC	Radioactive Waste Management Complex
SARA	Superfund Amendment Reauthorization Act
SCM	site conceptual model
SF	slope factor
SLERA	screening level ecological risk assessment
SNF	spent nuclear fuel
SRPA	Snake River Plain Aquifer
SSST	storage, stagings, sizing, and treatment
STP	sewage treatment plant
SVOC	semi-volatile organic compound
SWP	service waste percolation pond
TBC	to-be-considered
TCLP	toxicity characteristic leaching procedure
T/E	threatened and/or endangered
TRA	Test Reactor Area
TRU	transuranic
TRV	toxicity reference value
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
TU	temporary unit
UCL	upper confidence level
UREP	Utility Replacement and Expansion Project
UTL	upper tolerance level
VOC	volatile organic compound
WAG	waste area group

WCF	Waste Calcining Facility
WERF	Waste Experimental Reduction Facility
WINCO	Westinghouse Idaho Nuclear Company, Inc.
WIPP	Waste Isolation Pilot Plant
WWP	Warm Waste Pond

Final Record of Decision
Idaho Nuclear Technology and Engineering Center
Operable Unit 3-13

1. DECISION SUMMARY

NOTE: *The Idaho Nuclear Technology and Engineering Center (INTEC) was formerly known as the Idaho Chemical Processing Plant (ICPP). The facility name was changed in 1998 to more accurately reflect the operational mission. The previously published supporting documents use the ICPP nomenclature.*

1.1 Site Name, Location, and Description

The Idaho National Engineering and Environmental Laboratory (INEEL) is a government facility managed by the U.S. Department of Energy (DOE), located 51.5 km (32 mi) west of Idaho Falls, Idaho, and occupies 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain (ESRP). The Idaho Nuclear Technology and Engineering Center (INTEC) is located in the south-central portion of the INEEL, as shown in Figure 1-1.

Facilities at the INEEL are primarily dedicated to nuclear research, development, and waste management. Surrounding areas are for multipurpose use and are managed by the U.S. Bureau of Land Management (BLM). The developed area within the INEEL is surrounded by a 1,295-km^2 (500-mi^2) buffer zone used for cattle and sheep grazing. Communities nearest to the INTEC are Atomic City (south), Arco (west), Butte City (west), Howe (northwest), Mud Lake (northeast), and Terreton (northeast). In the counties surrounding the INEEL, approximately 45% is agricultural land, 45% is open land, and 10% is urban. Sheep, cattle, hogs, poultry, and dairy cattle are produced; and potatoes, sugar beets, wheat, barley, oats, forage, and seed crops are cultivated. Private individuals or the U.S. Government own most of the land surrounding the INEEL, as shown in Figure 1-2.

Public access to the INEEL is strictly controlled by fences and security personnel. State Highways 22, 28, and 33 cross the northeastern portion of the INEEL approximately 32.2 km (20 mi) from INTEC, and U.S. Highways 20 and 26 cross the southern portion approximately 8 km (5 mi) from INTEC. A total of 145 km (90 mi) of paved highways pass through the INEEL and are used by the general public.

To better manage environmental investigations, the INEEL is divided into 10 waste area groups (WAGs). Identified contaminant release sites in each WAG were grouped into operable units (OUs) to expedite the investigations and any required remedial actions. The INTEC is designated as WAG 3, which was subdivided into 13 OUs that were investigated for contaminant releases to environmental pathways. Within these 13 OUs, 101 release sites were identified. This Record of Decision (ROD) applies to 55 of the 101 sites, which, on the basis of the comprehensive remedial investigation (RI)/feasibility study (FS) for WAG 3 (OU 3-13), were identified as posing a potential risk or threat to human health and/or the environment. Of the 101 sites, 40 are recommended for "No Action" or "No Further Action." The six remaining sites (CPP-65, CPP-38, CPP-66, CPP-61, CPP-81, and CPP-82 will be managed under other OUs, WAGs, or INEEL regulatory programs.

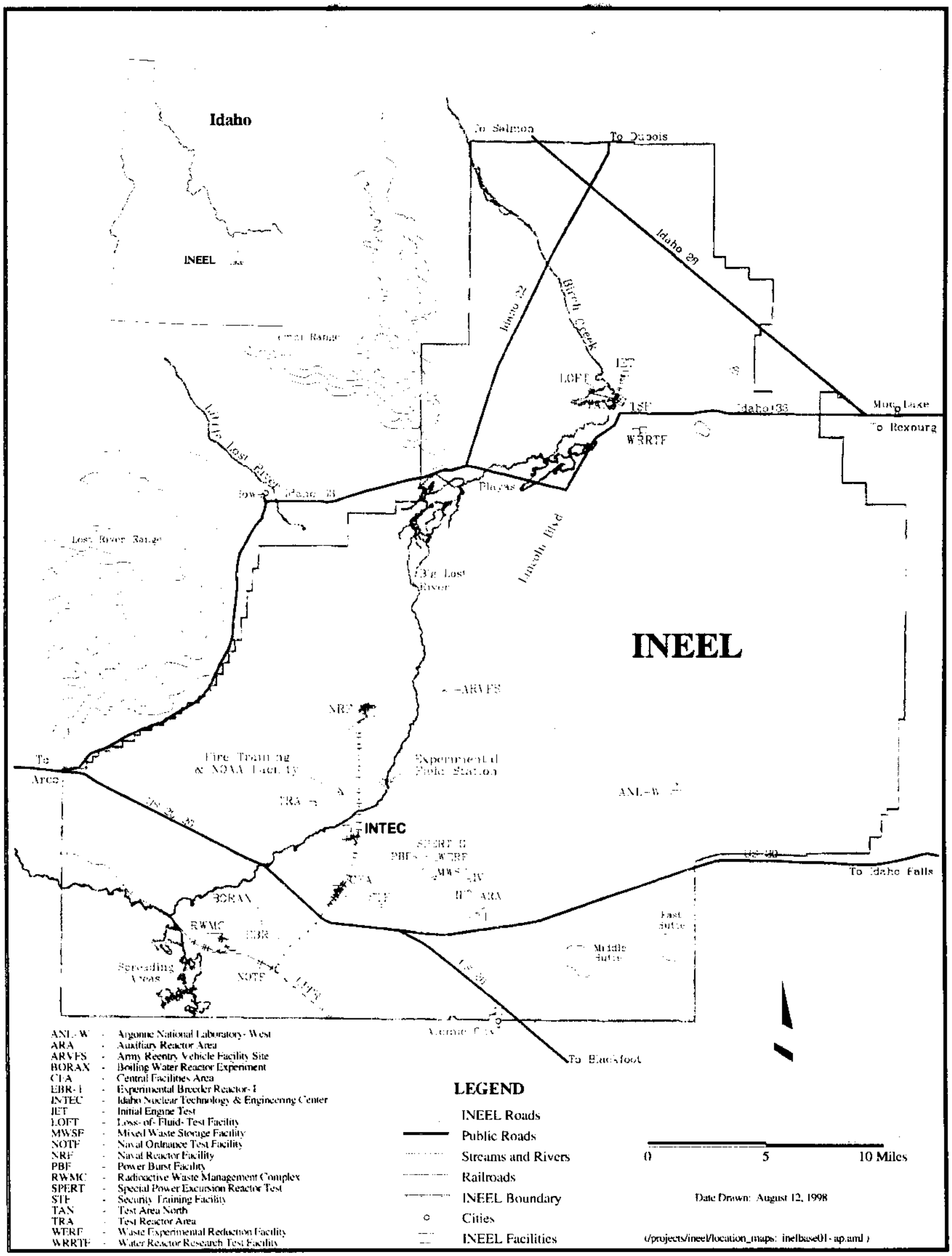


Figure 1-1. Location of the Idaho Nuclear Technology and Engineering Center.

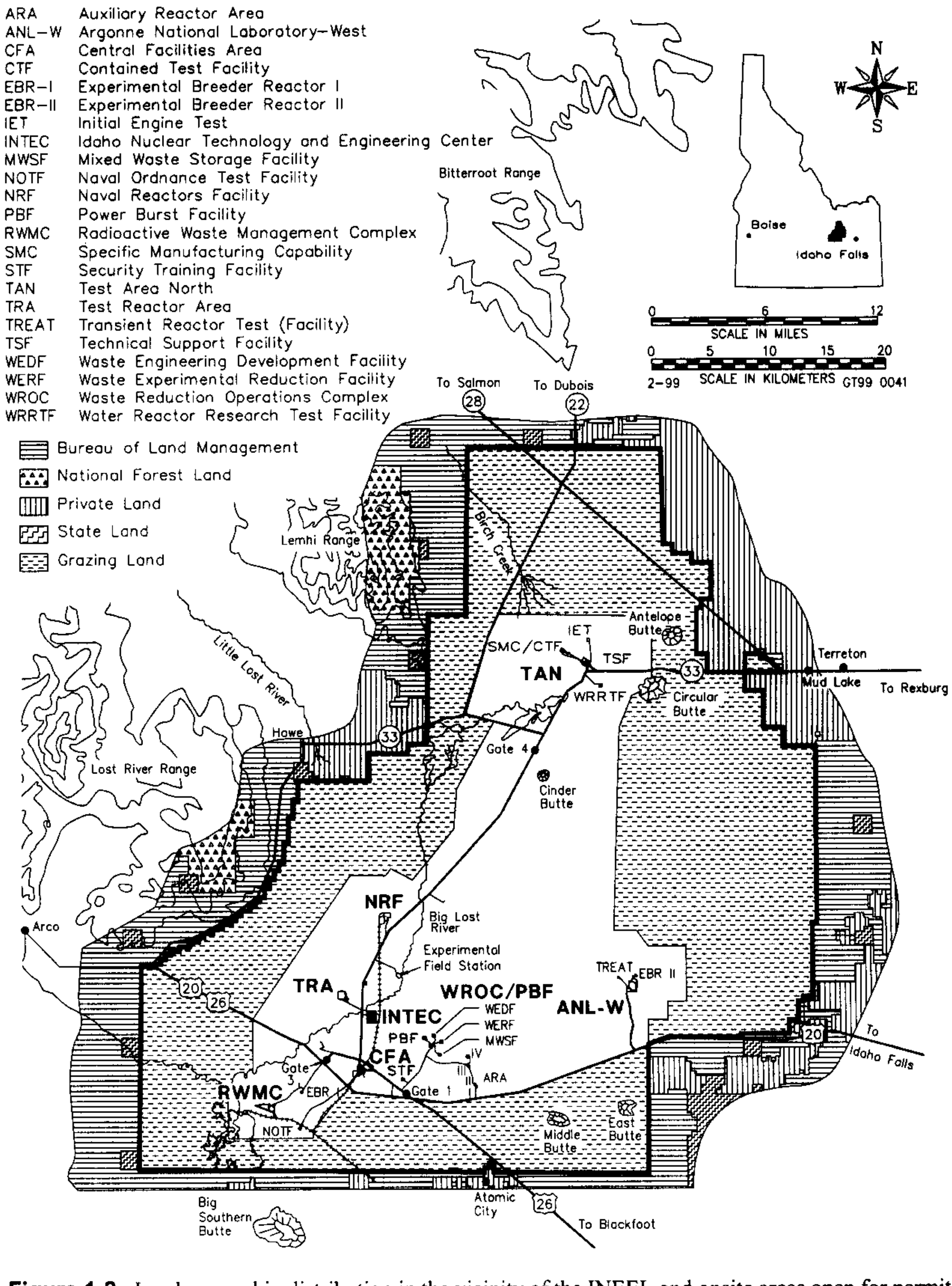


Figure 1-2. Land ownership distribution in the vicinity of the INEEL and onsite areas open for permit grazing.

The 55 release sites with identified risks greater than 1×10^{-4} or that pose a threat to human health and/or the environment require remedial action to mitigate these risks or threats. The 55 sites were divided into seven groups based on similar media, contaminants of concern (COCs), accessibility, or geographic proximity. The seven groups are:

- 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 locations of these groups are shown in Figures 1-3 through 1-9.

During the RI/FS and subsequent remedy development, data gaps were identified. In some cases the missing data were important enough to prevent selection of final remedies. Because delays in restoration were undesirable, OU 3-14 was created. Where available information was insufficient to select a final remedy in OU 3-13, interim actions were developed for implementation in the OU 3-13 ROD with the final remedy relegated to OU 3-14. Specifically, Group 1, Tank Farm Soils, and Group 5, the Snake River Plain Aquifer (SRPA), are interim actions in this ROD and are included in OU 3-14 for final remedy selection.

To allow flexibility in managing the remediation of the various groups discussed above, an OU 3-13 area of contamination (AOC) was designated as shown in Figure 1-10. An AOC is an area of contiguous surface contamination that can be used for consolidation of remediation wastes without triggering Land Disposal Resolutions and other Resource Conservation and Recovery Act (RCRA) requirements.

Action sites and cleanup levels are based on a 1×10^{-4} carcinogenic risk. For Cs-137, contaminated soils will be cleaned up to below 23 pCi/g, for the future residential use scenario. The background Cs-137 activity is approximately 1 pCi/g, which is equivalent to a 10^{-5} excess carcinogenic risk. The acceptable risk for cleanup to future residential standards for Cs-137 is 1×10^{-4} by the year 2095. "No Further Action" sites are sites that represent a threat if land use was residential, but do not represent a threat under an industrial land use scenario.

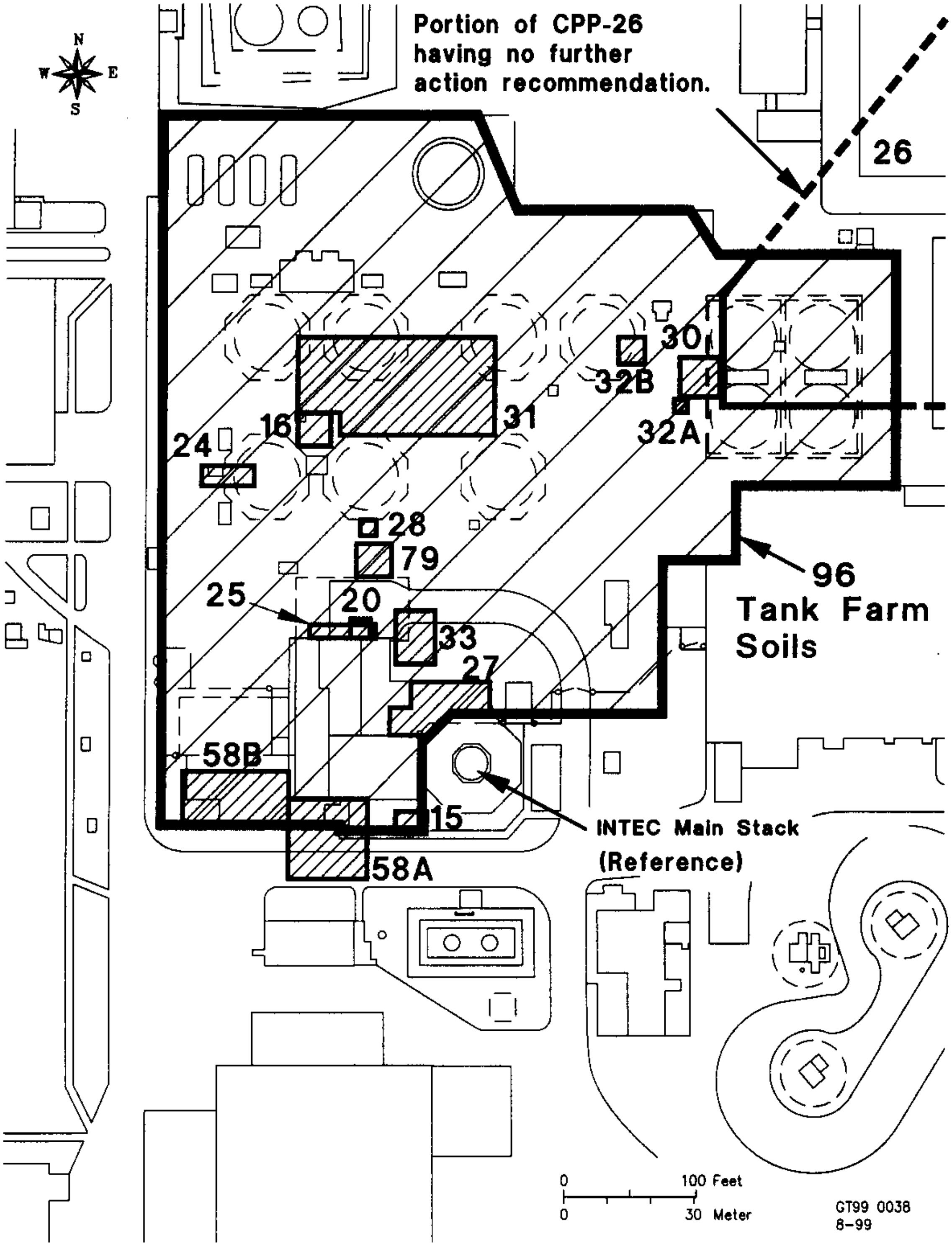


Figure 1-3. Group 1: Tank Farm Soils numbered release sites.

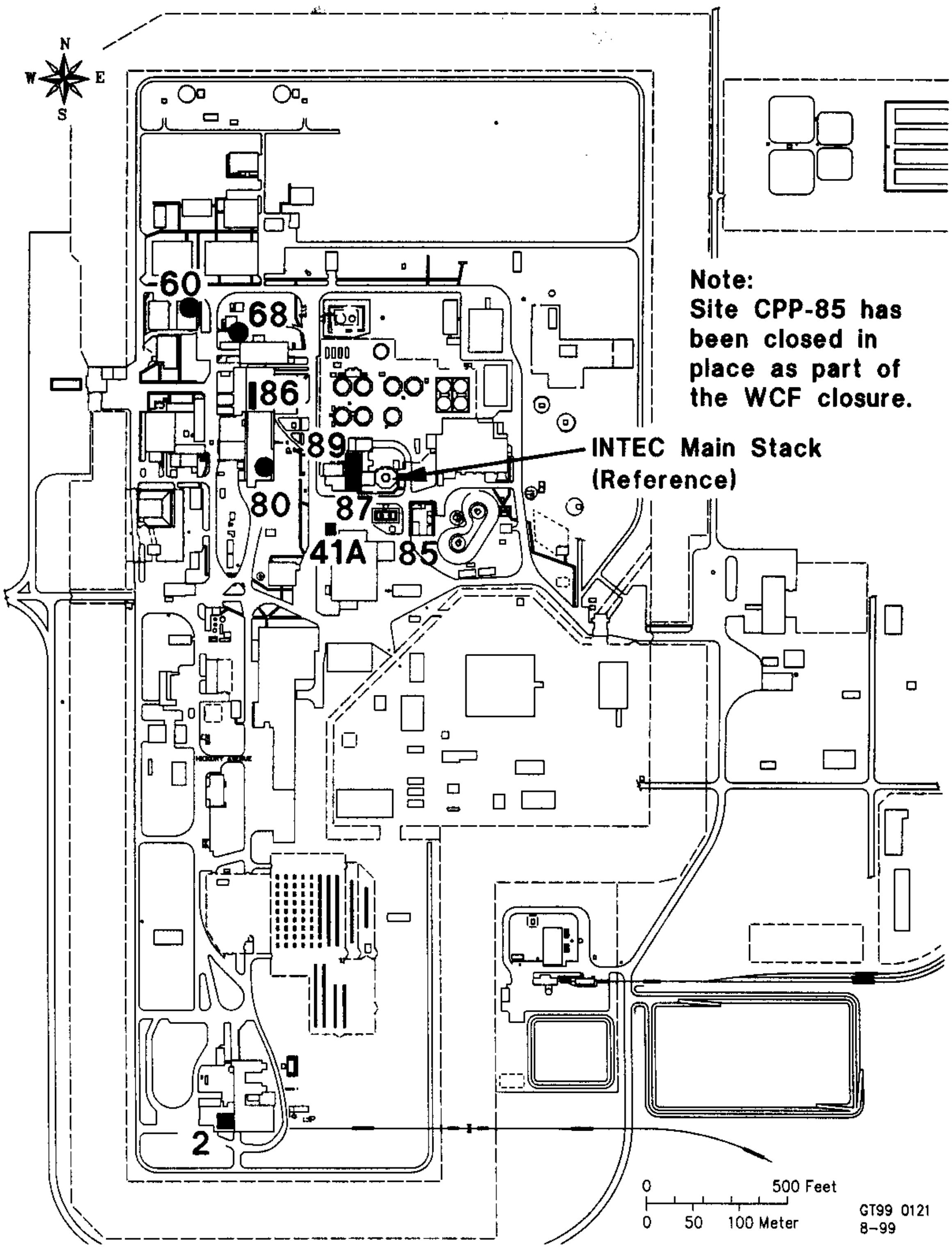
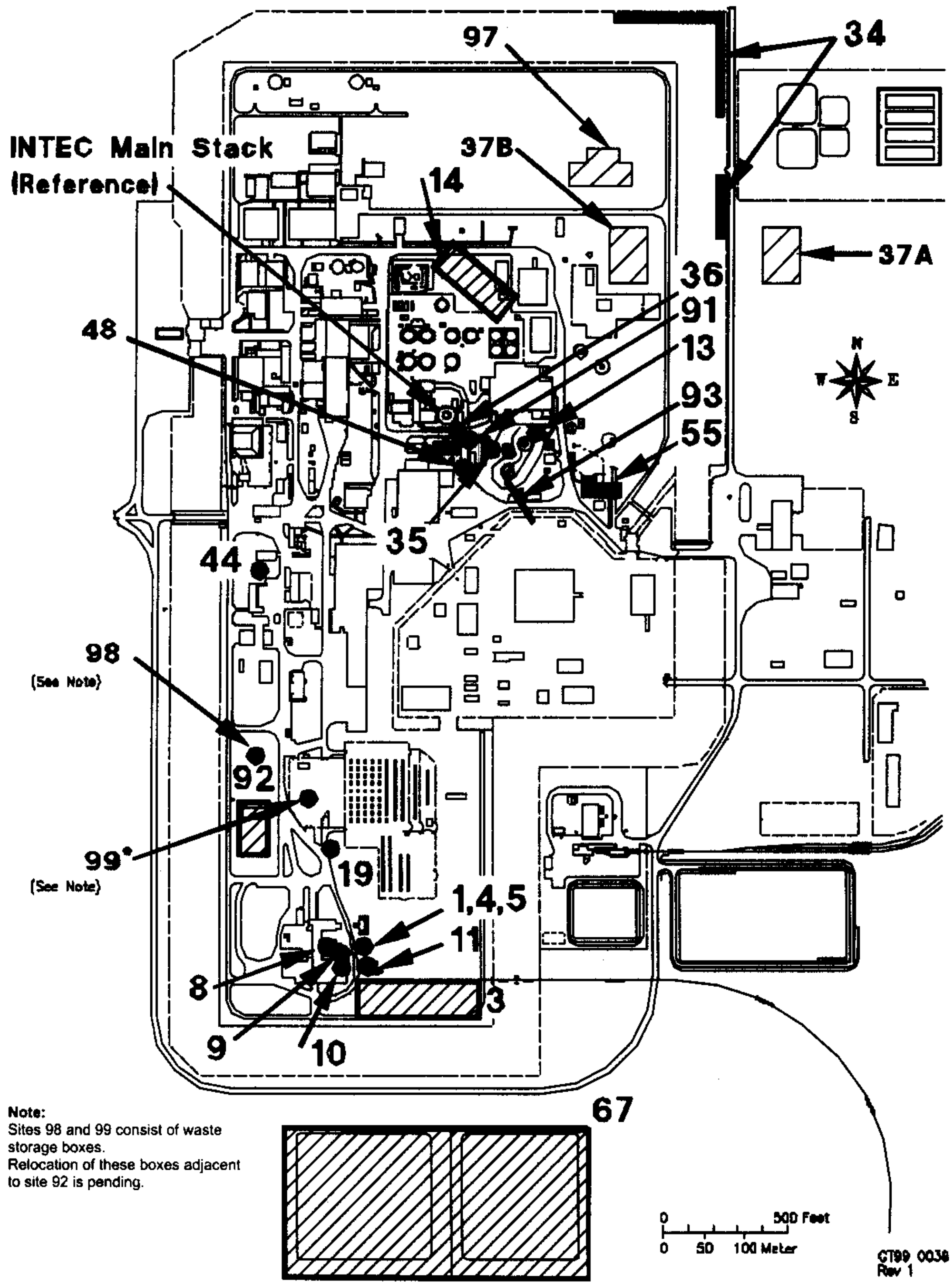


Figure 1-4. Group 2: Soils Under Building and Structures numbered release sites.



Note:
Sites 98 and 99 consist of waste storage boxes.
Relocation of these boxes adjacent to site 92 is pending.

Figure 1-5. Group 3: Other Surface Soils numbered release sites.

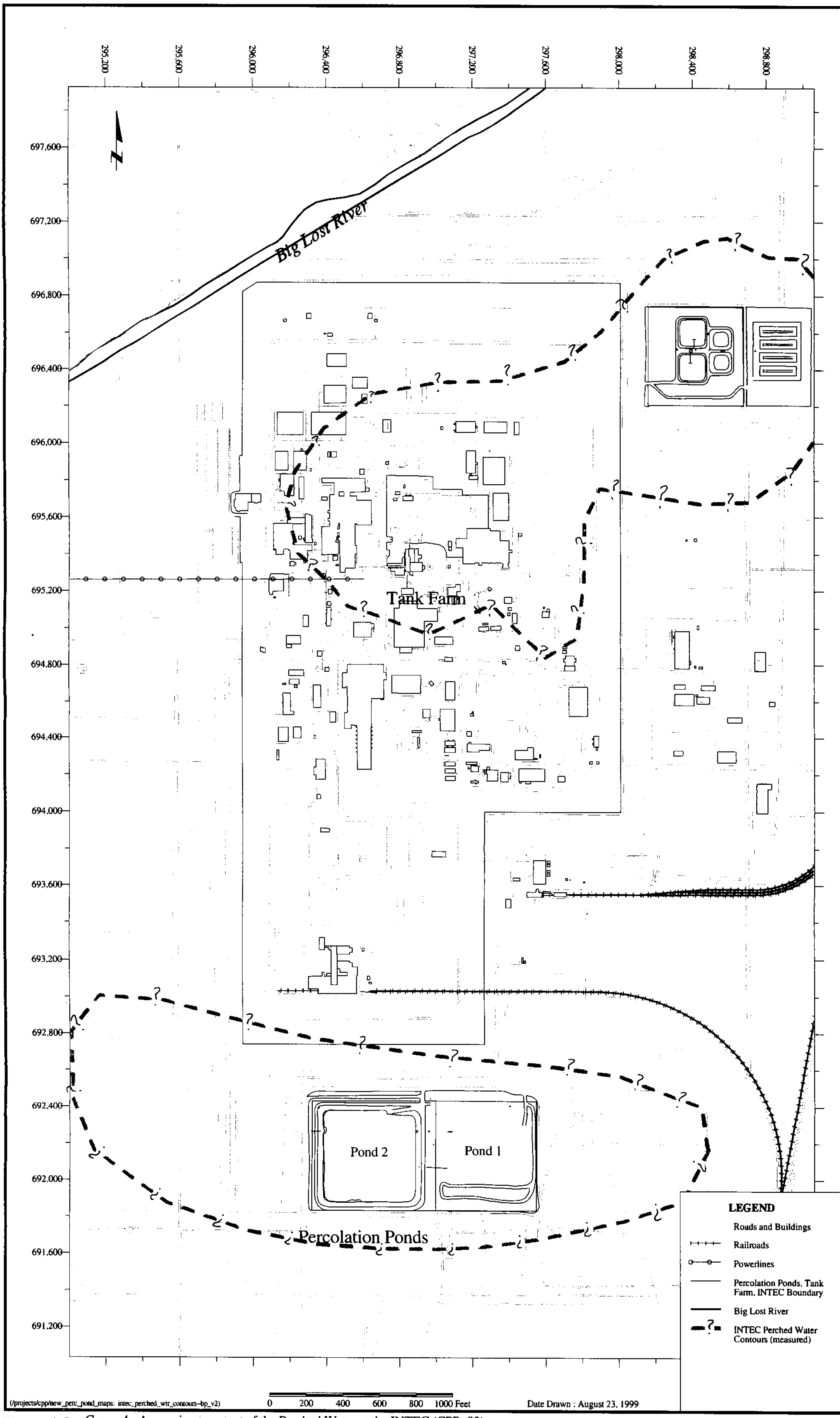


Figure 1-6. Group 4: Approximate extent of the Perched Water at the INTEC (CPP-83).

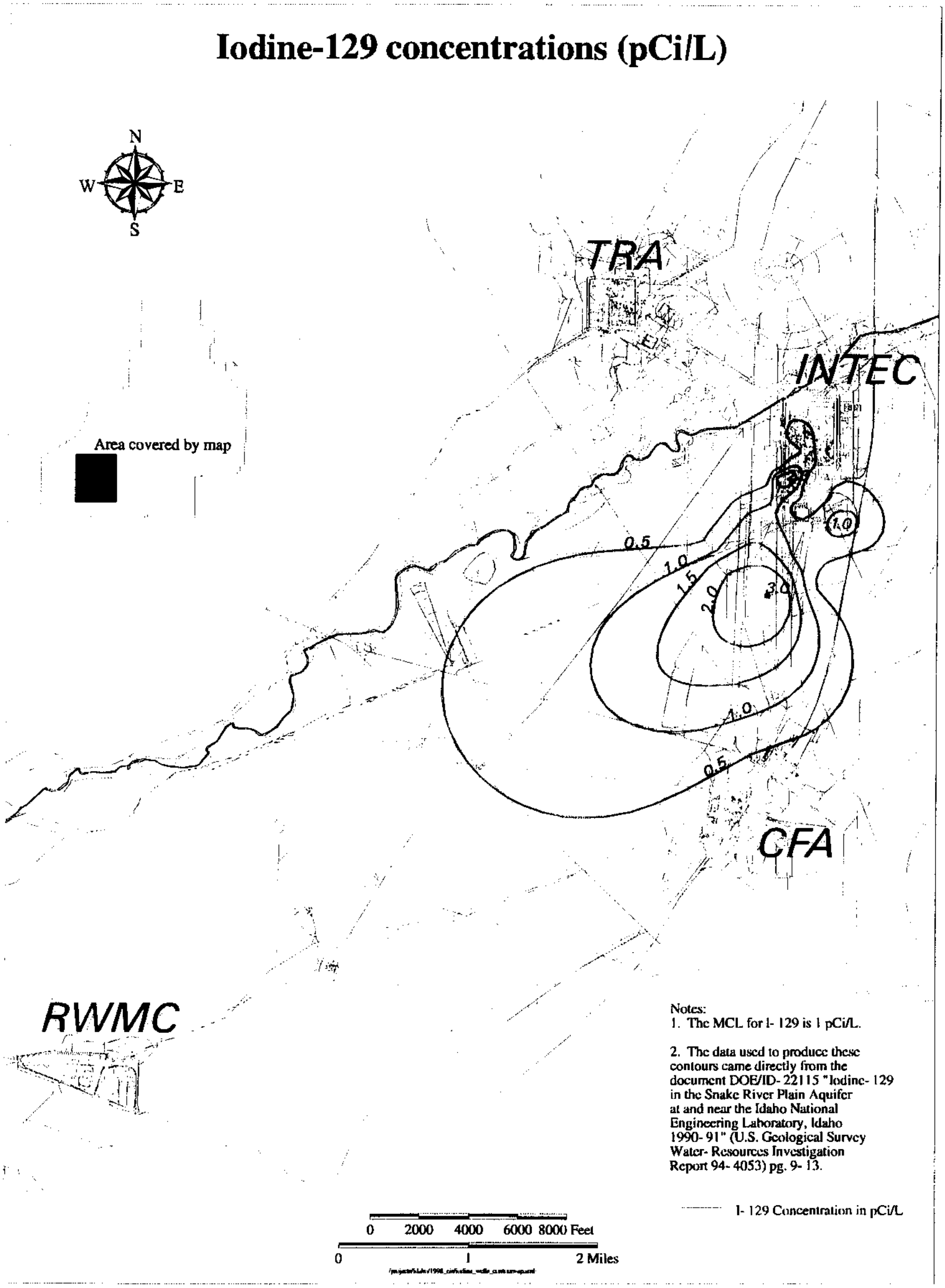


Figure 1-7. Group 5: Estimated extent of the I-129 plume in the Snake River Plain Aquifer (CPP-23).

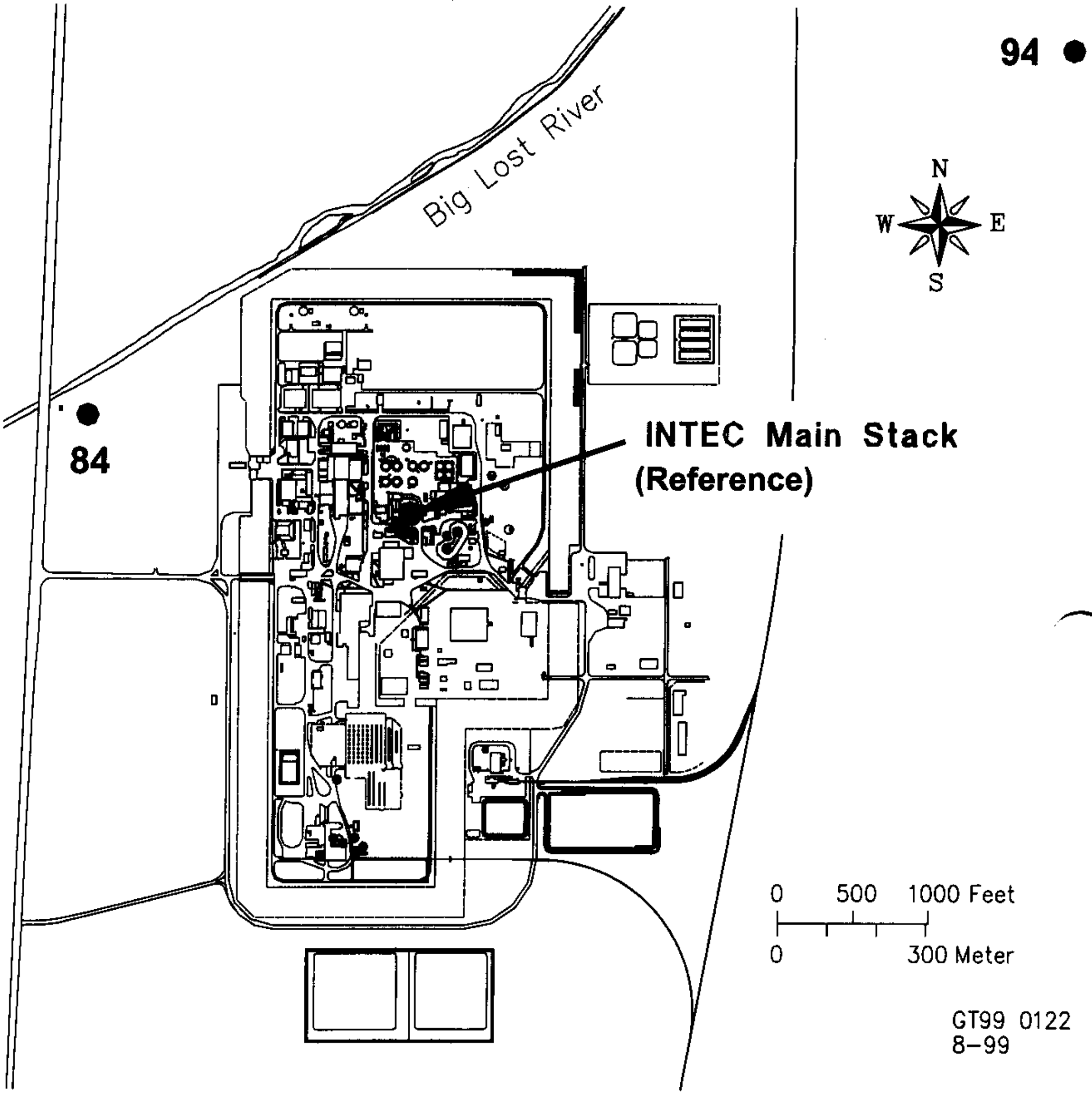


Figure 1-8. Group 6: Buried Gas Cylinders numbered release sites.

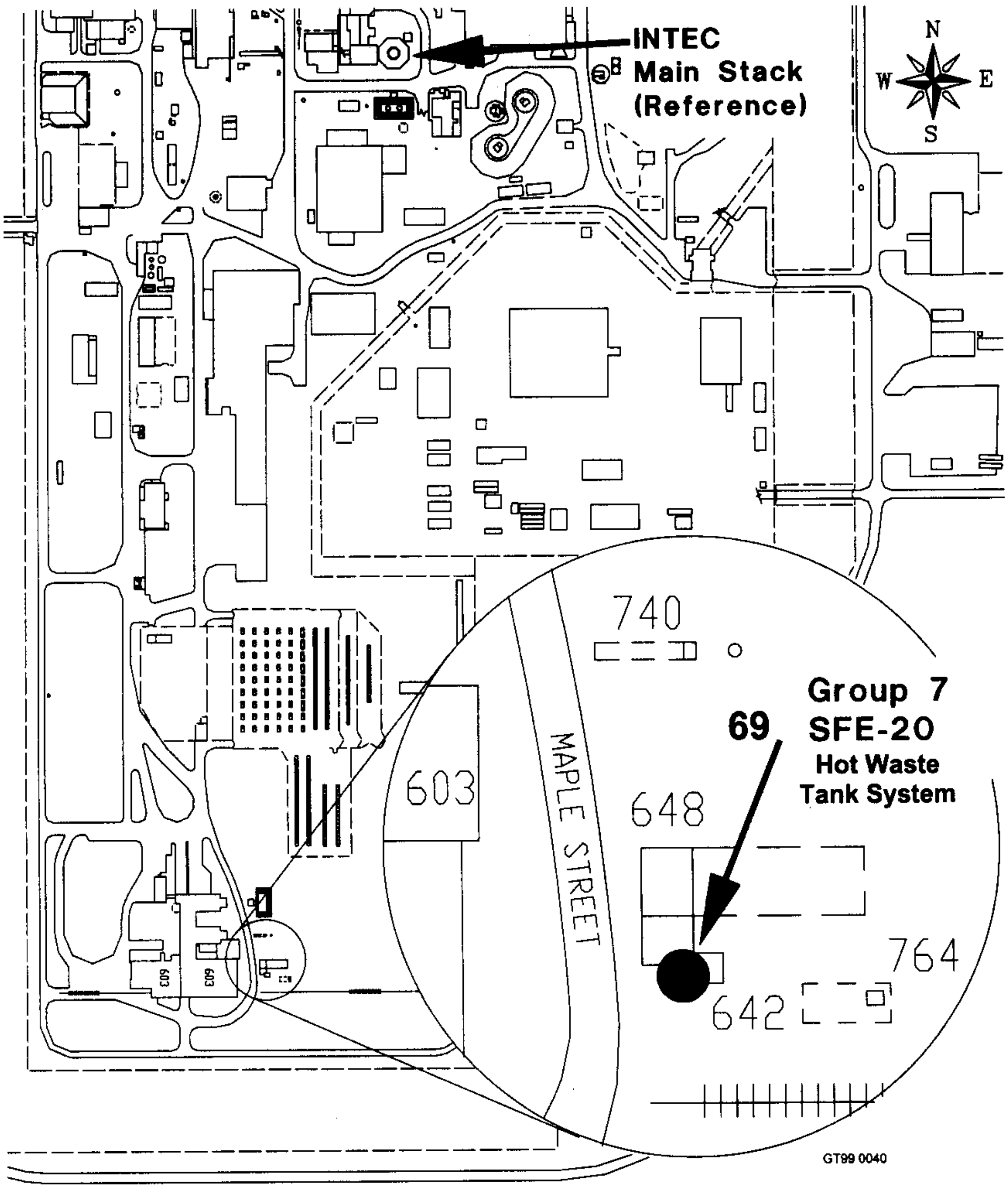


Figure 1-9. Group 7: SFE-20 Hot Waste Tank System numbered release sites.

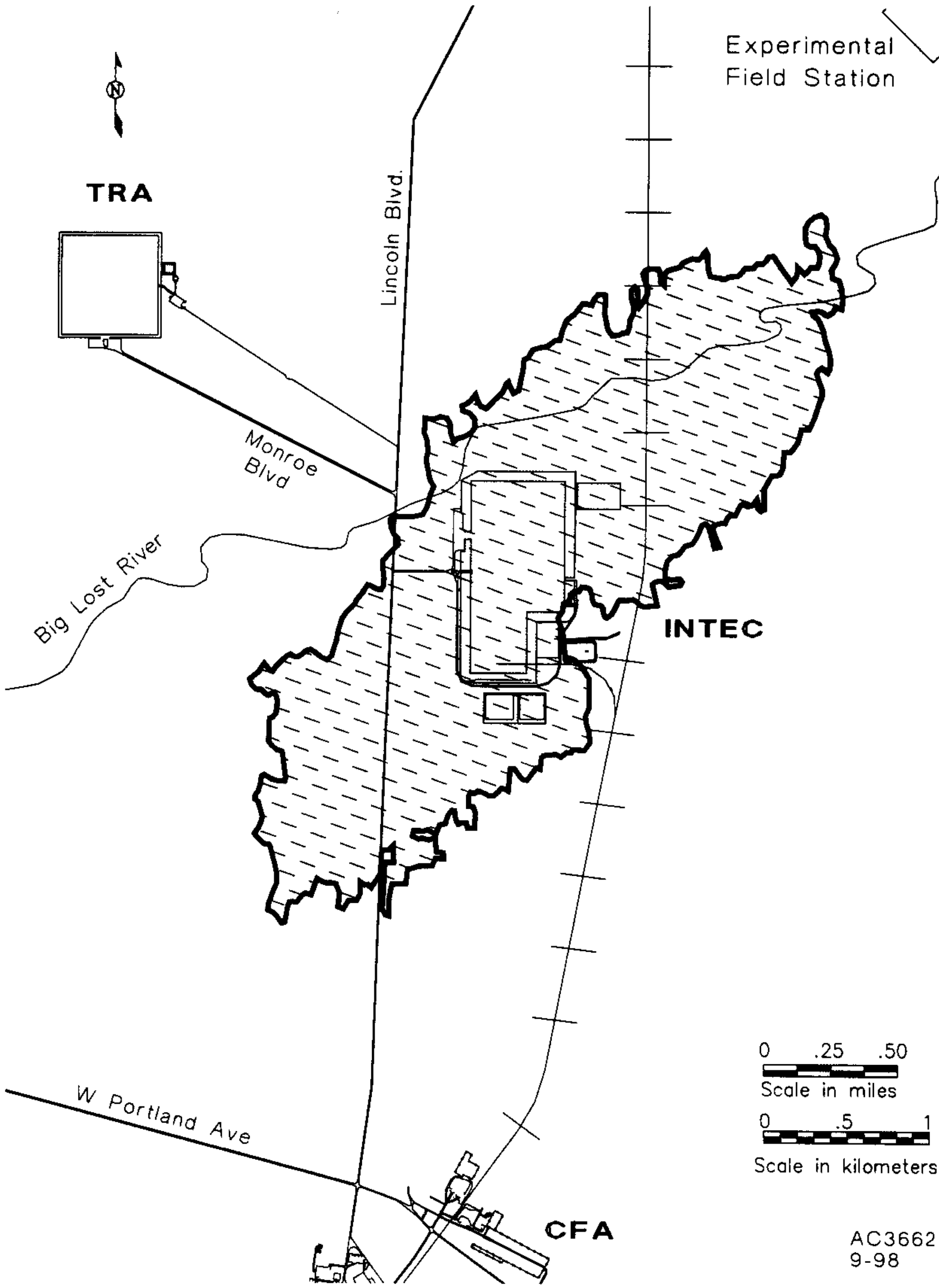


Figure 1-10. OU 3-13 area of contamination (CPP-95).

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

In 1989, the U.S. Environmental Protection Agency (EPA) proposed listing the INEEL on the National Priorities List (NPL) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The EPA issued a final ruling that listed the INEEL as a NPL site in November 1989 (54 Federal Register [FR] 29820). As a result, the INEEL became subject to the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Federal Facility Agreement and Consent Order (FFA/CO) and associated action plan (U.S. Department of Energy Idaho Operations Office [DOE-ID] 1991) 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 Action (HWMA). Under the FFA/CO, the INEEL was divided into 10 WAGs with the INTEC being listed as WAG 3

2.1 INTEC History

The INTEC began operating in 1952. The primary missions were reprocessing uranium for defense purposes, and research and storage of spent nuclear fuel (SNF). Irradiated defense nuclear fuels were reprocessed to recover unused uranium. In 1992, the reprocessing mission was phased out. The current INTEC mission is receiving and temporarily storing SNF and radioactive wastes for future disposition.

In addition to reprocessing spent nuclear fuel, INTEC stabilized high-level liquid waste (HLLW) from fuel reprocessing through a process known as calcination. That processing was conducted in a facility known as the Waste Calcining Facility (WCF) where radioactive HLLW was converted into a granular solid similar in consistency to sand. The liquid waste was drawn from underground storage tanks at the Tank Farm and sprayed into a vessel superheated by a mixture of kerosene and oxygen. Most of the liquid evaporates, while radioactive fission products adhere to the granular bed material in the vessel. The off-gases were treated and monitored before they were released to the environment. The calcined solids were transferred to large stainless steel structures encased in thick concrete vaults (bin sets). Calcining achieves an eight-to-one volume reduction from liquid to solid. Although processing of nuclear fuel was terminated in 1992, calcination of the HLLW continued until it was completed in February 1998. Sodium-bearing wastes are still being processed. The WCF was replaced in 1982, by another similar unit, the New Waste Calcining Facility (NWCF).

Releases of radioactive and hazardous materials to the environment have occurred over the past decades due to accidents and intentional operational releases, such as discharge of radionuclide-contaminated wastewater beneath the INTEC via the former injection well. Although these operational releases fail to meet contemporary standards, past intentional discharges did meet rules and standards of the times.

2.2 FFA/CO Implementation at INTEC

The action plan, presented in the FFA/CO, identified 83 release sites within WAG 3. Eighteen additional sites, including an area of windblown contamination, have subsequently been identified. These sites were combined into 13 OUs based on similar waste streams and projected remedial actions. A "No Action" determination was made for 10 sites based on summary assessments completed under the RCRA-based Consent Order and Compliance Agreement (COCA) before the FFA/CO was completed.

Following procedures identified in the action plan, preliminary scoping Track 1 and/or Track 2 investigations were completed for all sites except the 10 "No Action" sites and 4 new sites, CPP-96, -97, -98, and -99, recently added to the FFA/CO. A Track 1 investigation is a site evaluation using existing data to qualitatively determine if an actual or potential threat to human health or the environment exists. Track 1 investigations include very limited or no field characterization. A Track 2 investigation is a more detailed evaluation in which existing data and additional field characterization data are used to determine release site risks. Track 1 and Track 2 investigation identify if sufficient information exists to determine whether an unacceptable risk exists, and recommend steps to either: (a) conduct "No Action" or "No Further Action," (b) conduct an interim action or removal action, or (c) conduct additional investigation under the RI/FS process.

Site CPP-95, the Windblown Area for INTEC, was evaluated in the OU 10-06 RI/FS, which became an engineering evaluation/cost analysis (EE/CA) for a removal action (Lockheed Idaho Technologies Company [LITCO] 1995a)

Four new sites were recently added to OU 3-13. Site CPP-96, is considered part of the Group 1 Tank Farm soils and will be addressed by both the Tank Farm Interim Action under OU 3-13 and the Final Action selected under OU 3-14. Sites CPP-97, CPP-98, and CPP-99 will be remediated under the selected remedy for OU 3-13 Group 3. The Agencies have determined that six other sites, CPP-38, CPP-61, CPP-65, CPP-66, CPP-81, and CPP-82 are more appropriately dispositioned under other OUs or regulatory programs other than CERCLA. Site CPP-38 will be administered and remediated, if necessary, under the INEEL Asbestos Abatement Program. Site CPP-65 will be handled under the Idaho Wastewater Land Application Rules. Site CPP-66 may pose an ecological risk and was transferred to OU 10-04 for further evaluation and remedy selection, if necessary.

In 1997, a remedial investigation/baseline risk assessment (RI/BRA) (DOE-ID 1997b) was conducted to determine the comprehensive risks posed by past releases at WAG 3. That document addressed all known release sites including those previously subject to Track 1 or Track 2 investigations. The final RI/BRA was issued in November 1997. Concurrently, an FS (DOE-ID 1997a) was written to determine and evaluate feasible remedial alternatives. During preparation of the FS, the need for additional information was identified. Because of the cost of the remedies recommended at the INTEC, review by the National Remedy Review Board was required. The Board recommended modifications to the Feasibility Study concerning the Snake River Plain Aquifer alternatives and the cost estimates. To support the board's recommendations, an FS supplement was written and published in 1998 (DOE-ID 1998a).

Four CERCLA removal actions have been completed to date at WAG 3. The contents of a buried acid pipeline were removed during the summer of 1993 at Site CPP-81. The pipe was cleaned but was left in place. A second removal action was performed in the summer of 1993 on Calcine Bin Set 3 to prevent precipitation runoff from migrating through soil that was previously contaminated by a calcine spill. The contaminated soil was removed and disposed. A third removal action, completed in the fall of 1993, consisted of removing sludge from the Horizontal Filter Basin (CPP-740) and a dry well (CPP-301). The OU 3-13 RI/BRA (DOE-ID 1997b) was performed after these three removal actions, and therefore, the source removal was accounted for in the BRA. The fourth removal action, completed in the fall of 1998, consisted of consolidating four Cs-137 contaminated soil stockpiles from INTEC into the Test Reactor Area (TRA) Warm Waste Pond (WWP) 1957 Cell. The stockpiles identified as Acid Recycle, New Control Room, Electrical Utility System Upgrade, and Irradiated Fuel Storage Facility, all contained low activity radionuclide-contaminated soil.

Four polychlorinated biphenyl (PCB) sites had undergone removal actions prior to the signing of the FFA/CO. These sites CPP-49, -50, -51, and -61 comprised OU 3-01. The sites were evaluated in a

Track 1 (Westinghouse Idaho Nuclear Company, Inc. [WINCO] 1992a) and were all determined to require "No Further Action" on the basis of available clean up and sampling information. In this ROD, the Agencies have determined that additional information is needed to make a final decision for site CPP-61 and have transferred it to OU 3-14 for further evaluation.

2.3 Other Regulatory Programs at INTEC

In 1992, the State of Idaho and DOE-ID entered into a Consent Order to resolve alleged violations contained in a Notice of Noncompliance issued in 1990 by the EPA. The Consent Order was modified in 1994 and again in 1998. The second modification,[a] which supercedes the first modification, stipulated that by June 30, 2003, the DOE must cease use of high-level waste Tanks WM-182 through WM-186; ceasing use means emptying the tanks to the heels. However, Tank WM-185 could be used as emergency storage until tank closure or until sufficient volume in other tanks became available. In addition, the second Consent Order modification stipulated that on or before December 31, 2012, the DOE must permanently cease use of the six other tanks known as WM-180, WM-181, WM-187, WM-188, WM-189, and WM-190 and their associated vaults. A closure plan must be submitted by December 31, 2000 for the first tank.

In 1995, the State of Idaho and DOE signed a settlement agreement that would guide waste storage and treatment at INTEC. The agreement is commonly known as the Batt Agreement. Among many other requirements, the Batt Agreement stipulated the following:

- The DOE shall complete the process of calcining all remaining nonsodium-bearing HLLW currently located at INEEL by June 30, 1998.
- The DOE shall treat all high level waste (HLW) currently at the INEEL so that it is ready for disposal outside of Idaho by a target date of 2035.
- The DOE shall commence negotiating a plan and schedule with the State of Idaho for calcined waste treatment (into a form suitable for transport to a permanent repository or interim storage) by December 31, 1999.
- The DOE shall commence calcination of sodium-bearing waste by June 1, 2001.
- The DOE shall complete calcination of sodium-bearing waste by December 31, 2012.
- The DOE shall submit to the State of Idaho an application for a RCRA Part-B permit by December 1, 2012 for the treatment of calcined waste at INEEL into a form suitable for transport to a permanent repository or interim storage.
- The DOE shall operate the HLLW evaporator as to reduce Tank Farm volumes by no less than 1,249,000 L (330,000 gal) by December 31, 1997. After December 31, 1997, efforts will continue to reduce the remaining volume of the Tank Farm liquid waste by operation of the HLLW evaporator.

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a. Letter from the State of Idaho's Brian R. Monson to Don Rasch, DOE-ID, on June 12, 1998. Attached was the "Second Modification to Consent Order," Idaho Code 39-4413. (No subject line or number were provided on the letter.)

- The DOE agrees to treat spent fuel, HLW, and transuranic (TRU) wastes in Idaho requiring treatment so as to permit ultimate disposal outside the State of Idaho.

Several RCRA-regulated units operate at the INTEC. Currently, the INTEC Process Equipment Waste (PEW) Evaporators, Tank Farm, NWCF, and Calcine Storage Facility operate under RCRA interim status. A RCRA Part-B permit application will be submitted to the Idaho Division of Environmental Quality (DEQ) at a future date. The Percolation Ponds 1 and 2 were initially under the RCRA interim status permit but were RCRA-closed in 1995. The ponds are currently operated under a wastewater land application permit issued by the State of Idaho. The DEQ has agreed that these ponds have met clean closure requirements. The radionuclide contaminants in the pond sediments and potential subsurface contamination were evaluated in the RI/BRA as Site CPP-67 in OU 3-13.[a]

The NWCF is a facility that converts radioactive liquid waste solutions into a granular solid calcine material. Liquid wastes are evaporated in a fluidized bed allowing the dissolved metals and fission products to be converted to salts and oxides which are subsequently stored in the calcine bin-sets. The NWCF operates under a Permit to Construct issued by the State of Idaho and Federal National Emission Standards for Hazardous Air Pollutants (NESHAPs) administered by EPA and the state of Idaho. Although the EPA has proposed to revise air emission and operational requirements for hazardous waste incinerators (EPA 1997), those regulations have not yet been promulgated.

By June 1, 2000, the DOE must also decide if the NWCF will be closed or continue to be operated. If the DOE chooses to close the NWCF, a closure plan must be submitted by June 1 + 180 days. If DOE chooses to continue NWCF operations, DOE must submit a schedule for submission of a permit application by July 1, 2000.

The PEW evaporator system separates liquid radioactive waste into two fractions; one fraction is currently directed to the HLLW Tank Farm and the other fraction is directed to the Liquid Effluent Treatment and Disposal Facility. The PEW evaporator is included in the RCRA interim status document (DOE-ID 1997c), which includes a closure and post-closure plan that defines the closure and post-closure requirements and performance standards.

The WCF was taken out of service in 1981 after 18 years of operation. The WCF contains six units that are included in the INEEL RCRA Part-A permit application and are subject to the closure requirements for interim status treatment, storage, and disposal facilities (TSDFs). These units include four storage vessels, the WCF evaporator, and the high-efficiency particulate air (HEPA) filter storage area. Surface and subsurface releases of radionuclide-contaminated solutions from the WCF are addressed in the comprehensive OU 3-13 FS (DOE-ID 1997a), the Proposed Plan (DOE-ID 1998b), and this ROD. The WCF is not included in the FFA/CO and therefore, the disposition of the six RCRA units and ancillary equipment will be performed in accordance with the WCF RCRA closure plan, which calls for closure of the WCF as a landfill with a RCRA-compliant cap. The WCF RCRA closure plan was approved in August 1997. The closure consists of flushing the lines, isolating the structure, and grouting the six RCRA units in place, followed by collapsing the aboveground structures into the WCF lower levels and filling voids with concrete to act as a structural support for the cap. A concrete cap extending approximately 1.5 m (5 ft) beyond the WCF perimeter has been constructed. Final closure construction is expected to be completed by September 1999.

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b. Letter from the State of Idaho's Orville D. Green to Don W. Rasch, DOE-ID, on February 13, 1995. Attached to the letter was the "State of Idaho Permit to Construct an Air Pollution Emitting Source," Permit Number 023-00001. (INEL-ICPP Permit to Construct Amendment Request.)

On October 15, 1995, the State of Idaho, DOE, and U.S. Navy agreed that the INTEC HLLW evaporator would continue to operate and would reduce the total liquid waste volume by at least 1,249,000 L (330,000 gal) by December 31, 1997. It was also agreed that the DOE would finish calcining all nonsodium- and sodium-bearing wastes by June 30, 1998 and December 31, 2012, respectively. All nonsodium-bearing waste has been processed.

The environmental impacts of disposition of the HLLW and calcined solids stored at INTEC will be addressed in the Idaho High Level Waste and Facilities Disposition Environmental Impact Statement (Idaho HLW & Facilities Disposition [FD] Environmental Impact Statement [EIS]). In accordance with the requirements of the National Environmental Policy Act (NEPA), the Idaho HLW & FD EIS is being prepared to evaluate potential alternatives to disposition the HLW stored in the Tank Farm and elsewhere at INTEC. Potential alternatives to disposition of facilities associated with HLW will also be included in the Idaho HLW & FD EIS.

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

In accordance with CERCLA §113(k)(2)(B)(i–v) and §117, a series of opportunities for public information and participation in the RI/FS and decision process for WAG 3 was provided from October 1994 through February 1999. The opportunities to obtain information and provide input included a "kick-off" fact sheet, which briefly discussed the status of the RI/FS, numerous *INEEL Reporter* newsletter articles (a publication of the INEEL's Environmental Restoration Program), four Citizens' Guide supplemental updates, five "update" fact sheets, a Proposed Plan, briefings and presentations to interested groups, and public meetings.

In October 1994, a "kick-off" fact sheet concerning the WAG 3 RI/FS was sent to about 6,200 individuals of the general public and to 340 INEEL employees on the Community Relations Plan mailing list. Included in the fact sheet was a postage-paid return mailer comment form. Comments were received from four members of the public. The comments were evaluated and considered in the preparation of the project work plan. This fact sheet also offered technical briefings to those interested in the WAG 3 comprehensive investigation. It was the initial opportunity for the public to be involved in determining how the investigation would be conducted. No one requested a briefing at the time, but briefings were held later in the investigation process.

The INTEC WAG 3 investigation was discussed during September and October 1997 media briefings with reporters from Idaho Falls, Pocatello, Twin Falls, and Boise. During these briefings, representatives from the DOE and the INEEL discussed the project and answered questions. Newspaper articles were generated as a result of these briefings and a story was distributed by the *Associated Press.* The investigation was also highlighted in two issues of a national environmental restoration newsletter and on an Idaho Falls radio talk show.

Additionally, two "update fact sheets" were distributed to approximately 700 citizens on the INEEL Community Relations Plan mailing list. The first update fact sheet was distributed in November 1997 and the second in September 1998. The purpose of these documents was to keep citizens appraised of developments during the RI/FS, to include a schedule of the investigation, and to announce the approximate dates when public meetings would take place. These fact sheets also offered technical briefings to those interested in the WAG 3 investigation.

Regular reports concerning the status of the project were included in bimonthly issues of the *INEEL Reporter* and mailed to those on the mailing list. Reports also appeared in four issues of a *Citizens' Guide to Environmental Restoration at the INEEL* (a supplement to the *INEEL Reporter*) in early 1995, 1996, 1997, and 1998.

The DOE-ID gave several briefings on the WAG 3 investigation to the Citizens' Advisory Board—INEEL. The advisory board is a group of 15 individuals, representing the citizens of Idaho, who make recommendations to DOE, EPA, and the State of Idaho regarding environmental restoration activities at the INEEL. On November 18, 1998, the board met to finalize and submit their formal recommendations on the Proposed Plan to DOE.

Briefings were also held in 1998 with members of two environmental organizations, the Shoshone-Bannock (ShoBan) tribes, an economic development group, INEEL employees, several Idaho radio stations and newspapers, national publications, and four Idaho television stations.

Personal calls were made to stakeholders in the Pocatello and Moscow areas the week of November 1, 1998 to inform them of the upcoming public meetings and to see if a briefing was desired.

As a result, public meetings were held with the Shoshone-Bannock tribes the morning of November 16, 1998. Meetings were also held with stakeholder groups in Idaho Falls on the afternoon of November 16, Twin Falls on November 17, Boise on November 18, and Moscow on November 19. A meeting was held with University of Idaho students in Moscow on November 19, 1998.

During the week of October 18, 1998, DOE-ID issued a news release to more than 100 media contacts concerning the beginning of a 30-day public comment period pertaining to the WAG 3 Proposed Plan. Although the period began on October 23, 1998, it was automatically extended by the Agencies for an additional 30 days in anticipation of a large amount of public interest. The initial comment period ended on December 22, 1998, but at the request of United States Congresswoman Chenoweth (Idaho District #1), the comment period was extended until February 12, 1999. As a result of several news releases, a short note was placed in community calendar sections of newspapers and in public service announcements on radio stations. This note gave notice to the public that supportive WAG 3 investigation documents were available in the Administrative Record of the INEEL Information Repositories located in the DOE Public Reading Room at the INEEL Technical Library in Idaho Falls, the Albertson Library on the campus of Boise State University, and the University of Idaho Library in Moscow.

Display advertisements announcing the availability of the Proposed Plan, the locations of public meetings, and the comment period extension, appeared in six regional newspapers during the week of October 18, 1998 located in Idaho Falls, Boise, Moscow, Fort Hall, Pocatello, and Twin Falls. Large display advertisements appeared in the following newspapers: *Post Register* (Idaho Falls), *Sho-Ban News* (Fort Hall), *Idaho State Journal* (Pocatello), *Times News* (Twin Falls), *Idaho Statesman* (Boise), and *Daily News* (Moscow). A follow-up advertisement ran in newspapers approximately 2 days before the public meetings in Idaho Falls, Twin Falls, Boise, and Moscow. Additionally, a post card was mailed to about 6,200 citizens on the INEEL mailing list informing them of the availability of the Proposed Plan, comment period, and upcoming public meetings. A note was also sent to all INEEL employees informing them of the same.

Copies of the Proposed Plan were mailed to about 700 members of the public on the INEEL Community Relations Plan mailing list the week of October 18, 1998, urging citizens to comment on the plan and to attend public meetings. Public meetings were held in Idaho Falls on November 16, Twin Falls on November 17, Boise on November 18, and Moscow on November 19, 1998. Prior to public meetings in each location, an availability session took place from 4 to 7 p.m. The public meetings began at 7 p.m.

For the general public, participation in the decision-making process included receiving and reviewing the Proposed Plan, attending the availability sessions before the public meetings to informally discuss the issues, with the Agencies remedial project managers and INEEL environmental restoration technical personnel, and submitting verbal and written comments to the Agencies during the public comment period.

Written comment forms (including a postage-paid business-reply form) were available to those attending the public meetings. The forms were used to submit written comments either at the meeting or by mail. The reverse side of the meeting agenda contained a form for the public to use in evaluating the effectiveness of the meetings. A court reporter was present at each meeting to record transcripts of discussions and public comments. The meeting transcripts were placed in the Administrative Record for WAG 3 OU 3-13 in three INEEL Information Repositories. For those who could not attend the public meetings, but wanted to make formal written comments, a postage-paid written comment form was attached to the Proposed Plan.

A total of 55 people not associated with the project attended the public meetings. All comments received on the Proposed Plan were considered during the development of this ROD. The decisions for the actions selected in this ROD are based on the information in the Administrative Record for this OU.

The Idaho HLW and FD EIS held scoping workshops in Idaho Falls on October 16, 1997 and in Boise on October 23, 1997. The public revised issues of coordination WAG 3 during these workshops. The scoping activity report (DOE-ID 1998c) provides references to these concerns.

A Responsiveness Summary has been prepared as part of this ROD and is presented in Appendix A. All formal verbal comments presented at the public meetings and all written comments received are also included in Appendix A and in the Administrative Record for the ROD. Those comments are annotated to cross reference the comment to the appropriate response in the Responsiveness Summary.

An index of the Administrative Record for OU 3-13 is included as part of this ROD in Appendix B. This index shows all of the documents that are contained in the Administrative Record for OU 3-13. As the ROD for OU 3-13 is making the decision for the disposition of the sites contained in OU 3-00 (FFA/CO "No Action" Sites) through OU 3-13, the index and Administrative Record includes these other OUs. The decisions made in this ROD are based on the information contained in the Administrative Record.

4. SCOPE AND ROLE OF OPERABLE UNITS AND RESPONSE ACTIONS

This comprehensive ROD addresses the known contaminant releases at WAG 3 resulting from SNF reprocessing, storage and research, and ancillary activities except for those releases associated with the Tank Farm. Closure of RCRA-regulated units and impacts associated with the closed RCRA units also is not included in this ROD. However, post-closure monitoring of closed units, such as the WCF, and past releases of hazardous substances from RCRA-regulated units are addressed. Similarly, closure or decontamination and dismantlement (D&D) of HLW units is not included, but past releases of hazardous substances from these units are addressed.

The INTEC is one of 10 WAGs at the INEEL. Each WAG contains a number of contaminant release sites grouped into OUs based on similarity of waste streams and projected remedial actions. Fourteen OUs have been defined for WAG 3.[c] OU 3-01 through OU 3-13 are addressed in this ROD. OU 3-14 will address the final action for the Tank Farm Soils and SRPA inside the current INTEC security fence. The OU 3-13 RI/BRA determined that 51 release sites, including the perched water and the SRPA pose risks or threats to human health or the environment greater than allowable levels. Four new sites, recently added to OU 3-13, were not evaluated in the RI/BRA but are presumed to pose a risk or threat because of their origin and similar contaminants. During the OU 3-13 FS evaluation, the release sites and OUs were further categorized into seven groups relating to media, similar contamination, or geographic proximity. These groups are discussed and defined in the following sections. Table 4-1 lists each WAG 3 site, site description, and site grouping. The DOE, EPA and the IDHW have selected "No Action," "No Further Action,"or a remedial alternative for each of the release site groups and the individual sites listed in the table, based on the comparative analyses of alternatives presented in the WAG 3 comprehensive RI/FS and other documents contained in the Administrative Record. In addition, four new sites recently added to OU 3-13 and their planned disposition are discussed in Section 4.9 and in Table 4-1. Section 4.10 describes six other sites that will be dispositioned under another WAG or other regulatory programs, but will be reviewed by the CERLCA program during the 5-year review process.

4.1 Tank Farm Soils (Group 1)

The Tank Farm Soils (Figure 1-3) previously consisted of sites in OUs 3-06, 3-07, 3-08, 3-11, and 3-13. The sites are located in the area of the Tank Farm (Sites CPP-16, -20, -24, -25, -26, -28, -30, -31, -32, and -79) and adjacent to the PEW evaporator building (Sites CPP-15, -27, -33, and -58) are consolidated into Site-96. These sites consist of soil contamination that resulted from spills and pipeline leaks of radioactive liquids from plant liquid transfer operations. Distributed throughout the Tank Farm soils outside of the previously identified release sites are low concentrations of contaminants at varying locations and depths. New Site CPP-96 is a consolidation of all of the previously identified Tank Farm Soils sites and the intervening interstitial soils within the Site CPP-96 boundary. Contamination resulting from releases from waste transfer lines and valve boxes in the Tank Farm area currently account for approximately 95% of the known contaminant inventory, in total curies of radioactive material,

c. In addition, 10 "No Action Sites" were identified in the FFA/CO but were not given an operable unit number. See Section 4.8 for additional discussion.

Table 4-1. WAG 3 CPP release sites and site grouping.

Site	Operable Unit	Description	Site Group	OU 3-13 ROD Decision
CPP-01	OU 3-09	Concrete settling basins and dry wells east of CPP-603	3	RD/RA
CPP-02	OU 3-09	French drain west of CPP-603	2	RD/RA
CPP-03	OU 3-09	Temporary storage area southeast of CPP-603	3	RD/RA
CPP-04	OU 3-09	Contaminated soil area around CPP-603 settling tank	3	RD/RA
CPP-05	OU 3-09	Contaminated soil around CPP-603 settling basin	3	RD/RA
CPP-06	OU 3-09	Trench east of CPP-603 fuel storage basin	none	"No Further Action"
CPP-07	OU 3-02	Soil contamination northwest of CPP-642	none	"No Action"
CPP-08	OU 3-09	CPP-603 basin filter system line failure	3	RD/RA
CPP-09	OU 3-09	Soil contamination at northeast corner of CPP-603 south basin	3	RD/RA
CPP-10	OU 3-09	CPP-603 plastic pipeline break	3	RD/RA
CPP-11	OU 3-09	CPP-603 sludge and water release	3	RD/RA
CPP-12	OU 3-02	Contaminated paint chips and pad south of CPP-603	none	"No Action"
CPP-13	OU 3-08	Pressurization of solid storage cyclone northeast of CPP-633	3	RD/RA
CPP-14	OU 3-05	Old Sewage Treatment Plant west of CPP-664	3	RD/RA
CPP-15	OU 3-08	Solvent burner east of CPP-605	1	RD/RA
CPP-16	OU 3-07	Contaminated soil from leak in line from CPP WM-181 to PEW Evaporator	1	RD/RA-OU 3-14[a]
CPP-17	OU 3-09	Soil storage area south of CPP Peach Bottom fuel storage area	none	"No Further Action"
CPP-18	OU 3-02	Gas storage building, current location of CPP-668	none	"No Action"
CPP-19	OU 3-09	CPP-603 to CPP-604 line leak	3	RD/RA
CPP-20	OU 3-07	CPP-604 radioactive waste unloading area	1	RD/RA
CPP-21	OU 3-02	Solid waste storage bin south of CPP-601	none	"No Action"
CPP-22	OU 3-09	Particulate air release south of CPP-603	none	"No Further Action"
CPP-23	OU 3-02	CPP injection well (MAH-FE-PL-304)	5	RD/RA[b]
CPP-24	OU 3-07	CPP Tank Farm area bucket spill	1	RD/RA-OU 3-14[a]

Table 4-1. (continued).

Site	Operable Unit	Description	Site Group	OU 3-13 ROD Decision
CPP-25	OU 3-07	Contaminated soil in the Tank Farm area north of CPP-604	1	RD/RA
CPP-26	OU 3-07	Contaminated soil in the Tank Farm area from steam flushing	1	RD/RA
CPP-27	OU 3-08	Contaminated soil in the Tank Farm area east of CPP-604	1	RD/RA
CPP-28	OU 3-07	Contaminated soil in the Tank Farm area south of WM-181 by Valve Box A-6	1	RD/RA
CPP-29	OU 3-08	Contaminated soil north and west of the main stack (CPP-708)	none	"No Action"
CPP-30	OU 3-07	Contaminated soil in the Tank Farm area near Valve Box B-9	1	RD/RA-OU 3-14[a]
CPP-31	OU 3-07	Contaminated soil in the Tank Farm area south of Tank WM-183	1	RD/RA
CPP-32	OU 3-07	Contaminated soil in the Tank Farm area southwest and northwest of Valve Box B-4	1	RD/RA
CPP-33	OU 3-06	Contaminated soil in the Tank Farm area near WL-102, northeast of CPP-604	1	RD/RA
CPP-34	OU 3-06	Soil storage area (disposed trenches) in the northeast corner of the ICPP	3	RD/RA
CPP-35	OU 3-08	CPP-633 decontamination spill	3	RD/RA
CPP-36	OU 3-08	Transfer line leak from CPP-633 to WL-102	3	RD/RA
CPP-37a	OU 3-02	Gravel pit—outside INTEC fence	3	RD/RA
CPP-37b	OU 3-02	Gravel pit and debris landfill Inside INTEC fence	3	RD/RA
CPP-38	OU 3-04	Friable transite on CPP-601 through -606, -640, -644, and –648[c]	Closure under another program	
CPP-39	OU 3-13	CPP HF storage tank (YDB-105) and dry well. OU 3-13 no Track 1 or Track 2.	none	"No Action"
CPP-40	OU 3-06	Lime pit at the base of the CPP-601 berm and french drain	none	"No Action"
CPP-41a	OU 3-02	Fire training pits between CPP-666 and CPP-663, under asphalt	2	RD/RA
CPP-41b	OU 3-02	Fire training pits between CPP-666 and CPP-663	none	"No Action"
CPP-42	OU 3-10	Drainage ditch west of CPP-637	none	"No Action"

Table 4-1. (continued).

Site	Operable Unit	Description	Site Group	OU 3-13 ROD Decision
CPP-43	none	Grease pit south of CPP-637	none	"No Action" per FFA/CO
CPP-44	OU 3-10	Grease pit south of CPP-608	3	RD/RA
CPP-45	OU 3-11	CPP-621 chemical storage area spills	none	"No Action"
CPP-46	OU 3-10	CPP-637 courtyard pilot plant release	none	"No Action"
CPP-47	OU 3-06	Pilot plant storage area west of CPP-620	none	"No Action"
CPP-48	OU 3-13	French drain south of CPP-633	3	RD/RA
CPP-49	OU 3-01	PCB transformer yard (CPP-705)	none	"No Action"
CPP-50	OU 3-01	PCB transformer yard (CPP-731)	none	"No Action"
CPP-51	OU 3-01	PCB staging area west of CPP-660	none	"No Action"
CPP-52	none	Pickling shed east of CPP-631	none	"No Action" per FFA/CO
CPP-53	OU 3-02	Paint and paint solvent area south of CPP-697	none	"No Action"
CPP-54	OU 3-02	Drum storage area west of CPP-660	none	"No Action"
CPP-55	OU 3-02	Mercury-contaminated area south of CPP T-15	3	RD/RA
CPP-56	OU 3-10	Nitric acid contamination south of CPP-734	none	"No Action"
CPP-57	OU 3-02	Sulfuric acid spills east of CPP-606	none	"No Action"
CPP-58	OU 3-11	CPP PEW evaporator overhead pipeline spills	1	RD/RA
CPP-59	OU 3-02	Kerosene tank overflow west of CPP-633	none	"No Action"
CPP-60	OU 3-02	Paint shop at present location of CPP-645	2	RD/RA
CPP-61	OU 3-01	PCB spill in CPP-718 transformer yard	none	OU 3-14 RI/FS[d]
CPP-62	OU 3-02	Mercury-contaminated area near CPP TB-4	none	"No Action"
CPP-63	OU 3-02	Hexone spill by CPP-710	none	"No Action"
CPP-64	OU 3-02	Hexone spill west of CPP-660	none	"No Action"
CPP-65	OU 3-02	CPP Sewage Treatment Plant lagoons	Closure under another program	
CPP-66	OU 3-02	CPP coal-fired steam generation facility Fly Ash Pit	WAG 10	RD/RA
CPP-67	OU 3-03	CPP Percolation Ponds #1 and #2	3	RD/RA
CPP-68	OU 3-02	Abandoned gasoline tank CPP VES-UTI-652 (North of Building 606)	2	RD/RA

Table 4-1. (continued).

Site	Operable Unit	Description	Site Group	OU 3-13 ROD Decision
CPP-69	OU 3-09	Abandoned liquid radioactive waste storage Tank CPP VES-SFE-20	7	RD/RA
CPP-70	none	Septic tank east of CPP-655	none	"No Action" per FFA/CO
CPP-71	none	Seepage pits west of CPP-656	none	"No Action" per FFA/CO
CPP-72	none	CPP-758 cesspool east of CPP-651	none	"No Action" per FFA/CO
CPP-73	none	Leaching cesspool east of CPP T-15	none	"No Action" per FFA/CO
CPP-74	none	Seepage pit and septic tank west of CPP-626	none	"No Action" per FFA/CO
CPP-75	none	Septic tank and cesspool west of CPP-603	none	"No Action" per FFA/CO
CPP-76	none	Septic tank and cesspool west of CPP-659	none	"No Action" per FFA/CO
CPP-77	none	Seepage pit and cesspool north of CPP-662	none	"No Action" per FFA/CO
CPP-78	OU 3-09	Contaminated soil west of CPP-693, east of dry fuel storage area	none	"No Action"
CPP-79	OU 3-07	Tank farm release near Valve Box A-2	1	RD/RA
CPP-80	OU 3-12	CPP-601 vent tunnel drain leak	2	RD/RA
CPP-81	OU 3-12	Abandoned CPP-637/CPP-601 VOG line	none	OU 3-14 RI/FS[d]
CPP-82	OU 3-12	Abandoned line (3.8 cm [1.5in.]) PLA-766 west of Beech Street	none	OU 3-14 RI/FS[d]
CPP-83	OU 3-08	The entire perched water system at the INTEC	4	RD/RA
CPP-84	OU 3-13	Gas canisters (buried gas cylinders)	6	RD/RA
CPP-85	OU 3-13	Waste Calcining Facility blower corridor	2	Part of WCF closure
CPP-86	OU 3-13	CPP-602 waste trench sump	2	RD/RA
CPP-87	OU 3-13	CPP-604 VOG blower cell sump and floor drain	2	RD/RA
CPP-88	OU 3-13	Radiologically contaminated soil	none	"No Further Action" - Conduct 5-year review
CPP-89	OU 3-13	CPP-604/-605 tunnel excavation	2	RD/RA
CPP-90	OU 3-13	CPP-709 ruthenium detection	none	"No Further Action" - Conduct 5-year review

Table 4-1. (continued).

Site	Operable Unit	Description	Site Group	OU 3-13 ROD Decision
CPP-91	OU 3-13	CPP-633 blower pit drain	3	RD/RA
CPP-92	OU 3-13	Soil boxes west of CPP-1617	3	RD/RA
CPP-93	OU 3-13	Simulated calcine disposal trench	3	RD/RA
CPP-94	OU 3-13	Gas canisters (buried gas cylinders)	6	RD/RA
CPP-95	OU 3-13	Airborne plume (also shown in 10-06)	None	"No Further Action" - Conduct 5-year review
CPP-96	OU 3-13	Tank Farm interstitial soils	1	RD/RA
CPP-97	OU 3-13	Tank Farm soil stockpile	3	RD/RA
CPP-98	OU 3-13	Tank Farm shoring boxes	3	RD/RA
CPP-99	OU 3-13	Boxed soil	3	RD/RA

a. No action sites within the Tank Farm are consolidated into Site CPP-96. Because the sites are within the Tank Farm they will be subject to the Group 1 Interim Action and to the OU 3-14 RI/FS.

b. CPP-23 is a source for OU 3-13 Group 5 aquifer contamination outside the INTCE fence. The source will be remediated under OU 3-14.

c. CPP-38 is asbestos on roofs and walls of buildings. The site will be closed under the INEEL Asbestos Abatement Program.

d. Site moved to the OU 3-14 RI/FS because not enough data is available to make a risk-based decision.

at the INTEC. No evidence has been found to indicate that any of the Tank Farm tanks have leaked. However, contaminants found in the interstitial soils are likely the result of accidental releases and leaks from process piping valve boxes or sumps, and cross-contamination from operations and maintenance excavations. Limited site investigations have been conducted at the Tank Farm sites because many of the spill areas are in operational and highly radioactive areas. The principle threats posed by contaminated Tank Farm soils are external exposure to radiation and leaching and transport of contaminants to the perched water or SRPA. SRPA groundwater contaminated by Tank Farm soils releases could be consumed by future groundwater users.

4.2 Soils Under Buildings and Structures (Group 2)

The Soils Under Buildings and Structures are comprised of release sites that occur beneath INTEC buildings or structures, and include Sites CPP-02, -41a, -60, -68, -80, -85, -86, -87, and -89 (Figure 1-4). These sites consist of soil contamination that resulted from past hazardous or radioactive liquid spills, leaks, and plant operations.

- Site CPP-02 is an old french drain that was abandoned and partially excavated in 1966 and is located beneath Building CPP-603.
- Site CPP-41a is an old fire-training pit that was covered by asphalt during construction of building CPP-633.
- Site CPP-60 is the soils that were beneath the former paintshop building. CPP-645 is now over this site.
- Site CPP-68 is the former location of an abandoned, 1,892 L (500 gal) underground gasoline storage tank.
- Site CPP-80 resulted from a hazardous, radioactive liquid condensate leak from the Building CPP-601 vent tunnel drain.
- Site CPP-85 is the WCF Blower Corridor. It has been closed in place as part of the WCF under an approved HWMA closure plan. The WCF will be included with the Group 2 Soils Under Buildings and Structures sites in the CERCLA 5-year reviews.
- Site CPP-86 is a waste trench that runs beneath CPP-602, which collects liquid waste for transfer to the PEW evaporator from various CPP-602 operations.
- Site CPP-87 is located beneath the vapor off-gas blower cell of Building CPP-604.
- Site CPP-89 is a tunnel excavation located beneath Buildings CPP-604 and -605.

Sites CPP-87 and CPP-89 are integrally related; the soil and contamination removed from CPP-87 is the same as that removed at CPP-89. Contaminated soils from the tunnel were partially excavated, boxed, and stored at the plant.

The major threats posed by Group 2 sites are external exposure to contaminants if the building or structure is removed and potential leaching and transport of soil contaminants to the perched water or SRPA. The existing building or structure currently provides an adequate radiation protection barrier and serves to limit infiltration into the contaminated soils. Group 2 soils are not considered "principal threat" wastes because the levels of radionuclides present have not been directly measured.

4.3 Other Surface Soils (Group 3)

The Other Surface Soils consist of release sites located in the following areas:

- Building CPP-603
  (Sites CPP-01, -03, -04, -05, -08, -09, -10, -11, and -19)

- Building CPP-633
  (Sites CPP-36 and -91)

- Calcined Solids Storage Bins
  (Sites CPP-13, -35, and -93)

- Disposal Trenches
  (Site CPP-34)

- Old Sewage Treatment Plant (STP)
  (Site CPP-14)

- Grease Pit
  (Site CPP-44)

- Near Building CPP-1619
  (Site CPP-55)

- Near temporary Building TB-1

- Percolation Ponds that are situated south of the INTEC fence
  (Site CPP-67).

In addition, Group 3, also includes Sites CPP-37a, CPP-37b, and CPP-48. Site CPP-37a is a former gravel pit located outside of the current INTEC security fence, that is used to collect storm water runoff from the Tank Farm. Site CPP-37b is a former gravel pit located inside the current INTEC security fence that was previously used for disposal of wastewaters from the old STP and subsequently used for disposal of construction debris. Site CPP-48 is an excess chemical dump tank located south of the old WCF (CPP-633) that was used as a french drain from 1975 to 1981. Figure 1-5 shows the location of the Group 3 sites. These sites generally consist of soil contamination that resulted from inadvertent spills and leaks of radioactive waste, decontamination solutions, spent fuel storage water, storage of radionuclide-contaminated equipment, and other plant-generated wastewaters. Group 3 also includes Site CPP-92, which consists of 648 boxes of radionuclide-contaminated soils that were generated from a variety of INTEC activities. In addition, the new sites similar to Group 3 (CPP-97, -98, and -99) discussed in Section 4.9, consist of soils and other materials will be remediated as Group 3 soils.

The results of the RI/BRA (DOE-ID 1997b) indicate that the major threat posed by the Group 3 sites is external exposure to radionuclides. Additionally, three sites (CPP-35, -36, and -91) pose a risk to the SRPA.

4.4 Perched Water (Group 4)

Perched Water (Site CPP-83) occurs at depths ranging between 30 and 128 m (100 and 420 ft) in the basalts and the sedimentary interbeds beneath INTEC. Figure 1-6 shows the approximate extent of the perched water at INTEC. Perched water consists of variably saturated groundwater zones above the regional SRPA. The perched water zones result from local recharge from precipitation infiltration, the Big Lost River, the INTEC percolation ponds, the sewage treatment ponds, lawn irrigation, and other miscellaneous INTEC water sources. Perched water flow is primarily vertical, although some lateral flow occurs, and ultimately recharges the SRPA. Perched water has been contaminated by leaching and downward transport of contaminants, primarily Sr-90 and tritium from the overlying surface soils, and from two instances in which the INTEC injection well (CPP-23) collapsed and service wastewater was released to the perched zones.

The perched water does not pose a direct human health threat because it is not currently used for consumption and, in the absence of man-made recharge (e.g. from the percolation ponds), the perched water zones are not sufficiently productive to sustain permanent residence. A future water supply well located in the perched water would not be capable of providing sufficient water for domestic purposes. However, perched water does pose a threat as a contaminant transport pathway to the SRPA. Contaminants already in the perched water are a source of future SRPA contamination. Consumption of contaminated water from the SRPA is covered under Group 5. The primary man-made source of perched water recharge is the percolation ponds.

4.5 Snake River Plain Aquifer (Group 5)

The SRPA underlies the ESRP and has been designated by the EPA as a sole source aquifer for the region. The basalts and sedimentary interbeds underlying INTEC, where continually saturated, are part of the SRPA. The aquifer lies at a depth of about 137 m (450 ft) beneath the site. Regional groundwater flow is southwest at average estimated velocities of 1.5 m/day (5 ft/day). The average groundwater flow velocity at the INTEC is estimated at 3 m/day (10 ft/day) due to local hydraulic conditions. Hydraulic characteristics of the aquifer differ considerably from place to place depending on the saturated thickness and the characteristics of the basalts and sedimentary interbeds. The source of contamination in the SRPA originates primarily from the injection well (CPP-23). However, contaminated soils and perched water are predicted to contribute to future SRPA contamination. I-129, Sr-90, and plutonium isotopes were determined to be the only contaminants that pose an unacceptable risk to a hypothetical future resident beyond the year 2095. The primary I-129 source was the former injection well. The primary Sr-90 source(s) were the former injection well and the Tank Farm soils. The plutonium isotopes are primarily sourced from the Tank Farm. Figure 1-7 shows the estimated extent of the I-129 plume, which currently exceeds 1 pCi/L, and contributes to an exceedance of the 4 millirem (mrem)/year beta-gamma emitting radionuclide maximum contaminant level (MCL) in the SRPA. The major human health threat posed by contaminated SRPA groundwater is exposure to radionuclides via ingestion by future groundwater users.

Due to the uncertainty associated with the contaminant source estimates and potential releases from the Tank Farm soils, the remedial measures taken for the SRPA under OU 3-13 are designated as an interim action. The actions selected for the SRPA outside the current INTEC security fence are final actions under this ROD. The evaluation and remedy selection for the SRPA inside the current INTEC security fence will occur under OU 3-14. The OU 3-14 decisions will also remediate, if necessary, residual contamination associated with the former injection well (CPP-23).

4.6 Buried Gas Cylinders (Group 6)

Sites CPP-84 and CPP-94 comprise the Buried Gas Cylinders group. Site CPP-84 is located outside the current INTEC security fence, east of Lincoln Boulevard and south of the Big Lost River (see Figure 1-8). The site consists of a buried trench where compressed gas cylinders were previously disposed. The cylinders at the burial site originated from INTEC and contain gases used for construction. The exact number and contents of the discarded cylinders is not known, but it is believed that 40 to 100 cylinders were disposed at the site. The gases in the cylinders may include acetylene, compressed air, argon, carbon dioxide, helium, nitrogen, or oxygen. These gases do not pose a human health risk but are considered a safety hazard because ruptures of the cylinders could lead to personal injury, fire, or explosion. DOE will evaluate the safety concerns of removing the cylinders versus capping them in place.

Site CPP-94 includes an area about 2.4 km (1.5 mi) northeast of the INTEC along the south side of a dirt security road (see Figure 1-8). Four exposed gas cylinders have been observed at the site and are believed to contain hydrofluoric acid. The safety hazards associated with CPP-94 are similar to those at Site CPP-84. The potential for cylinder over-pressurization and bursting is considered the most serious hazard at CPP-94. The buried gas cylinders pose a safety hazard to inadvertent intruders (i.e., back hoe operators or drillers). Hydrofluoric acid is very corrosive, reacts violently with moisture, and can generate explosive concentrations of hydrogen gas. Fluoride, a chemical residual of hydrofluoric acid reactions, is a potential human health and ecological hazard.

4.7 SFE-20 Hot Waste Tank System (Group 7)

The SFE-20 Hot Waste Tank System is also known as Site CPP-69, which consists of a concrete vault containing an abandoned radioactive liquid waste storage tank. The top of the tank vault is located about 3 m (10 ft) below grade. The tank contains about 1,514 L (400 gal) of liquid and about 208 L (55 gal) of sludge (Figure 1-9). The tank system consists of the tank contents, tank, and associated structures located east of Building CPP-603. The SFE-20 Hot Waste Tank System was constructed in 1957 to collect liquid radioactive wastes from the south basin area of Building CPP-603 and the Fuel Receiving and Storage Facility. In 1976, the SFE-20 Hot Waste Tank System was taken out of service and the inlet pipe was disconnected and capped. Contaminated soil may have been used as backfill material for the excavation. The pump was also removed from the pump pit and the connections capped. A preliminary investigation conducted in 1984 indicated that the tank liquid and sludge contain elevated levels of Cs-137, Cs-134, Co-60, Sr-90, and isotopes of europium, plutonium, and uranium. The concentration of plutonium indicates that the liquid is transuranic waste and that the sludge may be classified as transuranic waste. Previous spills within the tank vault and pump pit contained similar contaminants. No data exists to determine if contamination currently exists under SFE-20, however, when the vault is removed any contaminated soils will be excavated and disposed in the ICDF in a manner consistent with the Group 3 soils remedy.

The major threat posed by the SFE-20 Hot Waste Tank System is a potential release to the underlying soils and subsequent leaching and transport of soil contaminants to the perched water or SRPA.

4.8 "No Action" And "No Further Action" Sites

The Agencies have determined that "No Action" or "No Further Action" be taken under CERCLA at 40 sites. In all cases, the determination applies to the soils only and not to overlying man-made structures. A "No Action" site is a site that has no contaminant source or has a minor contaminant source with an acceptable risk level under a current residential exposure scenario, i.e., the risk is less than 1×10^{-4} or hazard index (HI) <1 in the year 2000. A "No Further Action" site is a site that has a contaminant source or a potential contaminant source present that meets either of the following criteria:

- The site poses a current unacceptable residential risk, i.e., greater than 1×10^{-4} or HI <1 in the year 2000, but does not pose an unacceptable residential risk in the year 2095, i.e., less than 1×10^{-4} or HI >1. (Radioactive decay will allow many sites that are currently unacceptable to decay to acceptable risk levels by the year 2095.)

- The site has contamination that exists at depths greater than 10 ft bgs and does not have an exposure route available under current site conditions.

- The site has a minor contaminant source, as qualitatively determined, that exists under a building, structure, or asphalt.

Ten sites were designated as "No Action" sites with the signing of the FFA/CO, because it was determined that no hazardous substances were present or released. An additional 24 sites were determined to be "No Action" during the RI/BRA. Six sites were determined to be "No Further Action" sites through Track 1 or Track 2 investigations and RI/BRA analysis. Table 4-1 lists the 40 "No Action/No Further Action" sites. The technical basis for these decisions is contained in the Administrative Record.

All "No Further Action" sites will be reviewed during the CERCLA 5-year review process to ensure the protectiveness of the remedial actions taken under this ROD. Review of the "No Further Action" sites is necessary because continued operations of the INTEC may adversely impact these sites. Five-year reviews will also ensure that changes in the physical configuration of any INTEC facility or site where there is suspicion of a release of hazardous or radioactive substances (e.g., D&D) will be managed to achieve remediation goals established in this ROD. The 5-year reviews will continue as long as contaminants exist at levels which result in restricted or limited site usage.

Each site for which a "No Action" or "No Further Action" determination has been made is briefly discussed below. Additional details can be found in the Administrative Record.

4.8.1 "No Action/No Further Action" Sites Determined in OU 3-13 ROD

4.8.1.1 CPP-06. CPP-06 consists of a trench near the southern border of the INTEC that was used to dispose of fuel storage basin water from Building CPP-603. The water discharged was reported to contain radionuclides at or near background concentrations. One soil sample was collected from the trench. A risk assessment performed using those data indicated acceptable risks in the year 2095 but unacceptable risks in the year 2000. Therefore, the Agencies have determined that Site CPP-06 is a "No Further Action" site (LMITCO 1995b).

4.8.1.2 CPP-07. Site CPP-07 is an area of approximately 35 m^2 (375 ft^2) that was contaminated by steam condensates resulting from a jet-pump transfer of liquid low-level radioactive waste from Tank SFE-20 to WL-102. The contamination incident was a one-time occurrence. The surface contamination was measured at 200 mrem/hr β-γ. The contaminated surface soils were promptly removed and replaced with clean soil; no source remains at this site. The Agencies have determined that CPP-07 is a "No Action" site because the source was removed (WINCO 1992b).

4.8.1.3 CPP-12. Site CPP-12 was an area located south of Building CPP-603 where contaminated paint chips were found outside of a nearby radiation and contamination control area that was previously used for contaminated equipment storage. The paint chips originated from paint that was applied to a storage pad; weathering caused the paint to fall off and was wind dispersed outside of the control area. The contaminated paint chips and storage pad were both removed. Subsequent surveys indicate that no contaminated surface soils exist at this site. The Agencies have determined that Site CPP-12 is a "No Action" site because the minor source was completely removed (WINCO 1992c).

4.8.1.4 CPP-17. CPP-17 consists of two areas near Building CPP-603. The site was used for storing piles of soil, asphalt, concrete, metal debris, and other items that reportedly came from a variety of construction and maintenance activities within the INTEC. In addition, sludge and liquid generated during CPP-603 fuel storage basin maintenance activities may have been deposited in these areas resulting in contamination of the underlying soils. The soil in CPP-17 was containerized in approximately 653 standard radioactive waste boxes. Three soil borings were sampled to characterize CPP-17. The results of the investigation and risk assessment, which are reported in Chapter 14 of the BRA, indicated that the risks to current onsite workers and hypothetical future residents is acceptable but the current residential risks are unacceptable. Therefore, the Agencies have determined that Site CPP-17 is a "No Further Action" (LITCO 1995b).

4.8.1.5 CPP-18. Site CPP-18 is an area that was used to store spent gas cylinders. Building CPP-668 is presently located on this site. In addition, excavation for, and construction of Building CPP-668 would have disturbed any minor contamination that may have existed at the site (WINCO 1992d). The Agencies have determined that Site CPP-18 is a "No Action" site because there is no documentation or other evidence of a release.

4.8.1.6 CPP-21. Site CPP-21 is an area south of CPP-601 that was used to store solid waste including paper, rags, and contaminated metal. The waste was contained in three dumpsters. A radiological survey of the area revealed no evidence of contamination. The Agencies have determined that Site CPP-21 is a "No Action" site because there is no evidence of a source or a release at this site (WINCO 1993b).

4.8.1.7 CPP-22. Site CPP-22 is the location of surface contamination associated with a 1958 air release that resulted from the failure of a HEPA filter. The HEPA filter was associated with the Fuel Element Cutting Facility. Contamination from this airborne release has most likely been removed or covered over with soil during the period from 1958 to the present as a result of construction activities that have disturbed the area. The area was extensively surveyed and three boreholes were drilled within Site CPP-22 at the locations surveyed to have the highest radiation levels above background. During the investigation, the peak concentration for Cs-137 was 14 pCi/g. The Agencies have determined that Site CPP-22 is a "No Further Action" site because the future risks are acceptable but the current residential risks are not acceptable (LITCO 1995b).

4.8.1.8 CPP-29. Site CPP-29 is the result of a release of small quantities of radioactive liquid at the base of the original ICPP stack in 1974. The original contaminated area was estimated to be 0.7 m^2 (8 ft^2) and no more than a few inches thick. Since the release, the Main Stack Refurbishment Project completely excavated this site to a depth of 2.1 m (7 ft) (bls) and extended the concrete base of the new stack over the area of the release. The Agencies have determined that Site CPP-29 is a "No Action" site because the original area of contamination was completely excavated and covered with concrete (WINCO 1993c, DOE et al. 1994b).

4.8.1.9 CPP-39. Site CPP-39 consisted of a hydrofluoric acid storage tank, a concrete containment vault, and a 38-m (125-ft) tile line connected to the dry well. The storage tank was used as a makeup tank to provide hydrofluoric acid to the CPP-601 dissolution process. The tank was also used to receive off-specification hydrofluoric acid where it was either adjusted to meet specifications or neutralized and discharged to a dry well. The dry well and vault both contained limestone rock to neutralize the hydrofluoric acid. No radioactive constituents were associated with this process. The system was used from 1967 to 1984 and was removed in 1990; the clay tile pipe was removed in 1993. Sampling results and subsequent risk analysis indicate that current residential risks are acceptable. Cumulative risks from all contaminants at all depths evaluated were below a HI of 1 or the 1×10^{-4} carcinogenic risk levels. The Agencies have determined that Site CPP-39 is a "No Action" site because the risks are considered acceptable (DOE-ID 1997b).

4.8.1.10 CPP-40. Site CPP-40 is the location of a historic acid neutralization pit and associated piping. It consisted of a 19-m (62-ft) long drain pipe, a neutralization pit (lime pit), and a discharge pipe. The drain pipe led from a drip pan in CPP-601 that collected spills of hydrofluoric acid and other miscellaneous chemicals. The discharge from CPP-601 was discontinued in 1985 but water continued to flow into the neutralization pit until 1990. The drain pipe, neutralization pit, and discharge pipe have been removed. No radionuclides were detected in the material removed. The analysis of samples collected could not confirm the presence of residual contamination because only two out of three samples measured Cs-137 at levels slightly above background and below the risk-based concentration.

The Agencies have determined that Site CPP-40 is a "No Action" site because no source remains at this site and the maximum measured Cs-137 concentration is 1.3 pCi/g which is below the 1×10^{-4} risk-based concentration (WINCO 1993d and DOE-IDe 1997b).

4.8.1.11 CPP-41b. Site CPP-41b consists of a pit where oils and organic materials were placed in metal drip pans and ignited for fire brigade practice. The training pit is no longer in use. CPP-41b has been totally excavated and partially covered by Building CPP-666. No samples were taken from this site; therefore, no quantitative risk assessment was performed. The Agencies have determined that Site CPP-41b is a "No Action" site because the site has been excavated and removed.

4.8.1.12 CPP-42. Site CPP-42 is a drainage ditch that is west of CPP-637 and was originally designed to handle precipitation run-off. It was suspected that some nonradioactive laboratory waste had been disposed to the surface soil at this site. The Agencies have determined that Site CPP-42 is a "No Action" site because the calculated HI was less than one (LMITCO 1994).

4.8.1.13 CPP-45. Site CPP-45 was a storage area for various acids (HCL, HNO_3, HF, and H_2SO_4) and aluminum nitrate. During the history of operation in the CPP-621 area, five releases were documented and other spills or releases were suspected. The samples collected and ensuing risk assessment indicated that the contaminant levels were all below an HI of 1. The Agencies have determined that Site CPP-45 is a "No Action" site because the calculated risks were acceptable (WINCO 1993e).

4.8.1.14 CPP-46. Site CPP-46 is an area that was contaminated by a 1,700L (450 gal) spill of simulated zirconium fluoride waste. This simulated zirconium fluoride waste was being used as a nonradioactive feed stock for process testing. Following the release, the waste was neutralized and contaminated soils were removed. Subsequent soil samples confirmed that most of the affected soils were removed. The highest Cs-137 concentration was 2 pCi/g. The only remaining soil that was clearly contaminated was later entirely removed during excavation for footings of the concrete slabs on which the tanks now sit. The Agencies have determined that Site CPP-46 is a "No Action" site because the source has been removed and the current residential risks are considered acceptable (LITCO 1994, and DOE-ID 1997b).

4.8.1.15 CPP-47. Site CPP-47 is an area used to store high molar hydrofluoric acid. One to three 208-L (55-gal) drums were stored on pallets. Sometime in 1984, a small spill (approximately 7.5 L

[2 gal]) was known to have occurred. The area was sampled and the analysis showed that although high fluoride concentrations were observed, but they were below risk-based levels. The Agencies have determined that Site CPP-47 is a "No Action" site because the calculated HI is much less than 1 (WINCO 1992x).

4.8.1.16 CPP-49. Site CPP-49 is the site of soils underneath an active transformer yard that contained three PCB transformers. Visual evidence of leaks lead to sampling the concrete pads and surrounding soil. Sampling results indicate that the soil contained less than 0.1 ppm PCBs. One concrete pad sample contained 29.1 ppm PCBs. Subsequent sealing activities completed on the transformer pad have resulted in encapsulation of the pad within a larger resultant concrete pad structure. The Agencies have determined that Site CPP-49 and the soils under the transformer pad is a "No Action" site because the PCB concentrations observed in the soil were less than the CERCLA cleanup criteria for PCBs. In addition, the concrete pad was sealed and incorporated into a larger concrete pad (WINCO 1992a).

4.8.1.17 CPP-50. Site CPP-50 is the location of soils beneath a PCB transformer pad. The transformer contained 874 L (231 gal) of 400 ppm PCB oil. Leakage was noted during an inspection of the transformer in 1985. The leaked oil was isolated on the transformer concrete pad and did not impact the surrounding soil. The transformer was removed and disposed at an approved off-Site disposal facility. The Agencies have determined that Site CPP-50 is a "No Action" site because there is no evidence that contamination spread to the surrounding soil (WINCO 1992a).

4.8.1.18 CPP-51. Site CPP-51 is defined as the soil below a storage area for PCB-transformers, contaminated soil, debris, and concrete from the ICPP Utilities Replacement and Expansion Project. The storage area was unpaved. During the upgrade project, two transformers leaked onto plastic sheeting. The sheeting, transformers, and debris have been removed from the site. The PCB concentrations in the soil are less than the 1 ppm cleanup criteria specified by TSCA for unrestricted access areas (40 CFR 761.125 (c)(4)(v). Of the eight samples collected, the maximum PCB concentration observed was 0.120 ppm. The Agencies have determined that CPP-51 is a "No Action" site because the PCB contamination is below the TSCA cleanup standards (WINCO 1992a).

4.8.1.19 CPP-53. Site CPP-53 was an area used by a painting subcontractor for the storage of approximately 30 to 40 drums of paint and paint solvents. In 1983, the stored materials were removed to an EPA approved disposal facility and the area was covered with 61 to 76 cm (24 to 30 in.) of gravel. The area was subsequently used as a construction laydown area and vehicle parking. There are no documented releases at this site. Sample results did not indicate any contamination above detection limits. The Agencies have determined that Site CPP-53 is a "No Action" site due to the lack of an apparent source (WINCO 1992g).

4.8.1.20 CPP-54. Site CPP-54 is an area that was used to store approximately 30 to 40 drums of organic solvent and used oil. There are no known releases from the drums. Analysis of soil samples collected did not reveal any contamination above risk-based levels. The Agencies have determined that Site CPP-54 is a "No Action" site due the lack of an apparent source (WINCO 1992h).

4.8.1.21 CPP-56. Site CPP-56 is an area where a nitric acid leak occurred in a transfer line in 1968. The nitric acid was neutralized prior to disposal and was nonradioactive. In 1986-87, the site was excavated to support construction of CPP-796. Any residual contamination would have been blended with backfill soil as part of construction of CPP-796. The Agencies have determined that Site CPP-56 is a "No Action" site because the HI was qualitatively determined to be less than 1, and the residual contamination was removed (LITCO 1994).

4.8.1.22 CPP-57. Site CPP-57 is a sulfuric acid tank. Approximately 189 L (50 gal) of sulfuric acid spilled on the ground in 1984, and 17,034 L (4,500 gal) spilled in 1985. The soil was neutralized and removed; any residual acid that was not removed would have been naturally neutralized by the soils. The Agencies have determined that Site CPP-57 is a "No Action" site because no source remains and the HI was qualitatively determined to be less than one (WINCO 1992i).

4.8.1.23 CPP-59. Site CPP-59 consists of soils within a containment berm surrounding two 75,708 L (20,000 gal) kerosene storage tanks. Contamination of CPP-59 occurred in two separate kerosene releases that occurred in 1983; the combined release was 984 L (260 gal) of kerosene. There is no documentation of cleanup following the two discharges. The kerosene most likely evaporated or infiltrated into the soil. Nine borehole samples were collected to characterize CPP-59. Xylenes were the only volatile organic compounds (VOCs) detected in the soils at concentrations ranged between 1 and 11 μg/kg. Risks were calculated to be less than 1×10^{-4} and an HI less than 1. The Agencies have determined Site CPP-59 is a "No Action" site because the risk and HIs are less than 1×10^{-4} and one respectively. (WINCO 1992j, WINCO 1994a.)

4.8.1.24 CPP-62. Site CPP-62 is an area where paint solvents were discarded to the soil. In 1985, a cleanup of this area was conducted in which 28 drums of contaminated soil were removed and shipped to a commercial hazardous waste facility. Subsequently, in 1987, the area was excavated for the construction of the 7th Calcined Solids Storage Vault. The Agencies have determined that Site CPP-62 is a "No Action" site because the source was removed and additional excavation has been conducted (WINCO 1992k).

4.8.1.25 CPP-63. Site CPP-63 is the site of a hexone spill in 1982. During excavation for cathodic protection maintenance or repair, a hexone line was cut by a backhoe; approximately 189 L (50 gal) was released. There were no reports indicating if the soil was removed after the spill. Three soil samples were collected along the length of the broken line. The samples were analyzed for VOCs including hexone. The VOC concentrations were less than the method detection limits. The Agencies have determined that Site CPP-63 is a "No Action" site because the HI is less than 1 (WINCO 1993f).

4.8.1.26 CPP-64. Site CPP-64 is the site of a hexone spill in which a forklift operator punctured a drum of hexone. About 208L (55 gal) of hexone leaked onto the asphalt. Vermiculite was used to absorb most of the hexone and the vermiculate was collected and disposed. Soil samples from five boreholes were analyzed and revealed that no hexone was detected significantly below risk-based concentrations. The other contaminants detected were below an HI of 1. The Agencies have determined that Site CPP-64 is a "No Action" site because the initial spill was small, the source was removed, and the analytical results indicate acceptable risks (WINCO 1992l).

4.8.1.27 CPP-78. Site CPP-78 consists of a 2.3 m^2 (25 ft^2) area of potentially radioactively-contaminated soil located west of building CPP-693 and east of the Dry Fuel Storage Area. Contamination was discovered during excavation activities. The origin of the contamination is not known but is presumed to have resulted from a surface spill. Two soil borings were drilled and soil samples collected and analyzed. The analysis of the samples showed that the radiation levels barely exceeded background values and are below 1×10^{-4} residential risk-based concentrations. The Agencies have determined that Site CPP-78 is a "No Action" site because no discernable source could be found and the risk levels are acceptable (LITCO 1995).

4.8.1.28 CPP-88. Site CPP-88 consists of the radioactively-contaminated soils within the current INTEC security fence that have not been attributed to another specific release site. Investigation of CPP-88 included extensive document reviews and analysis of samples collected from 16 boreholes from various INTEC locations. The maximum Cs-137 concentration was 36.6 pCi/g and the 95% UCL for

Cs-137 was 14.1 pCi/g. The Agencies have determined that Site CPP-88 is a "No Further Action" site because it is above the current 1×10^{-4} residential risk range and below the year 2095 1×10^{-4} residential risk range (DOE-ID 1997b).

4.8.1.29 CPP-90. Site CPP-90 consists of soil contaminated by leaks in service waste transfer lines between Building CPP-709 and the CPP-23 injection well. The original concrete pipeline was replaced in 1959-1960 with a vitrified clay line. The vitrified clay line was replaced in 1969 with a stainless steel line that was partially replaced in 1982 with another stainless steel line. In 1986, the line was permanently taken out of service and abandoned in place. Three soil borings were drilled to support the BRA. Soil analytical data from those borings indicate a maximum Cs-137 concentration of 7.5 pCi/g and a 95% UCL for Cs-137 of 7.5 pCi/g. The Agencies have determined that Site CPP-90 is a "No Further Action" site because the future residential risk is acceptable but the current residential risk is not acceptable. (DOE-ID 1997b). This site will be reviewed under the CERCLA 5-year review to ensure that if this pipe is removed in the future, any contamination discovered will be properly addressed.

4.8.1.30 CPP-95. Site CPP-95 is the wind-blown plume and consists of areas outside the current INTEC perimeter fence that are potentially contaminated as a result of wind dispersion of radionuclides from facility operations. The area delineated as Site CPP-95 (i.e., the WAG 3 AOC) is shown in Figure 1-10. Surveys and soil sampling were conducted as part of the 10-06 RI and EE/CA. The 95% upper confidence level (UCL) 95% concentration for Cs-137 within the AOC is 5.9 pCi/g. Site CPP-95 is a "No Further Action" site , because it is above the current 1×10^{-4} residential risk range and below the year 2095 1×10^{-4} residential risk range (DOE-ID 1997b).

4.8.2 "No Action" Sites Designated in the FFA/CO

4.8.2.1 CPP-43—Grease Pit South of CPP-637. This pit was used for the disposal of an unknown quantity of oil and grease. The site occupies an area of 141 m^2 (1,520 ft^2). The site was filled, and a building (CPP-651) was constructed on the site in the mid-1970s. A "No Action" decision documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991a).

4.8.2.2 CPP-52. Site CPP-52 was a pickling shed used to treat piping and other structural materials with mineral acids during the original construction of the ICPP. The site involved an area of 13.4 m^2 (144 ft^2). The building was a temporary structure located east of CPP-631. Spent pickling solutions were disposed in liquid waste storage tanks; there are no records of spills or leaks. The building was demolished in 1954. A "No Action" decision documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991b).

4.8.2.3 CPP-70. Site CPP-70 is a septic tank located east of CPP-655. This septic tank was used to treat sanitary waste generated at the craft shop and warehouse building. Operations in the building included equipment maintenance and repair, welding, and carpentry. There are no drains located in the work areas and there is no evidence hazardous constituents were disposed in the septic system. A "No Action" decision documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991c).

4.8.2.4 CPP-71. Site CPP-71 consists of the seepage pits west of CPP-656. These pits were used in conjunction with the septic tank located east of CPP-655 (CPP-70). There are no records of hazardous constituent releases. A "No Action" decision documentation package was placed in the Administrative

Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991c).

4.8.2.5 CPP-72. Site CPP-72 consists of the CPP-758 cesspool east of CPP-651. Site CPP-72 used to treat sanitary sewage from temporary office trailers. The trailers have been disconnected and the system is no longer in use. Because the septic system was only connected to office restrooms, it is unlikely hazardous constituents were disposed in the system. A "No Action" decision documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991d).

4.8.2.6 CPP-73. Site CPP-73 is a cesspool located east of and connected to temporary building CPP-T-5, which was used as a lunch/break room by a construction contractor. No hazardous materials have been stored at this location, and no hazardous wastes are reported to have been disposed into the unit. A "No Action" decision documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991e).

4.8.2.7 CPP-74. Site CPP-74 is a seepage pit and septic tank located west of Building CPP-626. This septic system was constructed in the early 1970s and is used to treat sanitary waste from the fuel receiving and storage building and storage basin change room. The building contains a cafeteria, restroom facilities, showers, and office space. No operations involving hazardous materials are known to have occurred in the building and it is unlikely hazardous wastes have entered the system. The Summary Assessment recommending "No Action" for this site was approved in 1988. A "No Action" decision documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991f).

4.8.2.8 CPP-75. Site CPP-75 consists of the septic tank west of Building CPP-603. It was built in the early 1950s and received sanitary wastes before operation of CPP-74. The system was connected to a restroom facility, which was physically isolated from hazardous materials operations. The primary hazardous materials used in operations that might have been associated with this unit were mineral acids. The Summary Assessment recommending "No Action" for this site was approved in 1988. A "No Action" decision documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991g).

4.8.2.9 CPP-76. Site CPP-76 consists of the septic tank and cesspool west of Building CPP-659 which was used to treat sanitary wastewater from the old calcining facility, built in 1960. There are no records of hazardous wastes entering the system. The septic tanks are currently being removed in support of the NO_x Abatement Facility construction. The Summary Assessment recommending "No Action" for this site was approved in 1988. A "No Action" documentation package was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991h).

4.8.2.10 CPP-77. Site CPP-77 is a seepage pit and cesspool located north of Building CPP-662. There are no known records that indicate hazardous materials ever entered this system. The Summary Assessment recommending "No Action" for this site was approved in 1988. A "No Action" documentation package for this site was placed in the Administrative Record in September 1991; in December 1991, the Agencies formally determined that this site is a "No Action" site in the FFA/CO (WINCO 1991i).

4.9 New Soil Release Sites

The Agencies have added four release sites (CPP-96, -97, -98, and -99) to the FFA/CO action plan list of sites for OU 3-13. Site CPP-96 is a consolidation of all of the previously identified release and the intervening interstitial soils within the CPP-96 boundary. Sites CPP-97, -98, and-99 consist of soil and debris that originated from the Tank Farm upgrade project or the Building CPP-604 egress tunnel project, both of which were performed between 1993 and 1995. Previously, this material was managed as low-level radioactive waste; however, recent discussions between the Agencies has resulted in a realization that because the Tank Farm waste may be RCRA listed and the contaminated soil and debris may also be RCRA listed.

Site CPP-96, is considered part of the Group 1 Tank Farm Soils sites and will be addressed by both the Tank Farm Interim Action under OU 3-13 and the final action selected under OU 3-14. Sites CPP-97, CPP-98, and CPP-99 will be remediated under the selected remedy for Group 3 other surface soils in this ROD.

4.9.1 CPP-96—Tank Farm Interstitial Soils

Site CPP-96 is a consolidation of all of the previously identified release and the intervening interstitial soils within the CPP-96 boundary. Previously, the INTEC Tank Farm area included 14 known release sites. However, the arbitrary boundaries of each release site did not include all of the contaminated soils in the Tank Farm area; contamination was present outside of the initial known release sites. Site CPP-96 includes all of the interstitial soils within the Tank Farm area

4.9.2 CPP-97—Tank Farm Soil Stockpiles

Site CPP-97 consists of two tarp-covered soil stockpiles that originated from the Tank Farm upgrade project. One pile contains approximately 1,093 m^3 (1,430 yd^3) of radionuclide-contaminated soils. Radiation measurements at the time of generation ranged between 0 and 3 mR/hr. The second soil stockpile contains approximately 53 m^3 (70 yd^3) of radionuclide-contaminated soils with 3 to 50 mR/hr radiation readings. These soils will be included in Group 3 soils for disposal at the ICDF.

4.9.3 CPP-98—Tank Farm Shoring Boxes

The Tank Farm upgrade project used wooden shoring during excavation. Because the soil was contaminated, the shoring also became contaminated. The contaminated shoring was placed into 118 wooden radioactive waste boxes that have been managed as low-level radioactive waste. These soils and shoring will be included in Group 3 soils for disposal at the ICDF.

4.9.4 CPP-99—Boxed Soil

In addition to the aforementioned waste, the Tank Farm upgrade and CPP-604 tunnel egress projects generated 59 boxes of radionuclide-contaminated soil that have been managed as low-level radioactive waste. These boxed soils will be included in Group 3 for disposal at the ICDF.

4.10 Sites Addressed Under Other WAGs or Regulatory Programs

Six sites, CPP-38, CPP-61, CPP-65, CPP-66, CPP-81, and CPP-82, listed under the FFA/CO as part of WAG 3 are not included in the aforementioned seven groups. These sites were investigated as part of the WAG 3 RI/FS process. The Agencies have determined that these sites are most appropriately dispositioned outside OU 3-13, either in other programs or under other CERCLA OUs.

4.10.1 CPP-38—Asbestos in Nine INTEC Buildings

Site CPP-38 is part of OU 3-04 and consists of what was believed to be friable transite asbestos on the roof and walls in nine buildings at INTEC. A Track 1 decision document determined that the asbestos is a nonfriable form, thus representing a low risk to human health and the environment and poses no threat of release until building D&D occurs (WINCO 1993g). Therefore, the Agencies decided that this site would be more appropriately administered and remediated (if necessary) under the INEEL Asbestos Abatement Program rather than the FFA/CO. INEEL asbestos management is conducted in accordance with NESHAPS.

4.10.1.1 CPP-61. Site CPP-61 is an area within the CPP-718 transformer yard where a PCB oil spill occurred in the early 1980's. Approximately 1,510 L (400 gal) of PCB oil was spilled. The PCB concentration in the oil was 179 ppm. Most of the spill was contained, however, some spilled oil that contaminated the surrounding soil. In 1985, the spill area was cleaned up; approximately 40 drums of soil and debris were removed. A new transformer and concrete pad have been installed over the site. Three soil borings were drilled and soil samples analyzed for radionuclides. The radionuclides found were below risk-based soil concentrations (WINCO 1992a). The Agencies have determined that CPP-61 will be transferred to OU 3-14 for further evaluation because of the uncertain amount of PCB contamination that may remain under the concrete pad.

4.10.2 CPP-65—Sewage Treatment Plant Lagoon

Site CPP-65 is the lagoons for the INTEC Sewage Treatment Plant (STP). The plant treats sanitary waste from 31 INTEC facilities. The STP began operation in 1984 and is currently in use. The lagoons include four infiltration/percolation trenches that are used to dispose of treated sanitary wastewater. The lagoons were investigated as part of the RI/BRA (DOE-ID 1997b, Section 9.3).

The STP does not contain COCs in concentrations that present a threat to human health and the environment either through surface exposure or via transport to the Snake River Plain Aquifer. The Agencies have decided that final closure of the STP lagoons will be most appropriately handled under the Idaho Wastewater Land Application Rules (Idaho Administrative Procedures Act [IDAPA] 16.01.02); this decision was based on the low concentration of contaminants observed in lagoon water and the continued use of the lagoons.

4.10.3 CPP-66—Steam Plant Fly Ash Pit

Site CPP-66 is the coal-fired Steam Generation Facility Fly Ash Pit located southeast of the INTEC. The pit has been used for the disposal of fly ash produced by the INTEC Steam Generation Facility since 1984. The ash in the pit contains natural radionuclides and metals derived from coal and limestone. Site CPP-66 was evaluated using the Track 1 process in 1993 and recommended for "No Further Action" based on a human health risk evaluation. More specifically, the measured concentrations of radionuclides and inorganics in the fly ash are sufficiently low as to pose a negligible risk under both residential and occupational scenarios. Furthermore, the low permeability of the dried ash and low rainfall at the INEEL provide little driving force for leaching of ash constituents to the groundwater (WINCO 1993h). Subsequently, an ecological risk screening was performed during the OU 3-13 RI/BRA, which suggested that a risk to environmental receptors may exist from the metals present in the ash. The Agencies have determined that the site will be transferred to OU 10-04 for further evaluation and remediation, if necessary.

4.10.3.1 CPP-81. Site CPP-81 is an abandoned line from the 30-cm (12-in.) Calciner Pilot Plant. The line, located approximately 0.6- to 0.9-m (2- to 3-ft) bls, contained simulated calcine that became plugged in the line following a test run. During the fall of 1993, the line was cleaned as part of a time-critical removal action. The line was flushed with hot acid to remove the simulated calcine. No leaks were observed during the removal action indicating that no previous release to the environment had occurred. The final water rinse was analyzed and found to not contain contaminants above toxicity characteristic leaching procedure (TCLP) limits. The Agencies have determined the Site CPP-81 will be transferred to OU 3-14 for further evaluation because of the lack of sufficient data to make a final decision.

4.10.3.2 CPP-82. Site CPP-82 is the location of three waste water spills (designated Sites A, B, and C) caused by rupturing of previously abandoned underground lines. The lines were ruptured during excavation activities. In the spill associated with Site A, an estimated 9.4 L (2.5 gal) of low-level radioactive waste escaped; the abandoned line and contaminated soil associated with the leak were removed and disposed. Sites B and C are associated with spills of nonradioactive, nonhazardous waste water; these spills occurred during the repair activities associated with Site A. The Agencies have determined the Site CPP-82 will be transferred to OU 3-14 for further evaluation because of the lack of sufficient data to make a final decision.

5. SUMMARY OF SITE CHARACTERISTICS

5.1 Physiography, Geology, and Hydrology

The INEEL is located on the northeastern portion of the Eastern Snake River Plain (ESRP), a volcanic plateau that is primarily composed of silicic and basaltic volcanic rocks with interspersed sedimentary material. In this region, the climate is characterized as semidesert with hot summers and cold winters. Normal annual precipitation is 22.1 cm (8.71 in.). Within the ESRP, the INEEL is located in a topographically closed drainage basin. Natural sources of surface recharge in the basin include Birch Creek, the Little Lost River, and the Big Lost River. The Big Lost River channel is typically dry because of the arid climate, high infiltration rates through the alluvium, and active upstream irrigation and flood control diversions. Other natural sources of surface water include occasional heavy precipitation or snowmelt, which results in surface water runoff into natural drainage areas, usually in January through April of each year. The surface water serves as a recharge source to the underlying SRPA, which occurs at depths of 61 to 154 m (200 to 500 ft) bls. In the SRPA, regional groundwater flow is to the southwest at average estimated velocities of 1.5 m/day (5 ft/day), with significant local deviation due to local hydraulic influences and variability in saturated thickness and the characteristics of the basalts and sedimentary interbeds. The northern portion of the INTEC lies within the Big Lost River 100-year floodplain (Figure 5-1). The SRPA was designated a sole-source aquifer under the Safe Drinking Water Act on October 7, 1991 (55 FR 50634).

The INEEL contains valuable historic, cultural, and biological resources. To protect these resources, surveys will be performed prior to implementing field work to ensure that no cultural artifacts, threatened or endangered species will be impacted by any remedial action.

5.1.1 Conceptual Model of Water Sources and Hydrogeology at WAG 3

The INTEC is located in the south-central portion of the INEEL. Average elevation at INTEC is 1,498 m (4,917 ft). The facility's northwest corner is approximately 46 m (150 ft) southeast of the Big Lost River channel, which flows along the northwest border of the INTEC facility boundary. As with much of the Big Lost River on the INEEL, the channel is typically dry at INTEC, however, the Big Lost River flowed during most of 1997 and 1998. At land surface, as much as 18.2 m (60 ft) of surficial alluvium is composed of gravelly, medium-to-coarse-grained sediment. This alluviual material overlies a series of basalt/sediment units where the basalt is very transmissive, and the sediment units are relatively thin, much less transmissive, and laterally discontinuous. Below a depth of roughly 137 m (450 ft), the basalts are more massive, with one primary sedimentary interbed (H-I interbed) occuring at a depth of roughly 198 m (650 ft). These deeper units comprise the SRPA under and southwest of the INTEC. Regional groundwater flow in the area of INTEC is affected by local recharge as well as by locally high permeability basalts. The average groundwater flow velocity beneath the INTEC is about 3 m/day (10 ft/day).

As an operating facility, there are several sources of aquifer recharge at INTEC that include natural sources such as precipitation infiltration and intermittent flows of the Big Lost River, as well as anthropogenic water sources including the INTEC percolation ponds, sewage treatment ponds, lawn irrigation, and other miscellaneous sources. As this water infiltrates downward through the alluvium and the underlying transmissive basalts it is impeded by lenses of low permeability sediments and potentially by low permability basalt flows, creating local areas of higher water saturation or moisture content. In some instances, enough water is present in or on top of the sedimentary interbeds to form local perched water bodies. A hydrologic cross-section showing the conceptualization of this water/basalt/sediment system is shown in Figure 5-2. The water shown on this cross-section is based on water level measurements. Therefore, it does not depict saturated sediments or fractured basalt seepage paths beneath surface water features like the percolation ponds and the Big Lost River. In the simplified model used for contaminant transport modeling the sedimentary interbeds were grouped into three or four general units

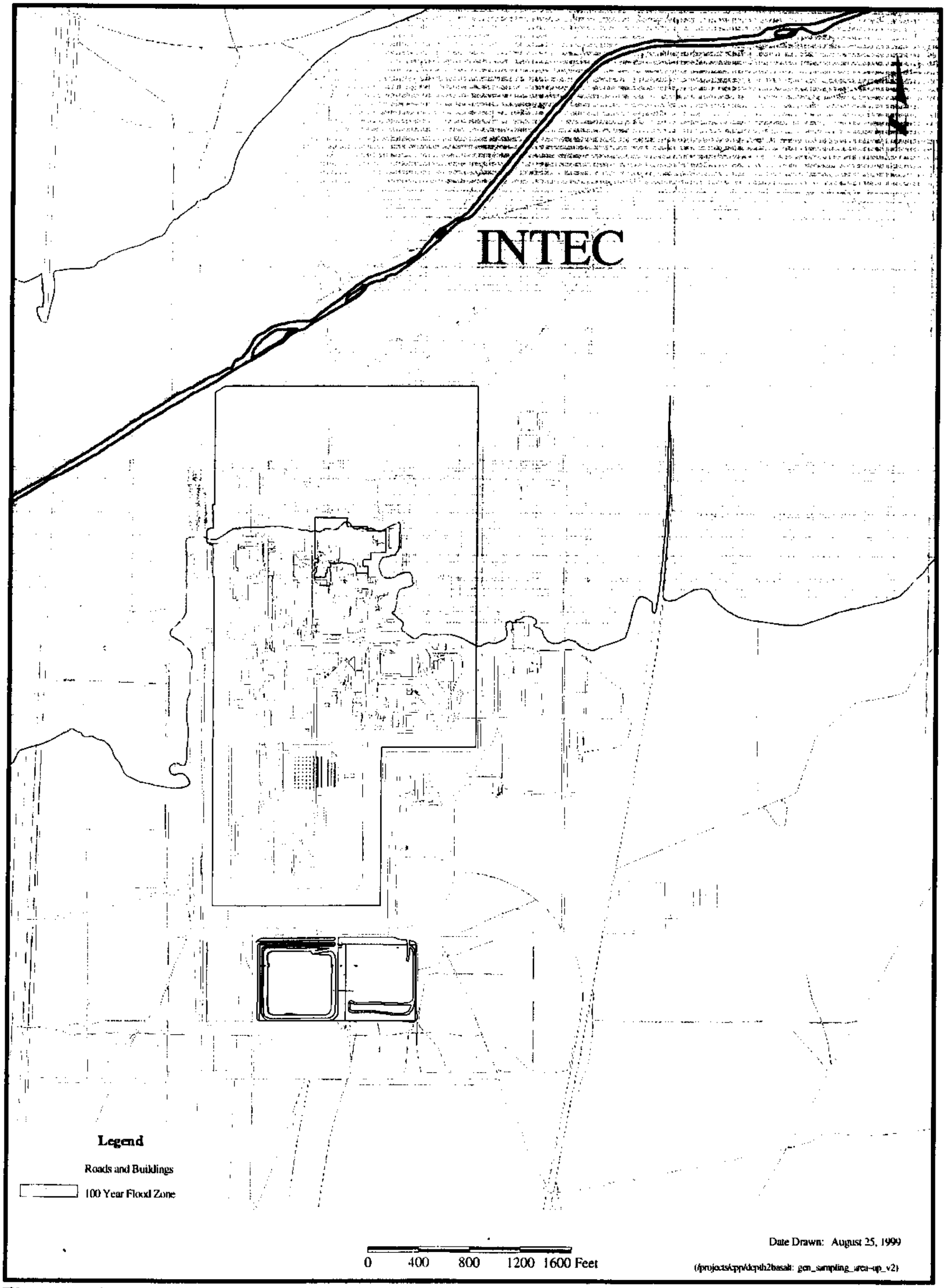
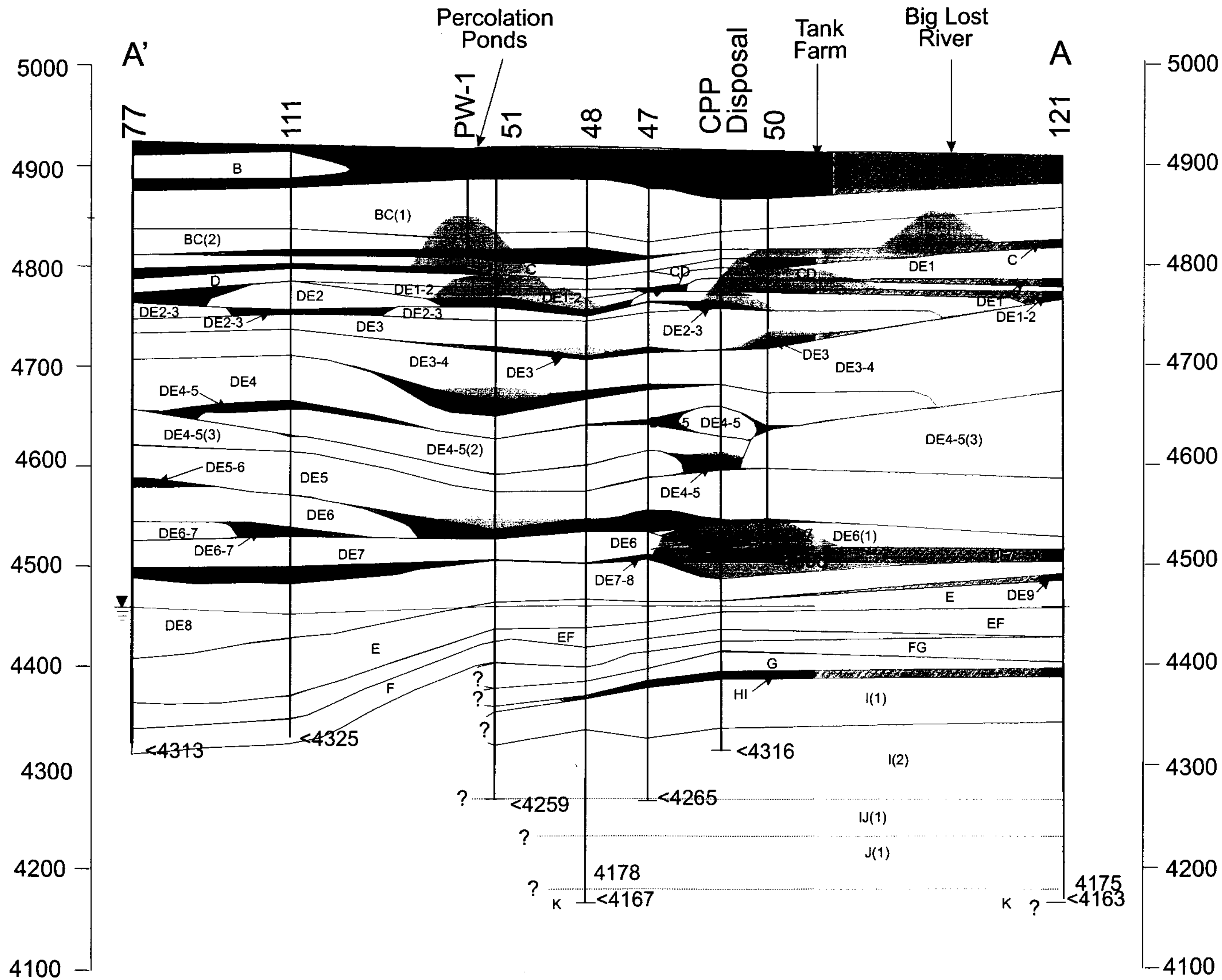


Figure 5-1. 100-year floodplain map at INTEC (USGS 1998).



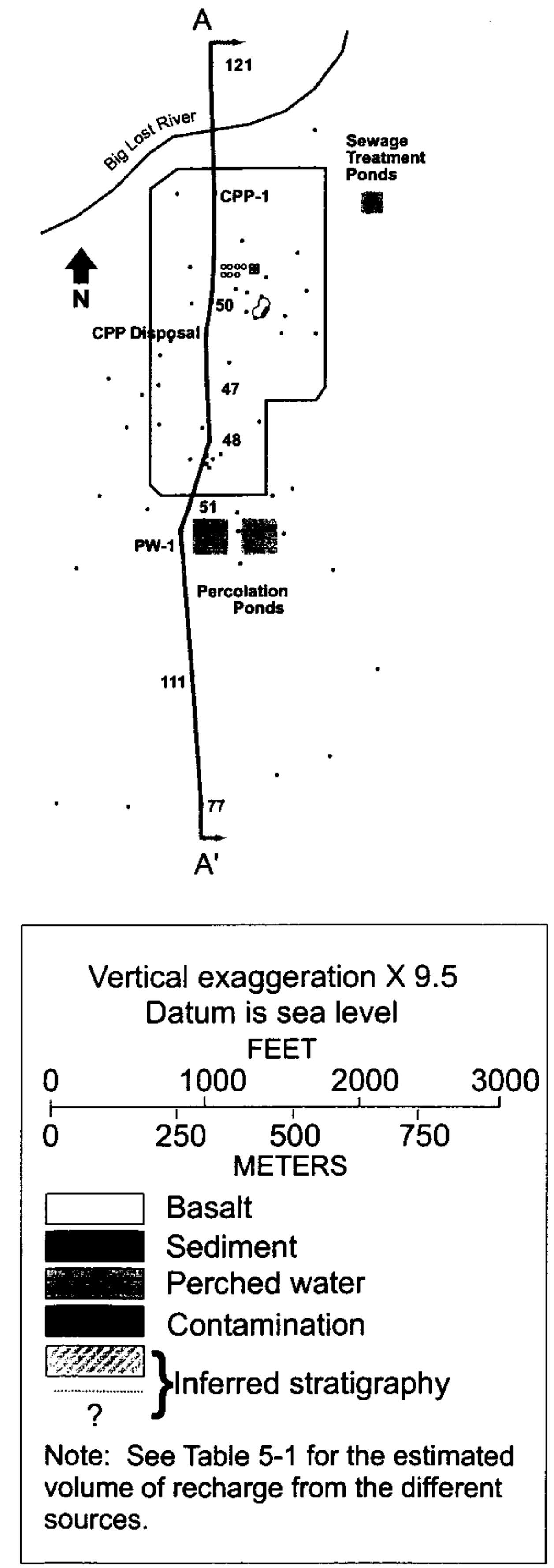


Figure 5-2. Cross section of the vadose zone at the INTEC illustrating the generalized movement of water from the surface to the aquifer, based on Anderson 1991.

based on drilling logs. Each modeled interbed zone consists of multiple noncontiguous sedimentary units that were lumped together to preserve total sediment thickness.

5.1.1.1 Recharge Sources. Perched water bodies are known to exist beneath the INTEC. Perched water bodies are present beneath the percolation ponds and the INTEC plant facilities, including the Tank Farm. The uppermost perched water zone identified at the INTEC occurs within the Big Lost River alluvium above the basalt. The source of water creating these perched water zones include both natural and man-made features. Natural perched water recharge sources at the INTEC include precipitation and the Big Lost River. Man-made perched water recharge sources include the INTEC percolation ponds (service wastewater ponds), water system leaks, sewage treatment ponds, landscape irrigation, unlined surface water drainage ditches, steam condensate, and CPP-603 basins. Table 5-1 provides the estimated volume of water recharging the perched water bodies at INTEC from the various sources. Figure 5-2 illustrates the occurrence of the interbeds beneath the INTEC and the associated perched water zones. The largest perched water body in the southern INTEC results from percolation pond infiltration.

The percolation ponds and the Big Lost River are the primary sources of recharge to perched water, comprising about 91% of the total recharge at the INTEC. The percolation ponds contribute about 70% of the total perched water recharge. Percolation Ponds 1 and 2 are located outside the INTEC southern security fence, southeast of CPP-603. The percolation ponds are unlined wastewater disposal ponds that were excavated in the surficial alluvium in 1982 and 1985. The Big Lost River contributes about 21% of the total perched water recharge.

5.2 Conceptual Model of Contaminant Distribution and Transport at WAG 3

Figure 5-3 is a conceptual drawing showing the main contaminant sources and transport mechanisms at WAG 3. Water infiltrating from the surface transports contaminants between contaminated surface soils and the SRPA. Contaminants present in the recharge water and perched water in the upper portion of the vadose zone are primarily Sr-90 and tritium. Contamination in the lower portion of the vadose zone is different in composition and concentration than the upper zone. The lower vadose zone perched water was influenced and partially contaminated as a result of two events during which the INTEC injection well (CPP-23) collapsed and service wastewater was released into the vadose zone above the lower sediment units. Additional contamination in the lower perched water zone is the

Table 5-1. Estimated volume of water recharging the perched water bodies at INTEC.

Source	Volume (gal/yr)	Volume Percent
Service wastewater (percolation ponds)	690,000,000	70.4
Sewage treatment ponds	14,974,228	1.5
Water system leaks[a]	3,973,202	0.4
Landscape irrigation[a]	1,299,470	0.1
Precipitation infiltration	64,957,269	6.6
Steam condensate	1,668,327	0.2
CPP-603 Basins	49,275	< 0.1
Big Lost River	202,564,301	20.7
Total	979,486,072	100

a. Estimate based on past leaks and irrigation practices. Actual loss from piping leaks is not known.

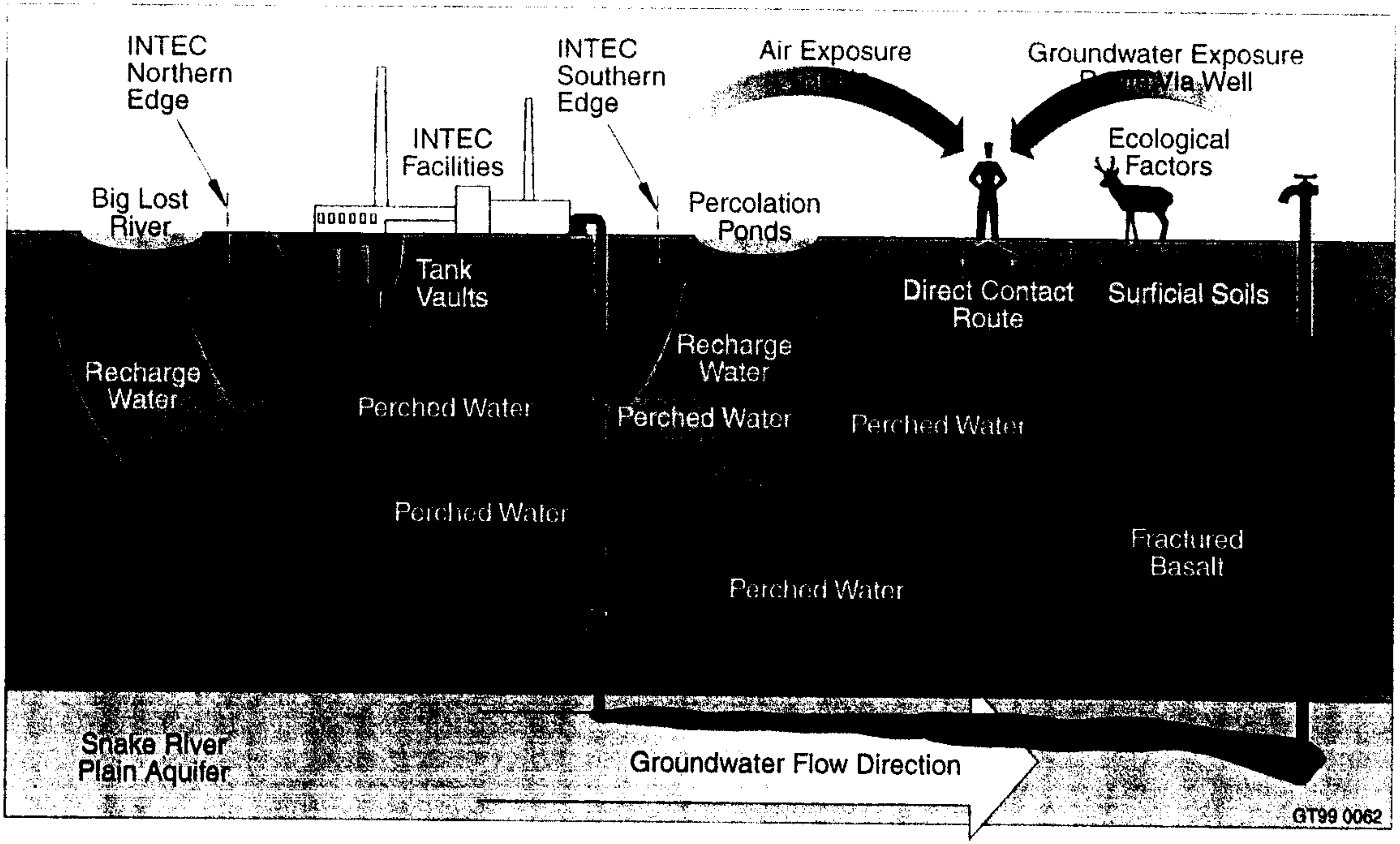


Figure 5-3. INTEC site conceptual model.

result of the transport of contaminants from the alluvial soils and upper perched water contamination. The lower vadose zone contamination includes Cs-137, Sr-90, plutonium, I-129 and mercury. Although contaminants are locally present in perched water, they are generally not available for consumption because of limited availability of that water. There are no water supply wells in the perched zone. Wells installed in the perched zone would not be capable of sustaining the pumping rates needed for future domestic water supplies. Furthermore, following this ROD's perched water remedies, the elimination and absence of man-made recharge will greatly reduce the primary recharge sources of perched water. As such, the perched water does not pose a direct human health threat, but impacts aquifer groundwater quality because it is a contaminant transport pathway between the contaminated surface soils and the SRPA.

The SRPA has been contaminated by historical INTEC operational waste disposal activities. Release site CPP-23 (OU 3-02) consists of the former INTEC injection well, which was the primary means of disposing of service wastewater from 1952 to 1984 and is the primary source of contamination in the SRPA at INTEC. In 1984, the well was removed from routine service and wastewater was subsequently discharged to the percolation ponds. After 1984, the well was used for emergency purposes in 1986, and was permanently sealed in 1989.

Radionuclides that were introduced into the aquifer from the former injection well include Pu-238, Pu-239, Pu-240, Sr-90, I-129, and tritium. Of these, tritium was the most common, comprising about 96% of the contaminant activity. At the time of injection, the radionuclides were generally below federally regulated levels. The injected wastewater also contained other (nonradioactive) chemicals including arsenic, chromium, mercury, and nitrates at concentrations below federal and state groundwater quality standards. Mercury, however, is estimated to exceed groundwater quality standards in the immediate vicinity of the former injection well but has not been detected in downgradient wells.

Subsequent migration of these contaminants has produced several overlapping groundwater contaminant plumes, containing tritium, Sr-90, and I-129 currently occurring in groundwater beneath INTEC and extending downgradient for several miles (Figures 5-4, 5-5, and 1-7). Short-lived (<30 year half-life) radionuclides, such as tritium, do not pose a long-term risk. Strontium is predicted to persist in the aquifer beyond 2095 at levels above the MCL if no action is taken. I-129 has a very long half-life and is predicted to persist in the aquifer at concentrations exceeding MCLs.

Leaching and transport of Tank Farm soil contaminants poses an additional future risk to the aquifer from Sr-90 and other contaminants (see Section 7). An evaluation of these risks and possible remedial actions for the Tank Farm soils is the focus of the OU 3-14 RI/FS.

The human health and environmental threat posed by the contaminated aquifer is groundwater ingestion. Based on the groundwater simulations presented in the RI/FS, the contaminant plume is not expected to migrate beyond the INEEL boundary at concentrations exceeding MCLs The plume does not present a threat to off-INEEL drinking water users. The remedial action objectives will assure that the aquifer meets MCLs within the INEEL boundary by 2095. As the plume gets further from INTEC, it becomes more dilute, and by the time it reaches the INEEL boundary the MCLs are no longer exceeded.

The aquifer beneath the INTEC fenceline will be evaluated in OU 3-14. The focus of OU 3-14 will address aquifer contaminants from the injection well (CPP-23) and the Tank Farm. Other sources of aquifer contamination inside the INTEC fence will also be investigated as part of OU 3-14, as necessary.

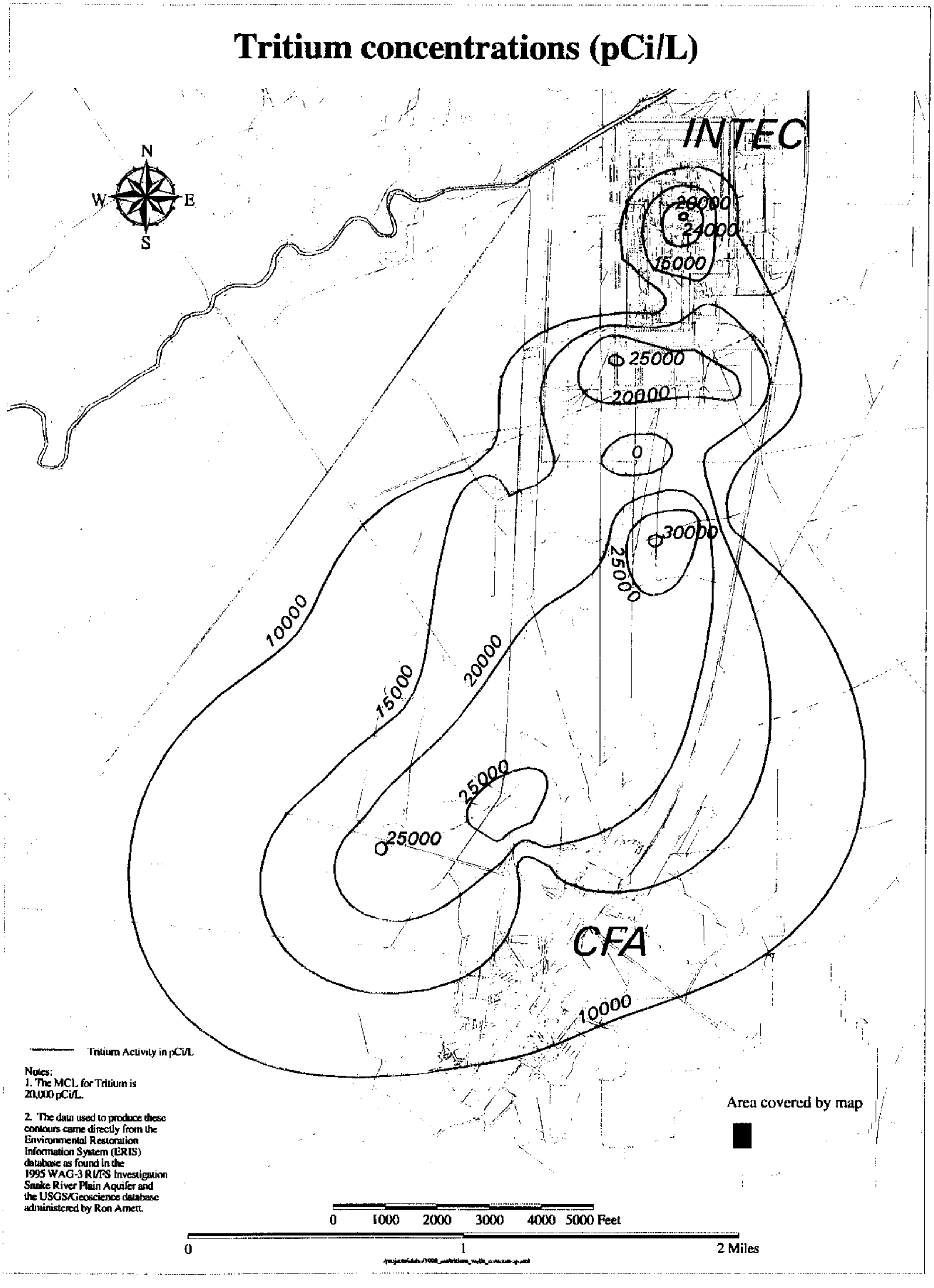


Figure 5-4. SRPA tritium plume (1995 data).

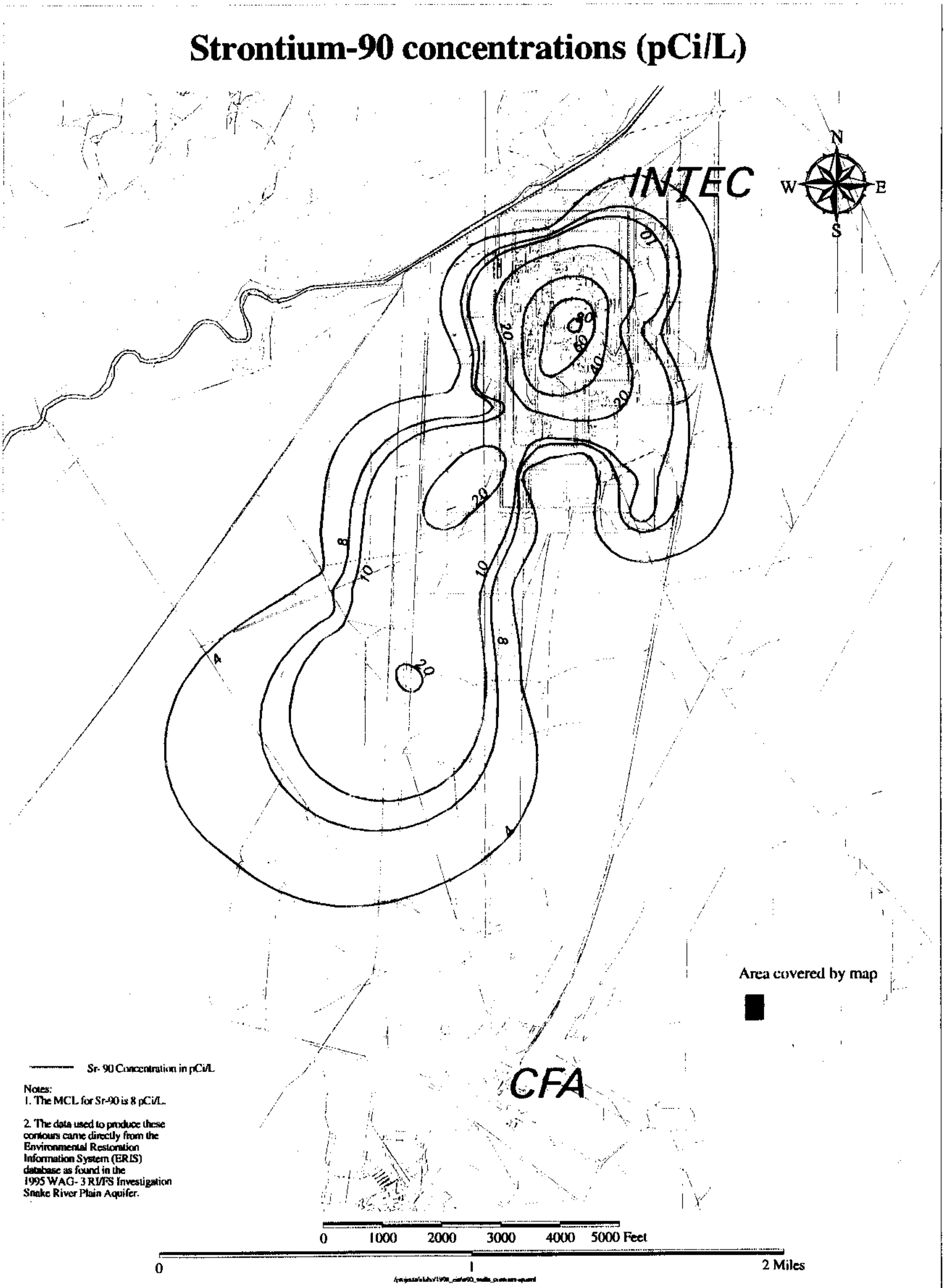


Figure 5-5. SRPA Sr-90 plume (1995 data).

5.3 Nature and Extent of Contamination

The nature and extent of contamination at the WAG 3 release sites determined to present an unacceptable risk or threat to human health or the environment are described below, by site group. These sites have actual or threatened releases of hazardous substances, which, if not addressed by implementing the response actions selected in this ROD, may present imminent and/or substantial endangerment to public health, welfare, and/or the environment. The detected contaminants of potential concern for each group or site are summarized.

5.3.1 Tank Farm Soils (Group 1)

Based on the results of drilling and sampling at previously identified release sites, the horizontal extent of contamination is generally localized at the site of the spill or leak, but, in some cases, contamination has been found to extend vertically to the soil/basalt interface at approximately 14 m (45 ft) bgs. Contamination has also been found along gravel lenses within the Tank Farm. Some spills and releases were cleaned up and excavated soils were replaced with contaminated backfill. Contaminants released to the soils are suspected to have migrated into the underlying basalt and the SRPA. Because current information regarding the nature and extent of Tank Farm contamination is inadequate to support selection of a final remedy, a separate RI/FS for the Tank Farm is underway. The OU 3-14 RI/FS will further investigate contamination at the Tank Farm and develop alternatives for a final remedy. An interim action for the Tank Farm soils is presented in this ROD. Soil contamination at the Tank Farm is summarized in Table 5-2 except data from sites CPP-16, CPP-24, and CPP-30 which are classified as "No Action" sites. All the Tank Farm sites are shown in Figure 1-3. The Tank Farm soils are considered principal threat wastes.

The major radionuclide contaminants in the Tank Farm soils are Am-241, Sr-90, Cs-137, Eu-154, Pu-238, Pu-239/240, Pu-241, and U-235. Nonradionuclide contaminants include mercury and nitrate.

Tank Farm sites with wastes derived from spills associated with the INTEC liquid waste treatment system will be assigned four EPA listed waste codes (F001, F002, F005, and U134). The wastes will also be evaluated to determine if they exhibit hazardous characteristics. The results of the investigations performed to date indicate that the principal threats posed by the Tank Farm Soils sites are from external exposure to surface and near-surface radionuclides and from future ingestion risks from leaching and transport of radionuclides to the SRPA. In addition, nonradionuclide constituents may be present in Tank Farm soils; the presence of such contamination will be addressed in the OU 3-14 RI/FS. Known releases to the Tank Farm include a number of separate documented release sources as follows:

5.3.1.1 CPP-15. The solvent burner at Site CPP-15 began operation in the late 1950s and was dismantled in 1983. Before the solvent burner, a stack preheater was located at this site. Waste solvent, primarily kerosene and tributyl phosphate degradation products contaminated with low levels of radionuclides, were held in the tank and piped to the solvent burner for disposal. Demolition of the solvent burner occurred in late 1983 including removal of the furnace/burner unit, furnace duct, control shed, piping, valves and controls within the shed, and piping penetrating the shed. In addition, an unknown amount of contaminated soil was removed along with the solvent tank. In September 1995, LMITCO construction personnel encountered elevated radiological readings while conducting an excavation in the western half of the site. Six soil samples were collected in the area of the contaminated footing. Based on this sampling, contaminants of potential concern (COPCs) identified for this site include thallium, zirconium, Am-241, Cs-137, Eu-154, Np-237, Pu-238, Pu-239/240, Tc-99, and U-235.

Table 5-2. Summary sampling results statistics for Tank Farm (Group 1) soil contaminants.[a]

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Ag	2.80E-01 B	1.15E+00 J	6.54E-01	1.78E-01	1.01E+00	50	35	70%	0.00E+00	35
As	2.80E+00 J	6.80E+00 J	4.25E+00	9.25E-01	6.10E+00	50	47	94%	5.80E+00	3
Ba	4.45E+01	1.93E+02 J	9.06E+01	4.39E+01	1.78E+02	50	50	100%	3.00E+02	0
Be	2.43E-02	4.50E-01	2.84E-01	1.49E-01	5.82E-01	16	15	94%	1.80E+00	0
Cd	2.20E-01 B	1.12E+01 J	3.84E+00	3.39E+00	1.06E+01	83	53	64%	2.20E+00	34
Co	1.86E+00	4.40E+00 B	3.33E+00	6.47E-01	4.62E+00	16	16	100%	1.10E+01	0
Cr	1.00E+00 J	1.13E+02 J	2.05E+01	2.07E+01	6.19E+01	58	58	100%	3.30E+01	10
Cu	7.38E+00	1.28E+01	9.92E+00	1.81E+00	1.35E+01	16	16	100%	2.20E+01	0
Hg	2.00E-02 J	4.44E+00	3.03E-01	6.32E-01	1.57E+00	95	59	62%	5.00E-02	53
Pb	4.80E+00	3.17E+01 J	1.17E+01	6.82E+00	2.53E+01	50	50	100%	1.70E+01	10
Mn	9.15E+01	1.18E+05	5.08E+03	2.42E+04	5.35E+04	24	24	100%	4.90E+02	1
Ni	1.34E-01 J	1.94E+01 J	1.35E+01	4.03E+00	2.16E+01	24	24	100%	3.50E+01	0
Se	5.10E-01 J	8.00E-01 B	6.97E-01	1.62E-01	1.02E+00	34	3	9%	2.20E-01	3
Sr	3.61E+03	3.61E+03	3.61E+03	NA	NA	1	1	100%	NA	NA
Th	4.85E+00	4.85E+00	4.85E+00	NA	NA	16	1	6%	4.30E-01	1
V	9.10E+00 B	1.85E+01	1.47E+01	2.77E+00	2.02E+01	17	17	100%	4.50E+01	0
Zn	3.20E+01	5.55E+01	4.18E+01	6.98E+00	5.58E+01	16	16	100%	1.50E+02	0
Zr	5.13E+00	1.40E+01	8.61E+00	3.55E+00	1.57E+01	5	5	100%	NA	NA
Fluoride	5.30E-01	6.72E+00 J	1.70E+00	1.14E+00	3.98E+00	41	40	98%	NA	NA
Nitrate	3.50E-01	8.10E+00	1.68E+00	1.54E+00	4.76E+00	54	51	94%	NA	NA

Table 5-2. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Methylene Chloride	5.90E-03 JB	9.10E-03 JB	8.08E-03	1.31E-03	1.07E-02	5	5	100%	NA	NA
Toluene	1.00E-03 J	2.00E-03 J	1.14E-03	3.78E-04	1.90E-03	22	7	32%	NA	NA
Trichloroethane	1.00E-03 J	4.60E-03 J	2.80E-03	2.55E-03	7.90E-03	6	2	33%	NA	NA
Am-241	6.00E-02	1.66E+04 J	6.25E+02	3.08E+03	6.79E+03	64	29	45%	1.1E-02	29
Ce-144	1.44E+01	1.44E+01	1.44E+01	NA	NA	12	1	8%	NA	NA
Co-60	9.00E-02	2.27E+04	1.81E+03	6.28E+03	1.44E+04	41	13	32%	NA	NA
Cs-134	1.30E-01	7.55E+04	5.40E+03	2.02E+04	4.58E+04	41	14	34%	NA	NA
Cs-137	4.78E-02	1.02E+08	1.31E+06	1.02E+07	2.17E+07	119	111	93%	8.2E-01	99
Eu-154	1.54E-01 J	5.65E+05	1.65E+04	9.54E+04	2.07E+05	45	35	78%	NA	NA
H-3	2.49E+04	2.49E+04	2.49E+04	NA	NA	1	1	100%	NA	NA
Np-237	1.00E-01 J	1.63E+00	5.12E-01	4.94E-01	1.50E+00	46	14	30%	NA	NA
Pu-238	2.99E-02	2.76E+05	8.25E+03	4.73E+04	1.03E+05	64	34	53%	4.90E-03	34
Pu-239/240	2.58E-02	1.26E+04	1.08E+03	3.35E+03	7.78E+03	70	26	37%	1.00E-01	17
Pu-241	1.05E+06	1.05E+06	1.05E+06	NA	NA	1	1	100%	NA	NA
Pu-242	3.20E+01	3.20E+01	3.20E+01	NA	NA	1	1	100%	NA	NA
Ru-106	6.66E-02	5.41E+01	2.71E+01	3.82E+01	1.04E+02	31	2	6%	NA	NA
Sr-90	1.60E-01	5.68E+07	7.02E+05	5.97E+06	1.26E+07	93	91	98%	4.90E-01	85
Tc-99	9.00E-01	3.67E+01	4.40E+00	1.02E+01	2.48E+01	12	12	100%	NA	NA
U-234	7.00E-02	2.12E+01	9.85E-01	2.75E+00	6.49E+00	63	61	97%	1.44E+00	3
U-235	2.03E-02	9.00E+03	7.70E+02	2.17E+03	5.11E+03	53	19	36%	NA	NA
U-236	7.55E-01	7.55E-01	7.55E-01	NA	NA	1	1	100%	NA	NA

Table 5-2. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
U-238	4.51E-02	1.39E+00	5.42E-01	4.31E-01	1.40E+00	63	58	92%	1.4E+00	0
Gross Alpha	5.20E+00	1.20E+01	7.35E+00	2.19E+00	1.17E+01	11	11	100%	NA	NA
Gross Beta	3.60E+01	6.89E+02	1.62E+02	1.86E+02	5.34E+02	11	11	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results used in the table are taken from Appendix G of the OU3-13 RI/FS Part A (DOE-ID, 1997b) for Group 1 Sites: CPP-15, -20, -25, -26, -27, -28, -31, -32A, -32B, -33, -58A, -58B and -79.
- Only those constituents that were identified above detection limits are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Ca, Fe, Mg, K, Na and K-40.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

B = The analyte reported value is <RDL, but >IDL.

J = The analyte was identified in the sample but the numerical result may not be accurate.

NA = Not Applicable.

RME = Reasonable Maximum Exposure.

5.3.1.2 CPP-16. CPP-16 consists of soil contaminated by a single release of low-level radioactive water that was spilled during a transfer between Tank WM-181 and the PEW Feed Tank WL-102. The water transferred between these two tanks typically contained very low-level levels of radioactivity; an estimated 1.2 Curies of Cs-137 was released. The soil at the spill site was reportedly removed as part of the ICPP Radioactive Waste System Project during a valve box replacement. (WINCO 1993a, DOE et al 1994a).

5.3.1.3 CPP-20. Site CPP-20 is the location of the Radioactive Waste Unloading Area north of building CPP-604, which was used before 1978. Waste from INEL facilities were transported to the unloading area at the ICPP where it was unloaded at this location via transfer hoses. The liquids were transferred to an underground storage tank before concentration in the PEW Evaporator. It is known that the liquid contained radioactive contaminants and was required to have a pH of less than 2. It has been reported that occasional spills occurred during the unloading process as a result of leaks in the hoses. The spills were reportedly cleaned up as they occurred.

The entire area was excavated in 1982 and 1983-1984 during Phase 1 and 2 of the Fuel Processing Facility Upgrade Project. During Phase I, the entire area was excavated down to 12.2 m (40 ft). Based upon personnel interviews, the first 3.1 m (10 ft) of soils were backfilled with 5 mR dirt that was then covered with 9.1 m (30 ft) of clean fill. The source of the clean fill is unknown. During Phase II, portions of the area were excavated again. Based on personnel interviews, soils were excavated down to 12.2 m (40 ft) in the eastern sections of sites CPP-20 and CPP-25. Only at the location of valve box C-30 were soils found to be contaminated and subsequently removed. The excavated soils were stockpiled and contaminated soils separated and later placed in trenches in the northeast corner of the ICPP outside of the security fence (Site CPP-34). Materials used to backfill the excavation consisted of 3 mR soil placed in the bottom 3.1 m (10 ft) and clean soils placed in the upper 9.1 m (30 ft). The source of the clean fill material included soils excavated from a sand and gravel pit located at the CFA.

No soil sampling data were collected at the CPP-20 site due to the area being excavated during the Phase 1 and 2 Fuel Processing Facility Upgrade Project. Although there are no records to verify the cleanup of this area, the radiological survey of this area in 1990-1991 did not detect surface radiation levels above background.

Contaminated soils at Site CPP-20 are believed to be confined to soil with gross radiation readings of 3 to 5 mR placed at depths between 9.1 to 12.2 m (30 to 40 ft) during upgrade projects in the 1980s. Soil above a depth of 9.1 m (30 ft) was reportedly clean fill. Because of the lack of confirmatory soil sampling in the area, soil concentrations from previously excavated Tank Farm soil were assumed representative of the soil beneath both sites (CPP-20 and CPP-25). This assumption was made even though the fill soil is believed to be uncontaminated because it was common practice to use backfill containing trace quantities of radioactivity during the 1980s.

5.3.1.4 CPP-24. Site CPP-24 is located in the Tank Farm and consists of an area of approximately 1.7 m^2 (18 ft^2). In 1954, approximately 38 L (1 gal) of radioactively-contaminated solution was spilled from a bucket onto the ground while work was being conducted at Tank WM-180. The logbooks indicate that the spilled material was removed. Although the exact location of this spill is not known, radiation surveys in the area revealed no radiation levels above background (WINCO 1993a, DOE et al 1994a).

5.3.1.5 CPP-25. Site CPP-25 is the location of a ruptured transfer line that released an unknown quantity of liquid waste adjacent to the north side of building CPP-604.

The eastern portion of Site CPP-25 overlaps the area of Site CPP-20. The transfer line that was being used to transfer liquid waste from WC-119 to WL-102, ruptured on August 28, 1960 contaminating the soil adjacent to the building. According to direct radiation readings at the time of the incident, the soil was initially contaminated to levels of $2 \times 10^{+04}$ R/hr. Approximately 7 m^3 (9 yd^3) of contaminated soil was removed and taken to the RWMC for disposal. No records exist to verify the effectiveness of these cleanup activities. However, during 1981 and 1983 the entire site was excavated during Phases I and II of the Fuel Processing Facility Upgrade Project. This excavation included the eastern portion of sites CPP-20 and CPP-25 as discussed above. Fill materials placed back into the excavation consisted of 3 mR material in the bottom of the excavation and clean soils in the upper 9.1 m (30 ft).

Contaminated soils at Site CPP-25 are believed to be confined to soil with gross radiation readings of 3 to 5 mR placed at depths between 9.1 to 12.2 m (30 to 40 ft) during upgrade projects in the 1980's. Soil above a depth of 9.1 m (30 ft) was reportedly clean fill. Because of the lack of confirmatory soil sampling in the area, sample results from previously excavated Tank Farm soil will be assumed, for the purposes of the BRA, to be representative of the soil beneath both sites CPP-20 and CPP-25.

5.3.1.6 CPP-26. CPP-26 consists of soil potentially contaminated by a 1964 release of radioactive steam that was inadvertently released to the air through a faulty hose coupling on the decontamination header. The volume of radioactively-contaminated steam that was released at Site CPP-26 is unknown. The release is assumed to have contaminated the land surface of approximately 13 acres to the northeast of building CPP-635. However, in an approved Track 2 NFA recommendation, the scope of the CERCLA investigation was limited to that portion of the site inside the Tank Farm. The original land surface at the time of the release (prior to membrane installation) is now located at a depth of 0.7 m (2.5 ft) bgs.

5.3.1.7 CPP-27 and CPP-33. Sites CPP-27 and CPP-33 consist of contaminated soil associated with subsurface releases of HLLW from the Tank Farm transfer system near the northeast corner of building CPP-604. These sites were determined to be related to releases from the same source and, therefore, are being addressed as a single release site. Following cleanup, it was estimated that 25 mCi of radioactivity in soil remained in place (WINCO 1993i).

In 1983, additional contaminated soil was discovered. This additional contamination, thought to be the result of a separate release from the same transfer line, was designated CPP-33. Cleanup efforts in 1983 removed approximately 10,710 m^3 (14,000 yd^3) of contaminated soil. Of this total, approximately 1,530 m^3 (2,000 yd^3) exceeding 30 mR/hr of beta-gamma radiation was removed and placed in trenches. The soil in these trenches is addressed separately as Site CPP-34 (Section 18). After the 1983 excavation, the CPP-33 area was backfilled and trace amounts of radioactively contaminated soils were reportedly left in place below, and lateral to the excavated area (WINCO 1993i). It appears that the majority of contamination is located in the southwest portion of the site where levels as high as 30 mR/hr were measured below a depth of 6.1 m (20 ft).

5.3.1.8 CPP-28. The contamination at Site CPP-28 was discovered in 1974 during the installation of a cathodic protection electrode in the Tank Farm area. Soil with radioactive contamination up to 40 R/hr was encountered at a depth of about 1.8 m (6 ft) bgs. The leak was later determined to be from a 0.3 cm (1/8 in.) diameter hole inadvertently drilled through one side of the 7.6-cm (3-in.) diameter stainless steel pipe during original construction in 1953. The HLLW consisting of first-cycle raffinate most likely leaked through secondary containment to the surrounding soil. In late 1974, approximately 45 m^3 (56 yd^3) of contaminated soil having an estimated 3,000 Ci of gross radioactivity was removed from the area above the pipeline leak. No contaminated soil was removed from below the pipe encasement due to high levels of radioactivity in the soil. The excavated area was subsequently backfilled.

5.3.1.9 CPP-30. Site CPP-30 was a 6 × 6 m (20 × 20 ft) area of surface soil contamination near Tank Farm Valve Box B-9. The area was contaminated during a one-time preventative maintenance activity in which residual decontamination solution from the floor of the value boxes contaminated personnel clothing, and equipment. The contaminated soil was removed and disposed at the Radioactive Waste Management Complex (RWMC) (WINCO 1993a, DOE et al 1994a).

5.3.1.10 CPP-31. In November 1972, HLLW was released to the surrounding soil during a transfer between tanks WM-181 and WM-180. The release was caused by a failure of a 8-cm (3-in) diameter carbon steel waste transfer line where it was speculated that the highly acidic HLLW corroded the transfer line. This transfer line is located about 2 ft below grade. Estimated radionuclide concentrations include Cs-137 (at up to 2,190,000 pCi/g), Sr-90 (up to 710,000 pCi/g), Pu-239/Pu-240 (up to 1,500 pCi/g), and U-235 (up to 9,000 pCi/g). Other radionuclides estimated to be present at lesser concentrations are Co-60, Cs-134, and Ru-106.

5.3.1.11 CPP-32. Site CPP-32E is an area of contaminated soil southwest of valve box B-4. This area is approximately 0.7 m^2 (8 ft^2) and about 0.3 m (1 ft) deep with radiological contamination up to 2 R/hr. The contaminated soil appeared to have originated from the stand pipe (air vent tube and view port pipe) that extended out of the valve box. It is likely that the contamination from the stand pipe at this site was the result of condensation of humidity in valve box B-4. CPP-32W is located about 15 m (50 ft) northwest of valve box B-4 and consists of soil contaminated to 2 R/hr covering an area of about 0.6 m^2 (6 ft^2) to a depth of about 0.3 m (1 ft). The contaminated material apparently originated from a 5.1-cm (2-in.) diameter aboveground line. The line was used to pump water from tank sumps to the PEW Evaporator. It is likely that the contaminated area was the result of a leak that occurred from this line during a transfer of water that contained radionuclides.

5.3.1.12 CPP-58. Site CPP-58W consists of soil affected by a release of PEW condensate in 1954. Site CPP-58E consists of soil affected by a leak of PEW condensate in 1976. The results of the gamma analysis detected only Cs-137 and K-40. Contamination is estimated to be present from 2 to 14 m (6 to 46 ft) below grade.

5.3.1.13 CPP-79. CPP-79 was originally defined as soil contaminated by the releases of waste solutions in July and August of 1986 due to an obstruction in a transfer line. A second, deeper zone of contamination at this site is believed to be related to the release of HLLW at Site CPP-28.

The releases occurred when the liquid waste was obstructed in the transfer line and backed up through an open drain line and into valve box A-2. Approximately 9,500 L (2,500 gal) of low-level radioactively contaminated liquid leaked. A second, deeper zone of contamination was discovered during the drilling of boring CPP-79-1 at a depth of 9.1 m (30 ft) bgs. This deeper zone of contamination has much higher concentrations of radionuclides than the shallower zone and appears to be related to the known release of HLLW at Site CPP-28. It is believed that the HLLW released at Site CPP-28 migrated to the south to the deep soil with high radionuclide concentrations encountered in boring 79-1.

5.3.2 Soils Under Buildings or Structures (Group 2)

Because of the inaccessibility of most of these sites, only limited soil characterization data are available. Knowledge of the associated processes and waste streams at these sites and an estimate of the potential leak or spill volume provided the basis for determining the types and quantities of contaminants that may be present at these sites. The soils at Sites CPP-87 and -89 have been sampled and analyzed. The results of the RI/BRA indicate that the primary threats posed by these sites are external exposure to the soils, should they be available for exposure and continued leaching of contaminants to the SRPA. The external exposure threat is currently an incomplete pathway and the leaching is being controlled by the presence of the building, which limits infiltration.

The Soils Under Buildings or Structures group is comprised of release sites in OUs 3-09, 3-12, and 3-13 that occur beneath INTEC buildings or structures, and includes Sites CPP-02, -41A, -60, -68, -80, -85, -86, -87, and -89 (Figure 1-5). These sites consist of soil contamination that resulted from past hazardous or radioactive liquid spills, leaks, and plant operations and are considered low-level threat wastes.

The individual release sites comprising Group 2 include:

5.3.2.1 CPP-02, French Drain West of Building CPP-603: 14,000,000 L (3,698,408 gal) of basin water was disposed per year. An estimated 493 Ci was released with the major isotope being tritium. The Graphite fuel storage building was constructed over this site. The site has not been sampled. If not for the depth of release and the presence of the graphite fuel storage building, this site would pose a threat due to external exposure. Modeling performed during the RI/FS indicated that this site presents a groundwater risk. Currently the leaching of contamination is being controlled by the building limiting infiltration. Should the building be removed this contamination will present a direct exposure risk and increased groundwater risk.

5.3.2.2 CPP-41A. Site CPP-41A is one of two pits where oils and organic materials were placed in metal drip pans and ignited for fire brigade practice. The training pits are no longer in use. CPP-41A is a pit that has been covered with asphalt and, because it is close to building CPP-663, it is suspected of having been excavated and removed during construction of CPP-663.

5.3.2.3 CPP-60. Site CPP-60 is a small cinder block building commonly referred to as a paint shop but was actually used to house hazardous materials. It was suspected that during paintbrush cleaning, solvents were discharged to the surrounding soil. The building was removed in the 1970's and CPP-645, an office building, is now located over the area. No samples were collected to confirm the existence or absence of contamination at this site (WINCO 1992f).

5.3.2.4 CPP-68. Site CPP-68 is the former location of an abandoned 1,892 L (500 gal) underground gasoline storage tank. Use of the tank was discontinued in 1983 and the tank was removed in 1986. During exhumation of the tank, there was no visual evidence to suggest that the tank leaked. There are no operating records prior to 1983 or records of spills associated with the operation of this tank. A single sample of the tank bed soil was analyzed and found to contain only traces of gasoline range organic constituents that did not exceed risk-based levels. In addition, visual examination of the tank bed soil did not suggest tank leakage (WINCO 1993g).

5.3.2.5 CPP-80, Building CPP-601 Vent Tunnel Drain Leak: Soil contamination resulted from leakage of corrosive condensate from a cast iron underground line. No soil sampling was performed due to the inaccessibility of the site. Approximately 397,468 L (105,000 gal) of condensate containing 550 Ci of radionuclides were estimated to have been released to the soil between 1983 and 1989. The leaked contaminants have been observed in the 34 m (110 ft) perched water. Due to the depth of the release and the presence of Building CPP-601 this site only presents risks via the groundwater exposure pathway. Modeling performed during the RI/FS indicated that this site presents a minor groundwater risk. For purposes of groundwater modeling, the inventory for this site was presumed to be equal parts Cs-137 and Sr-90. Currently the leaching of contamination is being controlled by the building limiting infiltration. Should the building be removed, this contamination will present a direct exposure risk and increased groundwater risk. Should the building be removed this contamination would pose an external exposure risk and a minor increased groundwater risk.

5.3.2.6 CPP-85. Site CPP-85 is the WCF blower corridor, which was used to vent gases from the WCF hot cells to the blower pit and subsequent HEPA filtration prior to atmospheric discharge. The WCF blower corridor is a 46 to 60 cm (18 to 24 in.) vitrified clay pipeline surrounded by a poured square concrete envelope. No samples were taken from inside the corridor, but samples collected from the blower pit downstream showed the presence of various fission products including Cs-137 at 49,600 pCI/g. Video inspection of the corridor interior taken in 1994 did not show any evidence of deterioration of the pipeline; therefore, there is no evidence of contamination on, or migration of, contaminants from the CPP-85 blower corridor (DOE-ID 1997b).

5.3.2.7 CPP-86. Site CPP-86 is a waste trench that runs underneath CPP-602, which is a laboratory and office building that also houses a liquid product denitrator. The trench, which lies approximately 3 m (10 ft) bls, collects liquid waste from various CPP-602 operations. The waste is subsequently routed to the PEW evaporator system. During modification of the trench in 1990, mercury was found in a sample of sludge and dirt that originated from the base of the trench (DOE-ID 1997b).

5.3.2.8 CPP-89 and CPP-87, Building CPP-604/605 Tunnel Excavation: This site consists of contaminated soil encountered while excavating an emergency fire exit from the basement area of Building CPP-604/605. The excavation included an area immediately south of CPP-604, as well as beneath the building. Contaminated soil adjacent to two deteriorated carbon steel pipes was excavated as part of the piping removal. The excavated soil was placed in boxes and is currently stored at CERCLA Site CPP-92. No effort was made to remove all of the contaminated soil. Soils remaining in place at CPP-89 have not been sampled. The boxed soil (CPP-92) from CPP-89 was sampled and the results are summarized in Table 5-3. The contaminants identified in these samples are consistent with soil contamination resulting from release of service waste and PEW evaporator condensates that typically include nitric acid, mercury, plutonium, Cs-137, and Sr-90. Modeling performed during the RI/FS indicated this site presents a groundwater risk. Currently the leaching of contamination is being controlled by the building limiting infiltration. Should the building be removed, this contamination will present a direct exposure risk and an increased groundwater risk.

5.3.3 Other Surface Soils (Group 3)

The Other Surface Soils group consists of release sites located in areas near Building CPP-603 (Sites CPP-01, -03, -04, -05, -08, -09, -10, -11, and -19), Building CPP-633 (Sites CPP-36 and -91), the calcined solids storage bins (Sites CPP-13, -35, and -93), disposal trenches (Site CPP-34), the old STP (Site CPP-14), the grease pit (Site CPP-44) near Building CPP-1619, Site CPP-55 near temporary Building TB-1, the percolation ponds (Site CPP-67) situated south of the INTEC fence CPP-37a, gravel pit east of the INTEC fence CPP-37b, an old construction landfill within the fence, and CPP-48, site of the former dump tank. In addition, Site CPP-92 is included in Group 3 and consists of 653 boxes of radionuclide-contaminated soils that were generated as a result of a variety of INTEC activities. Figure 1-6 shows the location of the Group 3 sites. These sites generally consist of soil contamination that resulted from inadvertent spills and leaks of radioactive waste, decontamination solutions, spent fuel storage water, storage of radionuclide-contaminated equipment, and other plant-generated wastewaters. The soils at the Group 3 sites are identified as low-level threat wastes.

Investigations conducted at these sites have determined the extent of soil contamination. Based on the results of drilling and sampling, the contamination generally occurs in the upper few feet of the soils; however, some sites (CPP-36 and CPP-91) have contamination that extends to the surface soil/basalt interface, at a depth of about 12 m (40 ft). The results of the RI/BRA indicate that the primary threat posed by these sites is external exposure to radionuclides.

Table 5-3. Summary sampling results statistics for soil contaminants at Site CPP-89 (excavated soil was placed into boxes that are currently stored in Site CPP-92).[a]

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of amples Greater than Background
As	1.60E+00 B	5.90E+00	4.11E+00	1.25E+00	6.61E+00	15	15	100%	5.80E+00	1
Hg	6.00E-02 B	1.04E+01	1.49E+00	2.90E+00	7.29E+00	17	15	88%	5.00E-02	15
Se	2.10E-01 B	.10E-01 B	3.20E-01	1.00E-01	5.20E-01	16	4	25%	2.20E-01	3
Am-241	2.00E-02	2.36E+01	2.83E+00	6.58E+00	1.60E+01	14	14	100%	1.10E-02	14
Co-60	3.90E+00	3.90E+00	3.90E+00	NA	NA	1	1	100%	NA	NA
Cs-134	2.30E+00	2.30E+00	2.30E+00	NA	NA	1	1	100%	NA	NA
Cs-137	1.40E-01	7.73E+03	1.25E+03	2.70E+03	6.65E+03	14	14	100%	8.20E-01	11
I-129	3.10E+00	3.10E+00	3.10E+00	NA	NA	1	1	100%	NA	NA
Np-237	1.50E-01	1.50E-01	1.50E-01	NA	NA	1	1	100%	NA	NA
Pu-238	2.00E-02	2.59E+02	3.83E+01	8.86E+01	2.16E+02	14	14	100%	4.90E-03	14
Pu-239/240	0.00E+00	2.47E+01	3.30E+00	7.57E+00	1.84E+01	14	14	100%	1E-01	4
Sb-125	1.30E+01	1.30E+01	1.30E+01	NA	NA	1	1	100%	NA	NA
Sr-90	3.00E-01	1.08E+04	1.48E+03	3.02E+03	7.52E+03	14	14	100%	4.90E-01	13
U-234	5.10E+00	5.10E+00	5.10E+00	NA	NA	1	1	100%	1.44E+00	1
U-235	2.30E-01	2.30E-01	2.30E-01	NA	NA	1	1	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results used in this table are samples collected from boxed soil from the 1991–1992 emergency fire exit excavation at building 604/605 (CPP-89).
- Samples were analyzed for VOCs, inorganics, and radionuclides. Only those constituents identified in Appendix G of the OU 3-13 RI/FS Part A (DOE-ID 1997b) are shown in this table.
- Samples rejected because of an unacceptable quality control parameter are not included in this table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

B = The analyte reported value is <RDL, but >IDL.

J = The analyte was identified in the sample but the numerical result may not be accurate.

NA = Not Applicable.

RME = Reasonable Maximum Exposure.

Because of the generally small area and contaminant mass of most of these sites, the quantities of COCs present at most sites do not pose a threat to groundwater. However, several sites have significant sources at or near the soil basalt interface. For those sites there is a minor threat to groundwater. The COCs at these sites include both radionuclide and nonradionuclide contaminants.

5.3.3.1 CPP-35 (Building 633 Decontamination Spill). Site CPP-35 resulted from a spill of decontamination fluid that entered the WCF air transport system and was released to soil. This release was estimated to have a contaminated area of 111 m^2 (1200 ft^2). The release was approximately 38 L (10 gal) of solution containing nitric acid, mercuric nitrate, heavy metals, fluoride, nitrates, and as much as 10 Ci of total activity. Contaminated soil and gravel were removed and shipped to the RWMC for disposal. Sampling results data from the Track 2 investigation are summarized for CPP-35 in Table 5-4. No contaminants were detected below 2 m (7 ft).

5.3.3.2 CPP-36 (Contaminated Soil Southeast of the INTEC Stack). The contamination at Site CPP-36 is the result of the three separate releases, which are described below:

1. In 1970, the calciner offgas lines between the WCF and the stack were excavated. Highly contaminated soil (up to 20 R/hr) was encountered at a depth of 1.8 m (6 ft) beneath Olive Avenue. The exact location of the release source is unknown. According to records, the contaminated soil was excavated and disposed at the RWMC. Clean fill was used as backfill.

2. In October 1974, contamination was encountered under Olive Avenue during excavation for installation of lines. This contamination apparently was the result of waste that flowed out of an orifice corroded by nitric acid. The waste was probably from liquids being transferred from Tank WC-119 (sump tank at the WCF) and Tank WC-102 (PEW evaporator).

3. In November 1974, 2,840 L (750 gal) of solution containing an estimated 4 Ci of total activity leaked into Valve Pit MAH-OGF-P-04.

Two quantitative sampling events were undertaken at this site before the Track 2 investigation. In 1974, three samples were collected from the excavation under Olive Avenue and analyzed for radionuclides. The depths from which the samples were collected cannot be established from available reports. In 1991, samples were collected from four boreholes (Golder Associates 1992). The boreholes were drilled to a maximum depth of 1.8 m (6 ft). The samples were analyzed for VOCs, metals, and radionuclides. The VOCs were not measured above detection levels.

The Track 2 investigation involved installing seven "observation wells" to measure subsurface radiation levels and the drilling and sampling of two boreholes. Samples from the boreholes were analyzed for selected metals, nitrate and nitrite, fluoride, pH, and radionuclides. Summary sampling results statistics for data from CPP-36 is provided in Table 5-5. Based on the result of investigations conducted at Site CPP-36, the zone of contamination is assumed to extend from the ground surface to the soil/basalt interface at about 12.8 m (42 ft). This depth is based on high activity levels measured in the deepest samples collected from borings CPP-36-1 and CPP-36-2. Results from the "observation wells" show elevated radiation levels to at least 7.6 m (25 ft) below ground surface (bgs).

The area of CPP-36 is shown in Figure 1-5. The initial area was expanded because "observation wells" located at the boundaries of the area indicate radiation levels above background. In addition, the CPP-36 area has been extended to the southeast to incorporate Site CPP-91. Investigative results indicate contamination at CPP-91 to be indistinguishable from CPP-36. The revised area of Site CPP-36 is about 748 m^2 (8,052 ft^2).

Table 5-4. Summary sampling results statistics for soil contaminants at Site CPP-35.[a]

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Mercury	5E-02 B	7.20E+00	1.66E+00	2.49E+00	6.64E+00	14	12	86%	5E-02	11
Cadmium	1.40E+00	1.40E+00	1.40E+00	NA	NA	14	1	7%	2.20E+00	0
Am-241	1.38E-02	1.21E+00	5.17E-01	6.01E-01	1.72E+00	3	3	100%	1.10E-02	3
Cs-137	2.14E-01	8.64E+03	6.63E+02	2.14E+03	4.94E+03	14	14	100%	8.20E-01	9
Eu-154	3.18E-01	11.80E+00	3.37E+00	4.81E+00	1.30E+01	5	14	36%	NA	NA
Pu-238	7.93E-01	1.32E+01	5.44E+00	6.77E+00	1.90E+01	3	3	100%	4.90E-03	3
Pu-239/240	5.24E-02	7.25E-01	3.21E-01	NA	NA	3	3	100%	1E-01	2
Sr-90	7.52E+00	3.24E+03	5.77E+02	1.10E+03	2.78E+03	8	8	100%	4.90E-01	8
U-234	9.59E-01 J	1.02E+00 J	9.82E-01	3.32E-02	1.05E+00	3	3	100%	1.44E+00	0
U-235	5.20E-02	7.20E-02	6.03E-02	1.03E-02	8.09E-02	3	3	100%	NA	NA
U-238	1.01E+00	1.14E+00	1.07E+00	6.51E-02	1.20E+00	3	3	100%	1.40E+00	0
Gross Alpha	3.65E+00	2.02E+02	2.76E+01	5.21E+01	1.32E+02	14	14	100%	NA	NA
Gross Beta	2.04E+01	1.21E+04	1.14E+03	3.19E+03	7.52E+03	14	14	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results used in this table are from samples colleced from two borings installed during the OU 3-08 Track II investigation (WINCO 1993c).
- Samples were also analyzed for fluoride, pH, nitrate, nitrite, and K-40. These constituents are not shown in this table because they are not present at hazardous concentrations.
- Samples rejected because of an unacceptable quality control parameter are not included in this table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

B = The analyte reported value is <RDL, but >IDL.

J = The analyte was identified in the sample but the numerical result may not be accurate.

NA = Not Applicable.

RME = Reasonable Maximum Exposure.

Table 5-5. Summary sampling results statistics for soil contaminants at Site CPP-36.[a]

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
As	3.20E+00	4.10E+00	3.69E+00	2.59E-01	4.21E+00	8	8	100%	5.80E+00	0
Ba	6.76E+01	8.92E+01	7.69E+01	7.43E+00	9.18E+01	8	8	100%	3E+02	0
Cd	8.10E-01B	8.40E-01 B	8.25E-01	2.12E-02	8.67E-01	19	2	11%	2.20E+00	0
Cr	9.60E+00	1.49E+01	1.21E+01	1.76E+00	1.56E+01	8	8	100%	3.30E+01	0
Hg	1.20E-01	1.66E+01	1.43E+00	3.78E+00	8.99E+00	19	19	100%	5E-02	19
Pb	7.20E+00	3.22E+02 J	4.74E+01	1.11E+02	2.69E+02	8	8	100%	1.70E+01	1
Am-241	1.03E+00	7.63E+02	2.29E+02	3.63E+02	9.55E+02	13	4	31%	1.10E-02	4
Cs-137	2.04E+01	4.08E+05	2.93E+04	9.71E+04	2.24E+05	20	20	100%	8.20E-01	20
Eu-154	8.75E-02	4.74E+03	5.91E+02	1.50E+03	3.59E+03	11	10	91%	NA	NA
I-129	1.23E+00	2.43E+02	6.33E+01	1.20E+02	3.03E+02	9	4	44%	NA	NA
Np-237	4.00E-02	1.90E+00	8.90E-01	6.99E-01	2.29E+00	9	5	56%	NA	NA
Pu-238	1.70E-01	8.18E+03	1.82E+03	3.58E+03	8.98E+03	13	5	38%	4.90E-03	5
Pu-239/240	7.00E-02	3.24E+02	7.41E+01	1.41E+02	3.56E+02	13	5	38%	1E-01	4
Sr-90	2.90E-01	5.13E+04	2.81E+03	1.14E+04	2.56E+04	20	20	100%	4.90E-01	19
U-234	1.00E-01	2.81E+00	6.54E-01	7.95E-01	2.24E+00	13	13	100%	1.44E+00	2
U-235	4.44E-02	9.95E-02	7.19E-02	2.26E-02	1.17E-01	13	5	38%	NA	NA
U-238	1.20E-01	1.84E+00	6.48E-01	5.94E-01	1.84E+00	13	13	100%	1.40E+00	1
Gross Alpha	5.46E+00 J	2.75E+04 J	3.73E+03	8.83E+03	2.14E+04	11	11	100%	NA	NA
Gross Beta	7.48E+01	2.51E+05	4.50E+04	9.85E+04	2.42E+05	11	11	100%	NA	NA

Table 5-5. (continued).

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from four borings installed during the 1991 assessment (Golder Associates 1991) and from two additional borings installed during the OU 3-08 Track II investigation (WINCO 1993c).
- Sampling results from an investigation in 1974 are not included in this table because the location of one of the samples and depths of all of the samples could not be established.
- The samples from the 1991 investigation were analyzed for VOC's, Metals and Radiological Constituents. No VOC's were measured above detection limits and only those metals and radiological constituents that were identified with concentrations greater than detection limits are shown in the table.
- The OU3-08 Track II Investigation samples were also analyzed for fluoride, pH, nitrate, nitrite and K-40. These constituents are not shown in the table because they are not present at hazardous concentrations.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

B = The analyte reported value is <RDL, but >IDL.

J = The analyte was identified in the sample but the numerical result may not be accurate.

NA = Not Applicable.

RME = Reasonable Maximum Exposure.

5.3.3.3 CPP-91 (Building CPP-633 Blower Pit Drain). Site CPP-91 consists of soil potentially contaminated by discharges from the drain at the base of a blower pit located on the north side of the WCF (CPP-633). The blower pit contains a drain that is believed to discharge directly to the sediments below the blower pit floor, which is approximately 3.1m (10 ft) bgs. In 1992, a cleanup of the blower pit revealed elevated radiation levels on the blower pit walls and floor. During the cleanup, water from rain and snowmelt had entered the blower pit and was observed to be flowing into the blower pit drain. A sample of the dirt on the blower pit floor showed elevated levels of Cs-137, Cs-134, Co-60, Eu-154, and mercury. This suggests that releases of radionuclide contamination may have occurred through the blower pit drain to the underlying soils over the 25+ years since the WCF became operational. Upon discovery of the water and drain in 1992, the drain and blower pit were both sealed. Table 5-6 summarizes sampling results data from the CPP-91 soil borings.

5.3.3.4 CPP-01 (Concrete Settling Basins and Dry Wells East of CPP-603). This site is associated with the fuel storage basin cleanup support system, and consists of the concrete horizontal settling basin (CPP-740), concrete vertical settling pit (CPP-301), and two dry wells (CPP-303 and MAH-SFE-SW-048) east of CPP-603. The fuel storage basin cleanup support system received a backwash slurry of filter aid material (diatomaceous earth) from the Fuel Receiving and Storage Facility filter system. The shielding water in the fuel storage basin was recirculated through the filters to prevent accumulation of dirt and algae. The filtered solids and filter aid material were periodically backwashed from the filters and pumped to CPP-301, a 1.5 × 1.5 × 5.8 m (5 × 5 × 19 ft) vertical settling vault. When the slurry in the vault settled, the supernatant was drained from the vault to a deep dry well, CPP-303, where the effluent percolated into the surrounding soils.

The filter backwash settling system operated from 1951 to 1962. The horizontal settling system was constructed in 1962. The system consisted of a horizontal settling basin CPP-740 and dry well SW-048. The CPP-301 was removed from service and valved off. The CPP-740 basin included a 1.2 × 1.6 × 9.1 m (4 × 5.3 × 30 ft) horizontal settling system of weir compartments and an access manhole. This system served to settle slurry solids and to drain the supernatant to dry well SW-048 and subsequently the surrounding soils. The total volume (18,295 L [5,000 gal]) of sludge and liquid in the horizontal settling basin CPP-740 and the vertical settling pit CPP-301 was removed in the fall of 1993 under a CERCLA removal action. The liquid removed was sent to the PEW facility and the sludge was dried and sent to the RWMC.

Use of dry wells was discontinued in 1966 due to internal administrative controls. This decision prompted reactivation of CPP-301 as a settling pit. Upon reactivation, steam jetting was used to transfer the supernatant to waste storage tank SFE-20 (Site CPP-69 in OU 3-09). In March 1969, several Experimental Breeder Reactor (EBR) No. 2 fuel canisters ruptured, releasing contamination to the basin water. The CPP-740 settling facilities were removed from service in 1977 when the filters were replaced by a pressurized sand filtration system.

Depth of contamination at CPP-01 is assumed to extend from ground surface to the sediment/basalt interface at 9.8 m (32 ft) bgs. Table 5-7 provides summary sampling results statistics for CPP-01.

5.3.3.5 CPP-04/05 (Contaminated Soil Area Around CPP-603 Settling Tank). These sites located east of CPP-603 were combined because they were determined to have resulted from the same release. Site CPP-04 includes a 10.0 × 20.4 m (33 × 67 ft) area of contaminated soil above the horizontal settling basin CPP-740. Site CPP-05 includes a 10.0 × 20.4 m (33 × 67 ft) area of contaminated soil above the vertical settling pit CPP-301. Soil contamination associated with the two sites resulted from unintentional releases during sludge removal from the two structures in 1978.

Table 5-6. Summary sampling results statistics for soil contaminants in CPP-91 soil borings.[a]

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
As	3.60E+00 P	1.03E+01 P	6.17E+00	2.20E+00	1.06E+01	10	10	100%	5.80E+00	6
Ba	7.81E+01 P	1.86E+02 P	1.11E+02	3.12E+01	1.73E+02	10	10	100%	3E+02	0
Be	3.70E-01 P	1.20E+00 P	5.90E-01	0.28E-01	6.46E-01	10	10	100%	1.80E+00	0
Cd	4.3 E-01 BP	3.30E+00 P	1.27E+00	8.90E-01	3.05E+00	10	10	100%	2.20E+00	1
Co	4.80E+00 BP	1.22E+01 P	7.05E+00	2.72E+00	1.25E+01	10	10	100%	1.10E+01	2
Cr	1.52E+01 JP	3.73E+01 JP	2.397E+01	7.49E+00	3.90E+01	10	10	100%	3.30E+01	2
Cu	1.25E+01 P	3.28E+01 P	1.768E+01	6.78E+00	3.12E+01	10	10	100%	2.20E+01	2
Hg	7.00E-02 B	5.40E-01	2.70E-01	1.50E-01	5.70E-01	10	8	80%	5.00E-02	8
Mn	1.67E+02 P	5.34E+02 P	2.616E+02	1.28E+02	5.18E+02	10	10	100%	4.90E+02	1
Ni	1.81E+01 P	3.80E+01 P	2.472E+01	6.85E+00	3.84E+01	10	10	100%	3.50E+01	2
Pb	5.60E+00 P	1.72E+01 P	9.74E+00	3.79E+00	1.73E+01	10	10	100%	1.70E+01	1
Sb	5.80E-01 BP	1.20E+00 B P	8.50E-01	2.30E-01	1.31E+00	10	9	90%	4.80E+00	0
Se	2.00E+00 P	2.00E+00 P	2.00E+00	NA	NA	10	1	10%	2.20E-01	1
Th	1.80E+00 BP	1.80E+00 BP	1.80E+00	NA	NA	10	1	10%	4.30E-01	1
V	2.34E+01 P	4.34E+01 P	3.083E+01	7.70E+00	4.62E+01	10	10	100%	4.50E+01	0
Zn	4.73E+01 P	1.07E+02 P	6.716E+01	2.03E+01	1.08E+02	10	10	100%	1.50E+02	0
Cs-137	1.00E-01	1.40E+02	3.081E+01	4.59E+01	1.23E+02	10	8	80%	8.20E-01	6
Pu-238	3.20E-01	3.20E-01	3.20E-01	NA	NA	1	1	100%	4.90E-03	1
Pu-239	6.00E-02	6.00E-02	6E-02	NA	NA	1	1	100%	1E-01	0
Sr-90	2.00E+01	7.58E+03	2.287E+03	3.60E+03	9.49E+03	4	4	100%	4.90E-01	4
Tc-99	2.32E+00	2.32E+00	2.32E+00	NA	NA	1	1	100%	NA	NA

Table 5-6. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
U-234	6.37E+00 J	6.37E+00 J	6.37E+00	NA	NA	1	1	100%	1.44E+00	1
U-235	2.00E-02	2.00E-02	2E-02	NA	NA	1	1	100%	NA	NA
U-236	1.00E-02 J	1.00E-02 J	1E-02	NA	NA	1	1	100%	NA	NA
U-238	6.40E-01	6.40E-01	6.40E-01	NA	NA	1	1	100%	1.40E+00	0
Gross Alpha	5.30E+00	1.90E+01	1.19E+01	4.69E+00	2.13E+01	9	8	89%	NA	NA
Gross Beta	2.70E+01	2.09E+04	284E+03	6.88E+03	2.98E+05	9	9	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from two borings installed during the OU 3-13 RI. Results are provided in Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b) and the ERIS Database.
- Samples were analyzed for SVOC's, VOC's, Metals and Radiological Constituents. Only those constituents that were identified above detection limits in the samples are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Ca, Fe, Mg, K, Na and Total Sr.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = (Non-Rad) The analyte was identified in the sample but the numerical result may not be accurate.

J = (Rad) The result is statistically positive at the 95% confidence level and is considered to be an estimated quantity.

B = The analyte reported value is < RDL, but > IDL.

P = Sample analysis by inductively coupled plasma atomic emission spectroscopy.

NA = Not applicable.

RME = Reasonable Maximum Exposure.

Table 5-7. Summary sampling results statistics for soil contaminants at Site CPP-01.[a]

Contaminants	Soil Concentration (pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Am-241	1.78E+00 J	1.78E+00 J	1.78E+00	NA	NA	3	1	33%	1.10E-02	1
Co-57	1.02E+00	1.02E+00	1.02E+00	NA	NA	19	1	5%	NA	NA
Co-60	1.38E+00	3.32E+02	7.12E+01	1.46E+02	3.63E+02	19	5	26%	NA	NA
Cs-137	1.29E+00	4.60E+04	4.64E+03	1.20E+04	2.86E+04	19	15	79%	8.20E-01	15
Eu-152	2.23E+00	1.04E+02	5.37E+01	5.75E+01	1.69E+02	19	4	21%	NA	NA
Eu-154	4E+00	7.97E+01	5.03E+01	4.06E+01	1.32E+02	19	3	16%	NA	NA
Eu-155	8.81E+00	8.81E+00	8.81E+00	NA	NA	19	1	5%	NA	NA
Pu-239	5.30E+00 J	1.20E+01 J	8.83E+00	3.36E+00	1.56E+01	11	3	27%	1.00E-01	3
Sr-90	1.11E+01	4.85E+03	9.43E+02	1.46E+03	3.86E+03	16	16	100%	4.90E-01	16
U-235	9.34E-03	3.94E-02	2.40E-02	8.55E-03	4.11E-02	11	11	100%	NA	NA
U-238	1.12E-01	2.50E-01	2.01E-01	4.26E-02	2.86E-01	11	11	100%	1.4	0
Gross Alpha	4.30E+00	3.32E+03	4.47E+02	8.61E+02	2.17E+03	19	14	74%	NA	NA
Gross Beta	7.46E+00	4.32E+04	4.99E+03	1.01E+04	2.52E+04	19	19	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis
- Analytical results are from samples collected from three borings and from the bottom of dry well SW-048 during the OU 3-09 Track 2 Investigation. Results are provided in the Final Preliminary Scoping Track 2 Summary Report For Operable Unit OU 3-09 (LITCO 1995b) and Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were also analyzed for Cd, K-40, Np-237, Pu-238 and U-234. This data is not shown because concentrations were below detection limits.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = Questionable LCS recovery or analytical yield.

NA = Not applicable

RME = Reasonable Maximum Exposure.

The contaminated area was later covered with 0.6 m (2 ft) of soil. Table 5-8 shows summary sampling results statistics for CPP-04/05.

The COPCs for CPP-04/05 include Ce-144, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, and U-235. The areal extent of contamination is estimated at 408 m^2 (4,422 ft^2). Assuming an average depth of contamination of 0.6 m (2.0 ft), the total volume of contaminated soil is estimated at 245 m^3 (8,844 ft^3).

5.3.3.6 CPP-08/09 (Contaminated Soil Area Around CPP-603 Basin Filter System). These sites were combined because they were determined to have resulted from failure of an underground carbon steel filter system line due to corrosion. Approximately 251 m^3 (2,700 ft^3) of soil were contaminated with approximately 79,494 L (21,000 gal) of radionuclide-contaminated water from the CPP-603 basin over a 7-day period.

The exact location of the leak was never determined. The leaking line section was replaced and removed from service. Contaminated soil resulting from the leak was apparently encountered by construction crews on the east side of CPP-603, where a section of the line was located. The area of contamination was delineated by radiological survey instruments, however no soil samples were collected. Site CPP-09 was identified in the FFA/CO as "soil contamination northeast corner of CPP-603 South Basin." Site CPP-08 was identified as "CPP-603 Basin Filter System Line Failure." Sites CPP-08 and -09 were combined as one site based on information gathered during preparation of Track 2 investigation for each site. Table 5-9 provides summary sampling results statistics for CPP-08/09.

The COPCs include Cs-137, Sr-90, Eu-152, Eu-154 and U-235. The assumed areal extent is 251 m^2 (2700 ft^2). The assumed depth of contamination is 9.4 m (31 ft), with an estimated contaminated soil volume of 2,370 m^3 (83,700 ft^3).

5.3.3.7 CPP-10 (Contaminated Soil Area around CPP-603 Plastic Pipeline Break). This site resulted from a release of approximately 3000 L (800 gal) of radionuclide-contaminated CPP-603 basin water that drained onto a shielded floor area as a result of failure of a PVC line in December 1976. Approximately 34 m^2 (366 ft^2) of asphalt and soil outside the building were contaminated. Apparently no remedial actions were performed at the site, other than placing several inches of clean soil over the contaminated area. Table 5-10 provides summary sampling results statistics for CPP-10.

Radionuclide contaminants include Co-60, Cs-137, Eu-152, -154, and -155, Sr-90, and U-235. The estimated area of CPP-10 is 31.2 m^2 (336 ft^2). Contamination is assumed to extend from ground surface to the soil-basalt interface at 10.4 m (34 ft) bgs.

5.3.3.8 CPP-11 (CPP-603 Sludge and Water Release). This site resulted from a release of contaminated sludge and water from CPP-603 in February 1978. Approximately 1,136 to 1,893 L (300 to 500 gal) of sludge and water were released, and covered an area of 8.5 x 17 m (28 x 56 ft). The initial spill was cleaned up and soils with radiation levels greater than 1 R/hr were removed.

The remainder of the area was roped off. Tank SFE-06 is located 1.8 m (6 ft) bgs at the site, and is still used for storage of radionuclide-contaminated waste. The tank is not known to be leaking. Summary sampling results statistics are provided in Table 5-11.

Contaminants of potential concern include arsenic, thorium, Co-60, Sr-90, Cs-137, Eu-154, and Np-237. Contamination is estimated to extend from ground surface to 5.5 m (18 ft) bgs. This estimate was based on radionuclide activities above background in samples collected at 3.8 m (12.5 ft) bgs.

Table 5-8. Summary sampling results statistics for radionuclides at Sites CPP-04/05.[a]

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Ce-144	2.00E-01	2.39E+03	1.20E+02	3.28E+02	7.76E+02	204	133	65%	NA	NA
Co-60	1.05E-02	1.45E+03	4.62E+01	1.57E+02	3.60E+02	204	172	84%	NA	NA
Cs-134	7.50E-02	2.26E+02	1.81E+01	3.77E+01	9.35E+01	204	89	44%	NA	NA
Cs-137	2.19E-01	2.65E+04	9.60E+02	3.27E+03	7.50E+03	204	204	100%	8.20E-01	196
Eu-152	2.00E-01	3.50E+04	9.32E+02	3.49E+03	7.91E+03	204	199	98%	NA	NA
Eu-154	4.73E-01	3.22E+04	9.31E+02	3.34E+03	7.61E+03	204	187	92%	NA	NA
Eu-155	5.38E-03	7.60E+03	2.27E+02	7.96E+02	1.82E+03	204	178	87%	NA	NA
U-235	4.75E-02	3.02E-01	7.01E-02	3.62E-02	1.43E-01	120	120	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from 51 borings installed to characterize the CPP-740 horizontal settling basin in 1981. Results are provided in the Radioactive Waste Characterization of CPP-603 Cleanup Basin-CPP-740 (EG&G 1982) and in Appendix E of the Preliminary Scoping Track 2 Summary Report For Operable Unit 3-09 (LITCO 1995b).

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

NA = Not applicable

RME = Reasonable Maximum Exposure.

Table 5-9. Summary sampling results statistics for soil contaminants at Site CPP-08/09.[a]

Contaminants	Soil Concentration (pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Cs-137	1.49E+01	1.08E+03	5.32E+02	5.83E+02	1.70E+03	4	4	100%	8.20E-01	4
Eu-152	4.38E+00	4.38E+00	4.38E+00	NA	NA	4	1	25%	NA	NA
Eu-154	7.78E-01	2.95E+00	1.86E+00	1.54E+00	4.94E+00	4	2	50%	NA	NA
Sr-90	2.52E+01 J	1.40E+02	8.53E+01	5.76E+01	2.01E+02	3	3	100%	4.90E-01	3
U-235	1.93E-02	2.61E-02	2.27E-02	4.81E-03	3.23E-02	2	2	100%	NA	NA
U-238	1.56E-01	1.61E-01	1.59E-01	3.54E-03	1.66E-01	2	2	100%	1.40E+00	0
Gross Alpha	5.10E+00	7.99E+01	2.91E+01	3.48E+01	9.87E+01	4	4	100%	NA	NA
Gross Beta	9.88E+01	9.36E+02	5.19E+02	4.34E+02	1.39E+03	4	4	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from one boring installed during the OU 3-09 Track 2 Investigation. Results are provided in the Final Preliminary Scoping Track 2 Summary Report For Operable Unit OU 3-09 (LITCO 1995b) and Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were also analyzed for Co-57, Co-60, Eu-155, K-40, U-234, Np-237, Pu-238, Pu-239 and Am-241. This data is not shown because concentrations were below detection limits.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = Questionable LCS recovery or analytical yield.

NA = Not applicable

RME = Reasonable Maximum Exposure.

Table 5-10. Summary sampling results statistics for soil contaminants at Site CPP-10.[a]

	Soil Concentration (pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Co-60	3.18E+00	3.18E+00	3.18E+00	NA	NA	6	1	17%	NA	NA
Cs-137	2.15E+00	1.19E+03	4.91E+02	5.36E+02	1.56E+03	6	6	100%	8.20E-01	6
Eu-152	9.16E+00	9.16E+00	9.16E+00	NA	NA	6	1	17%	NA	NA
Eu-154	5.70E+00	5.70E+00	5.70E+00	NA	NA	6	1	17%	NA	NA
Eu-155	1.48E+00	1.48E+00	1.48E+00	NA	NA	6	1	17%	NA	NA
Sr-90	4.17E+01	5.83E+01 J	5.00E+01	1.17E+01	7.34E+01	2	2	100%	4.90E-01	2
U-235	1.13E-02	1.42E-02	1.28E-02	1.46E-03	1.57E-02	3	3	100%	NA	NA
U-238	1.76E-01	2.10E-01	1.88E-01	1.88E-02	2.26E-01	3	3	100%	1.4	0
Gross Alpha	2.78E+00	1.38E+02	4.97E+01	5.65E+01	1.63E+02	6	5	83%	NA	NA
Gross Beta	1.42E+02	5.45E+03	1.48E+03	2.05E+03	5.58E+03	6	6	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from one boring installed during the OU 3-09 Track 2 Investigation. Results are provided in the Final Preliminary Scoping Track 2 Summary Report For Operable Unit OU 3-09 (LITCO 1995b) and Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were also analyzed for Co-57, K-40, U-234, Np-237, Pu-238, Pu-239 and Am-241. This data is not shown because concentrations were below detection limits.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = Questionable LCS recovery or analytical yield.

NA = Not applicable

RME = Reasonable Maximum Exposure.

Table 5-11. Summary sampling results statistics for soil contaminants at Site CPP-11.[a]

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
As	2.80E+00	6.40E+00	4.77E+00	1.27E+00	7.31E+00	10	10	100%	5.80E+00	2
Ba	6.34E+01 P	1.22E+02 P	9.76E+01	1.96E+01	1.37E+02	10	10	100%	3.00E+02	0
Be	2.50E-01 P	5E-01 P	4.23E-01	7.32E-02	5.69E-01	10	10	100%	1.80E+00	0
Cd	4.30E-01 P	1.70E+00 P	1.12E+00	5.00E-01	2.12E+00	10	10	100%	2.20E+00	0
Co	3.50E+00 B P	6.30E+00 B P	5.13E+00	7.83E-01	6.70E+00	10	10	100%	1.10E+01	0
Cr	1.32E+01 J P	2.37E+01 P	1.85E+01	3.07E+00	2.46E+01	10	10	100%	3.30E+01	0
Cu	7.80E+00 P	1.54E+01 P	1.31E+01	2.26E+00	1.76E+01	10	10	100%	2.20E+01	0
Hg	5.00E-02 B	5.00E-02 B	5.00E-02	NA	NA	10	1	10%	5.00E-02	0
Mn	1.32E+02 P	2.58E+02 NJ P	1.97E+02	4.44E+01	2.86E+02	10	10	100%	4.90E+02	0
Ni	1.16E+01 P	2.06E+01 P	1.73E+01	2.78E+00	2.29E+01	10	10	100%	3.50E+01	0
Pb	5.30E+00 P	8.80E+00 P	6.96E+00	1.11E+00	9.18E+00	10	10	100%	1.70E+01	0
Sb	4.40E-01 B P	8.30E-01 B P	6.06E-01	1.56E-01	9.18E-01	10	9	90%	4.80E+00	0
Se	8.50E-01 B P	8.50E-01 B P	8.50E-01	NA	NA	10	1	10%	2.20E-01	1
Th	1.30E+00 B P	1.30E+00 B	1.30E+00	NA	NA	10	1	10%	4.30E-01	1
V	1.83E+01	2.81E+01	2.50E+01	3.14E+00	3.13E+01	10	10	100%	4.50E+01	0
Zn	3.29E+01	6.42E+01	5.04E+01	8.44E+00	6.73E+01	10	10	100%	1.50E+02	0
Co-60	1.10E+01	6.10E-01	2.93E-01	2.75E-01	8.43E-01	10	3	30%	NA	NA
Cs-137	2.90E-01	7.27E+01	2.56E+01	2.64E+01	7.84E+01	10	10	100%	8.20E-01	9
Eu-154	3.60E-01	1.80E+00	7.53E-01	5.64E-01	1.88E+00	10	6	60%	NA	NA
Np-237	1.50E-01	1.50E-01	1.50E-01	NA	NA	1	1	100%	NA	NA
Sr-90	1.31E+01 J	1.31E+01 J	1.31E+01	NA	NA	1	1	100%	4.90E-01	1

Table 5-11. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
U-234	1.20E+00	1.20E+00	1.20E+00	NA	NA	1	1	100%	1.44E+00	0
U-238	1.00E+00	1.00E+00	1.00E+00	NA	NA	1	1	100%	1.40E+00	0
Gross Alpha	4.60E+00	2.30E+01	1.11E+01	5.16E+00	2.14E+01	10	10	100%	NA	NA
Gross Beta	2.40E+01	2.98E+03 J	3.74E+02	9.17E+02	2.21E+03	10	10	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from three borings installed during the OU 3-13 RI. Results are provided in Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b) and the ERIS Database.
- Samples were analyzed for CLP Metals and Radiological Constituents. Only those constituents that were identified above detection limits in the samples are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Ca, Fe, Mg, K and Na.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95% of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = (Non-Rad) The analyte was identified in the sample but the numerical result may not be accurate.

J = (Rad) The result is statistically positive at the 95% confidence level and is considered to be an estimated quantity.

B = The analyte reported value is < RDL, but > IDL.

N = Spiked sample recovery not within control limit.

P = Sample analysis by inductively coupled plasma atomic emission spectroscopy.

NA = Not applicable

RME = Reasonable Maximum Exposure.

Radionuclide activities were still above background levels at that depth; however, COPC activities decrease with depth. The areal extent of the site is 208 m^2 (2,240 ft^2). The total estimated contaminated soil volume is 1,140 m^3 (40,390 ft^3).

5.3.3.9 CPP-03 (Temporary Storage Area Southeast of CPP-603). Site CPP-03 is a temporary storage area southeast of CPP-603 that was used to store old and abandoned equipment, most of which was radioactively contaminated. The area was decommissioned in the late 1970s and all stored material was boxed and sent to the RWMC for disposal. Contaminated soil was removed, boxed and sent to the RWMC, and the area was covered with 28 cm (11 in.) of "cold" soil. Subsequently, 9,175 m^3 (12,000 yd^3) of contaminated soil excavated from the Tank Farm was stockpiled at the site before burial in three trenches located in the northeast corner of the INTEC.

Radiological field surveys in the area have indicated surface activity levels above background at various locations at the site. Three boreholes in the area were drilled to 3.0 m (10 ft) bgs in locations where high surface activities were observed. Samples were collected and submitted for radionuclide analysis. Summary sampling results statistics are provided in Table 5-12. The COPCs include Cs-137 and Sr-90. Cesium-137 is the primary COC, with contamination detected from the surface to about 1.2 m (4 ft) bgs. The areal extent of contamination is estimated at 6,970 m^2 (75,000 ft^2), and the estimated volume of contaminated soil is 8,364 m^3 (300,000 ft^3).

5.3.3.10 CPP-67 (CPP Percolation Ponds #1 and #2). Site CPP-67 consists of two unlined service waste percolation ponds. The ponds receive service wastewater consisting primarily of cooling water and condensed steam generated by various INTEC operations. INTEC wastewater that contains only traces of radioactivity (or none at all) passes through the service waste system. The waste consists primarily of cooling water and steam condensates. This waste activity is monitored before being discharged to SWP-1 or SWP-2. There are three main service waste systems at INTEC: (1) the eastside system, (2) the westside system, and (3) the CPP-604 PEW process condensate monitor/shutdown system. Figure 1-5 shows the relative location of the ponds, which are fenced to exclude entry of large wildlife and unauthorized personnel. Table 5-13 shows summary sampling results statistics for CPP-67.

SWP-1 is located outside the south INTEC security fence, southeast of CPP-603 and was established in 1984. The pond is approximately 125.0-m (410-ft) long in the east-west direction and 146.3 m (480 ft) 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, which locally outcrops in the pond.

The SWP-2 is located outside the south INTEC security fence, southeast of CPP-603. The 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 to 4 m (12 to 14 ft) deep. The pit was excavated in gravelly alluvium approximately 6 to 11 m (20 to 35 ft) thick, underlain with basalt. Basalt outcrops in the corner of SWP-2. The pond is designed to accommodate continuous disposal of approximately 11.4 M L (3 M gal) of water per day.

RCRA clean-closure equivalency was achieved for metals contamination in Pond SWP-1 in April 1994 and Pond SWP-2 in May 1995; therefore, only radionuclide contamination was assessed as part of the WAG 3 RI/BRA. Site CPP-67 is considered to be a significant source of the perched water beneath the southern portion of the INTEC.

Table 5-12. Summary sampling results statistics for soil contaminants at Site CPP-03.[a]

Contaminants	Soil Concentration (pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Cs-137	2.53E-01	6.16E+01	1.89E+01	2.46E+01	6.81E+01	9	7	78%	8.20E-01	7
Sr-90	1.60E+01	4.39E+01 J	3.00E+01	1.97E+01	6.94E+01	2	2	100%	4.90E-01	3
Gross Alpha	0.00E+00	7.24E+00	3.57E+00	3.25E+00	1.01E+01	9	4	44%	NA	NA
Gross Beta	3.02E+00	1.67E+02	4.68E+01	6.76E+01	1.82E+02	9	6	67%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from three borings installed during the OU 3-09 Track 2 Investigation. Results are provided in the Final Preliminary Scoping Track 2 Summary Report For Operable Unit OU 3-09 (LITCO 1995b) and Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were also analyzed for Co-57, Co-60, Eu-152, Eu-154, Eu-155 and K-40. This data is not shown because concentrations were below detection limits.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = Questionable LCS recovery or analytical yield.

NA = Not applicable

RME = Reasonable Maximum Exposure.

Table 5-13. Summary sampling results statistics for soil contaminants at Site CPP-67.[a]

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Ag	2.10E-01 BJ	1.80E+01 J	2.91E+00	3.84E+00	1.06E+01	87	34	39%	0.00E+00	34
As	1.20E+00 B	1.38E+01	4.52E+00	2.17E+00	8.86E+00	99	98	99%	5.80E+00	24
Ba	3.21E+01	4.00E+02	1.44E+02	8.40E+01	3.12E+02	92	92	100%	3.00E+02	4
Be	3.00E-01 J	8.30E-01	5.61E-01	1.62E-01	8.85E-01	67	8	12%	1.80E+00	0
Cd	4.20E-01 B	1.12E+01	1.82E+00	2.14E+00	6.10E+00	100	65	65%	2.20E+00	9
Co	1.70E+00 B	1.00E+01	4.82E+00	1.83E+00	8.48E+00	66	46	70%	1.10E+01	0
Cr	3.60E+00 NJ	1.08E+02	2.35E+01	1.90E+01	6.15E+01	99	95	96%	3.30E+01	15
Cu	8.60E+00 J	1.49E+02 J	2.43E+01	2.06E+01	6.55E+01	66	66	100%	2.20E+01	22
Hg	9.00E-02	1.26E+02 J	1.26E+01	2.76E+01	6.78E+01	81	66	81%	5.00E-02	66
Pb	3.90E+00 J	1.95E+01J	8.49E+00	3.33E+00	1.52E+01	98	88	90%	1.70E+01	1
Mn	3.86E+01 EJ	3.59E+02 EJ	1.23E+02	7.12E+01	2.65E+02	59	59	100%	4.90E+02	0
Ni	6.90E+00	2.83E+01	1.51E+01	5.37E+00	2.58E+01	67	67	100%	3.50E+01	0
Sb	3.60E-01 B	6.90E+00 B	1.42E+00	2.42E+00	6.26E+00	56	7	13%	4.80E+00	1
Se	1.00E-01 BJ	8.00E-01 J	3.88E-01	2.71E-01	9.30E-01	100	8	8%	2.20E-01	4
Th	2.10E-01 B	2.10E-01 B	2.10E-01	0.00E+00	2.10E-01	57	1	2%	4.30E-01	0
V	5.60E+00	3.63E+01 N	1.53E+01	5.66E+00	2.66E+01	67	67	100%	4.50E+01	0
Zn	2.44E+01 NJ	1.02E+02 J	4.77E+01	1.74E+01	8.25E+01	67	67	100%	1.50E+02	0
Cyanide	1.20E-01 B	5.20E-01 J	2.90E-01	2.07E-01	7.04E-01	65	3	5%	NA	NA
Sulfide	5.40E-01	1.57E+01	8.10E+00	5.20E+00	1.85E+01	10	10	100%	NA	NA
2-Butanone	7.00E-03 J	9.00E-03 J	8.00E-03	1.41E-03	1.08E-02	33	2	6%	NA	NA
Acetone	5.00E-03 J	9.10E-02 B	2.39E-02	2.99E-02	8.37E-02	7	33	21%	NA	NA
Benzene	1.00E-03 J	1.00E-03 J	1.00E-03	NA	NA	33	1	3%	NA	NA
bis(2-Ethylhexyl)-	3.60E-02 J	3.70E+00	1.31E+00	1.76E+00	4.83E+00	29	5	17%	NA	NA

Table 5-13. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
phthalate										
Butylbenzyl-phthalate	4.00E-02 J	1.40E+00	6.12E-01	6.75E-01	1.96E+00	29	4	14%	NA	NA
Carbon Disulfide	1.40E-02	1.40E-02	1.40E-02	NA	NA	33	1	3%	NA	NA
Chlorobenzene	1.00E-03 J	1.00E-03 J	1.00E-03	NA	NA	33	1	3%	NA	NA
Di-n-butylphthalate	3.80E-02 J	1.30E-01 J	8.92E-02	4.74E-02	1.84E-01	29	5	17%	NA	NA
Diethyl-phthalate	4.10E-02 J	4.10E-02 J	4.10E-02	NA	NA	29	1	3%	NA	NA
Methylene Chloride	2.00E-03 J	2.40E-02 J	9.63E-03	7.44E-03	2.45E-02	33	8	24%	NA	NA
Pentachloro-phenol	3.70E-01 J	3.70E-01 J	3.70E-01	NA	NA	29	1	3%	NA	NA
Toluene	1.00E-03 J	1.00E-03 J	1.00E-03	NA	NA	33	1	3%	NA	NA
Trichloroethane	1.00E-03 J	1.00E-03 J	1.00E-03	NA	NA	33	1	3%	NA	NA
Am-241	8.00E-02 J	7.80E+00	6.31E-01	1.46E+00	3.55E+00	53	27	51%	1.1E-02	27
Ce-144	4.00E-01	1.50E+00	9.23E-01	5.52E-01	2.03E+00	58	3	5%	NA	NA
Co-60	1.60E-01	2.35E+00	5.99E-01	6.43E-01	1.89E+00	58	12	21%	NA	NA
Cs-134	1.50E-01	3.50E+00	1.50E+00	9.23E-01	3.35E+00	58	23	40%	NA	NA
Cs-137	1.00E-01	1.80E+02	4.06E+01	4.67E+01	1.34E+02	58	43	74%	8.2E-01	35
Eu-154	2.80E-01	4.00E+00	1.63E+00	1.26E+00	4.15E+00	38	7	18%	NA	NA
H-3	6.10E-01 J	6.10E-01 J	6.10E-01	NA	NA	10	1	10%	NA	NA
I-129	1.46E+00	3.70E+00	2.50E+00	9.67E-01	4.43E+00	20	4	20%	NA	NA
Np-237	6.30E-01	1.63E+00	1.12E+00	2.90E-01	1.70E+00	10	10	100%	NA	NA
Pu-238	9.00E-02	3.04E+01	6.10E+00	7.50E+00	2.11E+01	53	36	68%	4.90E-03	36
Pu-239/240	5.00E-02	2.07E+00	5.49E-01	5.43E-01	1.64E+00	53	22	42%	1.00E-01	21
Ru-106	1.40E+00	5.97E+00	3.45E+00	1.91E+00	7.27E+00	58	7	12%	NA	NA

Table 5-13. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Sb-125	3.10E-01	5.10E+00	1.76E+00	1.73E+00	5.22E+00	58	8	14%	NA	NA
Sr-90	1.20E-01	1.63E+01	2.07E+00	3.73E+00	9.53E+00	54	24	44%	4.90E-01	20
U-234	0.00E+00	2.75E+00	9.98E-01	5.12E-01	2.02E+00	53	53	100%	1.44E+00	6
U-235	7.00E-02	7.00E-02	7.00E-02	NA	NA	43	1	2%	NA	NA
U-235/236	1.00E-01	1.00E-01	1.00E-01	NA	NA	10	1	10%	NA	NA
U-238	9.00E-02	2.60E+00	8.92E-01	4.37E-01	1.77E+00	54	50	93%	1.4E+00	4
Y-90	1.10E-01	1.20E+00	4.04E-01	4.05E-01	1.21E+00	11	7	64%	NA	NA
Gross Alpha	7.70E+00	7.30E+01	2.85E+01	1.78E+01	6.41E+01	34	34	100%	NA	NA
Gross Beta	1.19E+01	1.63E+02	4.80E+01	3.27E+01	1.13E+02	44	44	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from during 1991-92 by Golder Associates. Analytical results used to develop this table were taken from the WINCO Track 1 Decision Document Package OU 3-03, Site CPP-67, CPP Percolation Ponds #1 and #2 (WINCO, 1994), Appendix G of the OU3-13 RI/FS Part A (DOE-ID, 1997b) and from the ERIS database.
- Only those constituents that were identified above detection limits are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Ca, Fe, Mg, K and Na.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

B = The analyte reported value is < RDL, but > IDL.

E = The reported value is estimated because of the presence of interference.

J = The analyte was identified in the sample but the numerical result may not be accurate.

N = Spiked sample recovery was not within the control limits.

S = The reported value was determined by the method of standard additions.

NA = Not applicable.

RME = Reasonable Maximum Exposure.

Based on the investigative results, the zone of contamination for SWP-1 is estimated to be about 1.8 m (6.0 ft) thick, and extends from the surface to 1.8-m (6.0-ft) bgs. Based on the dimensions of SWP-1, the volume of contaminated soil beneath SWP-1 was estimated to be 32,922 m^3 (1,180,800 ft^3).

Based on the investigative results, the zone of contamination for SWP-2 is assumed to be 1.8-m (6.0-ft) thick, and extends from the surface to 1.8-m (6.0-ft) bgs. This depth is based on the decrease in radionuclide COPCs with depth, and the low activities measured in deeper samples. Based on the dimensions of the pit, the volume of contaminated soil beneath the pit was estimated to be 14,814 m^3 (1,500,000 ft^3).

5.3.3.11 CPP-34 A/B (Soil Storage Area). Site CPP-34 is a soil storage trench in the northeast corner of the INTEC. The area is 4,366 m^2 (47,000 ft^2). In 1984, radionuclide-contaminated soil at levels up to 30 mR/hr was removed from a pile east of CPP-603 and disposed of in the trench. The soil was originally excavated from Site CPP-33. Contaminants included nitric acid and radionuclides, including Cs-137, U-234, U-238, Np-237, Sr-90, and Pu-238. Table 5-14 shows summary sampling results statistics for CPP-34. Based on the investigative results, the primary COCs at this site are Cs-137 and Sr-90. The zone of contamination assumed for this site is from 0 to 6.1 m (0 to 20 ft). The volume of contaminated soil was estimated to be 20,912 m^3 (738,500 ft^3). An average width of the trench (10.7 m [35 ft]) was used to calculate soil volumes, as the width of the trench varied from 13.7 to 7.6 m (45 to 25 ft).

5.3.3.12 CPP-13 (Release from Solid Storage Cyclone NE of CPP-633). Site CPP-13 resulted from an air release of calcined, radioactively-contaminated waste. Site CPP-13 is located on an earthen berm covering underground storage Bin Set 3 which contains calcined high-level radioactive waste (WINCO 1993c). While attempting to clear a restriction in the solid storage cyclone (WC-912) on October 26, 1976, the cyclone became overpressurized and blew contaminated granular solids into the air.

The release contaminated the roof of building CPP-747, located on the top of the concrete-vaulted storage bin and the berm area northeast of building CPP-747. Subsequent cleanup efforts were successful in decontaminating the top of building CPP-747. Surface soil from the bin set area contains radioactivity levels ranging between 800 and 3,000 counts per minute (cpm). The contamination over the berm area was left in place and covered with approximately 0.15 m (6 in.) of clean soil. Summary sampling results statistics for soil contaminants are given in Table 5-15.

The zone of contamination at CPP-13 is assumed to extend throughout the estimated 7.6-m (25-ft) high berm to approximately 0.8 m (2.5 ft) below the base of the berm (original ground surface). The area of CPP-13 is estimated at 366 m^2 (3,949 ft^2).

5.3.3.13 CPP-19 (CPP-603 to -604 Line Leak). This site resulted from a 1978 release of 7,570 L (2,000 gal) of radionuclide-contaminated liquid that leaked from an underground waste transfer line between CPP-603 and WL-102 in CPP-604. The waste transfer line was constructed of 304 stainless steel that reduced from a 3.81- to 3.18-cm (1-1/2- to 1-1/4-in.) diameter line and ran for 530 m (0.33 mi) at a depth of approximately 1.5 m (5 ft) bgs. The major area of contamination was estimated at the time to be approximately 10 m^2 (108 ft^2) on the surface. The waste transfer line was abandoned in place after the leak was discovered. Table 5-16 shows summary sampling results statistics for soil contaminants for CPP-19.

Numerous radionuclides were identified as COPCs for Site CPP-19. Cesium-137, Sr-90, and isotopes of europium are the most widespread and are found at the highest activity levels. These COPCs range in activity as high as 408,000 pCi/g for Cs-137 at boring CPP-19-2 drilled at the site of the release.

Table 5-14. Summary sampling results statistics for soil contaminants at Site CPP-34.[a]

Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Ag	1.90E+00	2.50E+00	2.20E+00	4.24E-01	3.05E+00	20	2	10%	0.00E+00	2
As	1.50E+00	7.10E+00	3.96E+00	1.86E+00	7.68E+00	20	20	100%	5.80E+00	4
Ba	5.28E+01	2.39E+02	1.07E+02	4.87E+01	2.04E+02	20	20	100%	3.00E+02	0
Be	5.00E-01	5.00E-01	5.00E-01	NA	NA	2	1	50%	1.80E+00	0
Cd	6.00E-01	1.00E+00	7.80E-01	2.05E-01	1.19E+00	20	5	25%	2.20E+00	0
Cr	9.10E+00	2.80E+01	1.53E+01	4.12E+00	2.35E+01	20	20	100%	3.30E+01	0
Co	3.60E+00	7.60E+00	5.60E+00	2.83E+00	1.13E+01	2	2	100%	1.10E+01	0
Cu	1.27E+01	1.71E+01	1.49E+01	3.11E+00	2.11E+01	2	2	100%	2.20E+01	0
Fluoride	1.30E+00	2.60E+00	1.93E+00	3.72E-01	2.67E+00	15	15	100%	NA	NA
Hg	1.00E-01	6.00E-01	3.50E-01	3.54E-01	1.06E+00	20	2	10%	5.00E-02	2
Mn	1.19E+02	2.69E+02	1.94E+02	1.06E+02	4.06E+02	2	2	100%	4.90E+02	0
Ni	1.31E+01	2.60E+01	1.96E+01	9.12E+00	3.78E+01	2	2	100%	3.50E+01	0
Pb	3.00E+00	1.32E+02	1.41E+01	2.81E+01	7.03E+01	20	20	100%	1.70E+01	2
Se	7.00E-01	7.00E-01	7.00E-01	0.00E+00	7.00E-01	20	1	5%	2.20E-01	1
Sulfide	2.18E+01	8.14E+01	3.95E+01	2.46E+01	8.87E+01	5	5	100%	NA	NA
V	1.72E+01	2.21E+01	1.97E+01	3.46E+00	2.66E+01	2	2	100%	4.50E+01	0
Zn	3.71E+01	8.95E+01	6.33E+01	3.71E+01	1.38E+02	2	2	100%	1.50E+02	0
bis (2-ethylhexl) phalate	4.60E-01	6.20E-01	5.40E-01	1.13E-01	7.66E-01	20	2	10%	NA	NA
Cs-137	1.10E+00	2.00E+03	3.96E+02	6.13E+02	1.62E+03	20	16	80%	8.20E-01	16
Np-237	7.00E-01	7.00E-01	7.00E-01	NA	NA	20	1	5%	NA	NA

Table 5-14. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Pu-238	5.10E+00	5.10E+00	5.10E+00	NA	NA	20	1	5%	4.90E-03	1
Sr-90	1.60E+00	6.00E+03	8.13E+02	1.49E+03	3.79E+03	20	19	95%	4.90E-01	17
U-234	1.10E+00	2.50E+00	1.47E+00	4.40E-01	2.35E+00	20	8	40%	1.44	2
U-238	1.00E+00	2.80E+00	1.71E+00	6.45E-01	3.00E+00	20	9	45%	1.4	5

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from four borings installed during the 1990 Golder Associates Investigation (Golder Associates 1990). Results are provided in the Golder and Associates report and in Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were analyzed for inorganics, radionuclides, a full suite of VOCs, SVOCs, organochlorine pesticides, PCBs, herbicides and dioxins. Only those constituents that were identified above detection limits are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Ca, Mg, K and Na.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

NA = Not applicable

RME = Reasonable Maximum Exposure.

Table 5-15. Summary sampling results statistics for soil contaminants at Site CPP-13.[a]

Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
As	5.30E+00 BP	8.30E+00 P	6.30E+00	1.02E+00	8.34E+00	7	7	100%	5.80E+00	4
Ba	7.58E+01 P	1.13E+02 P	8.93E+01	1.39E+01	1.17E+02	7	7	100%	3.00E+02	0
Be	3.80E-01 BP	5.30E-01 BP	4.36E-01	5.13E-02	5.39E-01	7	7	100%	1.80E+00	0
Co	4.10E+00 BP	5.60E+00 BP	4.61E+00	5.70E-01	5.75E+00	7	7	100%	1.10E+01	0
Cr	1.16E+01 P	1.71E+01 P	1.37E+01	2.25E+00	1.82E+01	7	7	100%	3.30E+01	0
Cu	1.20E+01 JP	1.74E+01 JP	1.42E+01	2.01E+00	1.82E+01	7	7	100%	2.20E+01	0
Hg	1.30E-01	9.10E-01	4.40E-01	4.14E-01	1.27E+00	7	3	43%	5.00E-02	3
Mn	1.39E+02 JP	2.57E+02 JP	1.82E+02	4.07E+01	2.63E+02	7	7	100%	4.90E+02	0
Ni	1.41E+01 P	1.97E+01 P	1.57E+01	2.23E+00	2.02E+01	7	7	100%	3.50E+01	0
Pb	6.30E+00 P	1.39E+01 P	8.46E+00	2.51E+00	1.35E+01	7	7	100%	1.70E+01	0
Se	6.80E-01 BP	9.60E-01 BP	8.40E-01	1.24E-01	1.09E+00	7	4	57%	2.20E-01	4
V	1.69E+01 P	2.65E+01 P	2.11E+01	3.34E+00	2.78E+01	7	7	100%	4.50E+01	0
Zn	3.84E+01 P	8.59E+01 P	4.99E+01	1.64E+01	8.27E+01	7	7	100%	1.50E+02	0
Zr	7.50E+00 P	1.23E+01 P	1.06E+01	1.57E+00	1.37E+01	7	7	100%	NA	NA
Co-60	4.90E-01	9.00E-01	6.95E-01	2.90E-01	1.28E+00	7	2	29%	NA	NA
Cs-134	6.00E-01	6.00E-01	6.00E-01	NA	NA	7	1	14%	NA	NA
Cs-137	8.00E-02	4.63E+03	1.21E+03	2.04E+03	5.29E+03	7	7	100%	8.20E-01	6
Eu-154	2.20E+01	3.10E+01	2.65E+01	6.36E+00	3.92E+01	7	2	29%	NA	NA
Sr-90	4.70E+00	4.18E+03	1.37E+03	1.93E+03	5.23E+03	5	5	100%	4.90E-01	5
Tc-99	9.00E-01	2.70E+00	1.67E+00	9.29E-01	3.53E+00	4	3	75%	NA	NA

Table 5-15. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Gross Alpha	4	15	8.03E+00	3.72E+00	1.55E+01	7	7	100%	NA	NA
Gross Beta	27	7950	1.99E+03	3.35E+03	8.69E+03	7	7	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from three borings installed during the OU 3-13 RI. Results are provided in Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b) and the ERIS Database.
- Samples were analyzed for CLP Metals, zirconium and radiological constituents. Only those constituents that were identified above detection limits are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Ca, Fe, Mg, K and Na.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = (Non-Rad) The analyte was identified in the sample but the numerical result may not be accurate.

B = The analyte reported value is < RDL, but > IDL.

P = Sample analysis by inductively coupled plasma atomic emission spectroscopy.

NA = Not applicable

RME = Reasonable Maximum Exposure.

Table 5-16. Summary sampling results statistics for soil contaminants at Site CPP-19.[a]

Contaminants	Soil Concentration mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
As	3.10E+00 JP	7.00E+00 JP	4.65E+00	1.23E+00	7.11E+00	10	10	100%	5.80E+00	1
Ba	4.45E+01 P	1.84E+02 P	1.03E+02	4.64E+01	1.96E+02	10	10	100%	3.00E+02	0
Be	1.60E-01 P	6.60E-01 P	4.08E-01	1.56E-01	7.20E-01	10	10	100%	1.80E+00	0
Ca	2.18E+03 P	2.32E+05 P	3.53E+04	6.97E+04	1.75E+05	10	10	100%	2.40E+04	2
Cd	1.30E-01 BP	9.60E-01 BP	4.33E-01	2.92E-01	1.02E+00	21	10	100%	2.20E+00	0
Co	1.90E+00 BP	8.20E+00 BP	4.77E+00	2.00E+00	8.77E+00	10	10	100%	1.10E+01	0
Cr	5.10E+00 JP	2.63E+01 P	1.54E+01	7.45E+00	3.03E+01	10	10	100%	3.30E+01	0
Cu	6.00E+00 P	1.67E+01 P	1.25E+01	3.85E+00	2.02E+01	10	10	100%	2.20E+01	0
Hg	1.50E-01	1.50E-01	1.50E-01	0.00E+00	1.50E-01	10	1	10%	5.00E-02	1
Mn	9.11E+01 P	2.94E+02 NJP	1.80E+02	6.77E+01	3.15E+02	10	10	100%	4.90E+02	0
Ni	8.40E+00 P	2.64E+01 P	1.65E+01	5.76E+00	2.80E+01	10	10	100%	3.50E+01	0
Pb	3.80E+00 JP	1.01E+01 P	6.86E+00	1.80E+00	1.05E+01	10	10	100%	1.70E+01	0
Sb	5.30E-01 B P	8.30E-01 B P	7.12E-01	1.13E-01	9.38E-01	10	6	60%	4.80E+00	0
V	6.50E+00 BP	3.64E+01 P	1.94E+01	1.04E+01	4.02E+01	10	10	100%	4.50E+01	0
Zn	2.21E+01 NJP	8.60E+01 P	4.75E+01	2.00E+01	8.75E+01	10	10	100%	1.50E+02	0
Am-241	1.97E+00	1.97E+00	1.97E+00	NA	NA	3	1	100%	1.10E-02	1
Co-60	1.90E-01	2.16E+04	1.08E+04	1.53E+04	4.14E+04	21	2	10%	NA	NA
Cs-134	5.00E-02	6.00E-02	5.50E-02	7.07E-03	6.91E-02	10	2	20%	NA	NA
Cs-137	6.00E-02	4.08E+05	3.40E+04	1.18E+05	2.70E+05	21	12	57%	8.20E-01	10
Eu-152	1.52E+00	8.76E+04	2.92E+04	5.06E+04	1.30E+05	11	3	27%	NA	NA
Eu-154	1.70E-01	5.35E+04	1.34E+04	2.67E+04	6.68E+04	21	4	19%	NA	NA

Table 5-16. (continued).

Contaminants	Soil Concentration mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Eu-155	1.60E-01	9.62E+03	3.21E+03	5.55E+03	1.43E+04	21	3	14%	NA	NA
Nb-95	6.00E-02	9.00E-02	7.33E-02	1.53E-02	1.04E-01	10	3	30%	NA	NA
Pu-239/240	1.41E+02	1.41E+02	1.41E+02	NA	NA	1	1	100%	1.00E-01	1
Sr-90	2.85E+01	1.25E+05	2.68E+04	5.02E+04	1.27E+05	10	8	80%	4.90E-01	8
U-235	1.73E-02	2.36E+00	8.17E-01	1.34E+00	3.50E+00	5	3	60%	NA	NA
U-238	1.56E-01	4.53E-01	2.58E-01	1.69E-01	5.96E-01	5	3	60%	1.40E+00	0
Gross Alpha	1.57E+00	1.61E+04	1.50E+03	4.50E+03	1.05E+04	21	19	100%	NA	NA
Gross Beta	2.51E+00	5.48E+05	3.53E+04	1.25E+05	2.85E+05	21	21	90%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from two borings installed during the OU 3-09 Track 2 Investigation and two borings installed during the OU 3-13 RI. Results are provided in the Final Preliminary Scoping Track 2 Summary Report For Operable Unit OU 3-09 (LITCO 1995b), Appendix G of the OU 3-13 RI/FS Part A (DOE-ID 1997b) and the ERIS Database.
- Samples were analyzed for CLP Metals and Radiological Constituents. Only those constituents that were identified above detection limits in the samples are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Fe, Mg, K, Na and K-40.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = The analyte was identified in the sample but the numerical result may not be accurate.

B = The analyte reported value is < RDL, but > IDL.

N = Spiked sample recovery not within control limits.

P = Sample analysis by inductively coupled plasma atomic emission spectroscopy.

NA = Not applicable

RME = Reasonable Maximum Exposure.

The COPCs were detected at activity levels above background in samples collected just above the soil/basalt interface at approximately 9.2 m (31 ft) bgs. The zone of contamination is assumed to extend from the ground surface to the soil/basalt interface. The area of site CPP-19 has been expanded to the north, west, and south based on the soil boring results. The area of Site CPP-19 is estimated to be 306 m^2 (3,300 ft^2).

5.3.3.14 CPP-92 (Soil Boxes West of CPP-1617). This site is a group of 648 boxes of soil located west of CPP-1617 that contain soils and debris with low levels of radioactive contamination. The 0.6 × 1.2 × 2.4 m (2 × 4 × 8 ft) and 1.2 × 1.2 × 2.4 m (4 × 4 × 8 ft) boxes are constructed of 1.9-cm (0.75-in.) plywood and are lined with a polyethylene membrane. The soils were generated during various INTEC activities, including the Tank Farm upgrade, CERCLA remedial projects, the CPP-603 cleanup, excavation for the fire exit from building 604/605 and miscellaneous excavations at INTEC where soil contamination was encountered. Most of the boxes contain soil with such low levels of contamination that the RWMC will not accept the waste for disposal.

Boxed soil from the excavation for the fire exit from building 604/605 was sampled and analyzed for inorganics, VOCs, and radionuclides. Sampling results data for the soil generated during the 604/605 excavation are provided in Table 5-3.

The COPCs identified from contaminant screening for the various excavation activities are arsenic, Am-241, Cs-134, Cs-137, Co-60, Eu-152, Eu-154, I-129, Np-237, Pu-238, Pu-239/240, Sr-90, Sb-125, U-234, and U-235. VOCs were not detected in the samples. The only inorganics detected above background were arsenic at 5.9 mg/kg and mercury at 10.4 mg/kg. Mercury was below the EPA Region III risk-based soil concentration of 23 mg/kg residential, noncarcinogenic soil screening level. These contaminants are consistent with the types of contaminants contained in the service wastes and condensates from the PEW evaporator that have historically included nitric acid, mercury, plutonium, cesium, and strontium.

The soil and debris are contained in polyethylene-lined boxes that have not deteriorated. Therefore, it is assumed that significant amounts of contaminated soil have not leaked from the boxes and that lateral and vertical contaminant migration from the box staging area have not occurred. Assuming that the boxes are 80% full, there is a total of approximately 1,000 m^3 (37,000 ft^3) of soil in the boxes.

5.3.3.15 CPP-93 (Simulated Calcine Disposal Trench). This trench was excavated in the early to mid-1960s and was used to dispose of simulated calcine test batches before hot startup of the WCF. Ten test batches of solution containing aluminum nitrate, nitric acid, sodium nitrate and boric acid were calcined and disposed in the trench. None of the test batches contained radionuclides; however, one test batch contained mercuric nitrate. Sampling and analysis identified mercury, aluminum, nitrate/nitrite and sodium as contaminants. Table 5-17 shows soil contaminant summary sampling results statistics for CPP-93.

The nonradioactive simulated calcine associated with Site CPP-93 was generated in 1961 and 1962 during testing of building CPP-633 waste calcining equipment and systems before operation with high-level radioactive waste. Historical operator log entries and photographs indicate that several tons of simulated calcine material were disposed in the trench. The trench was approximately 61 m (200 ft) in length and 2.4 m (8 ft) in width at the bottom, sloping to 4.9 m (16 ft) in width at the top. The trench contained 1.1 to 1.2 m (3.5 to 4 ft) of nonradioactive calcine before being backfilled to grade with approximately 1.2 m (4 ft) of topsoil. Based on photographs and operator logs, the trench was used for simulated calcine disposal from 1964 through 1966.

Table 5-17. Summary sampling results statistics soil contaminants for Site CPP-93.[a]

	Soil Concentration (mg/kg [nonradionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Al	6.11E+03	1.20E+05	3.97E+04	4.48E+04	1.29E+05	8	8	100%	1.60E+04	3
Hg	2.80E+00	1.40E+02	4.43E+01	5.19E+01	1.48E+02	8	8	100%	5.00E-02	8
Nitrate/Nitrite	1.00E+00	7.49E+01	1.66E+01	2.77E+01	7.20E+01	8	8	100%	NA	NA
Na	4.29E+02 B	4.29E+02 B	4.29E+02	NA	NA	8	1	13%	5.20E+02	0

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from four borings installed during the OU 3-13 RI. Results are provided in Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b) and the ERIS Database.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

B = The analyte reported value is < RDL, but > IDL.

NA = Not applicable

RME = Reasonable Maximum Exposure.

During the investigation more than 60 borings were drilled to define the simulated calcine. Because the calcine was easily identified visually only a few samples were collected for laboratory analysis. The analytical results from borings CPP-93-1 through CPP-93-4 confirm the presence of thin layers of simulated calcine material in the vicinity of a trench located southeast of building CPP-603. The presence of simulated calcine material is supported by visual observations in the borings and elevated concentrations of mercury, aluminum, nitrate/nitrite, and sodium. The observed calcine was only 3- to 5-cm (1- to 2-in.) thick.

Samples of the simulated calcine contain elevated concentrations of mercury, aluminum, nitrate/nitrite, and sodium. Concentrations of sodium, nitrate/nitrite, and aluminum appear to decrease with depth in the borings to background levels but mercury concentrations are still above background at the deepest samples in the borings. The full extent of mercury above background has not been defined but the analytical data suggest that mercury concentrations would continue to decrease with depth below 3.0 m (10 ft). The results of additional borings drilled outside of the area of the trench indicate that significant lateral migration of mercury and aluminum from the buried calcine has not occurred.

The contaminated zone for this site is assumed to be from 0.8 to 7.6 m (2.5 to 25 ft). A volume of contaminated soil of 2,039 m^3 (72,000 ft^3) was estimated based on the reported dimensions of the trench. A trench width of 4.9 m (16 ft) down to a depth of 7.6 m (25 ft) was used to account for some lateral migration of COPCs. This site is being addressed as an ecological risk site.

5.3.3.16 CPP-14 (Decommissioned Sewage Treatment Plant). Site CPP-14 is the site of a decommissioned sewage treatment plant that operated from 1951 through 1982. The treatment plant processed sanitary wastes from nine facilities at the INTEC. Site CPP-14 is located in the north-central portion of the INTEC, south of Cypress Avenue, east of Beech Street, and north of the INTEC Tank Farm as shown on Figure 1-5. Site CPP-14 was determined in the RI/BRA (DOE-ID 1997b) to be solely an ecological concern due to the presence of mercury at a depth greater than 9 feet.

The treatment plant consisted of two Imhoff digestion tanks, a trickling filter, a chlorine contact basin, sludge drying beds, and a drain field. Raw sewage was initially digested in the Imhoff tank followed by secondary treatment of the effluent in the trickling filter. The digested sludge was transferred to the sludge drying beds, while liquid effluent from the trickling filter was chlorinated and discharged to the drain field.

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

- Removing the wastewater treatment facilities and associated equipment to a depth of 1.5-m (5- ft) belowgrade
- Removing and disposing of all remaining sludge in the drying beds
- Removing all buried piping, except the 0.3-m (12-in.) influent line and the 0.15-m (6-in.) effluent lines from the chlorine contact basin to the drain field.

The excavated area was backfilled and graded to match the surrounding ground surface.

The influent manhole, ejector pit, Imhoff tanks, final tank, and chlorination tank extended to as deep as 6.1 m (20 ft) belowgrade. The lower portions of these facilities were left abandoned in place.

Demolition planning documents stated that drainage holes approximately 0.09 m^2 (1 ft^2) would be cut in the bottoms of all abandoned structures to prevent accumulation of infiltrating surface water. Also left in place were the 0.3 m (12 in.) diameter influent line, the 0.15 m (6 in.) effluent line to the drain field, and the drain field distribution piping.

The extent of contamination at the former sewage treatment plant was evaluated based on the results of sampling. The zone of contamination in the area of the Imhoff Tanks is assumed to be 0.9 m (3.0 ft) thick, and extends from 2.4 to 3.4 m (8 to 11-ft) bgs. This thickness is based on the initial depth at which sludge was encountered in sampling, and the depth of the base of the tanks. The area of the tanks is 18.6 m^2 (200 ft^2). Radionuclide COPCs at this site include Cs-137, Np-237, U-235, and Sr-90. Of these, Cs-137, Np-237, and Sr-90 were detected at activities above 1.0 pCi/g. Cs-137 activity ranged as high as 6.21 pCi/g.

The zone of contamination at CPP-14 Plant site was assumed to be 8.2 m (27 ft) thick. This zone extends from 1.5 to 9.7 m (5.0 to 32.0 ft) bgs. The area of CPP-14 Plant site measures 900 m^2 (9,860 ft^2). Numerous radiological COPCs were detected in multiple plant site area samples. These include Cs-137, U-234, U-238, and Np-237. Of these, U-234 and U-238 were detected at the highest activities, 6.89 and 52.1, respectively. Cs-137 and Sr-90 detections were also common, but at lower activities. Table 5-18 provides summary sampling results statistics for soil samples collected at CPP-14.

The zone of contamination at the drain field is assumed to extend from 4.3 to 7.6 m (25 ft) bgs. The top of this interval is based on the depth of the drain field piping. The area of CPP-14 drain field is estimated to be 306 m^2 (3,300 ft^2). Radiological COPCs at the drain field are Np-237 and Sr-90. Of these COPCs, only Np-237 was detected above 1 pCi/g. Np-237 was detected at a maximum activity of 1.4 pCi/g.

5.3.3.17 CPP-37A (Gravel Pit #1). Site CPP-37A (Pit #1) is located outside of the INTEC security fence and measures approximately 43 m (140 ft) in width 64 m (210 ft) in length and is 4.3 m (14 ft) in depth. No information is available on the date pit usage began; however, Pit #1 was used for decontamination of radiolonuclide-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 currently receives stormwater runoff from the INTEC.

Soil samples were collected from Pit #1 in 1991. Analytical results are summarized in Table 5-19. Based on the contaminant screening, COPCs identified for Pit #1 were arsenic, Co-60, Am-241, Cs-137, Np-237, Pu-238, Sr-90, U-235, and U-238. The Track 2 investigation for Site CPP-37 (WINCO 1994a) Pit #1 indicated that arsenic was detected above background in eight out of 14 samples collected. 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, Pu-238, Sr-90, and U-238. 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), Np-237 (1.07 pCi/g) and U-235 (0.05 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).

The contaminated zone at Pit #1 is assumed to extend from 0 to 3.0 m (10 ft). The area of Pit #1 is 2,731 m^2 (29,400 ft^2) and 9,179 m^2 (98,800 ft^2) based on the dimensions reported in the Track 2 (WINCO 1994a).

Table 5-18. Summary sampling results statistics for soil contaminants at Site CPP-14.[a]

Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Imhoff Tanks										
Ag	1.22E+01	4.89E+01	3.06E+01	2.60E+01	8.26E+01	2	2	100%	0.00E+00	2
As	4.60E+00	4.90E+00	4.75E+00	2.12E-01	5.17E+00	2	2	100%	5.80E+00	0
Ba	1.75E+02	2.07E+02	1.91E+02	2.26E+01	2.36E+02	2	2	100%	3.00E+02	0
Be	5.30E-01 B	5.60E-01 B	5.45E-01	2.12E-02	5.87E-01	2	2	100%	1.80E+00	0
Cr	5.12E+01	6.07E+01	5.60E+01	6.72E+00	6.94E+01	2	2	100%	3.30E+01	2
Cu	9.63E+01	9.63E+01	9.63E+01	NA	NA	2	1	50%	2.20E+01	1
Hg	1.20E+00	4.00E+00	2.60E+00	1.98E+00	6.56E+00	2	2	100%	5.00E-02	2
Mn	2.07E+02	2.48E+02	2.28E+02	2.90E+01	2.86E+02	2	2	100%	4.90E+02	0
Ni	2.40E+01	2.62E+01	2.51E+01	1.56E+00	2.82E+01	2	2	100%	3.50E+01	0
Pb	3.56E+01	2.11E+02	1.23E+02	1.24E+02	3.71E+02	2	2	100%	1.70E+01	2
Th	2.40E-01 B	2.40E-01 B	2.40E-01	NA	NA	2	1	50%	4.30E-01	0
V	3.10E+01	3.49E+01	3.30E+01	2.76E+00	3.85E+01	2	2	100%	4.50E+01	0
Zn	1.35E+02	4.75E+02	3.05E+02	2.40E+02	7.85E+02	2	2	100%	1.50E+02	1
Acetone	1.30E-02	2.10E-02	1.70E-02	5.66E-03	2.83E-02	2	2	100%	NA	NA
Di-n-octyl Phthalate	2.90E-01 J	2.90E-01 J	2.90E-01	NA	NA	2	1	50%	NA	NA
Bis(2-Ethylhexyl) Phthalate	9.80E-01	1.70E+00	1.34E+00	5.09E-01	2.36E+00	2	2	100%	NA	NA
Toluene	6.00E-03 J	2.90E-02	1.75E-02	1.63E-02	5.01E-02	2	2	100%	NA	NA
Total Xylenes	5.00E-03 J	2.70E-02	1.60E-02	1.56E-02	4.72E-02	2	2	100%	NA	NA
Phenol	2.20E-01 J	2.30E+00	1.26E+00	1.47E+00	4.20E+00	2	2	100%	NA	NA

Table 5-18. (continued).

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
4-Methylphenol	7.60E-01 J	7.60E-01 J	7.60E-01	NA	NA	2	1	50%	NA	NA
1,2-Dichloroethane	3E-03 J	3E-03 J	3E-03	NA	NA	2	1	50%	NA	NA
1,4-Dichlorobenzene	3.10E-01 J	3.10E-01 J	3.10E-01	NA	NA	2	1	50%	NA	NA
Benzoic Acid	2.30E-01 J	3.20E-01 J	2.75E-01	6.36E-02	4.02E-01	2	2	100%	NA	NA
Methylene Chloride	1.20E-01 B	1.20E-01 B	1.20E-01	NA	NA	2	1	50%	NA	NA
Naphthalene	1.70E-01 J	1.30E+00	7.35E-01	7.99E-01	2.33E+00	2	2	100%	NA	NA
4-Chloroaniline	6.40E-01 J	1.10E+00 J	8.70E-01	3.25E-01	1.52E+00	2	2	100%	NA	NA
Phenanthrene	1.50E-01 J	3.70E-01 J	2.60E-01	1.56E-01	5.72E-01	2	2	100%	NA	NA
Fluoranthene	2.40E-01 J	7.20E-01 J	4.80E-01	3.39E-01	1.16E+00	2	2	100%	NA	NA
Pyrene	3.00E-01 J	6.60E-01 J	4.80E-01	2.55E-01	9.90E-01	2	2	100%	NA	NA
Benzo(a)anthracene	1.50E-01 J	3.80E-01 J	2.65E-01	1.63E-01	5.91E-01	2	2	100%	NA	NA
Chrysene	3.80E-01 J	3.80E-01 J	3.80E-01	NA	NA	2	1	50%	NA	NA
Benzo(b)fluoranthene	3.20E-01 J	3.20E-01 J	3.20E-01	NA	NA	2	1	50%	NA	NA
Benzo(k)fluoranthene	2.70E-01 J	2.70E-01 J	2.70E-01	NA	NA	2	1	50%	NA	NA
Benzo(a)pyrene	3.40E-01 J	3.40E-01 J	3.40E-01	NA	NA	2	1	50%	NA	NA
Aroclor-1260	6E+00 X	2.30E+01 X	1.45E+01	1.20E+01	3.85E+01	2	2	100%	NA	NA
Cs-137	4.94E+00	6.21E+00	5.58E+00	8.98E-01	7.38E+00	2	2	100%	8.20E-01	2
Np-237	1.70E+00	1.98E+00	1.84E+00	1.98E-01	2.24E+00	2	2	100%	NA	NA
Sr-90	7.10E-01	1.07E+00	8.90E-01	2.55E-01	1.40E+00	2	2	100%	4.90E-01	2
U-234	7.90E-01	1.15E+00	9.70E-01	2.55E-01	1.48E+00	2	2	100%	1.44E+00	0
U-235	5.00E-02	5.00E-02	5.00E-02	NA	NA	2	1	50%	NA	NA
U-238	5.10E-01	5.30E-01	5.20E-01	1.41E-02	5.48E-01	2	2	100%	1.40E+00	0

Table 5-18. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Y-90	7.00E-01	1.10E+00	9.00E-01	2.83E-01	1.47E+00	2	2	100%	NA	NA
Plant										
Ag	8.00E-01 B	8.30E+00 J	4.12E+00	2.77E+00	9.66E+00	11	5	45%	0E+00	5
As	2.40E+00	4.10E+00 J	3.50E+00	7.30E-01	4.96E+00	11	7	64%	5.80E+00	0
Ba	4.96E+01	1.49E+02	8.54E+01	3.16E+01	1.49E+02	11	11	100%	3.00E+02	0
Be	2.40E-01 B	6.30E-01 B	4.09E-01	1.44E-01	6.97E-01	11	10	91%	1.80E+00	0
Cd	4.00E-01 B	6.60E-01 B	5.25E-01	1.11E-01	7.47E-01	11	4	36%	2.20E+00	0
Co	3.70E+00 B	6.60E+00 B	4.72E+00	1.16E+00	7.04E+00	11	6	55%	1.10E+01	0
Cr	7.30E+00 J	3.04E+01	1.60E+01	6.44E+00	2.89E+01	11	11	100%	3.30E+01	0
Cu	9.40E+00	3.11E+01	1.50E+01	8.34E+00	3.17E+01	11	6	55%	2.20E+01	1
Hg	4E-02	1.10E-01	7.50E-02	4.95E-02	1.74E-01	11	2	18%	5.00E-02	1
Mn	1.02E+02 J	2.92E+02 J	1.69E+02	5.93E+01	2.88E+02	11	11	100%	4.90E+02	0
Ni	1.05E+01	2.65E+01	1.61E+01	5.57E+00	2.72E+01	11	11	100%	3.50E+01	0
Pb	4.60E+00 J	6.22E+01	1.68E+01	1.95E+01	5.58E+01	11	8	73%	1.70E+01	2
Sb	1.23E+01 B	1.23E+01 B	1.23E+01	NA	NA	11	1	9%	4.80E+00	1
V	1.04E+01	3.04E+01	1.82E+01	6.42E+00	3.10E+01	11	11	100%	4.50E+01	0
Zn	2.31E+01	7.71E+01	4.20E+01	1.91E+01	8.02E+01	11	8	73%	1.50E+02	0
2-Butanone	1.00E-03 J	1.00E-03 J	1.00E-03	NA	NA	11	1	9%	NA	NA
4-Nitrophenol	2.60E-01 J	2.60E-01 J	2.60E-01	NA	NA	10	1	10%	NA	NA
Di-n-octyl Phthalate	2.40E-01 J	2.40E-01 J	2.40E-01	NA	NA	10	1	10%	NA	NA
Methylene Chloride	2.50E-02 B	1.20E-01 B	7.33E-02	4.42E-02	1.62E-01	11	4	36%	NA	NA

Table 5-18. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Bis(2-Ethylhexyl) Phthalate	4.30E-02 J	4.30E-02 J	4.30E-02	NA	NA	10	1	10%	NA	NA
Toluene	4E-03 J	4E-03 J	4.00E-03	NA	NA	11	1	9%	NA	NA
Total Xylenes	4.40E-02	4.40E-02	4.40E-02	NA	NA	11	1	9%	NA	NA
Benzoic Acid	2.00E-01 J	2.00E-01 J	2.00E-01	NA	NA	10	1	10%	NA	NA
Tetrachloroethylene	1E-03 J	1E-03 J	1E-03	NA	NA	11	1	9%	NA	NA
Pentachlorophenol	3.80E-01 J	3.80E-01 J	3.80E-01	NA	NA	10	1	10%	NA	NA
Aroclor-1254	2.10E-02 JX	1.20E-01 JX	7.05E-02	7.00E-02	2.11E-01	10	2	20%	NA	NA
Aroclor-1260	1.00E-01 JX	5.70E-01 DJX	2.93E-01	2.46E-01	7.85E-01	10	3	30%	NA	NA
Am-241	1.15E+00	1.15E+00	1.15E+00	NA	NA	11	1	9%	1.10E-02	1
Cs-137	3.10E-01	3.89E+00	1.80E+00	1.40E+00	4.60E+00	11	5	45%	8.20E-01	3
Np-237	4.05E-01	5.50E+00	2.32E+00	1.50E+00	5.32E+00	11	9	82%	NA	NA
Sb-125	1.00E-01 J	1.00E-01 J	1.00E-01	NA	NA	11	1	9%	NA	NA
Sr-90	7.00E-02	5.70E-01	2.39E-01	1.71E-01	5.81E-01	11	7	64%	4.90E-01	1
U-234	9.00E-02 J	6.89E+00	8.89E-01	2.00E+00	4.89E+00	11	11	100%	1.44E+00	1
U-235	5.00E-02	6.80E-01	3.65E-01	4.45E-01	1.26E+00	11	2	18%	NA	NA
U-238	1.00E-01 J	5.21E+01	5.16E+00	1.56E+01	3.64E+01	11	11	100%	1.40E+00	2
Y-90	1.00E+01 J	4.00E-01	2.30E-01	1.54E-01	5.38E-01	7	3	43%	NA	NA
Drain Field										
Ag	3.30E+00 J	3.30E+00 J	3.30E+00	NA	NA	3	1	33%	0E+00	1
As	1.10E+00 J	8.60E+00	4.80E+00	3.75E+00	1.23E+01	3	3	100%	5.80E+00	1
Ba	7.12E+01	1.99E+02	1.17E+02	7.15E+01	2.60E+02	3	3	100%	3.00E+02	0

Table 5-18. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Be	4.30E-01 B	4.30E-01 B	4.30E-01	NA	NA	3	1	33%	1.80E+00	0
Cd	8.10E-01 B	8.10E-01 B	8.10E-01	NA	NA	3	1	33%	2.20E+00	0
Co	4.40E+00 B	9.00E+00 B	6.00E+00	2.60E+00	1.12E+01	3	3	100%	1.10E+01	0
Cr	1.57E+01	2.52E+01	1.90E+01	5.37E+00	2.97E+01	3	3	100%	3.30E+01	0
Cu	1.89E+01	1.94E+01	1.92E+01	3.54E-01	1.99E+01	3	2	67%	2.20E+01	0
Hg	3.80E-01 J	3.80E-01 J	3.80E-01	NA	NA	3	1	33%	5.00E-02	1
Mn	8.13E+01	4.13E+02 J	2.38E+02	1.67E+02	5.72E+02	3	3	100%	4.90E+02	0
Ni	1.33E+01	2.26E+01	1.75E+01	4.71E+00	2.69E+01	3	3	100%	3.50E+01	0
Pb	9.40E+00 J	1.55E+01 J	1.27E+01	3.08E+00	1.89E+01	3	3	100%	1.70E+01	0
Se	4.30E-01 B	6.90E-01 J	5.60E-01	1.84E-01	9.28E-01	3	2	67%	2.20E-01	2
Th	2.10E-01 B	2.40E-01 B	2.25E-01	2.12E-02	2.67E-01	3	2	67%	4.30E-01	0
V	1.47E+01	2.97E+01	2.24E+01	7.51E+00	3.74E+01	3	3	100%	4.50E+01	0
Zn	4.50E+01	8.86E+01	6.78E+01	2.19E+01	1.12E+02	3	3	100%	1.50E+02	0
Di-n-butyl Phthalate	9.00E-02 J	9.00E-02 J	9.00E-02	NA	NA	3	1	33%	NA	NA
Naphthalene	1.20E-01 J	1.80E-01 J	1.50E-01	4.24E+00	8.63E+00	3	2	67%	NA	NA
Phenanthrene	8.70E-02 J	8.70E-02 J	8.70E-02	NA	NA	3	1	33%	NA	NA
Aroclor-1260	7.20E-01 DJX	7.20E-01 DJX	7.20E-01	NA	NA	3	1	33%	NA	NA
Cs-137	3.15E+00	3.15E+00	3.15E+00	NA	NA	3	1	33%	8.20E-01	1
Np-237	5.90E-01	1.40E+00	1.04E+00	4.12E-01	1.86E+00	3	3	100%	NA	NA
Sr-90	9.00E-02	8.80E-01	5.00E-01	3.96E-01	1.29E+00	3	3	100%	4.90E-01	2
U-234	3.10E-01	4.20E-01	3.73E-01	5.69E-02	4.87E-01	3	3	100%	1.44E+00	0
U-238	2.30E-01	3.90E-01	2.90E-01	8.72E-02	4.64E-01	3	3	100%	1.40E+00	0

Table 5-18. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Y-90	9.00E-02	9.00E-01	4.95E-01	5.73E-01	1.64E+00	2	2	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from 17 soil samples collected from five pipe excavation locations and 10 boreholes installed under the OU 3-05 Track 2 investigation. Results are provided in The Track 2 Summary Report, Waste Area Group 3, Operable Unit 3-05, Old Sewage Treatment Plant West of CPP-664 (WINCO 1993j) and Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were analyzed for metals, radionuclides, VOCs, SVOCs, PCBs, pesticides/herbicides and dioxin/furans. Only those constituents that were identified above detection limits are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Al, Ca, Fe, Mg, K and Na.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = The analyte was identified in the sample but the numerical result may not be accurate.

B = The analyte reported value is <CRDL, but > IDL.

JX = The reported value is an estimate quantity manually entered onto the results form.

DJX = The compound was analyzed at a secondary dilution factor and was an estimated quantity that was manually entered onto the results form.

NA = Not Applicable.

RME = Reasonable Maximum Exposure.

Table 5-19. Summary sampling results statistics for soil contaminants at Site CPP-37A, Gravel Pit #1.[a]

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
As	4.10E+00	8.70E+00	5.83E+00	1.20E+00	8.23E+00	14	14	100%	5.80E+00	8
Ba	7.87E+01	2.29E+02	1.30E+02	4.85E+01	2.27E+02	14	14	100%	3.00E+02	0
Cd	3.50E-01 B	1.50E+00	8.27E-01	3.45E-01	1.52E+00	14	14	100%	2.20E+00	0
Cr	1.02E+01	3.01E+01	1.88E+01	5.61E+00	3.00E+01	14	14	100%	3.30E+01	0
Hg	1.20E-01 J	9.60E-01	5.70E-01	4.18E-01	1.41E+00	14	4	29%	5.00E-02	4
Pb	7.10E+00	1.77E+01	1.10E+01	3.75E+00	1.85E+01	14	14	100%	1.70E+01	1
Se	2.00E-01 BJ	4.10E-01 B	2.34E-01	7.28E-02	3.80E-01	14	14	100%	2.20E-01	1
Methylene Chloride	4.70E-02	1.40E-01	8.93E-02	3.91E-02	1.68E-01	NA	4	NA	NA	NA
Toluene	1.00E-03 J	1.00E-03 J	1.00E-03	NA	NA	NA	1	NA	NA	NA
1,1,1-Trichloro-ethane	5.00E-03 J	5.00E-03 J	5.00E-03	NA	NA	NA	1	NA	NA	NA
Am-241	2.30E-01	9.90E-01	4.76E-01	2.56E-01	9.88E-01	13	7	54%	1.10E-02	7
Co-60	5.50E-01	5.50E-01	5.50E-01	NA	NA	13	1	8%	NA	NA
Cs-137	1.40E-01	3.82E+00	1.13E+00	1.22E+00	3.57E+00	13	9	69%	8.20E-01	4
Np-237	3.20E-01	1.07E+00	6.62E-01	2.49E-01	1.16E+00	13	11	85%	NA	NA
Pu-238	1.00E-01	1.20E-01	1.10E-01	1.41E-02	1.38E-01	13	2	15%	4.90E-03	2
Sr-90	1.70E-01	6.90E-01	3.70E-01	1.69E-01	7.08E-01	13	9	69%	4.90E-01	2
U-234	2.20E-01	7.10E-01	3.63E-01	1.37E-01	6.37E-01	13	12	92%	1.44E+00	0
U-235	5.00E-02	5.00E-02	5.00E-02	NA	NA	13	1	8%	NA	NA
U-238	7.00E-02	3.99E+00	7.27E-01	1.00E+00	2.73E+00	13	13	100%	1.40E+00	1

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from ten borings installed under the OU 3-02 Track 2 Preliminary Scoping Package for CPP-37 by Golder Associates, Inc. Results are provided in the Draft Report for the Idaho Chemical Processing Plant Drilling & Sampling Program at Land Disposal Unit CPP-37 (Golder Associates 1992) and Appendix G of the OU 3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were analyzed for metals, radionuclides, VOCs, SVOCs, PCBs and pesticides/herbicides. Only those constituents that were identified above detection limits are shown in the table.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = The analyte was identified in the sample but the numerical result may not be accurate.

B = The analyte reported value is < RDL, but > IDL.

NA = Not applicable or not available.

RME = Reasonable Maximum Exposure.

5.3.3.18 CPP-37b, Gravel Pit and Debris Disposal Pit #2. Site CPP-37b is located inside the INTEC security fence. Before being backfilled, the site was approximately 79 m (260 ft) in width, 116 m (380 ft) in length and was 7.9-m (26-ft) deep and area of approximately 9,179 m^2 (98,800 ft^2). Prior to 1982, this pit was often used for the disposal of waters released from the sludge dewatering pit of the old STP (CPP-715). After 1982, the pit was used to dispose of construction debris, some of which may have been radionuclide contaminated. Anecdotal information suggests that the Pit may also have been used for the disposal of chemical wastes. Additionally, the CPP-37b 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 HLLW 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. 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. Table 5-20 provides summary sampling results statistics for soil samples from Site CPP-37B.

5.3.3.19 CPP-48 (French Drain South of CPP633). Site CPP-48 was an excess chemical dump tank located south of the old WCF (CPP-633) that was used as a french drain from 1975 to 1981 (herein referred to as "dump tank"). The dump tank was made of steel and measured approximately 1.5 m (5 ft) in diameter and 3.7 m (12 ft) long, with a lid and no bottom. The top of the dump tank stood approximately 0.6 m (2 ft) above the ground surface, with the tank bottom at 3 m (10 ft) bgs. As part of the calcining process, nitric acid and other chemicals consisting primarily of aluminum nitrate and calcium nitrate used in the calcining process were disposed into CPP-48. The chemicals and radionuclides released to the dump tank were not treated or neutralized before percolating into the soil matrix through the bottom of the tank. A portable above ground disposal line was used to discharge effluent to the dump tank. Table 5-21 provides summary sampling results statistics for soils collected at CPP-48.

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

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

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

Table 5-20. Summary sampling results statistics for soil contaminants at Site CPP-37B, Gravel Pit #2.[a]

	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide])									
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Ag	5.60E-01	8.50E+00	4.19E+00	4.01E+00	1.22E+01	28	3	11%	0E+00	3
As	1.20E+00 B	1.14E+01 J	4.42E+00	1.84E+00	8.10E+00	28	28	100%	5.80E+00	3
Ba	5.18E+01 J	4.68E+02	1.26E+02	7.73E+01	2.81E+02	28	28	100%	3.00E+02	1
Cd	4.10E-01 B	3.20E+00	1.22E+00	6.55E-01	2.53E+00	28	22	79	2.20E+00	1
Cr	1.08E+01	4.26E+01	1.85E+01	7.06E+00	3.26E+01	28	28	100%	3.30E+01	1
Hg	1.20E-01 J	1.20E-01 J	1.20E-01	NA	NA	28	1	3%	5.00E-02	1
Pb	1.90E+00 J	2.26E+01 J	9.60E+00	4.56E+00	1.87E+01	28	28	100%	1.70E+01	2
Se	2.00E-01 B	6.50E-01 B	2.81E-01	1.32E-01	5.45E-01	28	15	54%	2.20E-01	4
Methylene Chloride	3.50E-02	2.90E-01	1.20E-01	1.04E-01	3.28E-01	NA	7	NA	NA	NA
Kepone	7.00E-02 J	7.00E-02 J	7.00E-02	NA	NA	NA	1	NA	NA	NA
Acenaphthene	3.70E-02 J	3.70E-02 J	3.70E-02	NA	NA	NA	1	NA	NA	NA
Fluorene	6.10E-02 J	6.10E-02 J	6.10E-02	NA	NA	NA	1	NA	NA	NA
Phenanthrene	4.00E-01	4.00E-01	4.00E-01	NA	NA	NA	1	NA	NA	NA
Anthracene	3.50E-01	3.50E-01	3.50E-01	NA	NA	NA	1	NA	NA	NA
Fluoranthene	2.20E-01 J	2.20E-01 J	2.20E-01	NA	NA	NA	1	NA	NA	NA
Pyrene	2.10E-01 J	2.10E-01 J	2.10E-01	NA	NA	NA	1	NA	NA	NA
Benzo(a)anthr-acene	7.20E-02 J	7.20E-02 J	7.20E-02	NA	NA	NA	1	NA	NA	NA
Chrysene	1.10E-01 J	1.10E-01 J	1.10E-01	NA	NA	NA	1	NA	NA	NA
bis(2-Ethyl-hexyl)Phthalate	2.40E-01 J	2.40E-01 J	2.40E-01	NA	NA	NA	1	NA	NA	NA
Aroclor-1254	2.30E-01	2.30E-01	2.30E-01	NA	NA	NA	1	NA	NA	NA

Table 5-20. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Aroclor-1260	4.20E-01	4.20E-01	4.20E-01	NA	NA	NA	1	NA	NA	NA
Am-241	2.1E-01	3.89E+00	1.18E+00	1.40E+00	3.98E+00	26	6	26%	1.10E-02	6
Cs-137	1.40E-01	6.31E+00	2.04E+00	1.67E+00	5.38E+00	26	17	65%	8.20E-01	11
I-129	1.57E+00	1.57E+00	1.57E+00	NA	NA	26	1	4%	NA	NA
Np-237	3.20E-01	8.60E-01	5.13E-01	1.26E-01	7.65E-01	26	26	100%	NA	NA
Pu-238	6.00E-02	5.00E-01	1.99E-01	1.57E-01	5.13E-01	26	8	31%	4.90E-03	8
Sr-90	8.00E-02	4.31E+00	9.30E-01	1.06E+00	3.05E+00	26	21	81%	4.90E-01	12
U-234	1.50E-01	1.21E+00	3.12E-01	2.14E-01	7.40E-01	26	26	100%	1.44E+00	0
U-235	5.00E+02	7.00E-02	5.75E-02	9.57E-03	7.66E-02	26	4	15%	NA	NA
U-238	1.60E-013	7.44E+00	7.87E-01	1.46E+00	3.71E+00	26	26	100%	1.40E+00	3

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from four borings installed under the OU 3-02 Track 2 Preliminary Scoping Package for CPP-37 by Golder Associates, Inc. Results are provided in the Draft Report for the Idaho Chemical Processing Plant Drilling & Sampling Program at Land Disposal Unit CPP-37 (Golder Associates 1992) and Appendix G of the OU3-13 RI/FS Part A (DOE-ID 1997b).
- Selected samples were analyzed for metals, radionuclides, VOCs, SVOCs, PCBs and pesticides/herbicides. Only those constituents that were identified above detection limits are shown in the table.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = The analyte was identified in the sample but the numerical result may not be accurate.

B = The analyte reported value is < RDL, but > IDL.

NA = Not applicable or not available.

RME = Reasonable Maximum Exposure.

Table 5-21. Summary sampling results statistics for soil contaminants at Site CPP-48.[a]

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
As	2.70E+00	1.32E+01	5.45E+00	2.92E+00	1.13E+01	11	11	100%	5.80E+00	3
Ba	3.70E+01 B	3.14E+02	9.92E+01	7.51E+01	2.49E+02	11	11	100%	3.00E+02	1
Cr	7.70E+00	3.96E+01	1.79E+01	8.10E+00	3.41E+01	11	11	100%	3.30E+01	1
Cu	1.05E+01 J	1.05E+01 J	1.05E+01	NA	NA	1	1	100%	2.20E+01	0
Hg	5.10E-01	9.50E-01	7.87E-01	2.41E-01	1.27E+00	11	3	27%	5.00E-02	3
Ni	1.89E+01	1.89E+01	1.89E+01	NA	NA	1	1	100%	3.50E+01	0
Pb	4.60E+00	2.39E+01	9.51E+00	6.05E+00	2.16E+01	8	8	100%	1.70E+01	1
V	1.80E+01	1.80E+01	1.80E+01	NA	NA	1	1	100%	4.50E+01	0
Zn	4.52E+01	4.52E+01	4.52E+01	NA	NA	1	1	100%	1.50E+02	0
Nitrate	7.05E-01	5.71E+00	2.58E+00	2.42E+00	7.42E+00	7	5	71%	NA	NA
Nitrite	5.29E-01	5.90E-01	5.72E-01	2.91E-02	6.30E-01	7	4	57%	NA	NA
Nitrate/Nitrite	9.60E-01	5.40E+00	2.88E+00	2.12E+00	7.12E+00	4	4	100%	NA	NA
Chloride	1.20E+00 J	3.30E+00 J	2.42E+00	8.92E-01	4.20E+00	4	4	100%	NA	NA
Fluoride	5.20E+00	2.64E+02	1.91E+02	1.24E+02	4.39E+02	4	4	100%	NA	NA
Sulfate	2.21E+01	1.31E+02	5.18E+01	5.31E+01	1.58E+02	4	4	100%	NA	NA
Sulfide	1.56E+00	1.56E+00	1.56E+00	NA	NA	1	1	100%	NA	NA
Tin	3.00E-02	3.00E-02	3.00E-02	NA	NA	1	1	100%	NA	NA
Cs-137	3.30E+00	6.50E+01	4.13E+01	2.41E+01	8.95E+01	11	5	45%	8.20E-01	5
Eu-155	5.20E-01	6.70E-01	5.95E-01	1.06E-01	8.07E-01	4	2	50%	NA	NA
Pu-238	6.00E-02	9.00E-02	7.50E-02	1.29E-02	1.01E-01	4	4	100%	4.90E-03	4
Sb-125	2.40E+00	5.30E+00	3.28E+00	1.38E+00	6.04E+00	11	4	36%	NA	NA

Table 5-21. (continued).

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background [c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Sr-90	1.20E-01	2.60E-01	1.87E-01	7.02E-02	3.27E-01	8	3	38%	4.90E-01	0
U-234	1.10E+00	2.50E+00	1.58E+00	6.29E-01	2.84E+00	4	4	100%	1.44E+00	1
U-238	1.10E+00	2.70E+00	1.68E+00	7.04E-01	3.09E+00	4	4	100%	1.40E+00	2
Gross Alpha	9.00E+00	1.40E+01	1.15E+01	3.54E+00	1.86E+01	4	2	50%	NA	NA
Gross Beta	1.12E+02	1.22E+02	1.18E+02	4.32E+00	1.27E+02	4	4	100%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from 1 boring installed in 1991 and from three boreholes and excavated soil in 1993. Results are provided in the Closure Plan for Land Disposal Unit CPP-48 (INEL 1991) and the ERIS database.
- Selected samples were analyzed for inorganics, radionuclides, VOCs, SVOCs, pesticides/herbicides, and dioxins/furans. Only those constituents that were identified above detection limits are shown in the table.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = The analyte was identified in the sample but the numerical result may not be accurate.

B = The analyte reported value is < RDL, but > IDL.

NA = Not applicable or not available.

In August 1993, the dump tank was removed, cut into sections, packaged, and delivered to WERF for disposal. Four soil samples were taken at the bottom of the dump tank excavation (3 m [10 ft] bgs) and at (3.7 m [12 ft] bgs), to determine possible soil contamination in the underlying soil. Samples were analyzed for kerosene, VOCs, semiVOCs, RCRA metals, and radionuclides. Kerosene, VOC, and semiVOC constituents were not detected. Analysis for radionuclide contamination showed a Cs-137 concentration highest at 3.7 m (12 ft) bgs with 65±1 pCi/g, an Sb-125 concentration of 5.3±0.2 pCi/g at 3 m (10 ft), and the highest Eu-155 concentration of 0.67±0.10 pCi/g at 3.7 m (12 ft).

5.3.3.20 CPP-44. A grease pit south of CPP-608 has an ecological HI greater than 1.0 from exposure to cadmium, chromium III, chromium VI, lead, mercury, nickel, and decanal. Cadmium and nickel are native metals that are eliminated as COPCs when compared to 10X background (Rood et al. 1995). Table 5-22 provides summary sampling results statistics for soils collected at CPP-44.

5.3.3.21 CPP-55. An area contaminated with paint solvents, has an ecological HI greater than 1.0 from exposure to metals (arsenic, chromium III, chromium VI, lead, mercury, nickel, selenium, and silver). Arsenic, chromium III, lead, and nickel are native metals that are eliminated as COPCs when compared to 10X background (Rood et al. 1995). Chromium is not expected to persist in the environment in the chromium VI form (Bartlett and Kimble 1976, Rai et al. 1989). Mercury remains a concern after this initial screening with a maximum concentration of 5.2 mg/kg. The next highest was 0.62. It is highly probable that the one sample having the high hit was a small hotspot that would not contribute that greatly to average exposure. Table 5-23 provides summary sampling results statistics for soils collected at CPP-55.

5.3.4 Perched Water (Group 4)

Perched water consists of water in the vadose zone that is saturating sediments or basalts above the regional aquifer (Figure 5-2 and 5-3). The perched water is discussed in Sections 5.1 and 5.2. Contaminants already in the perched water are a potential source of SRPA contamination. Contaminants of concern (Sr-90) were selected based on transport of the contaminant to the SRPA, and future ingestion of SRPA groundwater post 2095. Other contaminants are summarized in the following paragraphs. The Perched Water (Group 4) is identified as containing low-level threat wastes. As noted in Section 5.2, Table 5-1, the perched water is a result of recharge from man-made sources at INTEC. When INTEC operations cease the recharge sources will stop and the perched water bodies will not yield sufficient water to be usable to future users.

As part of the WAG 3 RI, a complete round of groundwater samples were collected during May and June 1995 from all perched water wells having sufficient water for sample collection. These data are summarized in Table 5-24. The results of previous groundwater sampling efforts have been described in *the WAG 3 Comprehensive RI/FS Work Plan* (LITCO 1995c). Figure 5-6 shows well locations where perched water has been observed at INTEC and Figure 5-7 shows measured Sr-90 activities in the perched water.

The only chemical constituent in the upper perched groundwater zone beneath the northern portion of INTEC detected above either a Federal primary or secondary MCL was nitrate. The MCL for nitrate is 10 mg/L. The highest nitrate/nitrite concentrations (35.4 mg/L in well CPP 55-06 and 26.8 mg/L in well MW-10) were measured in the southeastern portion of the northern perched groundwater.

Table 5-22. Summary statistics for soil contaminants at Site CPP-44.[a]

Contaminants	Soil Concentration (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
As	2.1E+00 J	7.1E+00 J	4.66E+00	2.32E+00	9.30E+00	5	5	100%	5.80E+00	2
Be	8.80E-01	1.60E+00	1.17E+00	3.50E-01	1.87E+00	6	4	67%	1.80E+00	0
Cd	1.6E+00 J	8.40E+00 J	4.95E+00	2.58E+00	1.01E+01	6	6	100%	2.20E+00	5
Cr	2.93E+01 J	1.54E+03 J	5.17E+02	5.99E+02	1.72E+03	6	6	100%	3.30E+01	5
Cu	1.69E+01 J	4.78E+01 J	2.71E+01	1.17E+01	5.05E+01	6	6	100%	2.20E+01	3
Hg	2.60E-01	5.00E+00	2.43E+00	1.74E+00	5.91E+00	6	6	100%	5.00E-02	6
Ni	3.5E+01 J	3.44E+02 J	1.54E+02	1.10E+02	3.74E+02	6	6	100%	3.50E+01	5
Pb	8.9E+00 J	2.81E+02 J	8.69E+01	1.12E+02	3.11E+02	6	6	100%	1.70E+01	3
Sb	6.6E-01 BJ	1.9E+00 BJ	1.09E+00	7.00E-01	2.49E+00	6	3	50%	4.80E+00	0
Se	1.5E-01 BJ	2.20E+00 J	1.18E+00	1.45E+00	4.08E+00	6	2	33%	2.20E-01	1
Th	1.1E-01 BJ	4.70E-01 BJ	3.40E-01	2.00E-01	7.40E-01	6	3	50%	4.30E-01	1
Zn	4.03E+01 J	1.22E+02 J	6.79E+01	2.90E+01	1.26E+02	6	6	100%	1.50E+02	0
1,1,1-Trichloro-ethane	5.00E-03 J	5.00E-03 J	5.00E-03	NA	NA	6	1	17%	NA	NA
2-Pentanone, 4-hydroxy 4-methyl	7.80E+00 J	9.50E+00 J	8.65E+00	1.20E+00	1.11E+01	6	2	33%	NA	NA
Decanal	9.00E-03 J	9.00E-03J	9.00E-03	NA	NA	6	1	17%	NA	NA
Oil and Grease	2.58E+03 J	3.83E+03 J	3.21E+03	8.84E+02	4.98E+03	6	2	33%	NA	NA

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from soil samples collected from the surface soil overlying the pad, grease pit trench and the sump beneath the grease pit trench. Results are provided in the Track 2 Draft Final Scoping Summary Report – OU 3-10, Reference 10, Analytical Data Report, CPP-44 Grease Pit South of Building 608, November, 1993, (LITCO 1994).
- Selected samples were analyzed for metals, VOCs, SVOCs, PCBs, and TPH. Only those constituents that were identified above detection limits are shown in the table.
- Samples rejected because of an unacceptable quality control parameter are not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

J = The analyte was identified in the sample but the numerical result may not be accurate.

B = The analyte reported value is < RDL, but > IDL.

NA = Not applicable.

Table 5-23. Summary statistics for soil contaminants at Site CPP-55.[a]

Contaminants	Soil Concentration, (mg/kg [nonradionuclide] or pCi/g [radionuclide]) Minimum	Maximum	Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection	INEEL Background[c] (mg/kg or pCi/g)	Number of Samples Greater than Background
Ag	1.90E+00	6.10E+00	3.00E+00	1.31E+00	5.62E+00	49	16	33%	0.00E+00	16
As	3.80E+00	1.34E+01	6.34E+00	1.78E+00	9.90E+00	49	49	100%	5.80E+00	30
Ba	7.00E+01	6.09E+02	1.59E+02	1.01E+02	3.60E+02	49	49	100%	3.00E+02	4
Cd	9.40E-01	1.40E+00	1.16E+00	1.90E-01	1.54E+00	49	4	8%	2.20E+00	0
Cr	1.33E+01	6.47E+01	2.54E+01	9.09E+00	4.35E+01	49	48	98%	3.30E+01	6
Hg	5.00E-02	5.20E+00	4.30E-01	1.03E+00	2.49E+00	49	24	49%	5.00E-02	22
Ni	1.38E+01	1.21E+02	2.70E+01	2.04E+01	6.77E+01	49	49	100%	3.50E+01	7
Pb	4.10E+00	3.20E+01	9.59E+00	5.13E+00	1.99E+01	49	49	100%	1.70E+01	2
Sr-90	4.30E+03	4.80E+03	4.55E+03	3.54E+02	5.26E+03	5	2	40%	4.90E-01	2

a. NOTE:

- Duplicate sample results were not included in the statistical analysis.
- Analytical results are from samples collected from 11 boreholes drilled during the 1989-90 CPP-55 investigation by Golder Associates. Analytical results used to develop this table were taken from the Closure Report for CPP-55, Mercury Contaminated Area (DOE 1990) that was provided in the WINCO Track 1 Decision Document Package OU 3-02, Site CPP-55, Mercury Contaminated Area South of CPP T-15 (WINCO 1993).
- Selected samples were analyzed for VOC's, metals and radionuclides as well as the full 40 CFR 264 Appendix 8 and Target Compound List constituents. Those constituents identified in the Closure Report for CPP-55 are shown in the table except for the iron and K-40 which were detected but are not considered to be present at hazardous concentrations.
- Three organic constituents: toluene, 4-methyl 2-pentanone, and bis (2-ethylhexyl) phthalate were detected in the VOC analyses. However, all three were eliminated from further consideration during the validation procedure because all three are recognized laboratory contaminants.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

c. The INEEL background concentrations represent the 95% upper confidence limit (Rood et al. 1995).

B = The analyte reported value is < RDL, but > IDL.

NA = Not applicable.

Table 5-24. Summary sampling results statistics for contaminants in the perched water wells (May-June 1995).[a]

	Water concentration, mg/L or pCi/L							
Contaminants	Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection
Ag	7.70E-04 BNJ	1.40E-03 B	1.09E-03	4.45E-04	1.98E-03	16	2	13%
As	3.40E-03 B	4.90E-03 B	4.17E+00	7.51E-01	5.67E+00	16	3	19%
Ba	7.14E-02 B	3.94E-01	1.95E-01	9.14E-02	3.78E-01	16	16	100%
Be	1.20E-04	1.20E-04	1.20E-04	NA	NA	16	1	6%
Chloride	2.15E+01	1.25E+02	5.49E+01	2.78E+01	1.11E+02	16	16	100%
Co	5.70E-04	1.30E-03	7.80E-04	2.52E-04	1.28E-03	16	8	50%
Cr	4.30E-03 B	1.11E-02	6.05E-03	2.52E-03	1.11E-02	16	6	38%
Cu	1.30E-03 B	1.49E-02 B	3.75E-03	4.53E-03	1.28E-02	16	8	50%
Fluoride	1.60E-01	3.60E-01	2.51E-01	4.68E-02	3.45E-01	16	16	100%
Mn	8.50E-04 B	1.86E-01	2.11E-02	5.15E-02	1.24E-01	16	13	81%
Ni	2.50E-03 B	7.50E-03 B	4.63E-03	2.58E-03	9.79E-03	16	3	19%
NO_3/NO_2 - N	3.30E+00	6.96E+01	1.99E+01	1.69E+01	5.37E+01	16	16	100%
Pb	2.00E-03 BJ	2.00E-03 BJ	2.00E-03	NA	NA	16	1	6%
Sb	2.00E-03 B	6.40E-03 B	3.60E-03	1.67E-03	6.94E-03	16	5	31%
Se	3.00E-03 B	4.00E-03 B	3.33E-03	5.77E-04	4.48E-03	16	3	19%
Sulfate	2.62E+01	6.18E+01	4.03E+01	1.27E+01	6.57E+01	16	16	100%
Th	3.30E-03 B	5.00E-03 B	4.15E-03	1.20E-03	6.55E-03	16	2	13%
V	1.50E-03 BJ	6.70E-03 B	3.56E-03	1.81E-03	7.18E-03	16	11	69%
Zn	2.60E-03 B	6.93E-02 EJ	2.15E-02	2.06E-02	6.27E-02	16	10	63%
Am-241	3.00E-02	1.60E-01	9.50E-02	9.19E-02	2.79E-01	16	2	13%
Pu-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	2	13%
Pu-239/240	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	2	13%
Sr-90	7.00E-01	3.20E+05	4.06E+04	8.60E+04	2.13E+05	16	14	88%

Table 5-24. (continued).

Contaminants	Water concentration, mg/L or pCi/L Minimum	Maximum	Arithmetic Mean	Standard Deviation	RME[b]	Number of Samples	Number of Detects	Frequency of Detection
Tc-99	4.00E-01	7.36E+02 J	8.96E+01	1.91E+02	4.72E+02	16	14	88%
Tritium	6.21E+02	7.30E+04	2.00E+04	2.35E+04	6.70E+04	16	14	88%
U-234	1.90E+00 J	1.18E+01	4.70E+00	3.24E+00	1.12E+01	16	7	44%
U-238	8.00E-01 J	2.70E+00 J	1.94E+00	6.08E-01	3.16E+00	16	7	44%
Gross Alpha	2.30E+00	1.14E+03	1.88E+02	3.68E+02	9.24E+02	16	9	56%
Gross Beta	5.20E+00	5.89E+05	7.00E+04	1.51E+05	3.72E+05	16	16	100%

a. NOTE:

- Duplicate and QC sample results were not included in the statistical analysis.
- Analytical results are from perched groundwater samples collected during May and June 1995 as part of the OU 3-13 RI. Results are provided in Table 4-2 of the OU3-13 RI/FS Part A (DOE-ID 1997b) and the ERIS Database.
- Samples were analyzed for miscellaneous inorganics, TAL inorganics and radionuclides. Only those constituents that were identified above detection limits in the samples are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Ca, Fe, Mg, K, Na, Alkalinity, Bic Alkaline, Carbonate, TKN and Ammonia-N.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The RME concentration is the 95% upper value based on the empirical rule (95%of the measurements lie within two standard deviations of their mean).

B = Contaminant in associated blank.

E = The reported value is an estimate because of interference.

J = Estimated concentration.

N = Spiked sample recovery was not within control limits.

NA = Not applicable.

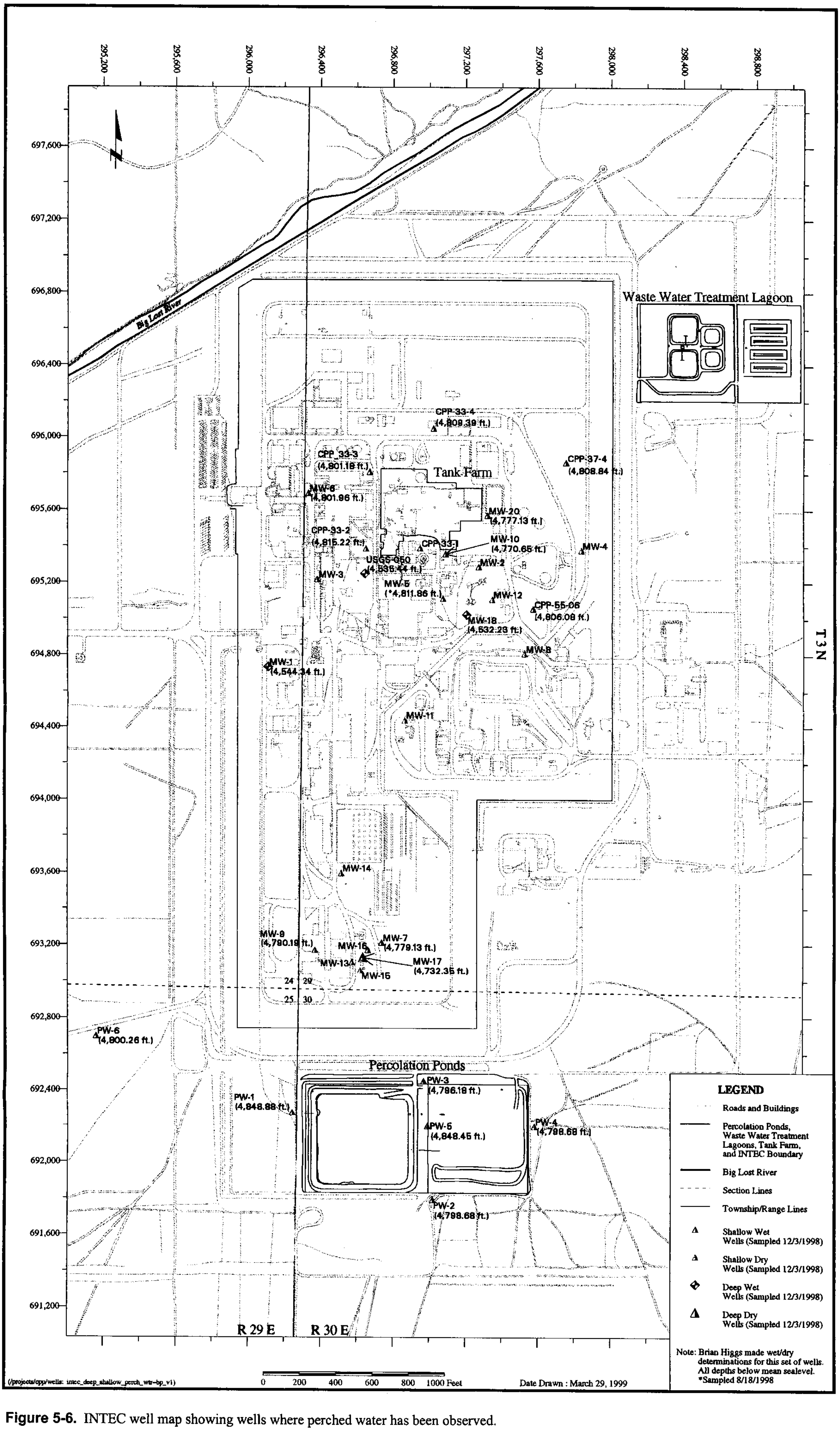


Figure 5-6. INTEC well map showing wells where perched water has been observed.

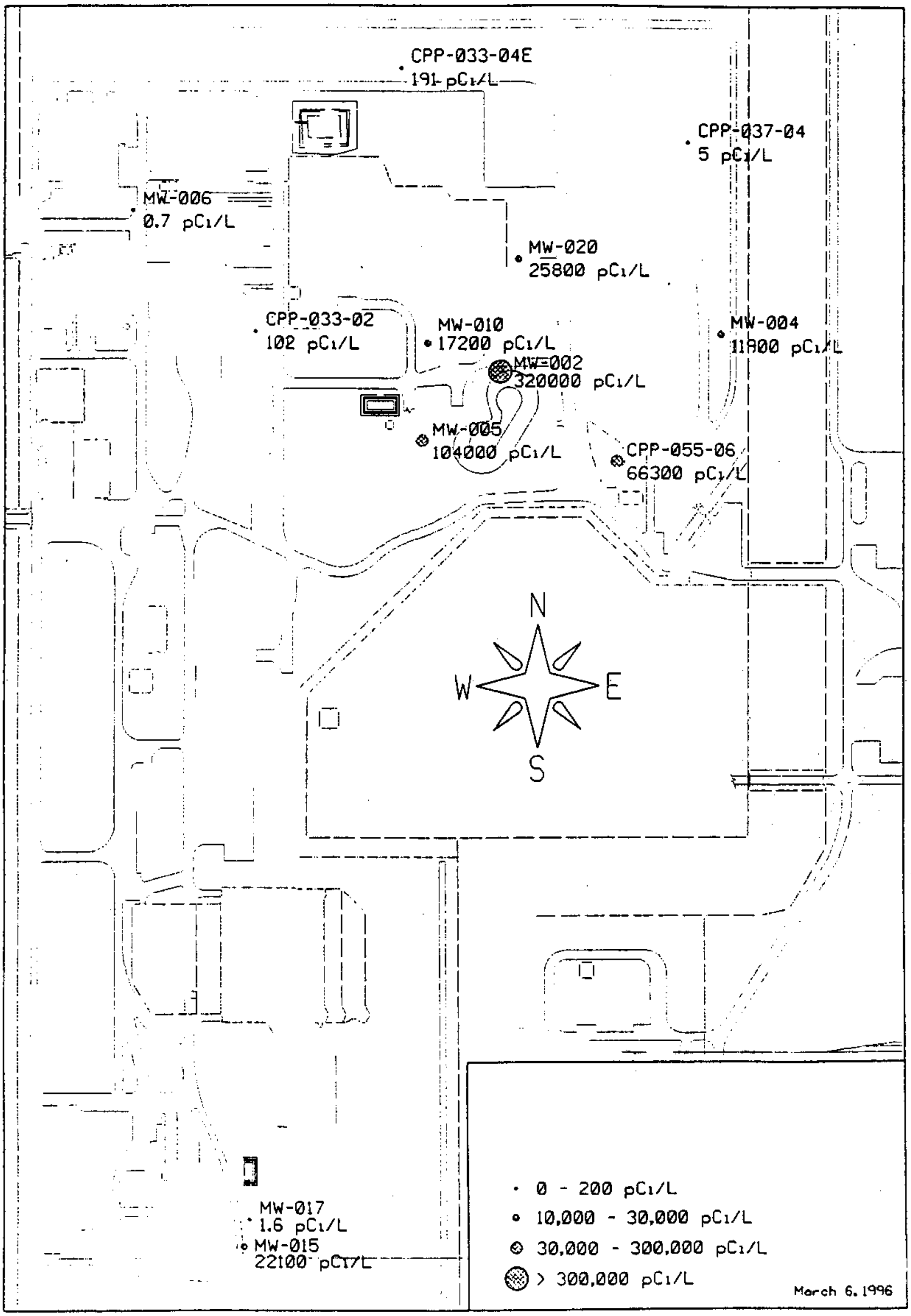


Figure 5-7. Sr-90 concentration in the upper perched groundwater (May-June 1995).

5.3.4.1 Northern Perched Groundwater. The highest perched water radioactive contamination occurs beneath the northern portion of INTEC, particularly associated with wells MW-2, MW-5, and CPP 55-06 (Figure 5-6). The maximum gross alpha and gross beta activity measured in the upper perched groundwater were 1,140±220 pCi/L and 589,000±2,600 pCi/L, respectively, in well MW-2. At a depth of approximately 42 m (140 ft), the maximum gross alpha and gross beta concentrations measured in the perched groundwater were 137±9 pCi/L and 65,300±600 pCi/L in wells MW-10 and MW-20.

The most significant radionuclides in the upper perched water body are Sr-90 and Tc-99. Low levels of H-3 were also detected in the upper perched water zone. The low H-3 concentrations in the upper perched water zone is a significant contrast to the waste stream that was directed to the INTEC disposal well where the vast majority of the associated radioactivity consisted of H-3. Strontium-90 was detected in all wells completed in the northern area of the upper perched water zone. The maximum Sr-90 concentration detected was 320,000±3,000 pCi/L (well MW-2) followed by 104,000±1,000 pCi/L (well MW-5) and 66,300±600 pCi/L (well CPP 55-06). The only other fission product detected in the upper perched groundwater is Tc-99. Tc-99 has been detected in all wells except CPP 33-4 and MW-6. The maximum Tc-99 concentration detected in the upper perched groundwater zone was 105±2 pCi/L in well MW-5.

Two wells (MW-10 and MW-20) are completed in water-bearing zones at depths of approximately 42 m (140 ft). The maximum concentrations for H-3, Sr-90, and Tc-99 from these wells are 38,000±50 pCi/L, 25,800±30 pCi/L, and 127±2 pCi/L, respectively. A comparison of the water quality from the wells completed in the upper perched groundwater body [i.e., at approximately 33 m (110 ft)] to this deeper zone indicates an increase in both H-3 and Tc-99 concentrations and a decrease in the Sr-90 concentrations.

5.3.4.2 Southern Perched Groundwater. Perched water has been identified beneath two areas of the southern INTEC. A small perched water body has been identified in the vicinity of building CPP-603 and a larger perched water body has developed from the discharge of waste water to the percolation ponds.

Wells that monitor the groundwater quality in the upper perched groundwater zone around CPP-603 include MW-7, MW-9, MW-13, MW-14, MW-15, MW-16, and MW-17. From the inorganic analysis, only nitrate/nitrite was detected at a concentration exceeding the MCL at well MW-15 (14.7 mg/L). The radionuclides detected in the groundwater include H-3 (3,360±176 to 25,700±400 pCi/L) and Tc-99 (6.4±0.6 to 23.7±0.6 pCi/L). In addition, Sr-90 and U-234 were detected in MW-15 at concentrations of 17,200±200 pCi/L and 11.8±1 pCi/L, respectively.

Perched groundwater in the percolation pond area is monitored by six wells, designated as PW-1 through PW-6, which monitor the upper-most perched groundwater body associated with waste water discharge to the percolation ponds. These wells have been monitored by the USGS since 1987. Wells PW-1, PW-2, PW-4, and PW-5 have been sampled on a quarterly basis as part of the INTEC groundwater monitoring program since 1991 (LITCO 1995c).

The waste stream to the percolation ponds is virtually the same as the waste stream formerly sent to the disposal well. Most of the historical radioactivity present in the PW-series wells is from H-3, with Sr-90 providing a secondary activity contribution. According to the USGS monitoring, activities from both H-3 and Sr-90 have remained relatively stable with the exception of an increased H-3 activity period in mid-1988. These data are presented in Figure 4-9 of the OU 3-13 RI (DOE-ID 1997b).

Constituents detected in the upper perched water zone in the vicinity of the percolation ponds that exceeded either a Federal primary or secondary MCL include chloride, nitrate, manganese, iron, and Sr-90. Chloride concentrations generally exceeded the Federal secondary MCL of 250 mg/L in all wells. Nitrate concentrations exceeded the federal primary MCL of 10 mg/L in a single sample collected from well PW-4 (14.1J mg/L from the October 1993 sample). Manganese concentrations exceeded the Federal secondary MCL of 50 μg/L in two samples collected from well PW-2 (165 μg/L from the October 1991 sample and 60.2 μg/L from the August 1993 sample). Iron concentrations exceeded the federal secondary MCL of 300 μg/L in one sample collected from PW-1 (324J μg/L from the April 1993 sample) and the first three samples collected from PW-2 (i.e., prior to September 1992). Strontium-90 concentrations exceeded the Federal primary MCL of 8 pCi/L in samples collected from PW-1, PW-4, and PW-5 with the maximum concentration measured during October 1991 sampling event at PW-1 (15.7 pCi/L).

5.3.4.3 Deep Perched Groundwater. Contamination in the lower portion of the vadose zone is different in composition from the upper perched zone. The lower vadose zone perched water contamination results from two events during which the INTEC injection well (CPP-23) collapsed and service wastewater was released into the vadose zone above the lower sediment units. The lower vadose zone contamination includes Cs-137, Sr-90, plutonium, I-129 and mercury. Deep perched groundwater is monitored at the INTEC by wells MW-1, MW-17, MW-18, and USGS-50 that are completed in water-bearing zones occurring at depths between 99.4 to 102.4 m (326 to 336 ft), 109.7 to 116.1 m (360 to 381 ft), 120.1 to 126.2 m (394 to 414 ft), and 109.7 to 123.4 m (360 to 405 ft), respectively. Historically, two rounds of groundwater samples have been collected from MW-1, one round of groundwater samples have been collected from MW-17 and MW-18, and a substantial database concerning radioactive contaminants is available for the water quality from USGS-50. Results from these water sampling events are described in the WAG 3 RI/FS Work Plan (LITCO 1995c).

Well MW-1 is located in the northern INTEC. The only chemical contaminant to exceed either a Federal primary or secondary MCL was nitrate/nitrite at a concentration of 69.6 mg/L. The radionuclides detected in water samples from well MW-1 include Sr-90 (4.5±0.4 pCi/L) and H-3 (24,700±400 pCi/L). Of these contaminants, only H-3 was measured above the Federal primary MCL of 20,000 pCi/L. Since H-3 concentrations in the deep perched water zone are higher than the H-3 concentrations in the overlying perched water bodies, the source of this contamination is either from a historical release where the contaminants have moved through the system or waste water disposal to the ICPP injection well.

Well MW-18 is completed in the deeper perched water zone near the eastern boundary of the INTEC. From the June 1995 sampling event, only nitrate/nitrite concentration at 34.4 mg/L exceeded either a Federal primary or secondary MCL. The radionuclides detected in the deep perched groundwater at this location include H-3 (73,000±700 pCi/L), Sr-90 (207±2 pCi/L), and Tc-99 (736±6J pCi/L). The H-3 and Tc-99 concentrations from this well are some of the highest concentrations measured in the perched groundwater beneath the ICPP.

USGS-50 was originally intended to be completed in the aquifer, but was ultimately drilled to a total depth of 123 m (405 ft) to monitor a deep perched water zone. This well is located in the north central portion of the facility. The highest concentrations of H-3 and Sr-90 occurred in 1969 and 1970. These elevated concentrations were attributed to the failure of the ICPP disposal well where the waste water was injected into the vadose zone rather than directly to the aquifer. Based on the response observed in well USGS-50 and the ICPP disposal well records, it appears the injection well failed in mid-1967 and allowed approximately 3.41×10^9 L (9.0×10^8 gal) of waste water to be injected into the basalt above the 69-m (226-ft) plug (Robertson et al. 1974). The ICPP disposal well was repaired by early 1971. It again failed in the 1970s and was repaired in 1982.

From the May 1995 water sampling of USGS-50, the concentrations of all chemical contaminants except nitrate/nitrite were below Federal primary or secondary MCLs. Nitrate/nitrite concentration was measured at 31.3 mg/L, compared to the Federal primary MCL of 10 mg/L. Radionuclides in the groundwater that were detected include H-3 (61,900±700 pCi/L), Sr-90 (151±2 pCi/L), and Tc-99 (63±1J pCi/L). The concentrations for H-3 and Sr-90 are within the expected values based on the historical sampling conducted by the USGS.

Well MW-17 is the only deep perched water monitoring well located in the southern portion of the INTEC. This well has been constructed to monitor three perched water bodies: an upper zone from 55.4 to 58.4 m (181.7 to 191.7 ft) bls, a middle zone from 80.4 to 83.5 m (263.8 to 273.8 ft) bls, and a lower zone from 110 to 116 m (360 to 381 ft) bls. During the May 1995 sampling event, water was only present in the upper and lower zones. None of the chemical constituents detected in the groundwater exceeded either a Federal primary or secondary MCL. Only two radionuclides (H-3 and Tc-99) were detected in groundwater samples collected from MW-17. The concentrations of these two radionuclides were similar between the upper and lower perched water zones. H-3 concentrations varied from 25,100±400 to 25,700±400 pCi/L and Tc-99 concentrations varied from 5.9±0.6 to 6.4±0.6 pCi/L.

5.3.5 Snake River Plain Aquifer (Group 5)

The water quality in the SRPA at and downgradient from the ICPP has been adversely impacted due to past facility operations. The SRPA (Group 5) is identified as containing low-level threat wastes. The majority of INTEC-related SRPA contamination is due to the disposal of wastes through the ICPP injection well. Contamination in the aquifer is also due to downward migration of contaminants from surface soils and perched groundwater zones. The injection well was the primary source for waste disposal from 1952 through February 1984 and used intermittently for emergency situations until 1986. The average discharge to the well during this period was approximately 1.4 B L/yr (363 M gal/yr) or about 3.8 M L/day (1 M gal/day) (DOE-ID 1997b). It has been estimated a total of 22,000 Ci of radioactive contaminants have been released in 4.2×10^{10} L (1.1×10^{10} gal) of water (WINCO 1994c). Table 5-25 is a summary of the total curies discharged to the injection well for each radionuclide and includes the curies remaining after radioactive decay (DOE-ID 1997b). The vast majority of this radioactivity is attributed to H-3 (approximately 96%) with minor components of Am-241, Tc-99, Sr-90, Cs-137, Co-60, I-129, and Pu. The remedy selection for the SRPA was based on groundwater transport modeling used to predict the activities/concentrations of contaminants in groundwater at the time of exposure (post 2095). This section presents data on the current water quality in the SRPA.

Since the 1950's, the USGS has installed 33 monitoring wells around the ICPP to characterize the occurrence, movement, and quality of the water in the SRPA. The location of the wells completed in the SRPA and the frequency of groundwater sample collection by the USGS are provided in Figure 4-12 of the OU 3-13 RI (DOE-ID 1997b). The ICPP has a groundwater sampling program of selected SRPA wells to satisfy the groundwater monitoring requirements for the RCRA and DOE Order 5400.1. This sampling program, implemented in October 1991, uses selected USGS wells and collects samples on a quarterly basis to be analyzed for the RCRA groundwater contamination parameters, RCRA drinking water parameters, RCRA groundwater quality parameters, and selected radionuclides. The results from this sampling program are provided in the WAG 3 RI/FS Work Plan (LITCO 1995c).

In May and June 1995, a complete round of groundwater samples were collected from the aquifer wells located near and downgradient from the ICPP (Figure 5-8). The results from this sampling effort are provided in Table 5-26. The aquifer data summarized in the RI are discussed in the following paragraphs. An isopleth map of 1995 I-129 concentrations is shown in Figure 1-7 to identify the extent of Group 5. A map of the 1995 Tritium plume is shown in Figure 5-4 and the Sr-90 plume is shown in Figure 5-5.

Table 5-25. Activity of radionuclides discharged to the ICPP injection well (RWMIS Database).

Radionuclide	Half Life (years)	Total Activity Injected (Ci)	Total Activity Remaining* (Ci)	Percent of the Injected Activity Remaining (after decay)	Percent of the Current Activity
Ag-110m	6.80E-01	8.36E-05	1.34E-12	0.0	0.00
Am-241	4.32E+02	3.17E-04	3.08E-04	97.2	0.00
Ba-140	3.49E-02	5.05E-04	8.86E-156	0.0	0.00
C-14	5.73E+03	1.27E-01	1.27E-01	99.8	0.00
Ce-141	8.90E-02	1.68E-04	3.19E-61	0.0	0.00
Ce-141/144	7.80E-01	1.16E-01	2.42E-14	0.0	0.00
Ce-144	7.80E-01	1.75E+01	2.07E-06	0.0	0.00
Co-57	7.40E-01	6.54E-03	8.91E-09	0.0	0.00
Co-60	5.27E+00	1.49E-01	8.77E-03	5.9	0.00
Cr-51	7.59E-02	5.37E-03	2.91E-67	0.0	0.00
Cs-134	2.06E+00	1.50E+00	2.03E-03	0.1	0.00
Cs-137	3.02E+01	2.05E+01	1.19E+01	57.8	0.30
Cs-138	6.10E-05	2.50E-01	0.00E+00	0.0	0.00
Eu-152	1.36E+01	8.12E-02	4.36E-02	53.7	0.00
Eu-154	8.80E+00	8.38E-02	2.95E-02	35.2	0.00
Eu-155	4.96E+00	2.22E-02	3.43E-03	15.5	0.00
H-3	1.23E+01	2.13E+04	3.89E+03	18.2	99.44
Hg-203	1.28E-01	7.33E-05	3.10E-42	0.0	0.00
I-129	1.57E+07	2.78E-01	2.78E-01	100.0	0.01
I-130	2.21E-02	2.98E+01	4.38E-152	0.0	0.00
K-40	1.28E+09	2.81E-12	2.81E-12	100.0	0.00
La-140	4.60E-03	6.22E-04	0.00E+00	0.0	0.00
Mn-54	8.80E-01	6.55E-03	7.02E-08	0.0	0.00
Nb-95	9.58E-02	4.63E-01	4.17E-35	0.0	0.00
Np-237	2.14E+06	5.48E-03	5.48E-03	100.0	0.00
Pr-144	3.29E-05	4.47E-01	0.00E+00	0.0	0.00
Pu-238	8.78E+01	1.32E-01	1.15E-01	87.1	0.00
Pu-239	2.44E+04	1.05E-02	1.04E-02	99.9	0.00
Pu-239/240	2.44E+04	3.74E-02	3.74E-02	99.9	0.00
Pu-240	6.57E+03	1.14E-03	1.14E-03	99.8	0.00
Rh-106	9.48E-07	4.81E+00	0.00E+00	0.0	0.00
Ru-103	1.10E-01	1.45E-01	4.59E-37	0.0	0.00
Ru-106	1.00E+00	1.70E+01	6.85E-04	0.0	0.00
Sb-124	1.65E-01	2.41E-04	5.02E-36	0.0	0.00
Sb-125	2.77E+00	1.86E+00	1.22E-02	0.7	0.00
Sr-85	1.78E-01	9.14E-05	1.78E-23	0.0	0.00
Sr-89	1.40E-01	5.59E+00	4.51E-27	0.0	0.00
Sr-89/90	2.86E-01	1.31E+00	6.40E-01	48.8	0.02
Sr-90	2.86E+01	1.60E+01	8.75E+00	54.8	0.22
U-234	2.45E+05	2.28E-02	2.28E-02	100.0	0.00
U-235	7.04E+08	1.94E-03	1.94E-03	100.0	0.00
U-236	2.34E+07	4.09E-04	4.09E-04	100.0	0.00
U-238	4.47E+09	6.81E-03	6.81E-03	100.0	0.00
Y-90	7.32E-03	1.32E+00	0.00E+00	0.0	0.00
Zn-65	6.68E-01	4.65E-04	1.39E-11	0.0	0.00
Zr-95	1.78E-01	2.34E-01	2.53E-23	0.0	0.00
Zr/Nb-95	1.78E-01	2.06E+01	1.38E-43	0.0	0.00
Unidentified Alpha	–	6.36E-01	–	–	–
Unidentified Beta-Gamma	–	5.82E+01	–	–	–
Others**		6.33E+02	–	–	–
	Total	2.22E+04	3.92E+03	–	100.0

* Decayed to January 1, 1995

** Estimate of radionuclides other than H-3 from 1957 to 1962 [assuming 95.5% of the total curies is H-3, Barraclough (1966)]

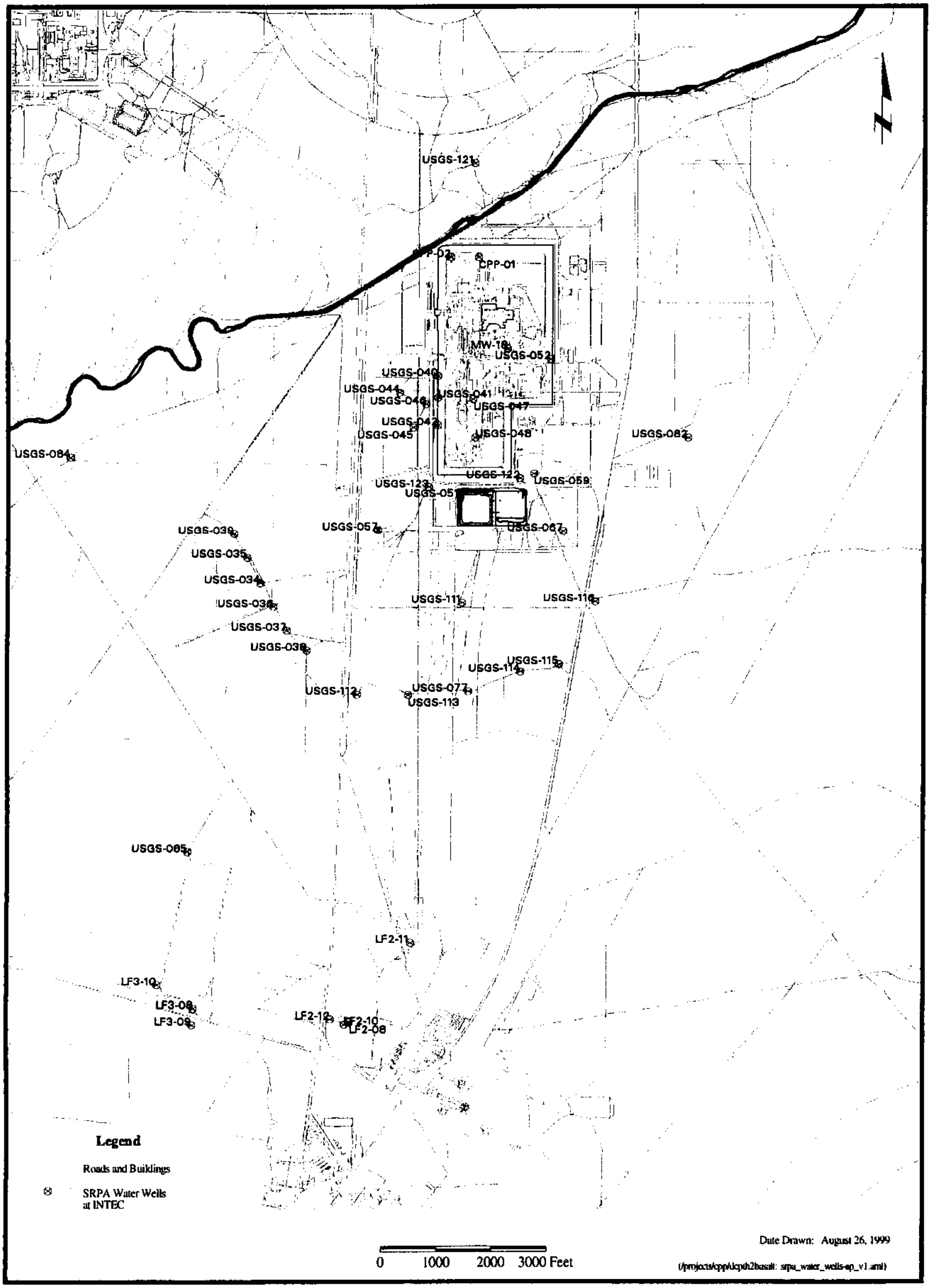


Figure 5-8. SRPA sampling wells location map.

Table 5-26. Summary sampling results statistics for contaminants in the SRPA Wells (May-June 1995).[a]

Contaminants	Water concentration, mg/L or pCi/L			Number of Samples	Number of Detects	Frequency of Detection
	Minimum	Maximum	PRG[b]			
Ag	6.30E-04 BNJ	8.80E-04 BNJ	1E-01[c]	38	3	8%
As	3.10E-03 B	1.08E-02 B	5E-02	42	3	7%
Ba	5.00E-02 B	2.05E-01	2E+00	42	42	100%
Cd	4.80E-04 B	3.00E-03 B	5E-03	42	4	10%
Co	5.20E-04 B	1.40E-03 B	NA	42	8	19%
Cr	1.80E-03 B	3.88E-02	1E-01	42	31	74%
Cu	1.60E-03 BJ	3.20E-03 B	1.3E+00	42	7	17%
Hg	1.00E-04 B	4.40E-04	2E-03	42	7	17%
Mn	8.40E-04 B	6.28E-02	5E-02[c]	42	10	24%
Ni	4.30E-03 B	2.06E-01	NA	42	6	14%
Pb	2.30E-03 BWJ	3.77E-02	1.5E-02	42	10	24%
Sb	1.90E-03 B	4.60E-03 B	6E-03	42	3	7%
Se	1.40E-03 B	3.70E-03 B	5E-02	42	7	17%
V	2.30E-03 B	9.90E-03 B	NA	42	24	57%
Zn	2.60E-03 B	4.54E-01 EJ	5E+00[c]	42	27	64%
Am-241	5.40E-01	5.40E-01	<1.5E+01[d]	49	1	2%
I-129[e]	9E-07	3.82E+00	1E+00[d]	33	32	94%
Sr-90	7.00E-01	8.40E+01	8E+00	70	49	70%
Tc-99	1.10E+00	4.48E+02	9E+02[d]	70	57	81%
Tritium	5.81E+02	3.07E+04	2E+04	49	45	92%
U-234	7.00E-01	2.60E+00	1.5E+01[f]	49	7	14%
U-238	8.00E-01	1.10E+00	1.5E+01[f]	49	4	8%

Table 5-26. (continued).

Contaminants	Water concentration, mg/L or pCi/L Minimum	Maximum	PRG[b]	Number of Samples	Number of Detects	Frequency of Detection
Gross Alpha	2.30E+00	1.00E+01	1.5E+01[g]	49	20	41%
Gross Beta	2.40E+00	4.69E+02	4mR/yr[h]	49	49	100%

a. NOTE:

- Duplicate and QC sample results were not included in the statistical analysis.
- Analytical results are from groundwater samples collected from the SRPA during May and June 1995 as part of the OU 3-13 RI. Results are provided in Table 4-4 of the OU3-13 RI/FS Part A (DOE-ID 1997b) and the ERIS Database.
- Samples were analyzed for TAL inorganics and radionuclides. Only those constituents that were identified above detection limits in the samples are shown in the table except for the following constituents which were detected but are not considered to be present at hazardous concentrations: Ca, Fe, Mg, K, and Na.
- Samples rejected because of an unacceptable quality control parameter were not included in the table.

b. The PRG concentrations are from the Primary Constituent Standards table in IDAPA 16.01.11.200(a) unless otherwise footnoted.

c. The PRG concentrations for manganese, silver, and zinc are from the Secondary Constituent Standards in IDAPA 16.01.11.200 (b).

d. The PRG concentrations for Am-241, I-129, and Tc-99 are calculated values based on the National Interim Primary Drinking Water Regulations, EPA-570/9-76-003.

e. Summary sampling data for I-129 was taken from data collected during the 1990-91 USGS sampling event (USGS 1994). The data shown in the table is only from those wells sampled both during the 1990-91 USGS sampling event and the WAG 3 RI/FS, May-June 1995, sampling event.

f. The PRG concentrations for U-234 and U-238 are from Section 8, Table 8-2 of this ROD.

g. The PRG concentration for gross alpha includes radium-226 but excludes radon and uranium.

h. The PRG concentration for gross beta (combined beta/photon emitters) is 4 mR/yr effective dose equivalent.

B = Contaminant in associated blank.

E = The reported value is estimated because of the presence of interference.

J = Estimated concentration.

N = Spiked sample recovery was not within control limits.

W = Post-digestion spike for GFAAS analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.

NA = Not applicable.

PRG = Preliminary Remediation Goal.

5.3.5.1 ***Cesium-137.*** According to Bartholomay (1997), Cs-137 has been detected above reporting levels through 1985 in wells USGS-40 and USGS-47 at the ICPP due to liquid-waste discharge to the ICPP injection well. During 1982 to 1985, maximum concentrations in wells USGS-40 and USGS-47 were 237±45 and 200±50 pCi/L, respectively. During 1986 to 1988, Cs-137 was not detected in these wells (Orr and Cecil 1991). Since 1988, cesium-137 was detected in one sample from well USGS-40 (70±30 pCi/L on January 15, 1990) and one sample from well USGS-47 (70±30 pCi/L on April 29, 1992). Cs-137 was not detected in any of the aquifer wells sampled during the WAG 3 RI. The half-life for Cs-137 is 30.17 yrs.

5.3.5.2 ***Plutonium.*** Monitoring the quantities of Pu-238 and Pu-239/-240 (undivided) discharged to the ICPP disposal well began in 1974. Prior to that time, alpha activity from plutonium disintegration was not separable from the monitored, undifferentiated alpha activity. During 1974 through 1985, about 0.15 Ci of Pu-238 and 0.05 Ci of Pu-239/-240 (undivided) were discharged to the ICPP injection well. During the period from 1986 to 1988, approximately 0.06 Ci of plutonium isotopes were discharged to the infiltration ponds at the ICPP. The half-lives of Pu-238, -239, and -240 are 87.7, 24, 100, and 6,560 years, respectively.

According to Orr and Cecil (1991), plutonium has been detected in the SRPA near the ICPP in wells USGS-40 and USGS-47. Both of these wells are located near the ICPP injection well. In well USGS-40, Pu-238 and Pu-239/-240 (undivided) were last detected in January 1987 at concentrations of 0.47±0.16 pCi/L and 5.5±0.4 pCi/L, respectively. In well USGS-47, Pu-238 was last detected in October 1983 at a concentration of 0.5±0.06 pCi/L. Since the 1986 to 1988 period reported by Orr and Cecil (1991).

Pu-238 was only detected in a single water sample collected from well USGS-48. The sample was collected in October 1990 and had a concentration near the MDL at 0.05±0.02 pCi/L. Between 1992 and 1995, all plutonium measurements at the INEEL were below the reporting level (Bartholomay 1997). Plutonium was not detected in any of the aquifer wells sampled during the WAG 3 RI field investigation of 1995.

5.3.5.3 ***Americium-241.*** Americium-241 is a decay product of Pu-241 and has a half-life of 432.7 years. According to Orr and Cecil (1991), Am-241 has only been detected in the SRPA near the RWMC and TAN. Since 1988, however, Am-241 was detected in well USGS-44 during July 1992 at concentrations of 0.07±0.03 and 0.08±0.03 pCi/L, in well USGS-37 during October 1992 at a concentration of 0.09±0.03 pCi/L, and in well USGS-85 during June 1991 at concentrations of 0.08±0.03 pCi/L. During 1992-1995, all other plutonium measurements were below the reporting level (Bartholomay 1997). During the WAG 3 RI field investigation in 1995, Am-241 was detected in well USGS-42 at a concentration of 0.54±0.14 pCi/L.

5.3.5.4 ***Iodine-129.*** From 1953 to 1983, an estimated 0.01 to 0.136 Ci/yr (0.56 to 1.18 Ci) of I-129 were contained in the wastewater discharged to the disposal well (Mann et al. 1988). For 1984 to 1986, the annual amount of I-129 in the wastewater discharged to the ICPP percolation ponds ranged from 0.0064 to 0.039 Ci.

Four rounds of groundwater samples (1977, 1981, 1986, 1990, and 1991) have been collected by the USGS from the SRPA at the ICPP (Mann and Beasley 1994). According to Mann and Beasley (1994), "In 1990 and 1991 concentrations of I-129 in water samples from wells that obtain water from the Snake River Plain aquifer ranged from 6.00E-7±2.00E-7 to 3.82±0.19 pCi/L. The mean concentration in water from 18 wells was 0.81±0.19 as compared to 1.3±0.26 in 1986." Mann et al. (1988) reported a similar decrease in I-129 groundwater concentrations between the 1981 and 1986 sampling events. The distribution of I-129 in the SRPA for 1990-91 is provided in Figure 1-7.

During the WAG 3 RI, I-129 was detected in wells USGS-67, LF2-12, and LF3-08 at concentrations of 1±0.3 pCi/L, 1.2±0.3 pCi/L, and 0.9±0.3 pCi/L, respectively. Two of these wells are located several miles downgradient from the ICPP. The limited amount of I-129 contamination in the aquifer is consistent with the observations made by Mann et al. (1988) where decreasing I-129 concentrations were attributed to decreasing I-129 disposal and the change in disposal techniques. The half-life of I-129 is 1.57E+07 years.

5.3.5.5 Tritium. A H-3 plume has developed in the SRPA from disposal of liquid wastes at the INEL. The principle sources of H-3 in the aquifer have been through injection of liquid wastes through the disposal well at the ICPP and discharge of waste water to the infiltration ponds at the ICPP and the TRA. It is estimated approximately 30,900 Ci of H-3 have been discharged to the SRPA at the ICPP since 1952 (Orr and Cecil 1991). Of this amount, approximately 22,200 Ci were discharged via the disposal well at the ICPP. The remainder of the H-3 was discharged to the aquifer via the ICPP percolation ponds.

According to Orr and Cecil (Page 30, 1991), "Tritium concentrations in water from the Snake River Plain aquifer decreased by as much as 39,000 pCi/L during 1986-1988. By October 1988, tritium concentrations ranged from 700±200 pCi/L to 61,600±1,100 pCi/L and the tritium plume extended southwestward in the general direction of ground-water flow. The size of the plume in which tritium concentrations exceeded 500 pCi/L decreased from about 51 mi^2 in October 1985 to about 45 mi^2 in October 1988. The area of the plume containing tritium concentrations in excess of the MCL of 20,000 pCi/L (EPA 1989, p. 551) decreased from 4.4 to 2.8 mi^2.' The reduced concentrations of H-3 were attributed to radioactive decay processes, overall reduction in H-3 disposal rates, dilution from recharge, and changes in the disposal methods

The distribution of H-3 in the SRPA for May 1995 is shown in Figure 5-4. The size of the plume that exceeds the federal drinking water standard of 20,000 pCi/L is approximately 3.3 km^2 (1.3 mi^2), significantly smaller than the 7.3 km^2 (2.8 mi^2) reported in October 1988.

5.3.5.6 Strontium-90. A plume of Sr-90 has formed downgradient from the ICPP primarily in response to the ICPP disposal well. According to Orr and Cecil (page 32, 1991), "in October 1985, the size of the strontium-90 plume where concentration exceeded 6 pCi/L was about 2 mi^2 (Pittman et al. 1988, p. 53); the concentrations of strontium-90 in wells 57 and 47 were 74±5 and 63±5 pCi/L, respectively. Strontium concentrations decreased as much as 33 pCi/L during 1986-1988. By October 1988, strontium-90 concentrations ranged from 8±2 to 48±3 pCi/L, and the area of the strontium-90 plume had decreased to approximately 0.8 mi^2. The strontium-90 concentrations in wells 57 and 47, both within the plume, decreased to 41±3 and 48±3 pCi/L, respectively." They attributed the reduced areal extent and concentration of Sr-90 to the diversion of liquid radioactive wastes from the disposal well to the infiltration ponds in addition to radioactive decay, diffusion, dispersion, and dilution from natural recharge. Since 1989, concentrations of Sr-90 in water samples from most wells have remained relatively constant.

The distribution of Sr-90 in the SRPA for May 1995 is provided in Figure 5-5. The areal extent of the Sr-90 plume has decreased between October 1988 and May 1995, consistent with the previous trend. The maximum Sr-90 concentration detected in the aquifer was 84 pCi/L in well MW-18. Historical Sr-90 concentrations for the USGS and CPP aquifer wells were provided in the WAG 3 RI/FS Work Plan (LITCO 1995c).

5.3.5.7 Technetium-99. Tc-99 was identified in 32 of the 44 wells sampled during the WAG 3 RI. The highest concentrations of Tc-99 were identified in the north central portion of the ICPP in wells MW-18, USGS-47, and USGS-52 having concentrations of 448±4 pCi/L, 235±3 pCi/L, and 174±2 pCi/L, respectively. The Tc-99 plume extends to the southwest of the ICPP and includes wells USGS-123, USGS-57, and USGS-39. The maximum Tc-99 concentration outside the ICPP security perimeter fence is 49 pCi/L in well USGS-123.

Chemical constituents detected in SRPA at the INEEL have in the past included total chromium, sodium, chloride, and nitrate. During the WAG 3 RI, water samples were collected from all aquifer wells and analyzed for CLP metals plus zirconium. From the 44 wells tested, only the water sample from well LF2-11 exceeded a federal primary or secondary MCL. The magnesium concentration in LF2-11 was measured at 62.8 μg/L, compared to a federal secondary MCL of 50 μg/L. This well is located approximately three miles downgradient from ICPP and since magnesium was not measured in other wells above the federal secondary MCL, this contamination is not likely associated with the ICPP.

5.3.6 Buried Gas Cylinders (Group 6)

Site CPP-94 includes an area about 2.4 km (1.5 mi) northeast of the INTEC along the south side of a dirt security road. Four exposed gas cylinders have been observed at the site and are believed to contain hydrofluoric acid. Site CPP-84 is located outside the INTEC fence line, east of Lincoln Boulevard and south of the Big Lost River. An estimated 40 to 100 cylinders were disposed in a trench at Site CPP-84. The safety hazards associated with CPP-94 and CPP-84 are similar. The potential for cylinder over-pressurization and bursting is considered to be the most serious hazard at both sites. Hydrofluoric acid is very corrosive, reacts violently with moisture, and can generate explosive concentrations of hydrogen gas. Fluoride, a chemical residual of hydrofluoric acid reactions, is a potential health and ecological hazard. No known release of the cylinder contents has occurred. As no sampling activities have been conducted at these sites, no sample results or sampling statistics are available. The buried gas cylinders (Group 6) are considered to contain low-level threat wastes.

5.3.7 SFE-20 Hot Waste Tank System (Group 7)

A preliminary investigation conducted in 1984 indicated that the tank liquid and sludge contain elevated levels of Cs-137, Cs-134, Co-60, Sr-90, and isotopes of europium, plutonium, and uranium. Previous spills within the tank vault and pump pit contained similar contaminants. Site CPP-69, soil contamination is associated with CPP-VES-SFE-20. Soils beneath the tank vault have not been sampled due to inaccessibility. There is no evidence that the vault has leaked. The soils were not included as a source in the vadose zone and groundwater models used for risk assessment. The SFE-20 Hot Waste Tank System (Group 7) is identified as containing principal threat wastes.

In February 1984, liquid and sediment samples were taken from the tank interior, vault floor, and pump pit (Table 5-27). The analysis consisted of only Co-60, Cs-137, Cs-134, Eu-152, Eu-154, Eu-155, Sb-125, total strontium, and plutonium and uranium isotopes. The reported concentrations of Cs-137, total strontium, and plutonium isotopes in the single tank liquid sample were 2,050,000; 9,700,000; and 17,600,000 pCi/L, respectively (WINCO 1984). For the same radionuclides, the concentrations in the tank sediment sample were reported at 55,400,000,000; 4,700,000,000; and 93,500,000 pCi/L, respectively. Three samples were collected from the floor (two liquids and one sediment). The reported concentrations in the two liquid floor samples for Cs-137 (analysis for total strontium and plutonium isotopes was not requested) taken from the south and center vault floor locations were 905,000 and 248,000,000 pCi/L, respectively. The reported concentrations of Cs-137, total strontium, and plutonium isotopes in the sediment sample collected on the north end of the vault were 8,920,000; 1,720,000; and

79,200 pCi/g, respectively. For the same radionuclides, the concentrations in the pump pit sediment sample were 2,290,000; 5,890,000; and 3,010 pCi/g, respectively. Only Cs-137 at a concentration of 76,000 pCi/L was reported for the pump pit liquid sampling (WINCO 1984).

There are no data available for nonradioactive constituents; however, the tank contents may contain inorganic and organic constituents that were associated with the operation of the CPP-603 spent fuel storage pool filtration system. It should be noted that generally, longer lived radionuclides (i.e., those having half-lives greater than 10 years) are of most concern and thus, those with shorter half lives were not summarized in this section.

Table 5-27. Summary analytical results for the SFE-20 hot waste tank system.

Identification Number and Location		Type	Co-60	Cs-137	Cs-134	Eu-152	Eu-154	Eu-155	Sb-125	Sr	Pu	U*
Radioisotopic content of smears and samples of SFE-20 area (Sample concentration (pCi/smear [sear samples], pCi/g [solids] or pCi/mL [liquids])												
1	Pipes (exteriors) and walls (interior) in pump pit ~ midway between CPP-642 and pit floor.	Smear	—[a]	7.68E+02	—[a]	—[a]	—[a]	—[a]	—[a]	—[b]	—[b]	—[b]
2	Pipes and walls in pump pit 1 to 2 ft from bottom.	Smear	—[a]	8.97E+03	—[a]	—[a]	—[a]	—[a]	—[a]	—[b]	—[b]	—[b]
3	Walls, floor, and ceiling of access tunnel.	Smear	5.54E+01	1.39E+04	5.92E+01	5.84E+02	5.70E+02	1.21E+02	—[a]	—[b]	—[b]	—[b]
4	Representative areas of vault walls.	Smear		2.19E+03								
5	SFE-20 tank (exterior).	Smear	1.51E+00	5.84E+04	9.84E+01	1.20E+03	7.70E+02	2.04E+02	—[a]	—[b]	—[b]	—[b]
7	Areas of apparent seepage on walls.	Smear	9.51E+01	4.16E+04	—[a]	—[a]	—[a]	—[a]	—[a]	—[b]	—[b]	—[b]
8	Floor-south end of vault.	Liquid	5.83E+00	9.05E+02	1.35E+00	—[a]	—[a]	—[a]	—[a]	—[b]	—[b]	—[b]
9	Floor-center section.	Liquid	1.05E+02	2.48E+05	1.55E+00	—[a]	—[a]	—[a]	—[a]	1.71E+05	1.02E+02	<1.60E-04
10	SFE-20 tank interior.	Liquid	7.43E+01	2.05E+03	7.76E+00	—[a]	—[a]	—[a]	7.32E+01	9.70E+03	1.76E+04	<1.60E-04
11	Floor-north end of vault.	Dry Solids	2.15E+04	8.92E+06	1.06E+04	1.50E+05	1.31E+05	4.73E+04	—[a]	1.72E+06	7.92E+04	—[b]
12	Bottom 6 in.-tank interior.	Wet Solids	3.27E+05	5.54E+07	1.62E+05	1.38E+05	1.21E+05	—[a]	—[a]	4.70E+06	9.35E+04	1.91E-03
13	Bottom of pump pit.	Wet Solids	2.38E+04	2.29E+06	1.33E+04	5.65E+04	4.62E+04	2.05E+04	4.73E+04	5.89E+06	3.01E+03	—[b]
14	Pump pit-sump.	Liquid	—[a]	76	—[a]	—[a]	—[a]	—[a]	—[a]	—[b]	—[b]	—[b]

Table 5-27. (continued).

Sample Number	Cs-137	K-40	Ra-226	Th-232	Alpha
Analysis for SFE-20 surface soil samples (Sample concentration [pCi/g])					
1	2.29E+01	1.78E+01	3.22E+00	2.03E+00	5.0E-02
2	4.40E+00	—[a]	3.18E+00	2.80E+00	2.35E+00
3	2.28E+01	—[a]	6.33E+00	2.10E+00	—[c]
4	2.39E+01	3.17E+01	—[c]	—[c]	—[c]
5	3.43E+01	2.91E+01	—[c]	—[c]	—[c]

- The unit of measures for Uranium (U) was reported in g/L.

a. Isotope below detection limit.

b. Analysis was not requested. Decision was based on earlier Alpha Scan results.

c. Analysis not performed. Analyzed only samples expected to show highest concentrations.

6. CURRENT AND POTENTIAL SITE AND RESOURCE USES

The original mission of INTEC was to reprocess spent reactor fuel elements to recover highly enriched uranium. In 1992, the mission was changed and the facility no longer reprocesses spent nuclear fuels. The current mission of INTEC is to provide safe interim storage of spent nuclear fuels, provide research and development support for the disposition of these fuels in a federal geologic repository, manage other HLW, manage wastes from past reprocessing and D&D activities, and develop improved waste management techniques.

6.1 Current Land Uses

The INEEL consists of approximately 2,305 km^2 (890 mi^2) (230,266 ha [569,000 acres]). The majority of this land, approximately 98%, has not been impacted by DOE site operations. Only 2% of the INEEL has been impacted by Site operations. Past use of the INEEL as a Department of Defense target range has resulted in an area of greater than 518 km^2 (200 mi^2) contaminated by unexploded ordnance. Land uses for the entire INEEL are currently restricted and controlled. There are no areas of current residential land use within the INEEL boundaries. The typical INEEL land use consists of wildlife management areas, government industrial operations areas, and waste management areas. Some recreational use, such as hunting, is allowed in designated areas during selected periods of time which are controlled by the DOE and the Idaho Department of Fish and Game or Native American Treaties. Additionally, the DOE through the BLM leases land parcels for commercial use, such as sheep grazing.

Current land-use is government-controlled industrial use. It is termed "controlled" because there is no unrestricted public access to the INTEC and INEEL. Although there are public highways that traverse the INEEL, activities beyond the highway right-of-way are controlled and restricted by fences and security guards. For example, access to INEEL facilities require proper clearance, training, or escort and self-imposed (DOE) controls to limit the potential for unacceptable exposures.

6.2 Reasonably Anticipated Future Land Use

Planning assumptions in the INEEL Comprehensive Facility Land Use Plan (DOE-ID 1998d) are that the INEEL will remain under government management and control for at least the next 100 years. Future government management and control becomes increasingly uncertain with time. Regardless of the future use of the land now occupied by the INEEL, the federal government has an obligation to provide adequate institutional controls (i.e., limit access) to areas that pose an unacceptable health or safety risk to the public and workers until that risk diminishes to an acceptable level for any intended uses. Achievement of this obligation hinges on Congress appropriating sufficient funds to the responsible government entity charged to maintain the institutional controls for as long as necessary and as long as the federal government of the United States remains viable. No residential development (i.e., housing) will be allowed to occur within INEEL boundaries during the next 100 years. Grazing will be allowed to continue in the buffer area.

Across the INEEL it is anticipated that there will be a mix of land uses to include unrestricted industrial uses, government-controlled industrial uses, unrestricted areas, controlled areas for wildlife management and conservation, and waste management areas. However, the unrestricted areas are not planned for residential development during the next 100 years. Future land use scenarios are identified in the *Long-Term Land Use Future Scenarios for the Idaho National Engineering Laboratory* (DOE-ID 1995a). This document was developed using a stakeholder process that involved a public participation forum, a public comment period, and the INEEL Citizens' Advisory Board (CAB). The public participation forum membership included members from the local counties and cities, the

Shoshone-Bannock Tribes, the BLM, DOE, U.S. Forest Service, U.S. National Park Service, Idaho Department of Transportation, Idaho Fish and Game, and eight business, education, and citizen organizations. In addition, the EPA, and IDHW participated in an ex-officio capacity. Following review and comment by the public participation forum, the document underwent a 30-day public comment period and was subsequently submitted to the CAB for review and recommendations. No recommendations for residential use of any portions of the INEEL until at least year 2095 have been received to date.

Areas of the INEEL are expected to be either industrial or non-industrial for the next 100 years. In the northern area of the INEEL, potential industrial use of the land for a spaceport is being considered. The non-industrial areas are expected to involve grazing and similar activities. In addition, the INEEL is currently a National Environmental Research Park and is expected to remain so for the foreseeable future. This future use is expected to last until at least 2095.

The reasonably anticipated future use for WAG 3 until 2095 is as a government-controlled industrial facility. The industrial area is expected to involve activities such as national laboratory research and development or handling, treatment, and disposal of radioactive materials. The industrial operations assumptions include a 10-ft basement scenario. Section 11 of this document discusses institutional controls to be implemented at OU 3-13 CERCLA sites. An Institutional Control Plan for specific sites will be developed during RD. Section 21.1of the FFA/CO provides EPA site access with or without prior notification. The Institutional Control Plan will include provisions that any lease or privatization effort by DOE will include EPA access.

6.3 Basis for Future Land Use Assumptions

The projection for future land use at INTEC is based upon:

- DOE projections for the future of its national laboratory research and development activities and nuclear reactor programs

- The presence of active industrial and research facilities

- The presence of an industrial infrastructure

- No apparent non-industrial uses, other than grazing within the INEEL

- Recommendations from the INEEL CAB and other stakeholders regarding future use assumptions.

6.4 Groundwater Uses

Current SRPA groundwater use at INTEC is for drinking and irrigation. Groundwater is extracted from several production wells, which are located upgradient of WAG 3 groundwater contamination. There is no current water usage from regions of the aquifer that have been contaminated above MCLs immediately downgradient of INTEC. Future groundwater use from contaminated portions of the SRPA outside of the current INTEC security fence will be restricted by institutional controls until 2095. Following 2095, it is anticipated that groundwater in the SRPA will be available for all uses. Groundwater contamination from INTEC is not expected to migrate past INEEL boundaries. Water use restrictions during the restoration time frame will apply only inside the INEEL boundaries.

There is no current or future planned groundwater use from the perched water zones. The perched water zones are transient and are not capable of producing sufficient water for domestic or other uses.

6.5 Groundwater Classification and Basis

The INTEC is located above the SRPA. The eastern portion of the aquifer was granted sole source aquifer status by the EPA on October 7, 1991. Three categories of aquifer protectiveness are applied under Idaho regulations: (1) Sensitive Resources, (2) General Resources, and (3) Other Resources. Since no previous action to categorize the SRPA under state regulations has occurred, the aquifer defaults to the "General Resources" category. General Resource aquifers are protected to ensure that groundwater quality standards are not exceeded. State water quality standards are specified by the Idaho Groundwater Quality Rule, the Idaho Water Quality Standards, and Wastewater Treatment Requirements. Idaho's groundwater standards incorporate 10 CFR 20 Appendix B, Table 2 and 40 CFR 141 and 143.

7. SUMMARY OF SITE RISKS

7.1 Human Health Risk Evaluation

The purpose of a human health risk assessment (HHRA) is to evaluate potential adverse impacts to human health resulting from exposure to site-related radioactive and nonradioactive contamination. The HHRA approach and results are summarized in this section. First, Section 7.1.1 summarizes the conservative screenings performed to identify sites or sources of contamination and COPCs by media. Contaminated media evaluated in the HHRA at OU 3-13 include soil, groundwater, and air. The release sites sources, COPCs, and COPC concentrations for each of these media were evaluated independently, primarily due to the complexity of the groundwater evaluation and the number of soil sites. These screenings were summarized and the results were then used as input in the performance of the baseline HHRA. This assessment is summarized in Section 7.1.2. A somewhat different grouping of sites was used in the RI/BRA (DOE-ID 1997b); however, the risk results are presented herein by the seven groups described in Section 4 of this ROD.

7.1.1 Derivation of Exposure-Point Concentrations

Generally, the analytical results of the field investigations conducted since 1991 were used to estimate exposure point concentrations for each site-related chemical. This was accomplished by implementing the measures below for each retained site:

- Extract (by site) contaminant of potential concern (COPC) concentration data from the Environmental Restoration Information System (ERIS) or from appropriate information sources
- Eliminate data that were rejected per the method validation
- Eliminate data that indicated probable blank contamination
- Segregate quality control data (e.g., blanks, duplicates)
- Average duplicate results
- Assume nondetects are one-half the reported sample quantitative limit
- Aggregate data by individual COPC
- Aggregate COPC data by select depths, i.e., surface and surface + subsurface (see Table 7-1)
- Calculate the 95% upper confidence level (UCL) of the arithmetic mean for each COPC by select depths (EPA 1992a)
- Assess appropriateness of the 95% UCL versus maximum concentration (EPA 1992a)
- Select appropriate concentration estimate
- Calculate contaminant concentration and/or contaminant mass.

Table 7-1. Results of the site and chemical screening processes.

OU/Site	COPCs
3-01/CPP-61 PCB Spill in CPP-718 Transformer Yard-Radiological contamination	Cesium-137 Strontium-90 Technicium-99
3-02/CPP-23 CPP Injection Well	Osmium[a] Cesium-137 Europium-152 Europium-154 Strontium-90
3-02/CPP-37A CPP Gravel Pit #1	Arsenic Americium-241 Cesium-137 Cobalt-60 Neptunium-237 Plutonium-238 Strontium-90 Uranium-235 Uranium-238
3-02/CPP-37B CPP Gravel Pit #2	Aroclor-1260 Kepone[a] Arsenic Americium-241 Cesium-137 Iodine-129 Neptunium-237 Plutonium-238 Strontium-90 Uranium-235 Uranium-238
3-02/CPP-65 Sewage Treatment Plant	Will be evaluated only as a source of recharge to perched zones and SRPA.
3-03/CPP-67 CPP Percolation Ponds #1 and #2—Sediments	Americium-241 Cerium-144 Cobalt-60 Cesium-134 Cesium-137 Iodine-129 Neptunium-237 Plutonium-238 Plutonium-239/-240 Ruthenium-106 Antimony-125 Strontium-90

Table 7-1. (continued).

OU/Site	COPCs
	Tritium Uranium-234 Uranium-235 Uranium-238
3-05/CPP-14 Imhoff Tanks	Aroclor-1260 Benzo(a)pyrene Phenanthrene[a] Cadmium Cesium-137 Neptunium-237 Strontium-90 Uranium-235
3-05/CPP-14 Plant Site	Aroclor-1260 Americium-241 Cesium-137 Neptunium-237 Antimony-125 Strontium-90 Uranium-234 Uranium-235 Uranium-238
3-05/CPP-14 Drain Field	Phenanthrene[a] Arsenic Neptunium-237 Strontium-90
3-06/CPP-33 Contaminated Soil in the Tank Farm Area NE of CPP-604	Arsenic Americium-241 Cesium-137 Neptunium-237 Plutonium-238 Plutonium-239/240 Strontium-90
3-06/CPP-34 Soil Storage Area in the NE Corner of the ICPP	Arsenic Cesium-137 Neptunium-237 Plutonium-238 Strontium-90 Uranium-234 Uranium-238
3-06/CPP-40 Lime Pit at the Base of the CPP-601 Berm and French Drain—Radiological Contamination	Cesium-137
3-07/CPP-20 CPP-604 Radioactive Waste Unloading Area	Americium-241 Cesium-134 Cesium-137

Table 7-1. (continued).

OU/Site	COPCs
	Cobalt-60 Europium-154 Neptunium-237 Plutonium-238 Strontium-90 Technicium-99
3-07/CPP-25 Contaminated Soil in Tank Farm Area North of CPP-604	Americium-241 Cesium-134 Cesium-137 Cobalt-60 Europium-154 Neptunium-237 Plutonium-238 Strontium-90 Technicium-99
3-07/CPP-26 Contaminated Soil in Tank Farm Area Steam Flushing—Operation inside the Tank Farm perimeter	Americium-241 Cesium-137 Europium-154 Plutonium-238 Plutonium-239 Strontium-90 Uranium-234 Uranium-235
3-07/CPP-28 Contaminated Soil in the Tank Farm Area South of WM-181 by Valve Box A-6	Cerium-144 Cesium-134 Cesium-137 Cobalt-60 Europium-154 Neptunium-237 Plutonium-239 Plutonium-240 Plutonium-241 Plutonium-242 Ruthenium-106 Strontium-90 Tritium Uranium-234 Uranium-235 Uranium-236
3-07/CPP-31 Contaminated Soil in Tank Farm Area South of Tank WM-183	Cesium-134 Cesium-137 Cobalt-60 Europium-154 Plutonium-239/-240 Ruthenium-106 Strontium-90

Table 7-1. (continued).

OU/Site	COPCs
	Uranium-235
3-07/CPP-32W/E Contaminated soil in the Tank Farm area of Valve Box B-4	Cesium-137 Europium-154 Strontium-90
3-07/CPP-79 Tank Farm Release Near Valve Box A-2	Americium-241 Cesium-137 Plutonium-238 Strontium-90 Uranium-234 Uranium-235
3-07/CPP-83 Perched Water	Arsenic Chromium Americium-241 Strontium-90 Technicium-99 Tritium Uranium-234 Uranium-238
3-08/CPP-13 Pressurization of the Solid Storage Cyclone NE of CPP-13	Arsenic Zirconium[a] Cobalt-60 Cesium-134 Cesium-137 Europium-154 Strontium-90 Technicium-99
3-08/CPP-15 Solvent Burner East of CPP-605—Radiological Contamination	Thallium[a] Zirconium[a] Americium-241 Cesium-137 Europium-154 Neptunium-237 Plutonium-238 Plutonium-239/-240 Tecnicium-99 Uranium-235
3-08/CPP-27 Contaminated Soil in Tank Farm Area East of CPP-604 and CPP-33	Americium-241 Cesium-137 Europium-154 Neptunium-237 Plutonium-238 Plutonium-239/-240 Strontium-90 Uranium-235
3-08/CPP-35	Americium-241

Table 7-1. (continued).

OU/Site	COPCs
CPP-633 Decontamination Spill	Cesium-137 Europium-154 Plutonium-238 Plutonium-239 Strontium-90 Uranium-235
3-08/CPP-36 Transfer Line Leak from CPP-633 to WI-102	Americium-241 Cesium-134 Cesium-137 Europium-154 Plutonium-238 Plutonium-239 Potassium-40 Strontium-90 Uranium-234 Uranium-235 Uranium-238
3-09/CPP-01 Horizontal Settling Basin, and Vertical Settling Pit and Soil Adjacent to SW-048 Dry Well and CPP-303 Dry Well—Environmental Release.	Americium-241 Cobalt-57 Cobalt-60 Cesium-137 Europium-152 Europium-154 Europium-155 Plutonium-239 Strontium-90 Uranium-235
3-09/CPP-02 French Drain West of CPP-603	Suspected Cesium-137 Suspected Strontium-90 Suspected Tritium
3-09/CPP-03 Temporary Storage Area SE of CPP-603 Stockpiled Soil	Cesium-137 Europium-152 Strontium-90
3-09/CPP-04 and CPP-05 Contaminated Soil Around CPP-603 Settling Tank	Cerium-144 Cobalt-60 Cesium-134 Cesium-137 Europium-152 Europium-154 Europium-155 Uranium-235
3-09/CPP-06 Trench East of CPP-603 Fuel Storage Basin	Cesium-137 Strontium-90

Table 7-1. (continued).

OU/Site	COPCs
3-09/CPP-08 and CPP-09 CPP-603 Basin Filter System Line Failure and Soil Contamination Near NE Corner of CPP-603 South Basin	Cesium-137 Europium-152 Europium-154 Strontium-90 Uranium-235
3-09/CPP-10 CPP-603 Plastic Pipeline Break	Cobalt-60 Cesium-137 Europium-152 Europium-154 Europium-155 Strontium-90 Uranium-235
3-09/CPP-11 CPP-603 Sludge and Water Release	Arsenic Thallium[a] Cesium-137 Cobalt-60 Europium-154 Neptunium-237 Strontium-90
3-09/CPP-17a Soil Storage Area South of CPP Peach Bottom Fuel Storage Area	Cesium-137 Europium-152 Europium-154 Strontium-90
3-09/CPP-17b Soil Storage Area South of CPP Peach Bottom Fuel Storage Area	Cobalt-57 Cesium-137
3-09/CPP-19 CPP-603 to CPP-604 Line Leak	Arsenic Calcium[a,b] Americium-241 Cobalt-60 Cesium-134 Cesium-137 Europium-152 Europium-154 Europium-155 Niobium-95 Plutonium-239 Strontium-90 Uranium-235
3-09/CPP-22 Particulate Air Release South of CPP-603	Cesium-137 Strontium-90 Technicium-99
3-09/CPP-69 Abandoned Liquid Radioactive Waste Storage Tank CPP VES-SFE-20	Cobalt-60 Cesium-134

Table 7-1. (continued).

OU/Site	COPCs
	Cesium-137 Europium-152 Europium-154 Europium-155 Plutonium-239/-240 Antimony-125 Strontium-90
3-09/CPP-78 Contaminated Soil West of CPP-693, East of Dry Fuel Storage Area	Strontium-90
3-10/CPP-46 CPP-637 Courtyard Pilot Plant Release—Radiological Contamination	Cesium-134 Cesium-137 Strontium-90 Technicium-99
3-11/CPP-58W/E Subsurface release of contaminants associated with PEW spills and CPP PEW Evaporator Overhead Pipeline Spills	Americium-241 Cesium-137 Europium-154 Plutonium-238 Plutonium-239 Strontium-90 Uranium-235
3-12/CPP-80 CPP-601 Vent Tunnel Drain Leak (VT-300)	Chloride[a] Sulfate[a] Zirconium[a] Cerium-144 Cesium-134 Cesium-137 Europium-154 Europium-155 Plutonium-238 Plutonium-239/-240 Ruthenium-106 Antimony-125 Strontium-90
3-13/CPP-85 WCF Blower Corridor	Cobalt-60 Cesium-134 Cesium-137 Europium-154 Strontium-90
3-13/CPP-87 VOG Blower Cell Floor Drain/Sump and PEW Evaporator Feed Pump Cell	Arsenic Barium Cadmium Chromium Lead[a] Mercury Cobalt-60 Cesium-134

Table 7-1. (continued).

OU/Site	COPCs
	Cesium-137
3-13/CPP-88 Radiologically Contaminated Soils Map	Arsenic Thallium[a] Cesium-137 Strontium-90
3-13/CPP-89 CPP-604/605 Tunnel Excavation	Americium-241 Cesium-134 Cesium-137 Cobalt-60 Iodine-129 Neptunium-237 Plutonium-238 Plutonium-239/240 Strontium-90 Antimony-125 Uranium-234 Uranium-235
3-13/CPP-90 CPP-709 Ruthenium Detection	Benzo(a)pyrene Phenanthrene[a] Arsenic Thallium[a] Cobalt-58 Cesium-134 Cesium-137 Europium-155 Niobium-95 Strontium-90
3-13/CPP-91 CPP-633 Blower Pit Drain	Arsenic Manganese Thallium[a] Cesium-137 Strontium-90
3-13/CPP-92 Soil Boxes West of CPP-1617	Americium-241 Cesium-134 Cesium-137 Cobalt-60 Europium-152 Europium-154 Iodine-129 Neptunium-237 Plutonium-238 Plutonium-239/240 Strontium-90 Antimony-125 Uranium-234 Uranium-235

Table 7-1. (continued).

OU/Site	COPCs
3-13/CPP-93 Simulated Calcine Trench	Aluminum Mercury
3-13/Windblown Area (OU 10-06)	Americium-241 Cesium-134 Cesium-137 Potassium-40 Plutonium-238 Plutonium-239 Plutonium-240 Strontium-90 Uranium-233 Uranium-235

a. No toxicity value is available. This will be further discussed in the uncertainty section.

b. Calcium is further evaluated since its concentration is about 9.67 times greater than background concentrations.

7.1.2 Site/Source and Contaminant Identification

7.1.2.1 Soil. This section summarizes the identification of sites and COPCs assessed in the HHRA for soil contamination. First, the sites that were designated "No Action" or "No Further Action" in the Track 1, Track 2, or RI/BRA were eliminated based on whether the soil concentration exceeded the PRGs. These sites either: (a) contain no source of contamination, either through process knowledge or as a result of sampling activity; or, (b) contain no source of contamination because of remediation. All signed and pending decision statements were reviewed during the RI/BRA to ensure that the assumptions on which these recommendations were based remain valid (see Section 4.8). The second step of the site screening process was based on the results of previous risk evaluations. All sites for which preliminary risk evaluations using Track 1 or Track 2 methods have shown cancer risk or hazard levels to be less than 1×10^{-6} or an HI < 1.0, respectively, were eliminated from further evaluation. The contamination screening process was performed for each of the retained WAG 3 release sites. Historical sampling data were used to identify COPCs present in soils at the WAG 3 sites. The list of contaminants was reduced by eliminating contaminants with observed concentrations less than INEEL background concentrations, by eliminating contaminants with detection frequencies less than 5% (i.e., one detect in 20 samples equals a 5% frequency of detection) and without evidence of release at the site, and by consideration of whether or not the contaminant is an essential nutrient. Because substances that are essential nutrients can be toxic at high concentrations, the latter screening step was only applied at sites where essential nutrient concentrations are less than 10 times the background concentration. The results of the site and contaminant screening are presented in Table 7-1. Soil concentrations for assessment were then calculated for sites of concern as discussed in Section 7.1.3 of the RI/BRA (DOE-ID 1997b).

7.1.2.2 Groundwater. This section summarizes the identification of COPCs and sources, and the modeling to determine groundwater contaminant concentrations. Groundwater COPCs were identified using three steps. First, an initial set of contaminants was identified by comparing the maximum concentrations measured in the aquifer and perched water to the limiting concentration defined by either the water concentration based on a 1E-06 risk level, an HI of 1, or the applicable MCL. The second identification step designed and applied a screening process to evaluate the potential for groundwater contamination from contaminated soils. Soil contaminants were evaluated for their maximum risk in the alluvium pore-water, their propensity to infiltrate through the alluvium, and the predicted reduction in activity due to radioactive decay. These first two steps used field data presented in Section 5.1 of Appendix F of the OU 3-13 RI/BRA, including maximum observed concentrations of individual chemical species and the associated risk. The field data included: (1) sampling and analysis of aquifer and perched water, (2) service wastewater source logs, and (3) sampling and analysis of soil contamination. Contaminants of concern based on other factors such as water sample information and soil contamination screens, were identified in the third step. As a result, three nonradionuclides and 10 radionuclides were identified as COPCs in groundwater as shown in Table 7-2. The identification and evaluation of the contaminant sources for the groundwater pathway are discussed in Section 5.2 of Appendix F of the OU 3-13 RI/BRA (DOE-ID 1997b).

The contaminant transport modeling was limited to three nonradionuclides (arsenic, chromium, and mercury) and 10 radionuclides (Am-241, Co-60, Cs-137, H-3, I-129, Np-237, Total Pu, Sr-90, Tc-99, and combined uranium). Each COPC was incorporated in the model using the mass (radionuclide activity is converted to mass units) defined from the known releases, service waste, soil contamination, or TRA discharge to the aquifer. These contaminant mass sources were modeled as either a uniform release over a known time frame, a variable release over a known time frame, or a one-time release at a particular time. For the simulations, the plutonium isotopes were combined into a Total Pu run and the uranium isotopes are combined into a Total U run.

Table 7-2. Summary of the identified groundwater COPCs.

COPCs Based on Water Samples				
Aquifer Based COPCs	Additional COPCs Based on Perched Water	Additional COPCs Based on Soil Contamination	Additional COPCs Based on Other Considerations	Final List of the COPCs for the Groundwater Pathway
Am-241	None	Arsenic	Cs-137	Arsenic
H-3		Chromium	Mercury	Chromium
I-129		Co-60		Mercury
Np-237		U-235		Am-241
Sr-90		Pu-238		Co-60
Tc-99		Pu-239		Cs-137
u-234		Pu-240		H-3
U-238				I-129
				Np-237
				Total Pu
				Sr-90
				Tc-99
				Total U

The total mass or activity of the contaminants at the general source location was divided into more specific locations and given the best estimate of time during which the releases occurred. Table 6-1 and Figure 6-1 of Appendix F of the OU 3-13 RI/BRA report summarize source locations and simulation time frames for each of the contaminant sources. Section 7 of Appendix F of the OU 3-13 RI/BRA presents the vadose zone and aquifer simulation results. Table 6-4 of the OU 3-13 RI/BRA (DOE-ID 1997b) presents a summary of the results by COPC.

The aquifer transport simulation results consist of contour plots of the peak concentration at eight different time frames centered about the MCL, contours of either the HI or risk number, depending on applicability, for eight time frames centered on the 10^{-6} risk (or HI = 1), and the time history of the peak concentration and corresponding risk for the entire aquifer, for the Test Reactor Area footprint and the INTEC footprint. (TRA is an upgradient source of tritium and chromium to INTEC.) Tables 6-5 to 6-8 of the RI/BRA present result summaries by COPC.

Concentrations for each contaminant were calculated as maximum values to coincide with the 100-year future residential scenario time frame over the entire WAG 3 and therefore is the same regardless of location within the INTEC. This was the only scenario for which groundwater was considered a pathway. The risk calculated for the SRPA are on-Site risks. There are no projected off-INEEL impacts to downgradient SRPA users.

7.1.2.3 Air. Area-weighted concentrations were calculated using the soil concentration terms prepared for each group and site within INTEC that are presented in Sections 8 through 26 of the OU 3-13 RI/BRA (see Table 7-3 of this ROD). For the onsite worker scenarios, COPC concentrations in the 0- to 15-cm (0- to 0.5-ft) depth range were used. For the future residential scenario, COPC concentrations in soil in the 0- to 3.05-m (0- to 10-ft) depth range were used. The individual site concentrations were then used to estimate the contaminant air concentrations due to emissions that may result from multiple sites of concern within WAG 3. This methodology is presented in Section 7.1.3.2 and 27.2 of the OU 3-13 RI/BRA (DOE-ID 1997b). Each COPC concentration term was calculated as an

Table 7-3. COPC exposure-point concentrations in air.

COPCs	Current Onsite Worker: Fugitive Dust (mg/m^3 or pCi/m^3)	Current Onsite Worker: Volatiles (mg/m^3)	Future Onsite Worker: Fugitive Dust (mg/m^3 or pCi/m^3)	Future Onsite Worker: Volatiles (mg/m^3)	Future Onsite Resident: Fugitive Dust (mg/m^3 or pCi/m^3)	Future Onsite Resident: Volatiles (mg/m^3)
Aroclor-1260	—	—	—	—	1.9E-11	1.6E-13
Benzo(a)pyrene	1.5E-12	8.4E-16	1.5E-12	8.4E-16	1.6E-12	5.7E-16
Aluminum	—	—	—	—	7.1E-07	—
Arsenic	1.2E-09	—	1.2E-09	—	7.4E-08	—
Manganese	3.2E-09	—	3.2E-09	—	3.4E-09	—
Mercury	—	—	—	—	8.3E-10	—
Uranium	5.1E-09	—	5.1E-09	—	4.3E-09	—
Am-241	4.5E-06	—	3.9E-06	—	1.1E-05	—
Ce-144	4.6E-07	—	9.5E-46	—	1.3E-45	—
Co-57	4.4E-10	—	1.2E-50	—	1.7E-50	—
Co-58	—	—	—	—	—	—
Co-60	5.1E-06	—	1.0E-11	—	7.4E-11	—
Cs-134	1.5E-06	—	3.6E-21	—	8.5E-21	—
Cs-137	5.0E-04	—	5.0E-05	—	2.3E-03	—
Eu-152	1.3E-04	—	8.1E-07	—	2.4E-06	—
Eu-154	1.0E-04	—	3.9E-08	—	1.0E-07	—
Eu-155	1.4E-05	—	1.2E-11	—	2.2E-11	—
H-3	2.7E-07	—	9.7E-10	—	5.4E-09	—
I-129	3.1E-06	—	3.1E-06	—	1.2E-06	—
K-40	—	—	—	—	3.0E-07	—
Nb-95	4.4E-12	—	—	—	—	—
Np-237	1.3E-06	—	1.3E-06	—	1.4E-06	—
Pu-238	5.5E-06	—	2.5E-06	—	4.2E-06	—
Pu-239/240	1.7E-06	—	1.7E-06	—	3.2E-06	—
Pu-241	—	—	—	—	5.4E-07	—
Pu-242	—	—	—	—	3.8E-09	—
Ru/Rh-106	2.9E-07	—	4.6E-37	—	1.8E-37	—
Sb-125	1.7E-07	—	2.3E-18	—	1.8E-18	—
Sr-90	2.1E-04	—	1.9E-05	—	6.3E-04	—
Tc-99	6.4E-07	—	6.4E-07	—	1.6E-06	—
U-234	2.1E-06	—	2.1E-06	—	1.5E-06	—
U-235	5.6E-08	—	5.6E-08	—	5.8E-08	—
U-236	—	—	—	—	9.0E-11	—
U-238	1.7E-06	—	1.7E-06	—	1.4E-06	—

— Indicates that the contaminant is not a COPC in the medium or at the site.

7.1.2.4 average value over the entire WAG 3 are and therefore, the same value is used regardless of location within INTEC.

7.1.3 Human Health Risk Assessment

The OU 3-13 HHRA methodology is presented in Section 7 of the OU 3-13 RI/BRA (DOE-ID 1997b). This methodology was applied consistently for all retained sites within WAG 3. The HHRA evaluated risks due to exposure to COPCs through soil ingestion, fugitive dust inhalation, VOC inhalation, external radiation exposure, groundwater ingestion, ingestion of homegrown produce, dermal absorption of groundwater, and inhalation of water vapors during indoor water use. The approach is described in the following sections.

7.1.3.1 Exposure Assessment. The exposure assessment stage of the human health risk evaluation process estimates the exposure route, magnitude, frequency, and duration of exposures that receptors may experience due to contact with contaminants at a specific site or group of sites. The primary purpose of the exposure assessment is to estimate total dose for a receptor that can later be compared with chemical-specific dose response data to estimate cancer risk and the likelihood of other noncancer adverse health effects. A conceptual site model (CSM) was prepared to identify receptors and exposure routes under current and future land use conditions (Figure 7-1). The CSM illustrates the contaminant sources, primary release mechanisms, secondary sources and release mechanisms, exposure pathways, exposure routes, and receptors specific to WAG 3. Aspects of the exposure assessment process are described in more detail below.

7.1.3.2 Identification of Potentially Exposed Receptor Populations. The identification of potentially exposed receptor populations includes consideration of applicable current and future land use scenarios. A discussion of these scenarios at the INEEL is found in Section 7 of the BRA. As shown by the CSM, potential receptor populations include occupational site workers and hypothetical future residents. The current land use includes continued use of operating facilities. Access to these facilities is controlled; therefore, the only potential receptor is an occupational worker during the current land use scenario.

Because current industrial uses at WAG 3 are expected to continue in the future, the future land use scenario included occupational workers. Also, for the purposes of the WAG 3 HHRA, it was assumed that residential development may occur and thus, exposures to hypothetical future on-Site residents may occur and were evaluated. The residential receptor is assumed to be an adult for all potentially complete pathways; additionally, a child receptor was included in the soil ingestion pathway assessment. For this pathway, the child and adult parameters were averaged on a time-weighted basis. Child exposures were evaluated specifically for the soil ingestion exposure route because children have the potential for much greater exposure via this route. The timing for the future land use exposure scenarios was assumed to be 100 years in the future for both receptor populations.

7.1.3.3 Identification of Potential Exposure Pathways. The CSM for WAG 3 includes several exposure pathways and associated routes that were selected for further evaluation based on process and release history. The completeness of exposure pathways and routes are expected to vary between release sites according to the presence or absence of site-related chemicals or the presence of engineering features or artifacts that prevent exposure from taking place. Exposure pathways evaluated at each site of concern are summarized in Table 7-4. Site-specific features that influenced the completeness of pathways and exposure routes are described separately for each site in Sections 8 through 26 of the OU 3-13 RI/BRA.

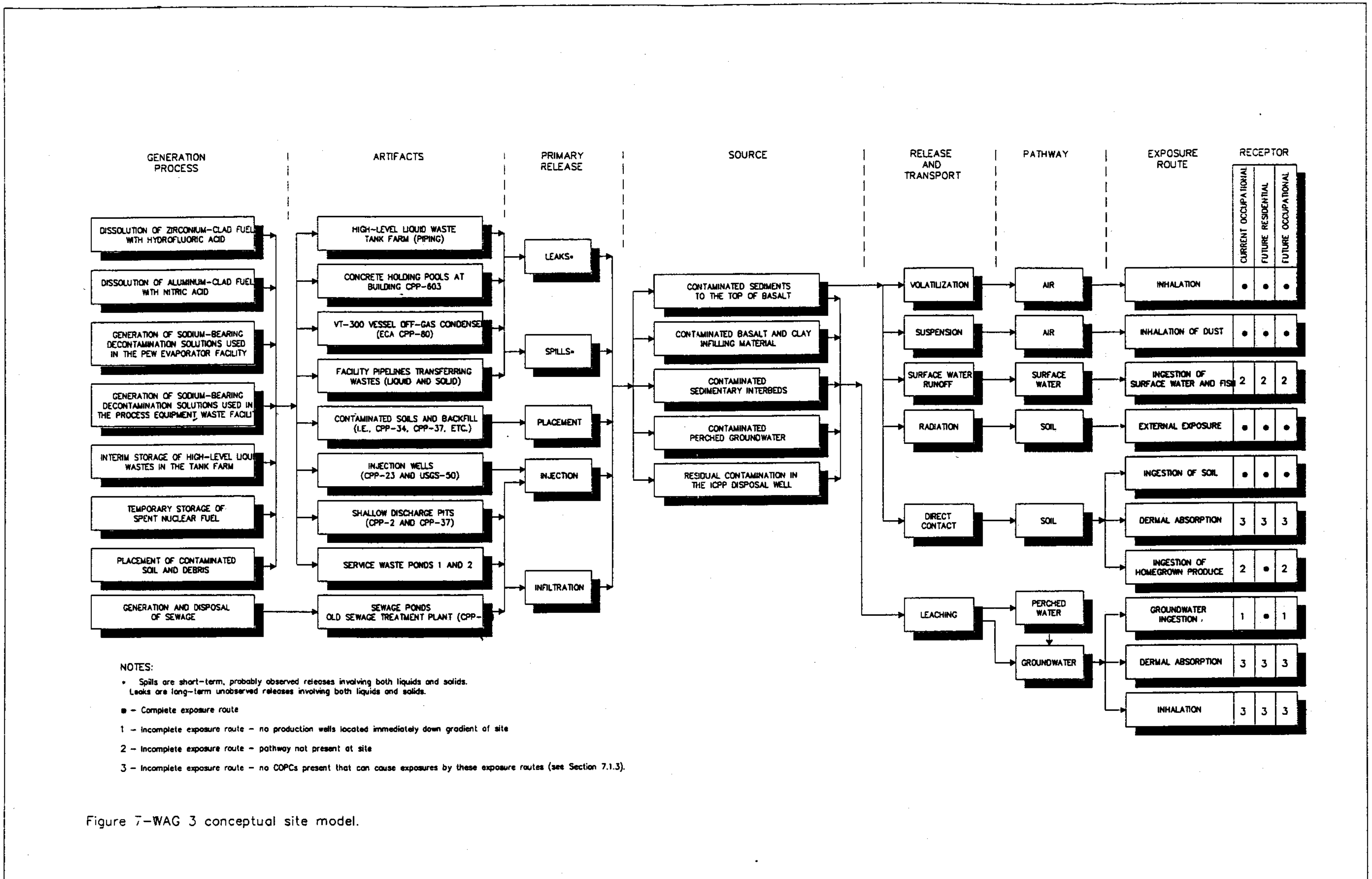


Figure 7-1. WAG 3 conceptual site model.

Table 7-4. Potentially complete exposure pathways quantitatively evaluated for WAG 3 and associated soil depths by exposure route.

Potentially Exposed Receptor	Scenario	Potentially Complete Exposure Pathways and Soil Depths by Exposure Route
Occupational worker	Current land use	Inhalation of VOCs (0-15 cm [0-6 in.])[a] Inhalation of airborne particulates (0-15 cm [0-6 in.])[a] Ingestion of surface soil (0-15 cm [0-6 in.])[a] External radiation (0-1.22 m [0-4 ft])[b]
Residential	Future land use	Inhalation of VOCs (0-3.05 m [0-10 ft])[c] Inhalation of airborne particulates (0-3.05 m [0-10 ft])[c] Ingestion of surface soil (0-3.05 m [0-10 ft])[c] Ingestion of homegrown produce (0-3.05 m [0-10 ft])[c] Ingestion of groundwater External radiation (0-3.05 m [0-10 ft])[c]
Occupational worker	Future land use	Inhalation of VOCs (0-15 cm [0-6 in.])[a] Inhalation of airborne particulates (0-15 cm [0-6 in.])[a] Ingestion of surface soil (0-15 cm [0-6 in.])[a] External radiation (0-1.22 m [0-4 ft])[b]

a. Exposure is assumed to be limited to surface soil. Surface soil is considered as the top 0-15cm (0-6 in.).

b. Exposure is assumed to be limited to the 0 to 1.22-m (0-4-ft) interval for undisturbed soil. Contamination below that depth is assumed to be shielded by the top soil.

c. Exposure is assumed to be possible for all contamination within the 0 to 3.05-m (0 to 10-ft) interval because of the excavation required for a basement. Conceivably, soils across the interval have the potential to become surface soil thus allowing exposure to occur to the hypothetical resident.

7.1.4 Toxicity Assessment

Toxicity values were used to assess potential adverse effects to humans from COPCs at WAG 3. A toxicity value is the numerical expression of the substance dose-response relationship used in the risk assessment. Toxicity values for the COPCs, consisting of slope factors for carcinogens, and reference doses for noncarcinogens, were obtained primarily from HEAST and the IRIS database. Slope factors and reference dose values are presented in Section 7.2 of the OU 3-13 RI/BRA (DOE-ID 1997b).

7.1.5 Human Health Risk Characterization

The human health risk characterization is presented as both cancer risk and noncarcinogenic hazard to a potential receptor. Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the HQ, which is the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose (RfD). A RfD is defined as a daily exposure level of a contaminant for humans that will not produce deleterious effects during a lifetime. By adding the HQs for all contaminants within a medium or across all media to which a given population may be reasonably exposed, the HI can be calculated. The HI expresses noncarcinogenic effects of multiple contaminant exposures within a single medium or across media. Potential carcinogenic risks are expressed as an estimated probability that an individual might develop cancer in their lifetime from exposure. This probability is based on projected intakes and chemical-specific, dose-response data called slope factors (SFs). Slope factors and the estimated daily intake of a compound, averaged over a lifetime of exposure, are used to estimate the incremental risk that an individual exposed to that compound may develop cancer.

7.1.5.1 Potential Human Health Risks Due to Soil Exposures. The intake equations used to calculate the scenario-specific intakes from contaminated soils are presented in Section 7 of the OU 3-13 RI/BRA (DOE-ID 1997b). These intakes and the available toxicity information were then used to estimate the increased cancer incidence and noncarcinogenic hazards. The results of the soil exposure risk calculations are presented by site in Sections 8 through 26 of the OU 3-13 RI/BRA (DOE-ID 1997b). As discussed below, these risks were evaluated cumulatively in Section 28 of the OU 3-13 RI/BRA (DOE-ID 1997b). There are no noncarcinogenic risks above unity for the future on-Site resident. The projected excess risk of incurring cancer for a future onsite resident from soil exposure is 2 in 100.

7.1.5.2 Potential Human Health Risks Due to Groundwater Exposures. The current cancer risk and noncarcinogenic hazard associated with ingestion of the contaminated groundwater by a future on-Site resident at the year 2095 are presented in the OU 3-13 RI/BRA (DOE-ID 1997b), Table 27-3. The predicted increased cumulative cancer risk due to all COPCs in groundwater south of the INTEC fenceline are 5 in 100,000, and exist only if no action is taken under OU 3-14. Plutonium is predicted to have a peak concentration of 36.2 pCi/L in the year 3085. The predicted activity and related risk was based on conservative groundwater transport modeling that will be further evaluated in the OU 3-14 RI/FS. The dermal and inhalation routes from groundwater exposure were evaluated, but were eliminated because the contaminants are not volatile and are not readily absorbed through the skin. Therefore, the risk associated with these exposure routes was determined to be insignificant.

7.1.5.3 Potential Human Health Risks Due to Air Exposures. The intake equations used to calculate the scenario-specific intakes from the inhalation of fugitive dust and volatilized contaminants are presented in Section 7 of the OU 3-13 RI/BRA. These intakes and the available toxicity information were used to estimate the increased cancer incidence and noncarcinogenic hazards (Tables 7-5 and 7-6). The results indicate that the increased cancer risk from exposure to area-weighted air concentrations is less than 1E-06 under all three scenarios. The noncarcinogenic hazard for this pathway was found to be well below a HI of 1 for all three scenarios. As discussed below, these risks were evaluated cumulatively in Section 27 of the OU 3-13 RI/BRA report (DOE-ID 1997b).

7.1.5.4 Cumulative Risk Presentation. Cumulative cancer risks and noncarcinogenic hazards associated with WAG 3 were estimated by summing all risk contributions across all pathways and exposure routes for all contaminants. Risk contributions from the groundwater and air pathways were added to risk contributions from the soil pathway at each group and site within WAG 3. The results are presented visually in Section 27 of the OU 3-13 RI/BRA (DOE-ID 1997b). From these results Tables 7-7 and 7-8 were developed. This table presents the COCs identified by the HHRA and the corresponding cancer risk for each group of sites by exposure scenario at WAG 3.

7.1.6 Human Health Risk Uncertainty

Many sources of uncertainty are introduced during the risk assessment process, beginning with site investigations and sampling and analysis through risk characterization. Site-specific uncertainty is discussed separately for each release site in Sections 8 through 26 of the OU 3-13 RI/BRA. A summary of uncertainty sources and their potential effects on the risk evaluation is given in the following paragraphs.

7.1.6.1 Exposure Pathways. Generally, pathways and exposure routes were evaluated in the OU 3-13 RI/BRA according to their potential risk contribution. Exclusion of less significant pathways may underestimate the total risk to human health. However, those pathways not quantified were estimated to represent small sources of exposure and were not expected to influence risk management decisions.

Many of the sites are rarely, if ever, visited by onsite workers. The actual exposure time is significantly lower than the values used in human health risk assessments (i.e., 10 hr/d) and therefore risk calculations likely represent an overestimate of the actual risk.

7.1.6.2 Contaminant Fate and Transport. With the exception of radionuclides, the evaluation of human health risks assumed that environmental media concentrations determined from sampling will remain at the same levels over the assumed periods of exposure. This assumption is likely to result in an overestimation of risk, since concentrations are expected to decline over the long-term as natural processes degrade, dilute, or remove site contaminants. The rate of the these natural processes in the contaminated media are unknown, therefore, the magnitude of the overestimate is difficult to determine.

7.1.6.3 Exposure-Point Concentration. The exposure-point concentrations used for assessing risks associated with the reasonable maximum exposure case were either the maximum detected value or the upper 95th percentile of the mean value (whichever is less). Nondetected values were treated as concentrations equal to half the detection limit. This procedure would overestimate the risk except in cases where the actual concentration of the chemicals is below the detection limits.

7.1.6.4 Exposure Levels. The amount of exposure that an individual receives is highly dependent on their activity patterns. There is considerable variability regarding the values assumed in calculating human intake factors. For instance, estimates of soil ingestion rates for all populations are subject to ongoing debate. This may again result in overestimating or underestimating the risk on an individual basis. Additionally, exposure levels estimated for this project did not take into account the fact that individuals such as onsite workers would be required to wear personal protective equipment (PPE) when working in contaminated areas. This results in an overestimation of risk for these potential receptors.

7.1.6.5 Cancer-Risk Estimates. The predicted cancer risk in humans due to chemical exposure (i.e., nonradiological) is often based on cancer dose-response data in animals. There is a long-standing controversy in the scientific community as to the best way by which cancer-dose response data obtained from animal studies should be extrapolated to humans. In general, the EPA follows a conservative procedure in deriving slope factors, so cancer risk estimates due to chemical exposure based on these values are likely considerably higher than the true risks.

7.1.6.6 Computer Modeling. A computer model was used to estimate exposure concentrations of site-related chemicals in groundwater. These values were subsequently used to estimate chronic daily intakes, and subsequent total cancer risk and noncarcinogenic hazard. Numerical predictions of contaminant fate and transport in the vadose zone and the aquifer were based on: (1) hydrogeologic data forming the conceptual models for both zones; (2) contaminant release source term estimates; and (3) estimates of the contaminant-soil-basalt chemical interactions. The uncertainty in the conceptual model and its parameterization was qualitatively assessed. This uncertainty may have lead to either an over estimation or under estimation of risk. Uncertainty in source term estimates, including the volume, mass and content; and in the interaction of the contaminant with the soil and basalt, parameterized as the distribution coefficient or K_d; cannot be quantified accurately. The predicted contaminant concentrations are much more sensitive to these latter two parameter values than the first. The uncertainty associated with the use of a computer model to estimate groundwater exposure concentrations is discussed in detail in Section 6 of the OU 3-13 RI/BRA.

Table 7-5. Cancer risks due to COPC concentrations in air.

	Current Onsite Worker		Future Onsite Worker		Future Onsite Resident	
COPCs	Inhalation of Fugitive Dust	Inhalation of Volatiles	Inhalation of Fugitive Dust	Inhalation of Volatiles	Inhalation of Fugitive Dust	Inhalation of Volatiles
Aroclor-1260	—	—	—	—	NTD	NTD
Benzo(a)pyrene	2E-14	1E-17	2E-14	1E-17	2E-14	8E-18
Aluminum	—	—	—	—	NTD	—
Arsenic	1E-15	—	1E-15	—	1E-13	—
Manganese	NTD	—	NTD	—	NTD	—
Mercury	—	—	—	—	NTD	—
Uranium	NTD	—	NTD	—	NTD	—
Am-241	4E-15	—	3E-15	—	1E-14	—
Ce-144	1E-18	—	2E-57	—	3E-57	—
Co-57	3E-23	—	8E-64	—	1E-63	—
Co-58	—	—	—	—	—	—
Co-60	8E-18	—	2E-23	—	1E-22	—
Cs-134	1E-18	—	2E-33	—	6E-33	—
Cs-137	2E-16	—	2E-17	—	1E-15	—
Eu-152	2E-16	—	1E-18	—	4E-18	—
Eu-154	2E-16	—	8E-20	—	2E-19	—
Eu-155	3E-18	—	3E-24	—	5E-24	—
H-3	6E-22	—	2E-24	—	1E-23	—
I-129	9E-18	—	9E-18	—	3E-18	—
K-40	—	—	—	—	5E-20	—
Nb-95	3E-25	—	—	—	—	—
Np-237	1E-15	—	1E-15	—	1E-15	—
Pu-238	3E-15	—	2E-15	—	3E-15	—
Pu-239/240	1E-15	—	1E-15	—	2E-15	—
Pu-241	—	—	—	—	5E-16	—
Pu-242	—	—	—	—	2E-18	—
Ru/Rh-106	8E-19	—	1E-48	—	5E-49	—
Sb-125	2E-20	—	3E-31	—	2E-31	—
Sr-90	3E-16	—	3E-17	—	1E-15	—
Tc-99	4E-20	—	4E-20	—	1E-19	—
U-234	7E-16	—	7E-16	—	5E-16	—
U-235	2E-17	—	2E-17	—	2E-17	—
U-236	—	—	—	—	3E-20	—
U-238	5E-16	—	5E-16	—	4E-16	—
Total Cancer Risk	3E-14	1E-17	3E-14	1E-17	2E-13	8E-18

— Indicates that the contaminant is not a COPC in the medium or at the site.
NTD indicates that toxicity data is not available.

Table 7-6. Noncarcinogenic hazards due to COPC concentrations in air.

COPCs	Current Onsite Worker		Future Onsite Worker		Future Onsite Resident	
	Inhalation of Fugitive Dust	Inhalation of Volatiles	Inhalation of Fugitive Dust	Inhalation of Volatiles	Inhalation of Fugitive Dust	Inhalation of Volatiles
Aroclor-1260	—	—	—	—	NTD	NTD
Benzo(a)pyrene	NTD	NTD	NTD	NTD	NTD	NTD
Aluminum	—	—	—	—	NTD	—
Arsenic	NTD	—	NTD	—	NTD	—
Manganese	4E-06	—	5E-07	—	5E-07	—
Mercury	—	—	—	—	1E-07	—
Uranium	NTD	—	NTD	—	NTD	—
Am-241		—	—	—	—	—
Ce-144	—	—	—	—	—	—
Co-57	—	—	—	—	—	—
Co-58	—	—	—	—	—	—
Co-60	—	—	—	—	—	—
Cs-134	—	—	—	—	—	—
Cs-137	—	—	—	—	—	—
Eu-152	—	—	—	—	—	—
Eu-154	—	—	—	—	—	—
Eu-155	—	—	—	—	—	—
H-3	—	—	—	—	—	—
I-129	—	—	—	—	—	—
K-40	—	—	—	—	—	—
Nb-95	—	—	—	—	—	—
Np-237	—	—	—	—	—	—
Pu-238	—	—	—	—	—	—
Pu-239/240	—	—	—	—	—	—
Pu-241	—	—	—	—	—	—
Pu-242	—	—	—	—	—	—
Ru/Rh-106	—	—	—	—	—	—
Sb-125	—	—	—	—	—	—
Sr-90	—	—	—	—	—	—
Tc-99	—	—	—	—	—	—
U-234	—	—	—	—	—	—
U-235	—	—	—	—	—	—
U-236	—	—	—	—	—	—
U-238	—	—	—	—	—	—
Total Noncarcinogenic Hazard	4E-06	0E+00	5E-07	0E+00	6E-07	0E+00

— Indicates that the contaminant is not a COPC in the medium or at the site.

NTD indicates that toxicity data is not available.

Table 7-7. Summary of RI/BRA conclusions and recommendations for groups and sites of concern.

Group /Site	Contaminants Identified	Risk Assessment Results[a]	Conclusions and Recommendations
Sites of Exclusive Groundwater Concern (CPP-02,-23, -65, -69, -80, -83, -87, -89)	CPP-02: Radionuclides	CPP-02: Unknown potential for groundwater contamination, site included in the groundwater model.	These sites were evaluated in the RI/BRA to the extent that they are a source of recharge and/or contamination to the SRPA and will be evaluated further in the OU 3-13 Feasibility Study.
	CPP-23: Radionuclides	CPP-23: Significant potential source of groundwater contamination, site included in the groundwater model.	
	CPP-65: Low levels of radionuclides and inorganics	CPP-65: Significant source of water, insignificant source of ground-water contamination, site included in the groundwater model.	
	CPP-69: Radionuclides and metalsCPP-80: Radionuclides	CPP-69: No identified source, site not included in the groundwater model. CPP-80: Unknown potential for groundwater contamination, site included in the groundwater model.	
	CPP-83: Radionuclides and metals	CPP-83: Significant potential source of groundwater contamination, site included in the groundwater model.	
	CPP-87: Radionuclides	CPP-87: No identified route for contamination transport to the aquifer, site not included in the groundwater model.	
	CPP-89: Radionuclides and metals	CPP-89: Unknown potential for groundwater contamination, site. Included in the groundwater model.	
Tank Farm (CPP-20/25, -26, -28, -31, -32W/E, -79)	Radionuclides at all sites	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future residential: surface risk >1E-04 due to external radiation exposure (Cs-137)	The potential increased cancer risk is unacceptable regardless of land use assumptions. Alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this group.

Table 7-7. (continued).

Group /Site	Contaminants Identified	Risk Assessment Results[a]	Conclusions and Recommendations
Tank Farm South (CPP-15, -27/33, -58W/E)	Radionuclides at all sites	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future residential: surface risk >1E-04 due to external radiation exposure (Cs-137) and ingestion of homegrown produce (Cs-137)	The potential increased cancer risk is unacceptable regardless of land use assumptions. Remedial alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this group.
Waste Calcine Facility (CPP-35, -36/91, -85)	CPP-35: Radionuclides CPP-36/91: Radionuclides CPP-85: No release identified	Current occupational: surface risk > 1E-04 due to external radiation exposure (Cs-137) Future occupational: surface risk > 1E-04 due to external radiation exposure (Cs-137) Future residential: surface risk > 1E-04 due to soil ingestion (Am-241, Cs- 137, Sr-90), homegrown produce ingestion (Cs-137 and Sr-90), and external radiation exposure (Cs-137)	The potential increased cancer risk is unacceptable regardless of land use assumptions. Remedial alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this group.
Old Storage Pool (CPP-01/04/05, -08/09, -10, -11)	Radionuclides for all sites	Current occupational: surface risk > 1E-04 due to external radiation exposure (Co-60, Cs-134, Cs-137, Eu-152, Eu-154) Future occupational: surface risk > 1E-04 due to external radiation exposure (Cs-137, Eu-152) Future residential: surface risk > 1E-04 due to external radiation exposure (Cs-137, Eu-152, Eu-154)	The potential increased cancer risk is unacceptable regardless of land use assumptions. Remedial alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this group.
Storage Yard East of CPP-603 (CPP-03, -17A, -17B)	Radionuclides for the 3 sites	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future occupational: 1E-04> surface risk > 1E-06 due to radiation exposure (Cs-137) Future residential: surface risk > 1E-04 due to external radiation exposure (Cs-137)	The potential increased cancer risk is slightly greater than 1E-04 under current occupational and future residential assumptions. Only site CPP-03 should be evaluated further in the OU 3-13 Feasibility Study.

Table 7-7. (continued).

Group /Site	Contaminants Identified	Risk Assessment Results[a]	Conclusions and Recommendations
CPP-37A/B	Radionuclides and arsenic	Current occupational: 1E-04 > surface risk > 1E-06 due to external radiation exposure (Cs-137) Future occupational: 1E-04 > surface risk > 1E-06 from external radiation exposure (Cs-137, Np-237) Future residential: 1E-04 > surface risk > 1E-06 due to soil ingestion (arsenic) and external radiation exposure (Cs-137, Np-237)	The potential increased cancer incidence at this release site is less than 1E-04 under all land use assumptions; therefore, further evaluation in the OU 3-13 Feasibility Study is not warranted.
CPP-67	Radionuclides	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future occupational: 1E-04> surface risk > 1E-06 due to external radiation exposure (Cs-137, Np-237) Future residential: surface risk >1E-04 due to external radiation exposure (Cs-137)	The potential increased cancer risk is unacceptable under future residential land use assumptions. Remedial alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this site.
CPP-14	Radionuclides	Current occupational: 1E-04>surface risk > 1E-06 due to external radiation exposure (Cs-137, Np-237) Future occupational: 1E-04> surface risk > 1E-06 due to external radiation exposure (Cs-137, Np-237) Future residential: 1E-04> surface risk > 1E-06 due to external radiation exposure (Cs-137, Np-237)	The potential increased cancer incidence at this release site is less than 1E-04 under all land use assumptions; therefore, further evaluation in the OU 3-13 Feasibility Study is not warranted.
CPP-34	Radionuclides	Current occupational: 1E-04> surface risk > 1E-06 external radiation exposure (Cs-137) Future occupational: 1E-04> surface risk > 1E-06 due to external radiation exposure (Cs-137) Future residential: surface risk > 1E-04 due to homegrown produce ingestion (Sr-90) and external radiation exposure (Cs-137)	The potential increased cancer risk is unacceptable under future residential land use assumptions. Remedial alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this site.

Table 7-7. (continued).

Group /Site	Contaminants Identified	Risk Assessment Results[a]	Conclusions and Recommendations
CPP-13	Radionuclides	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137, Eu-154) Future occupational: surface risk > 1E-04 due to external radiation exposure (Cs-137) Future residential: surface risk >1E-04 due to homegrown produce ingestion (Sr-90) and external radiation exposure (Cs-137)	The potential increased cancer risk is unacceptable under all land use assumptions evaluated. Remedial alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this site.
CPP-06	Radionuclides	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future occupational: 1E-04 > surface risk > 1E-06 due to external radiation exposure (Cs-137) Future residential: 1E-04 > surface risk > 1E-06 due to external radiation exposure (Cs-137)	The potential increased cancer incidence at this release site is greater than 1E-04 under current land use but less than 1E-04 under future occupational and residential land use assumptions; therefore, further evaluation of this site in the FS is not warranted.
CPP-19	Radionuclides	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future occupational: 1E-04 > surface risk > 1E-06 due to external radiation exposure (Cs-137) Future residential: surface risk > 1E-04 due to soil ingestion (Cs-137, Sr-90), homegrown produce ingestion (Cs-137, Sr-90) and external radiation exposure (Cs-137, Eu-152, Eu-154)	The potential increased cancer incidence at this release site is greater than 1E-04 under current and future residential land use assumptions but less than 1E-04 under future occupational land use. Remedial alternatives protective of future residents should be evaluated during the OU 3-13 Feasibility Study for this site.
CPP-22	Radionuclides	Current occupational: surface risk >1E-04 due to external radiation exposure (Cs-137) Future occupational: 1E-04 > surface risk > 1E-06 due to external radiation exposure (Cs-137) Future residential: 1E-04 > surface risk > 1E-06 due to external radiation exposure (Cs-137)	The potential increased cancer incidence at this release site is greater than 1E-04 under current land use but less than 1E-04 under future occupational and residential land use assumptions; therefore, further evaluation of this site in the OU 3-13 Feasibility Study is not warranted.

Table 7-7. (continued).

Group /Site	Contaminants Identified	Risk Assessment Results[a]	Conclusions and Recommendations
CPP-90	Radionuclides	Current occupational: 1E-04> surface risk > 1E-06 due to radiation exposure (Cs-137) Future occupational: 1E-04> surface risk > 1E-06 due to radiation exposure (Cs-137) Future residential: 1E-04> surface risk > 1E-06 due to external radiation exposure (Cs-137)	The potential increased cancer incidence at this release site is less than 1E-04 under all land use assumptions; therefore, further evaluation of this site in the OU3-13 Feasibility Study is not warranted.
CPP-88	Radionuclides	Current occupational: 1E-04> surface risk > 1E-06 due to radiation exposure (Cs-137) Future occupational: 1E-04> surface risk > 1E-06 due to radiation exposure (Cs-137) Future residential: 1E-04> surface risk > 1E-06 due to external radiation exposure (Cs-137)	The potential increased cancer incidence at this release site is less than 1E-04 under all land use assumptions; therefore, further evaluation of this site in the OU3-13 Feasibility Study is not warranted.
CPP-92	Radionuclides	The waste boxes that contain radioactive soil were not evaluated quantitatively in the RI/BRA Report.	The disposition of these boxes will be deferred to the OU 3-13 Feasibility Study.
CPP-93	Mercury	Current occupational: HI > 1 Future occupational: HI > 1 Future residential: non-carcinogenic hazard > 1 due to ingestion of home grown produce	The noncarcinogenic hazard under future residential assumptions is > 1; therefore, further evaluation of this site in the OU 3-13 FS is warranted.

a. The risk assessment results in this table do not include the air and groundwater contribution. The contaminant in parenthesis is the risk driver for the predominant exposure route.

Table 7-8. Human health baseline risk assessment summary for WAG 3 sites of concern.

Group	COC	Half-life*	Exposure Scenario Excess Risk of Incurring Cancer: Current Worker	Future Worker (in 2095)	Future Resident (in 2095)
Group 1—INTEC Tank Farm[a]	Cs-137**	30	6 in 10	6 in 100	3 in 10
	Sr-90***	29	5 in 10,000	5 in 100,000	2 in 10,000
	U-235	10^9	5 in10,000	5 in 10,000	2 in 1,000
Group 2—Soils Under Buildings and Structures	NSR[c]		NSR[c]	NSR[c]	NSR[c]
Group 3—Other Surface Soils	Cs-137	30	5 in 100	5 in 1,000	2 in 100
	Eu-152	13.3	2 in 1,000	1 in 100,000	6 in 100,000
	Eu-154	8.8	2 in 1,000	8 in 10,000,000	4 in 1,000,000
	Sr-90	29	1 in 100	1 in 1,000	4 in 1,000
Group 4—Perched Water	Total Pu	10^4	NR[d]	NR[d]	NR[d]
	Sr-90	29	NR[d]	NR[d]	NR[d]
Group 5 – Snake River Plain Aquifer[a, i]	Am-241	432	NR	NR[j]	4 in 2,000,000[e]
	Cs-137	30	NR	NR[j]	4 in 1,000,000[e]
	I-129	1.57×10^7	NR	NR[j]	2 in 100,000[e]
	Np-237	2.1×10^6	NR	NR[j]	8 in 1,000,000[e]
	Sr-90	29	NR	NR[j]	9 in 1,000,000[e]
Group 6—Buried Gas Cylinders	—		NRC[f]	NRC[f]	NRC[f]
Group 7—SFE-20 Hot Waste Tank System[g,h]	Pu	2×10^4	NRC[h]	NRC[h]	NRC[h]
	U	10^9	NRC[h]	NRC[h]	NRC[h]

* Half-life (in years) used in modeling for OU 3-13 risk assessment.

** Cs-137 contributes to risk only via direct exposure.

*** Sr-90 contributes to risk via groundwater, soil direct exposure, and ingestion.

a. Pu, which primarily originates from the Tank Farm soils, is predicted to exceed SRPA MCLs and pose a groundwater ingestion risk in the year 2750. Pu is not predicted to exceed MCLs or pose a risk in 2095. Refinement of those predictions and remediation, if necessary, will be addressed in the OU 3-14 RI/FS.

b. Key COCs and their concentrations are assumed to be the same as for Group 3 soils.

c. No surface risks (NSR) due to incomplete exposure pathway while buildings are in place. No risk to future residential receptor if buildings are left in place, or removed with subsequent capping or removal of underlying soil. Release sites pose a potential risk to groundwater via soil contaminant leaching and transport. Risks to groundwater are presented under Group 5. The contaminants from soils are not a significant future impact to groundwater.

d. No risk because perched water is not capable of sustaining a pumping rate needed for future domestic water supplies; therefore, it is not a source of potable water. However, perched water is a source of contamination for the SRPA. Risk calculations on future impacts will be refined under the Tank Farm RI/FS (OU 3-14).

e. These values are predicted risk to future residential in 2095 and beyond. Cumulative groundwater risk to future residential in 2095 and beyond is 5 in 100,000 outside the current INTEC security fence. Risk calculations on future impacts inside the current INTEC security fence will be refined under the Tank Farm RI/FS (OU 3-14).

f. No risks were calculated (NRC) for these sites. These sites present a safety risk and threaten future release of contaminants.

g. High concentrations of radionuclides exist in the tank sludge.

h. No risks were calculated because no exposure pathways currently exist. The tank is housed with a concrete secondary containment vault that may pose a future risk to groundwater if a release occurs.

i. Although workers drink SRPA, the drinking water wells do not intersect the plume.

j. No risk to future worker if institutional controls remain in place or water treatment is implemented.

7.2 Ecological Evaluation

The assessment was performed using the results of a previously conducted screening level ecological risk assessment (SLERA) and the same basic methodology developed in the *Guidance Manual for Conducting Screening Level Ecological Risk Assessment at the INEL* (VanHorn et al. 1995), subsequently referred to as the Guidance Manual. The SLERA was conducted to screen sites identified in the FFA/CO (DOE-ID 1991) and to identify those contaminants present at WAG 3 that have the potential to cause undesirable ecological effects. The sites and contaminants identified as a result of that assessment, in addition to those sites for which inadequate sampling information existed for inclusion in the SLERA, were analyzed. The SLERA approach and results are described in the sections below. The results of this assessment will be integrated with similar assessments for other INEL WAGs to support the performance of the INEL-wide baseline ERA. The identification of these sites of concern and the associated contaminants also provided input to the data gap analysis for the OU 10-04 ERA.

7.2.1 Site and Contaminant Screening

As discussed in Section 28.2.2 of the OU 3-13 RI/BRA (DOE-ID 1997b), for potentially contaminated soil sites, a preliminary site screening was performed to identify sites of concern to ecological receptors. Sites with contamination at greater than 3-m (10-ft) bgs (no pathway to the environment) or sites that were determined to be uncontaminated (no known source) were eliminated. This screening identified 37 sites of concern. As discussed in Section 28.2.7, any contaminant identified at these sites was initially screened from concern if the maximum contaminant concentrations was less than the 95/95% upper tolerance level (UTL) for background concentrations for composite samples (Rood et al. 1995) and/or was less than ecologically based screening levels (EBSLs). As a result 27 sites of concern remained to be evaluated in the ERA.

Contaminant concentrations in water at CPP-65 and CPP-67 were compared to toxicology benchmarks for nonradionuclides and developed EBSLs for water ingestion for radionuclides as discussed in Section 28 of the OU 3-13 RI/BRA (DOE-ID 1997b). The results of this assessment are presented in Tables 7-9 and 7-10. Any contaminant exceeding these benchmarks for water contamination was retained for discussion in the risk characterization. A list of threatened and endangered species, species of special concern, and sensitive species that may be found on the INEEL is given in Table 7-11.

7.2.2 Exposure Assessment

As discussed in 28.3 in the OU 3-13 RI/BRA (DOE-ID 1997b), the remaining contaminants at each site of concern were then evaluated to determine a dose to the receptor from soil exposure. The magnitude, frequency, and duration of exposure between the environment and the ecological receptors was modeled as discussed in Section 28.3 of the OU 3-13RI/BRA (DOE-ID 1997b). The 95% UCL of the arithmetic mean of the contaminant concentration was used when available. Many sites previously evaluated for human health in Track 1 or 2 efforts did not have these calculations performed and for this step of the ERA the maximum value reported in these documents was used.

7.2.3 Toxicity Assessment

Each contaminant was evaluated to determine a chronic dose that may have potential adverse effects to ecological receptors. The toxicity reference value (TRV) is defined as the dose for a receptor that is likely to be without appreciable risk or deleterious effects from chronic exposure. The TRVs development is presented in Appendix I of the OU –13 RI/BRA report (DOE-ID 1997b).

Table 7-9. Screening of liquid effluent concentrations at the Sewage Treatment Plant, CPP-65.

COPC	Liquid Effluent Concentration (mg/L)[a]	Toxicological Benchmark (mg/L or pCi/L)[b]	Water Concentration of Concern(mg/L)[c]
As	1.0E-03	1.6E-01	X
Ba	8.4E-02	1.56E+01	X
Cd	5.0E-03	2.3E-02	X
Cl	9.5E+01	2.3E+05[c]	X
Cr	6.0E-03	9.36E+00	X
Cu	1.7E-02	4.7E+01	X
Pb	2.8E-03	1.01E+01	X
Hg	1.0E-04	9.1E-02	X
Mo	1.7E-02	3.3E-01	X
Ni	1.5E-02	1.14E+02	X
Se	2.0E-03	9.6E-02	X
Ag	1.0E-03	NA	1.0E-03[d]
Zn	2.7E-02	3.04E+02	X
Nitrate	1.21E+01	1.9E+03	X
Total phosphorous	2.9E+00	NA	2.9E+00[e]
Plutonium-239/240	1.9E-03[f]	NA	X
Strontium-90	3.6E-01[f]	NA	X

a. Effluent concentrations are mean concentrations, except Cl, nitrate, and total phosphorous are maximum observed concentrations. Units are mg/L, except for radionuclides, which are pCi/L.

b. These are toxicological benchmarks for wildlife exposure through drinking water from Opresko et al., (1995) unless otherwise noted. The lowest applicable NOAEL-based benchmark was selected from the Opresko et al. (1995) database for conservative screening purposes. NA = not available.

c. Based on EPA Region IV Water Management Division, Water Quality Standards Unit=s Screening List (Suter II and Tsao, 1966). This contaminate was eliminated form the assessment based on this criteria.

d. Silver toxicity is related to water hardness. At water hardnesses of 50, 100 and 200 $mgAL^{-1}$ as $CaCo_3$, the U.S. EPA (1980) recommended that the concentration of total recoverable silver not exceed 1.2, 4.1 and 13 μgAL^{-1}, respectively, at any time. The water hardness at INEEL has a maximum of 500 mg/L. Therefore toxicity would be lower. Also the concentration in the effluent is within the range seen as background nationally. Kopp (1969) found silver in 6.6% of 1,577 surface waters sampled with a mean detected concentration of 2.6 µg/L (range: 0.1E 38 µg/L). For 1970B1979, according to U.S. surface water sampling data from EPA's STORET database, the annual mean levels ranged from 1 to 9 µg/L and annual maximum concentrations were 94 to 790 µg/L (Scow et al. 1981). Based on this rationale the silver at the concentration in the effluent was eliminated as a concern.

e. Phosphorous is an essential component of the animal body and eliminated as a concern at this level. Excess phosphorous is excreted in the urine (NAS, 1980). This contaminant will be eliminated as a concern based on this rationale.

f. Radionuclide levels acceptable as drinking water for human receptors should be acceptable for ecological receptors as well. These contaminants will be eliminated based on this criterion.

Table 7-10. Screening of nonradionuclide liquid effluent concentrations at CPP-67, Percolation Ponds.

COPC	Liquid Effluent Concentration (mg/L)[a]	Sediment Concentration (mg/kg)	K_d (cm^3/g)[c]	Calculated Water Concentration (mg/L)	Toxicological Benchmark (mg/L)[b]	Results of Screening[d]
Al	ND (4E-02)	X	X	X	2.45E+00	E
As	ND (1.5E-03)	X	X	X	1.6E-01	E
Ba	1.04E-01	X	X	X	1.56E+01	E
Be	X	5.00E-01	250	3.3E-03	1.88E+00	E
Cd	ND (1E-03)	X	X	X	2.3E-02	E
Cl	2.98E+02	X	X	2.98E+02	NA	NB
Cr	6.30E-02	X	X	X	9.36E+00	E
Co	X	4.60E+00	55	8.33E-02	NA	NB
Cu	6.30E-03	X	X	X	4.7E+01	E
Fe	5.70E-02	X	X	X	NA	NB
Pb	ND (1.5E-02)	X	X	X	1.01E+01	E
Mn	1.60E-03	X	X	X	2.51E+02	E
Hg	ND (2.5E-04)	X	X	X	9.1E-02	E
Ni	4.50E-03	X	X	X	1.14E+02	E
Se	ND (1E-03)	X	X	X	9.6E-02	E
Ag	ND (2E-03)	X	X	X	NA	NB
Tl	X	2.10E-01	3,300	6.36E-05	2.1E-02	E
V	X	1.88E+01	1,000	1.88E-02	5.4E-01	E
Zn	X	4.58E+01	18	2.51E+00	3.04E+02	E
Cyanide	X	1.20E-01	0.0000	5.63E-01	1.8E+02	E
Fluoride	ND (5.4E-01)	X	X	X	7.48E+01	E
Nitrate	5.58E+00	X	X	X	1.9E+03	E
Nitrite	ND (8E-0)	X	X	X	NA	NB
Phosphate	5.22E+00	X	X	X	NA	NB
Sulfate	5.15E+01	X	X	X	NA	NB
Sulfide	X	1.57E+01	0.0000	7.34E+01	NA	NB
Anthracene	X	2.40E-01	0.0000	1.13E+00	NA	NB
Benzo(a)anthracene	X	6.20E-01	0.0000	2.91E+00	NA	NB
Benzo(a)pyrene	X	3.50E-01	0.0000	1.64E+00	1.27E+00	X
Benzo(b)fluoranthene	X	4.40E-01	0.0000	2.06E+00	NA	NB
Bis(2-ethylhexyl)phthalate	X	2.50E-01	18.0000	1.37E-02	1.0E+01	E
Chrysene	X	6.00E-01	0.0000	2.81E+00	NA	NB
Fluoranthene	X	1.50E+00	0.0000	7.03E+00	NA	NB
Methylene chloride	X	1.10E-02	0.0000	5.16E-02	1.67E+01	E
Phenanthrene	X	8.10E-01	0.0000	3.80E+00	NA	NB
Pyrene	X	9.30E-01	100	8.08E-00	NA	NB

a. Effluent concentrations are maximum observed concentrations. ND = not detected; detection limit is in parentheses.

b. These are toxicological benchmarks for wildlife exposure through drinking water from Opresko et al. (1995). The lowest applicable NOAEL-based benchmark was selected from the Opresko et al. (1995) database for conservative screening purposes. Concentrations are given if the observed or calculated water concentration exceeds the toxicological benchmark. The resulting final concentrations are used as the water concentrations in the internal ingestion route of exposure. NA = Not available.

c. The K_d values are based on a compilation of available K_d values in the literature, except for Be and V, which are from the Track 2 guidance manual. When no K_d value is available, it is conservatively assumed to be zero.

d. E=Eliminate, NB=no benchmark, X=exceeds benchmark.

Table 7-11. Threatened and endangered species, special species of concern, and sensitive species that may be found on the INEEL.*

Common Names	Scientific Name	Federal Statusb,c	State Statusc	BLM Statusc	USFSf Statusc	INPS Statusc
Plants						
Lemhi milkvetch	*Astragalus aquilonius*	X	X	S	S	S
Painted milkvetch[e]	*Astragalus ceramicus var. apus*	3c	X	X	X	R
Plains milkvetch	*Astragalus gilviflorus*	NL	X	S	S	I
Winged-seed evening primrose	*Camissonia pterosperma*	NL	X	X	X	S
Nipple cactus[e]	*Coryphantha missouriensis*	NL	X	X	X	R
Spreading gilia	*Ipomopsis (Gilia) polycladon*	NL	X	S	X	2
King's bladderpod	*Lesquerella kingii var. cobrensis*	X	X	X	X	M
Tree-like oxytheca[e]	*Oxytheca dendroidea*	NL	X	R	X	R
Inconspicuous phacelia[d]	*Phacelia inconspicua*	C2	SSC	S	S	
Puzzling halimolobos	*Halimolobos perplexa var. perplexa*	X	X	X	S	M
Ute=s ladies tresses[d]	*Spiranthes diluvialis*	LT	X	X	X	X
Birds						
Peregrine falcon	*Falco peregrinus*	LE	E	X	X	
Merlin	*Falco columbarius*	NL	X	S	X	
Gyrfalcon	*Falco rusticolus*	NL	SSC	S	X	
Bald eagle	***Haliaeetus leucocephalus***	**LT**	**T**	**X**	**X**	
Ferruginous hawk	***Buteo regalis***	**C2**	**SSC**	**S**	**X**	
Black tern	***Chlidonias niger***	**C2**	**X**	**X**	**X**	
Northern pygmy owl[d]	*Glaucidium gnoma*	X	SSC	X	X	
Burrowing owl	***Athene cunicularia***	**C2**	**X**	**S**	**X**	
Common loon	*Gavia immer*	X	SSC	X	X	
American white pelican	*Pelicanus erythrorhynchos*	X	SSC	X	X	
Great egret	*Casmerodius albus*	X	SSC	X	X	
White-faced ibis	***Plegadis chihi***	**C2**	**X**	**X**	**X**	
Long-billed curlew	*Numenius americanus*	3c	X	S	X	
Loggerhead shrike	***Lanius ludovicianus***	**C2**	**NL**	**S**	**X**	
Northern goshawk	***Accipiter gentilis***	**C2**	**S**	**X**	**S**	
Swainson's hawk	*Buteo swainsoni*	X	X	S	X	
Trumpeter swan	***Cygnus buccinator***	**C2**	**SSC**	**S**	**S**	
Sharptailed grouse	*Tympanuchus phasianellus*	C2	X	S	S	
Boreal owl	*Aegolius funereus*	X	SSC	S	S	
Flammulated owl	*Otus flammeolus*	X	SSC	X	S	
Mammals						
Gray wolf[f]	*Canis lupus*	LE/XN	E	X	X	
Pygmy rabbit	***Brachylagus (Sylvilagus) idahoensis***	**C2**	**SSC**	**S**	**X**	
Townsend's western big-eared bat	***Plecotus townsendii***	**C2**	**SSC**	**S**	**S**	

Table 7-11. (continued).

Common Names	Scientific Name	Federal Statusb,c	State Statusc	BLM Statusc	USFSf Statusc	INPS Statusc
Merriam's shrew	*Sorex merriami*	X	S	X	X	
Long-eared myotis	***Myotis evotis***	**C2**	X	X	X	
Small-footed myotis	***Myotis subulatus***	**C2**	X	X	X	
Western pipistrelle[d]	*Pipistrellus hesperus*	NL	SSC	X	X	
Fringed myotis[d]	*Myotis thysanodes*	X	SSC	X	X	
California myotis[d]	*Myotis californicus*	X	SSC	X	X	
Reptiles and Amphibians						
Northern sagebrush lizard	***Sceloporus graciosus***	**C2**	X	X	X	
Ringneck snake[d]	*Diadophis punctatus*	C2	SSC	S	X	
Night snake[e]	*Hypsiglena torquata*	X	X	R	X	
Insects						
Idaho pointheaded grasshopper[d]	*Acrolophitus punchellus*	C2	SSC	X	X	
Fish						
Shorthead sculpin[d]	*Cottus confusus*	X	SSC	X	X	

* Species in **bold** are those T/E and Category 2 (C2)[b] species included for the WAG 3 ERA.

a. This list was compiled from the U.S. Fish and Wildlife Service (USFWS) (letter dated July 16, 1997) the Idaho Department of Fish and Game Conservation Data Center threatened, endangered, and sensitive species for the State of Idaho (CDC 1994), and RESL documentation for the INEEL (Reynolds 1994; Reynolds et al. 1986).

b. The USFWS no longer maintains a candidate (C2)species listing but addresses former listed species as "species of concern" (USFWS April 30, 1996). The C2 designation is retained here to maintain consistency between the SLERA and WAG ERA assessments.

c. Status Codes: S = sensitive; 2 = State Priority 2; 3c = no longer considered for listing; M = State monitor species; NL = not listed; 1 = State Priority 1; LE = listed endangered; E = endangered; SSC = species of special concern; and C2 = Category 2 (defined in CDC 1994). BLM = Bureau of Land Management; INPS = Idaho Native Plant Society; XN=Experimental, non-essential, R = removed from sensitive list (non-agency code added here for clarification).

d. No documented sightings at the INEEL; however, the ranges of these species overlap the INEEL and are included as possibilities to be considered for field surveys.

e. Recent updates resulting from Idaho State Sensitive Species meetings (BLM, USFWS, INPS, USFS) - (INPS 1995;1996)

f. United States Forest Service (USFS) Region 4.

Plant uptake factors for contaminants were estimated using reported values in literature and analogous procedures of physicochemical properties. None of these studies were performed at the INEEL and, therefore, are not necessarily representative of local conditions. This may result in overestimation or underestimation of potential health impacts.

7.2.4 Risk Characterization

As discussed in Section 28.4 of the OU 3-13 RI/BRA (DOE-ID 1997b) the modeled exposure dose is divided by the TRV to calculate a HQ. The results are reported in terms of HQs for each contaminant at each site. Any contaminant with a HQ greater than the target value (one for nonradionuclide and 0.1 for radionuclide) was presented in the risk characterization.

Twenty-two sites remained after the HQ analysis. All these sites have nonradiological contamination and eight have radiological contamination with HQ's greater than the target value. This includes CPP-13, -14 (Imhoff tanks, Area 1), -19, -34, -37a, -39, -40, -42, -44, -55, -66, -67, -84, -88, -90, -93, Old Storage Pool Group (CPP-01, -04, -05, -08, -09, -10, -11, -88), Storage Yard Group (CPP-03, -17a, -17b, -88), Tank Farm Group (CPP-20, -25, -26, -28, -31, -32E/W, -79, excavated soil), Tank Farm South Group (CPP-15, -27, -33, -58, -88), and WCF Group (CPP-35, -36, -85, -88, -91). With the exception of the facility ponds (Cieminski 1993, Cieminski and Flake 1995), no formal surveys for presence and use of WAG 3 facilities by threatened and/or endangered (T/E) and species of concern have been conducted. In 1997, a field survey was conducted for individual sites of concern for habitat qualities and potential to support INEEL T/E species or other species of special concern. A low overall site rating for loggerhead shrike, peregrine falcon, and ferruginous hawk was given to sites CPP-34 and CPP-37a. A low overall rating for bats was given at CPP-34 and CPP-37b. Big game was also given a low overall rating at site CPP-34. Sites rated overall as "low" are those having one or two positive attributes and therefore potential for incidental use by wildlife. These sites may generally be discounted as contributing significantly to chronic wildlife contaminant exposures. This survey was conducted to allow evaluation of WAG sites of concern in an ecological context. The duration and rigor of these surveys were not adequate to verify presence or frequency of occurrence. The rankings for sites are subjective, based on professional opinion supported by limited observation.

7.2.5 Additional Screening

An additional screening was used for the further elimination of sites and contaminants for consideration in the FS. It was determined that the evaluation should eliminate unnecessary and undesirable remediation for ecological receptors based on the following rationale.

The exposure scenario used for ecological receptors assumes that the fences are down and the site has a viable habitat that is completely accessible to receptors. However, many of the sites of concern are currently within the fenced area that defines the industrial complex that is the INTEC. Both the fence and the activities associated with this currently active facility should limit the exposure of receptors to much less than that modeled in the ERA. Additionally, (with some exceptions [particularly sites with water sources]) most of these sites are gravel and unsuitable habitat at the present time and would not provide any special attraction to ecological receptors.

It is accepted in the risk assessment process that many of the input parameters are developed to be conservatively protective of the receptors. Particularly, based on limited knowledge and the uncertainty of extrapolating to multiple species, TRV development is very conservative. This is particularly true for native metals, which can vary greatly regionally.

Based on this rationale, an additional screening was determined appropriate for the WAG 3 sites as agreed on in an October 20, 1997 conference call between DOE-ID, EPA, and IDHW.

This screening was composed of two steps:

1. As a risk management decision, it was decided to eliminate ecological contaminants as a concern if the exposure point concentration was less than 10x the background value (Rood et al. 1995). For those contaminants that have no site-specific background the mean for the western United States presented in Shacklette and Boerngen (1984) or other sources was considered acceptable.

2. For those sites that initially used the maximum values, if possible, the 95% UCLs were calculated (see Table 7-12) for each contaminant that was not eliminated in the HQ evaluation of the ERA. This value was also eliminated if the 95% UCL was less than the 10x background.

This screening resulted in eliminating Sites CPP-37A, -39, -40, -42, -84, -88, and -90 as sites of concern. The sites and COCs remaining after the screening are listed in Table 7-13. Four sites pose solely an ecological risk, CPP-14 (the Imhoff Tank), CPP-44, -55, and -66.

Because Sites CPP-14, -44, and -55 presented an unacceptable risk for ecological receptors only, these sites were added to the Other Surface Soils Sites (Group 3) for alternative evaluation. The ecological risk screening approach resulted in establishing conservative risk assumptions. Actions undertaken at sites CPP-44, -14, and –55 are based on the small volume of COC contaminated material and the cost benefit of action now rather than further study. Final assessment for site CPP-66 will be conducted under OU 10-04. For sites that pose a potential threat to both human and ecological receptors, it is assumed that remedial alternatives developed to address human health risks will also be designed to adequately address ecological concerns. This WAG ERA represents the second phase of the three-phased approach to ERA. The first phase is the "preassessment" performed at the WAG level. This screen is performed to reduce the number of sites and contaminants to be addressed in subsequent assessments. This screen for WAG 3 is presented in Section 28 of the RI/BRA (DOE-ID 1997b).

In phase two, the WAG sites and COCs identified by the initial screening are assessed for potential risks to ecological receptors using an approach that parallels the human health risk assessment methodology.

The third phase of the ERA process is the OU 10-04 (INEEL Site-wide) ERA, which is performed to integrate the results of the WAG ERAs to evaluate risk to OU 10-04 ecological resources. The OU 10-04 ERA will integrate the results of the WAG ERAs for all INEEL WAGs to determine whether contamination at the WAGs contributes to potential risk to populations and communities on an ecosystem-wide basis. Those sites previously screened at the WAG level based on either 10x background or 10x HQ will be reevaluated at a population level at this time. If the OU 10-04 ERA determines that those WAG 3 sites screened at less than 10x background or HW less than 10, require further action, that action will be determined during the WAG 3 5-year reviews.

7.3 Basis for Response

Forty-nine sites within WAG 3 have actual or threatened releases of hazardous substances that if not addressed by implementing the response actions selected in this ROD, may pose unacceptable risks to human health or the environment. For analysis of remedial alternatives, release sites were combined into

Table 7-12. Results of additional site/contaminant evaluation and screening.

Site	COC	Maximum Concentration	95% UCL	10X Background	Elimination Rationale
CPP-13	Arsenic	8.30E+00		5.80E+01	Below 10X background
	Mercury	5.95E-01	4.70E-01	5.00E-01	95% UCL below 10X background
CPP-14					
Area 1	Chromium III	5.12E-01		5.80E+01	Below 10X background
	Lead	3.56E+01		1.70E+02	Below 10X background
Area 2	Mercury	1.20E+00		5.00E-01	Sample was taken at approximately 9 ft bgs
	Silver	1.22E+01		3.7E+01	Below 10X background
CPP-19	Arsenic	6.30E+00		5.80E+001	Below 10X background
CPP-34	Arsenic	7.10E+00		5.80E+01	Below 10X background
	Mercury	6.00E-01	2.80E-01	5.00E-01	95% UCL below 10X background
CPP-37A	Mercury	9.60E-01	4.40E-01	5.00E-01	95% UCL below 10X background
CPP-39	Barium	1.10E+03		3.00E+03	Below 10X Background
	Di-2-ethylhexylphthalate	1.40E+01			Contaminant below 15 ft
	Fluoride	9.29E+02		2.80E+03[a]	Below 10X background
	Mercury	1.70E-01		5.00E-01	Below 10X background
	Silver	1.87E+01		3.7E+01	Below 10X background
CPP-40	Chromium III	7.20E+01		3.30E+02	Below 10X background
	Fluoride	1.10E+01		2.80E+03[a]	Below 10X background
	Lead	6.00E+01		1.70E+02	Below 10X background
CPP-42	Barium	1.10E+03		3.00E+03	Below 10X background
CPP-44	Cadmium	8.40E+00		2.20E+01	Below 10 X background
	Chromium III	1.54E+03		3.30E+02	Retain
	Chromium VI	1.54E+01		NA	Retain
	Decanol	9.00E-03		NA	Retain
	Lead	2.81E+02		1.70E+02	Retain
	Mercury	5.00E+00		5.00E-01	Retain
	Nickel	3.44E+02		3.50E+02	Below 10X background
CPP-55	Arsenic	1.34E+01		5.80E+01	Below 10X background
	Chromium III	6.50E+01		3.30E+02	Below 10X background
	Chromium VI	6.50E+01	8.70E+00	NA	Not expected to exist as Chromium VI in the environment
	Lead	3.20E+01		1.70E+02	Below 10X background
	Mercury	5.20E+00	6.10E-01	5.00E-01	Retain
	Nickel	6.50E+01		3.50E+02	Below 10X background
	Selenium	6.40E-01		2.20E+00	Below 10X background
	Silver	300E+00		3.7E+01	Below 10X background
CPP-66	Boron	3.10E+02		2.30E+02	Retain
	Fluoride	1.65E+02		2.80E+03[a]	Below 10X background
	Selenium	1.60E+00		2.20E+00	Below 10X background
	Strontium	6.90E+02		2.00E+03[a]	Below 10X background
CPP-88	Arsenic	7.10E+00		5.80E+01	Below 10X background
	Mercury	1.00E+00	3.00E-01	5.00E-01	95% UCL below 10X background
	Nickel	1.63E+02		3.50E+02	Below 10X background
CPP-90	Antimony	9.50E+00		4.80E+01	Below 10X background
	Arsenic	2.95E+01		5.80E+01	Below 10X background
	Mercury	1.00E+00	4.50E-01	5.00E-01	95% UCL below 10X background
CPP-93	Aluminum	1.20E+05		1.60E+05	Below 10X background
	Mercury	1.40E+02	6.80E+01	5.00E-01	Retain
Old Storage	Arsenic	5.90E+00		5.80E+01	Below 10X background
	Mercury	5.52E-01	2.20E-01	5.00E-01	95% UCL below 10X background

Table 7-12. (continued).

Site	COC	Maximum Concentration	95% UCL	10X Background	Elimination Rationale
	Nickel	5.51E+01		3.50E+02	Below 10X background
Storage Yard	Arsenic	5.90E+00		5.80E+01	Below 10X background
	Mercury	5.52E-01	3.30E-01	5.00E-01	95% UCL below 10X background
	Nickel	5.51E+01		3.50E+02	Below 10X background
Tank Farm	Mercury	2.30E-01		5.00E-01	Below 10X background
Tank Farm	Arsenic	5.90E+00		5.80E+01	Below 10X background
	Cadmium	3.42E+00		2.20E+01	Below 10X background
	Mercury	1.51E+00	2.60E-01	5.00E-01	95% UCL below 10X background
	Nickel	5.51E+01		3.50E+02	Below 10X background
WCF	Arsenic	7.30E+00		5.80E+01	Below 10X background
	Mercury	7.50E+00	1.50E+00	5.00E-01	Retain
	Nickel	2.80E+02		3.50E+02	Below 10X background

a. Background from Shacklette and Boerngen (1984).

Table 7-13. Sites and COCs which may present an unacceptable risk to ecological receptors.

Site	Nonradionuclides	Radionuclide	Comments
CPP-13	Mercury	Sr-90	
CPP-14 (Imhoff Tanks)	Mercury		Solely an ecological concern. Approximately 105 m^3 of soil.
Area 1			
CPP-19		Cs-137, Eu-152, Eu-154, Sr-90, Co-60	
CPP-34		Sr-90	
CPP-44	Chromium III, Chromium VI, Lead, mercury		Solely an ecological concern. Approximately 88 m^3 of soil.
CPP-55	Chromium VI		Solely an ecological concern. Approximately 325.5 m^3 of soil.
CPP-66	Boron		Solely an ecological concern. Approximately 79,800 m^3 of soil.
CPP-67	Metals and organics	Am-241, Np-237, Pu-238/239, U-234, and U-238	This site will be remediated based on the HHRA, an assessment beyond the screening level was not deemed necessary.
CPP-93	Mercury		
Old Storage Pool (CPP-01, -04, -05, -08, -09, -10, -11, -88)		Cs-137, Eu-152, Eu-154, Co-60, and Sr-90	
Tank Farm (CPP-20, -25, -26, -28, -31, -32E/W, -79, excavated soil)		Am-137, Cs-137, Eu-154, Pu-239, and Sr-90	
Tank Farm South (CPP-15, -27, -33, -58, -88)		Cs-137	
WCF (CPP-35, -36, -85, -88, -91)	Mercury	Am-241, Cs-134, and Cs-137	

groupings including Tank Farm Soils, Soils Under Buildings and Structures, Other Surface Soils, Perched Water, the SRPA, and Buried Gas Cylinder Sites. Individual sites include the SFE-20 Hot Waste Tank System. The response actions selected in this ROD are designed to reduce the potential threats to human health and/or the environment to acceptable levels.

8. REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) for OU 3-13 were developed in accordance with the NCP and CERCLA RI/FS guidance. RAOs specify contaminants and media of concern, potential exposure pathways, and remediation goals. Remediation goals establish acceptable exposure levels that are protective of human health and the environment. Factors that are considered in establishing remediation goals are outlined in 40 CFR 300.430(e)(2)(i). RAOs are specific risk criteria that take into consideration the assumed future land uses at the INTEC. The RAOs were defined through discussions between the Agencies (IDHW, EPA, and DOE). The RAOs are primarily based on the results of the baseline risk assessment and applicable or relevant and appropriate requirements (ARARs).

To achieve a reasonable degree of protection at the WAG 3 sites, the Agencies have selected remedy for each group of sites that meet the RAOs. These remedies protect human health and the environment and meet regulatory requirements. The WAG 3 RAOs were developed for specific media (i.e., soils, perched water, or groundwater). The applicable RAOs for a particular site or group of sites depend on the specific media impacted.

RAOs were also developed for ecological receptors, based on a screening-level ERA. For release sites that pose a potential threat to both human health and ecological receptors, it is assumed that remedies selected to protect human health will be designed to address ecological concerns. A specific RAO was developed for sites that solely pose a threat to ecological receptors. For ecological receptors, the remediation goal for protection of the environment at INTEC is to reduce contaminant concentrations to less than 10 times the background COC concentration.

The INTEC land use assumptions used to develop the RAOs include industrial use prior to 2095, and potential residential use after that time. Other assumptions used to develop the RAOs included:

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 this 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.

The human health RAOs developed for soils and groundwater at OU 3-13 include:

1. Groundwater

   a. For INTEC-impacted groundwater (located in the groundwater contaminant plume outside of the current INTEC security fence) restore the aquifer for use by 2095 and beyond, so that the risk will not exceed a cumulative carcinogenic risk of 1×10^{-4} for groundwater ingestion.

   b. For INTEC-impacted groundwater (located in the groundwater contaminant plume outside of the current INTEC security fence) restore the aquifer to drinking water quality (below MCLs) for use by 2095 and beyond.

   c. For INTEC-impacted groundwater (located in the groundwater contaminant plume outside of the current INTEC security fence) restore the aquifer to so that the non-carcinogenic risk will not exceed a total HI of 1 for groundwater ingestion.

   d. For INTEC-impacted groundwater (located in the groundwater contaminant plume outside of the current INTEC security fence), prevent groundwater consumption by the public until Objectives a, b, and c, listed above, are met.

   e. 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., MCLs) in the SRPA.

2. Surface Soils

   a. Prevent exposure to contaminated surface soils at each release site such that for all surface exposure pathways, a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1 is not exceeded at each release site. These RAOs also address "No Further Action" Sites where the current radiological contaminant levels will meet residential risk-based concentration on or before year 2095. The RAOs will be achieved as follows:

      (1) 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.

      (2) Government Control Phase: expected between year 2045 and 2095

         (a) Implement Institutional Controls to limit the duration and frequency of exposure to non-capped contaminated soil areas by the public to achieve a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.

(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.

(3) Post-Government Control, Beyond 2095. Continue Institutional Controls at all capped areas to prevent disturbance of capped areas to achieve a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.

3. Perched Water

a. Prevent migration of radionuclides from perched water in concentrations that would cause SRPA groundwater outside the current INTEC security fence to exceed a cumulative carcinogenic risk of 1×10^{-4}, a total HI of 1; or applicable State of Idaho groundwater quality standards (i.e., MCLs) in 2095 and beyond.

b. Prevent excavations into and drilling through the contaminated earth materials remaining after the desaturation of the perched water to prevent exposure of the public to a cumulative carcinogenic risk of 1×10^{-4}, a total HI of 1; and protection of the SRPA to meet Objective 3a listed above.

4. Snake River Plain Aquifer (INTEC-derived groundwater contaminant plume outside current INTEC security fence)

a. Prior to 2095, prevent current on-site workers and general public from ingesting SRPA groundwater that exceeds a cumulative carcinogenic risk of 1×10^{-4}; a total HI of 1; or applicable State of Idaho groundwater quality standards (i.e., MCLs).

b. In 2095 and beyond, ensure that SRPA groundwater does not exceed a cumulative carcinogenic risk of 1×10^{-4}; a total HI of 1; or applicable State of Idaho groundwater quality standards (i.e., MCLs).

5. Other Areas

a. For other source areas that either pose a safety hazard, a threat of release to groundwater, or an ecological hazard, the RAOs include:

(1) Eliminate the safety hazard posed by buried compressed gas cylinders at sites CPP-84 and CPP-94.

(2) Eliminate the threat of release to the SRPA posed by the SFE-20 Hot Waste Tank System.

(3) Prevent ecological receptor exposure to surface soil COCs with a concentration greater than 10 times background concentrations that may cause adverse effects to resident populations of flora or fauna, as determined by the screening level ERA.

8.1 Remediation Goals

To meet the RAOs, remediation goals are established. These goals generally are quantitative cleanup levels based primarily on risk to human health and the environment. The remediation goals are based on the results of the BRA and evaluation of expected exposures and risks for selected alternatives. If an ARAR is more restrictive, then the ARAR standard is used as the remediation goal. The remediation goals will be used to assess the effectiveness of the selected remedial alternatives in meeting the RAOs.

A 1×10^{-4} cumulative carcinogenic risk or cumulative HI of 1 for noncarcinogenic contaminants, whichever is more restrictive for a given contaminant, is the primary basis for determining remediation goals for the OU 3-13 sites of concern. The higher end of the carcinogenic risk range has been selected because the carcinogenic risk at INTEC from natural background radiation due to surface elevation and background soil radiological contamination is estimated at 10^{-4} (EPA 1994, NEA 1997, UNEP 1985).

Remediation goals for contaminated soils are based on soil concentrations that satisfy the 1×10^{-4} carcinogenic risk goal or non-carcinogenic HI of 1 for current non-workers and future workers and residents. Risk-based soil concentrations corresponding to a 1×10^{-4} risk or a HI of 1 for individual soil COCs are presented in Table 8-1. If more than one COC is present at a particular release site, these activities or concentrations will be modified so that the cumulative risk is 1×10^{-4} or HI is 1. These risk-based remediation goals will be used to verify the effectiveness of the selected remedial action and to determine if additional remedial action (such as additional excavation) is necessary prior to closing the release site.

Table 8-1. Soil risk-based remediation goals.

Contaminant of Concern	Soil Risk-Based Remediation Goal[a] For Single COCs[b] (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[c]	
Mercury (human health)	23

a. Source of risk-based soil remediation goals: Table 2-1 of the OU 3-13 FS. Risk-based remediation goals developed for residential scenario.

b. If multiple contaminants are present, use a *sum of the fractions* to determine the combined COC remediation goal.

c. The mercury remediation goal was selected from the EPA Region 3, April 1996, screening guidance for soil ingestion under the residential scenario.

Dose-based soil remediation goals that correspond to the concentration- or activity-based soil remediation goals in Table 8-1 will be developed during RD to facilitate field implementation of the remedial action. It should be noted that for current on-site DOE-workers, the occupational dose limit is specified in 10 CFR 835.202. The annual occupational dose limit is a total effective dose equivalent equal to 5 rem (0.05 Sv). For exposure of the general public prior to the Year 2095, land use is projected as industrial. The above remediation goals combined with institutional controls are considered protective for industrial use of the area by the general public prior to the Year 2095.

Nonradionuclide remediation goals for mercury, lead, and chromium were also estimated for ecological receptors. The ecological receptor remediation goals estimated for these constituents are 0.5 mg/kg for mercury, 170 mg/kg for lead, and 330 mg/kg for chromium. These remediation goals are being used because of the small volume of the sites and the cost effectiveness of taking remedial action versus additional study to refine the estimate. An evaluation of whether additional soil excavation is necessary to protect ecological receptors will be conducted after the WAG 10 plant uptake treatability study is completed.

Remediation goals for INTEC-derived COCs present in the SRPA groundwater outside the current INTEC security fence are based on the applicable State of Idaho groundwater quality standards (IDAPA 16.01.011.200). The SRPA COCs consist of tritium, Sr-90 and daughters, I-129, Np-237, chromium, and mercury prior to 2095 and Sr-90, I-129, Np-237, plutonium and uranium isotopes and their daughters, and mercury in 2095 and beyond. The SRPA groundwater remediation goals for these COCs are presented in Table 8-2.

The remediation goal for INTEC-derived alpha-emitting radionuclides (i.e., Np-237, Pu isotopes and their daughters, Am-241, and U isotopes and their daughters) in SRPA groundwater outside the current INTEC security fence corresponds to a cumulative alpha-activity of 15 pCi/L in the year 2095 and beyond. Modeling has shown that alpha-emitting radionuclides are not expected to exceed the 15 pCi/L standard in the SRPA inside the current INTEC security fence until the year 2750, with a peak concentration occurring in the year 3804. Remediation, if necessary, of the Tank Farm inside the current INTEC security fence are expected to mitigate the future alpha-emitting radionuclide impacts in the SRPA outside the current INTEC security fence. Remediation goals for the alpha-emitting radionuclides in the SRPA inside the current INTEC security fence will be established in the final action developed in OU 3-14.

The remediation goal for beta-gamma-emitting radionuclides (tritium, Sr-90 and daughters, and I-129) in SRPA groundwater outside the current INTEC security fence is restricted to a cumulative dose of 4 mrem/yr in the year 2095 and beyond. The remediation goals for chromium and mercury are 100 ug/L and 2 ug/L, respectively, for individual constituent MCLs.

8.1.1 Tank Farm Soils Interim Action (Group 1)

The principal threats at the Tank Farm Soils release sites are external exposure to radiation and potential leaching and transport of contaminants to the perched water or the SRPA. The remediation goals for the Tank Farm Soils interim action are:

1. Preventing intrusion into soil contaminants by the general public

2. Reduce precipitation infiltration by approximately 80% of the average annual precipitation at the site

3. Maximize run-off and minimize surface water ponding on the Tank Farm

4. Prevent surface water run-on from a 1 in 25 year, 24 hour storm event

5. Minimize infiltration and subsequent contaminant leaching due to external building drainage and run-on.

These remediation goals support groundwater RAOs 1a through 1d; surface soil RAO 2A(1)(a), perched water RAO 3a, and SRPA RAO 4b.

8.1.2 Soils Under Buildings and Structures (Group 2)

The primary threat posed by Soils Under Buildings and Structures sites is external exposure to radionuclides and possible leaching and transport of soil contaminants to the perched water or SRPA. The selected alternative for Group 2 is a deferred action. It is assumed that the present buildings or structures aid in limiting external exposure and infiltration directly over the contaminated soils.

Remediation goals were developed for the Soils Under Buildings and Structures for the pre-D&D and post-D&D time periods. The remediation goals for the pre-D&D time period are to prevent exposure to current workers and non-workers and to minimize possible leaching and transport of contaminants to underlying SRPA groundwater. The remediation goals for the post-D&D time period are to prevent exposure to future workers and residents and to minimize possible leaching and transport of contaminants to underlying SRPA groundwater.

Table 8-2. SRPA 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-241and 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.

These remediation goals will be accomplished by the following:

1. Pre-D&D

   a. Warning current building or structure users that contaminated soils lie beneath the basement floor. Maintaining the buildings or structures to minimize moisture infiltration and to prevent unacceptable exposure to current industrial users.

   b. Minimizing surface water run-on and precipitation infiltration adjacent to the buildings or structures by modifying drainage patterns around buildings and performing surface modifications as necessary to minimize leaching and transport of soil contaminants to underlying SRPA groundwater.

2. Post-D&D

   a. Implementing the institutional controls described in Table 11-1.

   b. Capping the contaminated areas 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]).

   c. Excavating the contaminated soils that exceed the soil remediation goals listed in Table 8-1 and subsequent disposal and management in the ICDF.

These remediation goals support groundwater RAOs 1a through 1e, surface soil RAO 2a, perched water RAO 3a, and SRPA RAO 4b.

8.1.3 Other Surface Soils (Group 3)

The primary threat posed by the Other Surface Soils is external exposure to contaminated soils. The remediation goal for the Other Surface Soils is to prevent external exposure to current workers and non-workers and future workers and residents. This remediation goal will be accomplished by:

1. Implementing the institutional controls described in Table 11-1.

2. Minimizing future residental exposure to surface soils in 2095 and beyond by excavating the contaminated soils exceeding the remediation goals in Table 8-1, to a minimum depth of 3m (10 ft) and subsequent disposal and management of the excavated soils in the ICDF.

3. 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 remediation goal supports surface soil RAO 2a.

8.1.3.1 INEEL CERCLA Disposal Facility (ICDF) Goals and Requirements. Contaminated soils from the Group 3 sites will be disposed and managed in the ICDF. The primary threats posed by soils and debris disposed and managed in the ICDF are external exposure to radiation and the release of leachate to underlying groundwater that could potentially impact the SRPA. The remediation goal for the ICDF is to consolidate contaminated soils at a single location to prevent exposure of human and ecological receptors. This remediation goal will be accomplished by siting, designing, operating, and closing the ICDF to prevent exposures or leachate releases to the underlying SRPA groundwater. The siting, design, operation, closure, and post-closure requirements necessary to accomplish these remediation goals include:

Siting Requirements—The ICDF will meet or exceed RCRA Subtitle C location standards specified in IDAPA 16.01.05.008 (40 CFR 264.18).

Design Requirements—The ICDF design will:

1. Meet or exceed RCRA Subtitle C design standards specified in IDAPA 16.01.05.008 (40 CFR 264.301 and 40 CFR 264.302) and the PCB Chemical Waste Landfill design requirements 40 CFR 761.75.

2. Minimize precipitation run-on and maximize precipitation run-off to effectively reduce infiltration through the contaminated soils and debris.

3. Minimize subsidence of the waste and the landfill cap.

4. Ensure that the resulting design is protective of human and ecological receptors.

5. Ensure that the resulting design is protective of the SRPA.

Operational Requirements—The ICDF operation will:

1. Limit disposed wastes to those generated by the INEEL CERCLA program.

2. Limit disposed wastes to those with contaminant concentrations that will not result in MCLs being exceeded in the SRPA.

3. Limit disposed wastes to low level radioactive waste, PCB solids, hazardous, and mixed low level radioactive waste.

4. Treat waste (soils, debris, and treatment residues) on-Site as necessary to meet Agency-approved Waste Acceptance Criteria developed during the RD.

5. Treat waste (soils, debris, and treatment residues) originating from outside the WAG 3 AOC to comply with the land disposal requirements specified in IDAPA 16.01.05.011 (40 CFR 268 and 40 CFR 268.49) as applicable.

6. Minimize leachate generation. Leachate will be collected and treated using physical/chemical treatment (i.e., evaporation in a surface impoundment designed in accordance with the substantive requirements of the hazardous waste surface impoundments (IDAPA 16.01.05.008 [40 CFR 264.221]). Residues from the evaporation process will be managed in the ICDF as necessary during the active life and post-closure period of the ICDF cells.

Closure and Post-Closure Requirements—The ICDF closure and post-closure will:

1. Meet or exceed RCRA Subtitle C closure and post-closure care requirements specified in IDAPA 16.01.05.008 (40 CFR 264.310).

2. Ensure that the final cover is designed to serve as an intrusion barrier for a period of at least 1,000 years.

3. Minimize subsidence of the landfill and its final cover.

4. Place easily located permanent markers at all corner boundaries for each cell of the landfill that identify the potential exposure hazards.

5. Place permanent land use restrictions, zoning restrictions, and deed restrictions on the ICDF and its adjacent buffer zone to permanently preclude industrial or residential development until unacceptable risk no longer remains at the site.

6. Include the disposal records and the surveyed permanent marker locations in the land use restriction documents.

These remediation goals support groundwater RAOs 1a through 1e, surface soil RAOs 2a(1)(a) and 2a(2)(c), and SRPA RAO 4b.

8.1.4 Perched Water (Group 4)

The primary threat posed by perched water is migration of contaminants to the SRPA. The perched water remediation goals are to:

1. Reduce recharge to the perched zones

2. Minimize migration of contaminants to the SRPA, so that SRPA groundwater outside of the current INTEC security fence meets the applicable State of Idaho groundwater standards by 2095.

The remediation goals for the perched water are primarily designed to reduce the moisture content of the perched zone so that the contaminant transport rate in the vadose zone is reduced and radionuclide contaminants present in the perched zone have more time to naturally decay and reduce the concentration of potential contaminants released to the SRPA.

The perched water remediation goals will be accomplished by:

1. Limiting recharge to the perched zone by closing and relocating the existing percolation ponds, and ceasing lawn irrigation, where necessary, at the INTEC so that the moisture content is sufficiently reduced to retard Sr-90 migration by approximately three (3) half-lives (about 90 years).

If the moisture content and contaminant flux is not sufficiently reduced as indicated by moisture content and perched water monitoring and verified by the OU 3-13 vadose zone model, then additional infiltration controls will be implemented to achieve the necessary desaturation, and corresponding reduction in contaminant transport rate, in the perched zone. The additional infiltration controls that will be implemented (in the listed order) include:

1. Lining the Big Lost River

2. Closing and relocating the existing Sewage Treatment Plant lagoons and infiltration galleries

3. Upgrading the INTEC-wide drainage controls, repairing leaking fire water lines, and eliminating steam condensate discharges.

These remediation goals support groundwater RAOs 1a through 1c, perched water RAOs 3a and 3b, and SRPA RAO 4b.

8.1.5 Snake River Plain Aquifer (Group 5)

The primary threat posed by SRPA is ingestion of contaminated groundwater. The remediation goals for the SRPA outside the current INTEC security fence are to:

1. Preventing current on-site workers and non-workers during the institutional control period from ingesting contaminated drinking water above the applicable State of Idaho groundwater standards or risk-based groundwater concentrations.

2. Achieving the applicable State of Idaho groundwater standards or risk-based groundwater concentrations in the SRPA plume south of the INTEC security fence by the year 2095.

Modeling predicts that the applicable State of Idaho groundwater standards will be naturally achieved by 2095, except for Sr-90, I-129, and plutonium isotopes. Modeling also predicts that removal of the existing percolation ponds (the principal component of the selected Perched Water remedy) will reduce the moisture content so that the individual Sr-90 MCL is achieved by 2095.

Modeling also has shown that plutonium, an alpha-emitting radionuclide, is not expected to exceed the 15 pCi/L alpha-emitting radionuclide standard in the SRPA inside of the current INTEC security fence until the year 2750, with a peak concentration occurring in the year 3804. Remediation, if necessary, of the SRPA inside the current INTEC security fence will mitigate the future plutonium impacts in the SRPA outside the current INTEC security fence. The remedy for the SRPA inside the current INTEC security fence is being developed under OU 3-14. Therefore, a decision on plutonium remediation goals is deferred to the OU 3-14 ROD.

The SRPA remediation goals will be accomplished by:

1. Maintaining institutional controls over the area of the INTEC-derived SRPA contaminant plume outside of the current INTEC security fence to prevent exposure to contaminated groundwater during the time that groundwater in the aquifer remains above the remediation goals specified in Table 8-2.

2. Determining if groundwater quality outside the current INTEC security fence will be restored by 2095 and beyond. If the modeled action levels for COCs are exceeded, a contingent pumping and treatment action will be implemented to remove sufficient contaminant source to facilitate aquifer restoration by 2095.

These remediation goals support groundwater RAOs 1a through 1e, and SRPA RAOs 4a and 4b.

8.1.6 Buried Gas Cylinders (Group 6)

The principal threat posed by the buried gas cylinders is a safety hazard, including chemical exposure, fire, explosion, and projectile hazards. The remediation goal for the buried gas cylinders is to remedy the safety hazard posed by the disposed cylinders.

The remediation goal will be accomplished by:

1. Excavating, removing, treating, and disposing the cylinders (waste that meets the ICDF WAC will be disposed in the ICDF).

The Agencies may elect to pursue a contingent remedy of capping in place pursuant to the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310) if safety concerns with excavation and removal prevent implementation of the selected remedy.

The remediation goal supports Other Areas RAO 5a.

8.1.7 SFE—20 Hot Waste Tank System (Group 7)

The principal threats posed by the SFE-20 Tank system is external exposure and the potential for a contaminant release to the environment. The remediation goals for the SFE-20 tank system are as follows:

1. Limit potential external exposures to workers and non-workers

2. Remove radioactive and hazardous substances remaining in the tank system to prevent potential contaminant releases to the underlying soils or groundwater.

The remediation goals will be accomplished by:

1. Maintaining existing institutional controls to prevent current worker and non-worker exposure.

2. Removing, excavating, treating, and disposing the SFE-20 hot waste tank system waste and components to eliminate the threat of release to the environment (waste that meets the ICDF WAC will be disposed in the ICDF).

3. Remediating contaminated soils present beneath the SFE-20 tank system that may pose an external exposure risk or threat to groundwater (waste that meets the ICDF WAC will be disposed in the ICDF).

These remediation goals support Other Areas RAO 5a and also support groundwater RAOs 1a through 1c.

9 DESCRIPTION OF ALTERNATIVES

A range of cleanup alternatives was developed and evaluated against the nine CERCLA evaluation criteria for each of the seven release site groups. The alternatives were developed from a list of representative remediation technologies for technical and cost evaluation purposes. With the exception of the "No Action" alternative, the selected remedies are protective of ecological concerns. The "No Action" alternative is not protective of human health and the environment beyond the institutional control period. The alternatives evaluated for each group are summarized in the following sections. For more detailed descriptions of the evaluated alternatives refer to the OU 3-13 FS and FSS (DOE-ID 1997a, DOE-ID 1998a). More detailed descriptions of the selected alternatives are found in Section 11. It should be noted that during preparation of the cost estimates for the FS, assumptions were made regarding what activities comprise existing institutional controls (e.g., land use/site access restrictions, monitoring, maintenance). The following alternative descriptions reflect those assumed activities. The original broad assumptions have changed, however, and the current, more specific institutional control scenarios are presented in Section 11.

The alternative descriptions in this section and Section 10 are from the comparisons in the OU 3-13 FS. The selected alternatives have been refined subsequent to the FS. The detailed descriptions in Section 11 reflect these changes.

9.1 Tank Farm Soils Interim Action (Group 1)

After review of the OU 3-13 RI/FS, the Agencies determined that additional information was required to select a final remedy for this group of sites. The Agencies have postponed a final decision on the Tank Farm because of the uncertainty concerning contaminant extent, and site risks. Additional site characterization and risk analysis will be performed at the Tank Farm in a separate RI/FS that is designated as OU 3-14. Remedial alternatives will be developed in the OU 3-14 RI/FS using the existing and newly developed data and will be presented to the public in a separate proposed plan.

An interim action is selected for the Tank Farm in this ROD while the new RI/FS is conducted. The interim action will be performed to minimize contaminant exposures and to limit further impacts to soil and groundwater until a final remedy is implemented. A final remedy decision is anticipated prior to 2008. The interim action is consistent with the expected final remedy. Interim action alternatives were developed and evaluated for the Tank Farm in the FS Supplement. The implemented interim action will be designed to prevent exposure to contaminants present at the site and to minimize moisture that may infiltrate through the Tank Farm soils and leach and transport contaminants to the perched water, and possibly to the SRPA. Interim actions are justified because the facility will be in operation until 2012. Until the facility is closed, surface water controls remain necessary. This action will likely be a component of the final remedy. Three alternatives were developed and evaluated for the Tank Farm Soils Interim Action to meet the current remediation objectives and are discussed in the following sections.

9.1.1 Interim Alternatives Descriptions.

9.1.1.1 Alternative 1—"No Action" with Monitoring. Alternative 1 consists of the existing institutional controls currently implemented at the site. No active remediation will be performed at the site to alter the existing conditions. The existing institutional controls include site access restrictions, radiation monitoring, and maintenance for a period of 8 years or until a final remedy decision is made by the Agencies and implemented.

9.1.1.2 Alternative 2—Enhanced Institutional Controls. Alternative 2 consists of the existing institutional controls described for Alternative 1 and additional monitoring and institutional controls. This additional monitoring and controls include the installation of new clustered monitoring wells in the perched water and aquifer to enhance the existing groundwater monitoring capabilities during the interim action period and to verify hydraulic parameters and water quality. They also include additional warning signs, surface and subsurface markers, and land use restrictions to prevent exposures to contaminated groundwater.

9.1.1.3 Alternative 3—Enhanced Institutional Controls with Surface Water Control. Alternative 3 includes the existing and additional institutional controls described for Alternative 2 and an interim remedy to control surface water runon and infiltration at the Tank Farm. The interim remedy includes surface grading and sealing of the Tank Farm soils to divert 80% of the average annual precipitation away from the contaminated areas, and exterior building drainage improvements to direct water away from the contaminated areas so that moisture infiltration is minimized and contaminants are not mobilized. The run-on water will be managed as part of the existing surface water drainage system, and the run-off water will be collected and managed in a lined evaporation pond, to be constructed as part of this alternative.

9.2 Soils Under Buildings or Structures (Group 2)

Contaminant source releases are not well defined for the Soils Under Buildings and Structures sites. Contaminated soil release sites are assumed to be present as a result of accidental past releases during plant operations. The releases occurred under buildings or structures making characterization difficult. The primary threat posed by these sites is external exposure to radionuclide-contaminated soil if the buildings or structures are removed. The soils also pose a minor threat to groundwater. Although these potential releases to the environment are recognized, the release sites are not readily accessible and may remain covered by the facilities, since the buildings or structures may be closed in place as operations cease. The D&D program is determining the fate of individual buildings. Buildings may remain in place upon closure. Evaluations, conducted as part of the CERCLA 5-year review process, will confirm whether the presence of the existing structures over these sites limits soil exposures and moisture infiltration. Three alternatives were evaluated for the Soils Under Buildings or Structures group to minimize the threat of contaminant exposure or mobilization.

9.2.1 Alternatives Descriptions

9.2.1.1 Alternative 1—"No Action" with Monitoring. Alternative 1 is comprised of existing institutional controls currently implemented at the site. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include DOE land use and site access restrictions. These controls will remain in place until 2095.

9.2.1.2 Alternative 2—Containment. Alternative 2 is a deferred action which includes the existing institutional controls described for Alternative 1, additional institutional controls, and soil containment with engineered barriers. The additional institutional controls may include land or regulatory restrictions to prevent inadvertent exposure to contaminants. The proposed engineered barriers will be comprised of natural earthen materials designed to isolate the contaminants until they are no longer a risk. The final cover designs will meet ARARs and are subject to the FFA/CO review process. It should be noted that the engineered barriers cannot be constructed until adjacent building or structures have undergone D&D. In the meantime, the presence of the existing buildings or structures is assumed to limit soil exposures and moisture infiltration. The effectiveness of the buildings and structures in limiting exposures and infiltration will be evaluated as part of the CERCLA 5-year review process for OU 3-13.

If the building or structure is entombed in place, the end-state will be subject to review under the FFA/CO to ensure that the RAOs for perched water, surface soils, and the SRPA are met.

9.2.1.3 Alternative 3—Removal and Onsite Disposal. Alternative 3 was developed in the event that contaminated soils present beneath the buildings or structures become exposed following D&D. Alternative 3 includes the existing and additional institutional controls described for Alternative 2, and removal and on-Site disposal of contaminated soils exposed during D&D. The exposed contaminated soils will be excavated and disposed in the ICDF.

9.3 Other Surface Soils (Group 3)

The Other Surface Soils release sites resulted from miscellaneous contaminant spills or past waste disposal activities at the INTEC. The primary threat posed by most of these release sites is external exposure. One site (CPP-93) contains mercury at concentrations potentially hazardous to humans. Three of the sites, CPP-14, -44, and -55, pose solely an ecological risk because of nonradionuclide contaminants, such as mercury, chromium, and lead. These sites are being remediated under the screening action levels because of their small size (i.e., soil volume) and the cost benefit of not pursuing further studies on them. Five alternatives were evaluated for the Other Surface Soils release sites to address a range of potential cleanup actions that are protective of human health and the environment. The alternatives include existing and additional institutional controls, containment using an engineered barrier, removal and onsite disposal, and removal, ex situ treatment, and off-Site disposal.

9.3.1 Alternatives Descriptions

9.3.1.1 Alternative 1—"No Action" with Monitoring. Alternative 1 is comprised of existing institutional controls currently implemented at the site. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include site access restrictions, radiation surveys, air monitoring, and maintenance. These controls will remain in place until 2095.

9.3.1.2 Alternative 2—Institutional Controls. Alternative 2 includes the existing institutional controls described for Alternative 1 and additional institutional controls to control exposures to contaminated soils. The additional institutional controls include land use and/or regulatory restrictions to prevent inadvertent exposure to contaminants. For the boxed soils comprising Site CPP-92, the soils will be loaded into SEALAND®-type containers 10 years after ROD signature to provide additional stability and control.

9.3.1.3 Alternative 3—Containment. Alternative 3 includes existing and additional institutional controls described for Alternative 2 and containment using an engineered barrier. The proposed engineered barrier is comprised of natural earth materials and designed to isolate the contaminants, minimize water infiltration, and reduce contaminant leaching and transport for up to 1,000 years. The engineered barrier will be subject to operation and maintenance activities and 5-year reviews under CERCLA as long as an unacceptable risk remains. Some of the operating facilities may interfere with barrier construction, so that final containment may not be implemented until facility D&D has concluded several decades in the future.

9.3.1.4 Alternative 4A—Removal and Onsite Disposal. Alternative 4A includes the existing institutional controls described in Alternative 1 and removal and onsite disposal of low level radioactive, hazardous, mixed low level radioactive waste, or PCB contaminated soils at each release site in this group. These excavated soils will be disposed in an ICDF. After removal of soils at individual sites, institutional controls will be terminated at each site but maintained at the location of the ICDF. The ICDF is planned to be constructed southwest of the INTEC facility and west of the current INTEC percolation ponds.

ICDF—To implement onsite disposal of WAG 3 and other CERCLA-generated wastes at the INEEL, construction and operation of an engineered disposal facility is proposed. The ICDF will be an engineered facility meeting RCRA Subtitle C design and construction requirements, which are the same regulations required for commercial disposal facilities.

The ICDF will be constructed with a disposal capacity of about 400,000 m^3 (510,000 yd^3). The disposal cells, including a buffer zone, will cover approximately 219,000 m^2 (80 acres). Current projections of INEEL-wide CERCLA waste volumes total about 356,283 m^3 (466,000 yd^3). The selected location (Figure 11-3) lies beyond the area that would be inundated by the Big Lost River 100-year flood event. However, design criteria for the life for the facility's include protection from inadvertent intrusion for up to 1,000 years. Therefore, a 1000-year flood event, assuming Mackay Dam failure, will be evaluated during the remedial design.

The ICDF will accept only those wastes generated within INEEL boundaries during CERCLA actions. The OU 3-13 wastes lie within the WAG 3 AOC. Other INEEL wastes are not included within the OU 3-13 AOC. Wastes proposed for disposal at the ICDF would include low-level, mixed low-level, hazardous, and limited quantities of Toxic Substances Control Act (TSCA) wastes. Most of the waste will be contaminated soil, but wood and debris from sites CPP-98 and CPP-99 and other INEEL CERCLA sites are expected; specific waste acceptance criteria will be developed during RD. Acceptance criteria will include restrictions on contaminant concentrations based on groundwater modeling results and the goal of preventing potential future risk to the SRPA.

9.3.1.5 Alternative 4B—Removal, Treatment, and Off-Site Disposal. Alternative 4B is identical to Alternative 4A except that disposal in an off-Site facility is contemplated. Soils will be selectively excavated to reduce the soil volume, packaged, and transported by truck or rail to a permitted engineered disposal facility located off-Site. Waste will be treated off-Site at the receiving facility, if necessary, to satisfy land disposal restrictions.

9.4 Perched Water (Group 4)

Although contaminants may be present in the perched water, this water does not pose a threat to human health because it is not available for consumption. However, it does pose a risk to human health and the environment because of its potential to migrate to the SRPA, which is designated as a primary drinking water source. Three alternatives were developed and evaluated to limit exposure to contaminated perched water, and to prevent this water from contaminating the SRPA.

9.4.1 Alternatives Descriptions

9.4.1.1 Alternative 1— "No Action" with Monitoring. Alternative 1 is comprised of existing institutional controls currently implemented at the site. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include site access restrictions, radiation surveys, perched water monitoring, and wellhead maintenance. These controls will remain in place until 2095.

9.4.1.2 Alternative 2—Institutional Controls with Aquifer Recharge Control.
Alternative 2 proposes existing and additional institutional controls and aquifer recharge controls to

prevent exposures to perched water and to reduce moisture content in the perched water. The existing institutional controls are the same as those described for Alternative 1. The additional institutional controls may include land or regulatory restrictions, to prevent inadvertent exposure to contaminated perched water. In addition, perched water-monitoring wells will be installed to provide additional information about the deep perched water. The proposed remedies are actions that control sources supplying water to the perched zone. The aquifer recharge controls, discussed below, are designed to reduce leaching and transport of soil contaminants to perched water, reduce the volume of water in the perched zone, and minimize contaminated perched water releases to the SRPA.

The initial aquifer recharge controls will include removal of the percolation ponds from service and discontinuing lawn irrigation at the INTEC, where necessary. A major contribution to the perched water originates from the existing percolation ponds, which contribute approximately 70% of the water recharging the perched water bodies. Removal of this water source will slow the rate of contaminant transport to the SRPA sufficiently to allow natural radioactive decay to reduce the mass of Sr-90 in the perched zone so that applicable groundwater quality standards will not be exceeded in 2095 or beyond in the SRPA. Discharge to the existing percolation ponds will cease on or before December 31, 2003. See Section 11 for a more detailed description.

If removal of the percolation ponds and ceasing lawn irrigation do not protect the aquifer, additional aquifer recharge controls will be implemented. Additional recharge controls may include lining the Big Lost River (which contributes about 21% of the perched water recharge), repairing leaking fire water lines, curtailing steam condensate discharges to the subsurface, or removing the existing Sewage Treatment Plant lagoons and infiltration galleries. The costs of implementing these additional recharge controls have not been included in the cost estimates in Section 11.

9.4.1.3 Alternative 3—Aquifer Recharge Control and Perched Water Removal, Treatment, and Disposal. Alternative 3 consists of the existing and additional institutional controls and aquifer recharge controls described for Alternative 2 with localized pumping, treatment, and disposal of perched water contaminant hotspots for a period of 25 years. Localized perched water extraction would attempt reduction of contaminant mass and contaminant flux to the SRPA. Five new extraction wells would be installed to perform perched water removal and would be included in the perched water-monitoring program. Contaminated perched water would be removed from the five new wells and nine existing wells using pulsed pumping at low pumping rates to allow for sufficient well recovery. Extracted perched water would be stored in storage tanks, and treated and disposed. Approximately 174 million L (46 million gal) of perched water would be extracted under this alternative.

9.5 Snake River Plain Aquifer Interim Action (Group 5)

Contamination in the SRPA primarily resulted from historic wastewater disposal practices at the former INTEC injection well. The COCs are radionuclides and mercury. The contaminated soils and perched water also contribute to future contamination in the SRPA. Predictive modeling suggests that if recharge source control actions are not taken, additional contamination may be leached and transported to the SRPA. In the conceptual model, the currently contaminated perched water is also a significant source of future contamination to the SRPA. Four alternatives were developed to manage the risk posed by contaminants in the SRPA.

9.5.1 Alternatives Descriptions

9.5.1.1 Alternative 1—"No Action" with Monitoring. Alternative 1 is comprised of existing institutional controls presently implemented at the site to minimize potential exposure to contaminated groundwater. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include site access restrictions, radiation surveys, groundwater monitoring, and maintenance. These controls will remain in place until 2095. Groundwater monitoring will include sampling and analysis of existing and new groundwater wells until 2095 to determine changes in contaminant concentrations and water quality, and the rate of the contaminant plume migration. Groundwater monitoring will be conducted, as necessary, to verify achievement of the RAOs.

9.5.1.2 Alternative 2A—Institutional Controls, Monitoring, and Source Control. Alternative 2A proposes the existing institutional controls described for Alternative 1, additional institutional controls, and additional monitoring and perched water infiltration source control to limit exposure to contaminated groundwater. The additional institutional controls include land use or regulatory restrictions to prevent exposure to contaminated groundwater within the INTEC. In addition, six new groundwater-monitoring wells will be installed to supplement the 10 existing wells. Under this alternative, contaminants present in the SRPA will decrease in concentration by radioactive decay and dispersion. Source control measures, included in other alternative remedies (Group 4, Alternatives 2 and 3), significantly decreases future contamination in the SRPA. Predictive modeling demonstrates that if the contaminant contributions from the perched water mobilized by the existing percolation ponds are eliminated by relocation of the percolation ponds, then contaminant concentrations in downgradient wells will still be slightly above acceptable limits at year 2095. Monitoring will be conducted to assess reduction of contaminant levels in the SRPA and to ensure that no down-gradient receptors will be impacted. Monitoring will be maintained until the contaminant concentrations are below the RAOs.

9.5.1.3 Alternative 2B—Institutional Controls with Monitoring and Contingent Remediation. Alternative 2B includes the existing and additional institutional controls described for Alternative 2A plus active groundwater remediation if sufficient quantities of contaminants of concern are found above the groundwater action level(s).

This action level(s), which is based on modeling results described in Section 5.3.2.3 of the FS Supplement (DOE-ID 1998a), ensures that existing concentrations of I-129 measured in the SRPA will not result in groundwater concentrations in the year 2095 exceeding the derived MCL of 1 pCi/L. If action levels are exceeded, as described in Section 11, treatability studies will commence to determine if pumping from the zones of highest contamination is feasible and to evaluate methods to remove I-129 or other COCs from the groundwater.

The cost estimate for this alternative is based on the assumption that groundwater will be extracted from about 20 wells at an estimated rate of 3.8 L/min (1 gpm) per well. The actual number of wells and extraction rates will be determined during remedial design. Actual treatment technologies will be selected during the proposed treatability studies. For comparison and cost estimating purposes, ion exchange treatment technology is assumed to be part of this alternative. Remedial action will be terminated following the removal of the design-specified volume of groundwater.

9.5.1.4 Alternative 3—Contingent Localized Groundwater Removal, Treatment, and Disposal. Alternative 3 includes the existing and additional institutional controls described for Alternative 2B, and localized removal, treatment, and disposal of groundwater extracted from SRPA hotspots until 2095, if the I-129 or other COCs action level(s) is exceeded. Groundwater will be extracted from the full vertical extent of the aquifer without targeting any specific layer. Groundwater extraction from within hotspots will locally reduce the contaminant mass in the aquifer. Five new extraction wells and six new injection wells will be installed in areas of high contaminant concentrations in the SRPA to depths of about 183 m (600 ft) bgs. Actual treatment technologies will be selected during the proposed treatability studies. For comparison and cost estimating purposes, the most likely candidate treatment technology, ion exchange, is assumed to be part of this alternative. Extracted groundwater will be treated in a newly constructed water treatment plant using ion exchange to concentrate the contaminants. The concentrated waste will be treated and disposed onsite. The remediated water will be reinjected into the aquifer through the six injection wells. Remediation could be challenging and may require treatability studies because current technology is not sufficiently developed to remove I-129 to its derived MCL of 1 pCi/L. The treatability studies will also evaluate the presence of mercury, Sr-90, chromium, Tc-99, and tritium, all of which are known or are predicted to be present in the groundwater plume at significant concentrations. While these contaminants are not long-term risk drivers, they may foul the groundwater treatment system or pose radiological exposure concerns if brought to the surface for treatment. Groundwater extraction and injection will also reduce contaminant transport by hydraulically controlling the contaminant plume in localized areas. A total of approximately 492 billion L (130 billion gal) of water, over the 100-year operating life, would be extracted and treated under this alternative.

9.6 Buried Gas Cylinders (Group 6)

The Buried Gas Cylinders group is comprised of Sites CPP-84 and CPP-94. These sites generally contain buried compressed gas cylinders that contain construction gases at Site CPP-84 and hydrofluoric acid at Site CPP-94. The exact number of cylinders is unknown but is estimated to be between 40 and 100. The principal threat posed by either of these sites is the potential for an injury caused by puncture or explosion of the cylinders. A risk assessment was not performed for these sites during the RI/BRA. Three alternatives were developed and evaluated for the Buried Gas Cylinders to address the safety hazards posed by these sites.

9.6.1 Alternatives Descriptions

9.6.1.1 Alternative 1—"No Action" with Monitoring. Alternative 1 consists of existing institutional controls. Under Alternative 1, no active remediation will be performed at the site. The existing institutional controls will consist of security, access restrictions, and site inspections until 2095.

9.6.1.2 Alternative 2—Removal, Treatment, and Disposal. Alternative 2 consists of the removal, ex situ treatment, and disposal of the gas cylinders at each site. This alternative will also include initial site characterization using geophysical surveys to determine the location and quantity of buried gas cylinders prior to removal. After the cylinders are located, they will be removed using conventional excavation techniques within a containment structure. Gases present in the excavated cylinders will be vented to the atmosphere if they are benign, or treated using a method suitable for the particular gas. A contractor that specializes in gas cylinder removal, treatment, and disposal will perform Alternative 2. The subcontractor performing work at an appropriate offsite facility will dispose of any treatment residuals. The sites will be maintained under existing institutional controls until the cylinders are removed, treated, and disposed.

9.6.1.3 Alternative 3—Containment. Alternative 3 consists of the existing institutional controls described for Alternative 1, additional institutional controls, and containment. Additional institutional controls will include land-use or regulatory restrictions. The principal component of Alternative 3 is containment using an engineered barrier. The barrier will consist of natural earthen materials designed to isolate the buried gas cylinders. A concrete pad will be poured over each of the sites prior to placement of the engineered barrier to minimize the potential for an uncontrolled gas release during barrier construction.

9.7 SFE-20 Hot Waste Tank System (Group 7)

Based on the results of the preliminary investigation conducted at the SFE-20 site in 1984, radiological contamination is present within the tank liquids and sludges, and on the tank, tank vault, and pump pit surfaces. The principal threat posed by the SFE-20 tank system is a release of the radioactive contaminants from the tank due to loss of integrity that could potentially contaminate soils, perched water, or SRPA groundwater beneath the site. In 1976, the tank and its transfer system were replaced. The SFE-20 inlet pipe was disconnected, and the pipe leading to the SFE-20 tanks was capped. At present, there is no exposure to humans or ecological receptors under existing conditions given that the tank vault is 3 m (10 ft) below the ground surface and area access is restricted. However, radiation exposure could occur if the existing access restrictions are not maintained. In addition, the excavation needed to cap the piping to SFE-20 may have been backfilled with radionuclide contaminated soil. Four alternatives were developed and evaluated for the SFE-20 tank system to limit exposure to radiation or to minimize the potential for a release to occur from the tank system.

9.7.1 Alternatives Descriptions

9.7.1.1 Alternative 1—"No Action" with Monitoring. Alternative 1 consists of existing institutional controls. Under Alternative 1, no active remediation will be performed at the site. The existing institutional controls will consist of security, access restrictions, site inspections, environmental monitoring, and general maintenance until 2095.

9.7.1.2 Alternative 2—In Situ Stabilization with Containment. Alternative 2 consists of the existing institutional controls described for Alternative 1, additional institutional controls, in situ treatment, and containment. Characterization of tank liquid, sludge, and surrounding soil is needed for remedial design. Additional institutional controls will include land-use and regulatory restrictions. The principal component of Alternative 2 is containment using an engineered barrier. The barrier will consist of natural earthen materials designed to minimize exposure and moisture infiltration at the site for up to 1,000 years. Prior to placing the barrier, the tank system, including the tank vault, will be filled with concrete grout to stabilize tank liquids and sludge and minimize differential settlement after capping.

9.7.1.3 Alternative 3—Liquid Removal and Treatment with In Situ Stabilization. Alternative 3 consists of existing and additional institutional controls described for Alternative 2, removal and ex situ treatment of the tank liquid, and in situ treatment of the tank sludge, tank, and associated structures. Characterization of tank liquid, sludge, and surrounding soil is needed for remedial design and liquid waste disposal. The tank liquid will be removed and treated at the PEW evaporator. The tank sludge, tank, and associated structures will be filled with concrete or similar grout to solidify and stabilize the contaminants that remain.

9.7.1.4 Alternative 4—Removal, Treatment, and Disposal. Alternative 4 includes the existing institutional controls described for Alternative 1, removal and ex situ treatment of the tank liquid and sludge, and excavation, removal, and onsite disposal of the tank and associated structures. The tank liquid will be removed and treated as described in Alternative 3. The tank sludge will be removed and treated (ex situ) using a suitable grout to solidify and stabilize the contaminants in the sludge. Characterization of tank sludge, liquid, and surrounding soil is needed for remedial design and waste disposal. The sludge will be drummed and disposed at a suitable engineered disposal facility. The remaining components of the tank system will be excavated, removed, and disposed either in the ICDF or offsite depending on the ICDF waste acceptance criteria. The excavation will be backfilled to grade with clean soils.

10. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives discussed in Section 9 were evaluated against the nine evaluation criteria as specified by CERCLA. These criteria include:

1. **Overall Protection of Human Health and the Environment**—This criterion addresses whether a remedy provides adequate protection of human health and the environment, and describes how risks posed by each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with ARARs**—This criterion addresses whether a remedy will meet all of the ARARs under federal and state environmental laws and/or justifies a waiver.

3. **Long-Term Effectiveness and Permanence**—This criterion refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

4. **Reduction of Toxicity, Mobility, or Volume Through Treatment**—This criterion addresses the degree to which a remedy employs recycling or treatment that reduces the toxicity, mobility, or volume of the COCs, including how treatment is used to address the principal threats posed by the site.

5. **Short-Term Effectiveness**—This criterion addresses any adverse impacts on human health and the environment that may be posed during the construction and implementation period, and the period of time needed to achieve cleanup goals.

6. **Implementability**—This criterion addresses the technical and administrative feasibility of a remedy including the availability of materials and services needed to implement a particular option.

7. **Cost**—This criterion includes estimated capital and operation costs, expressed as net present-worth costs.

8. **State Acceptance**—This criterion reflects aspects of the preferred alternative and other alternatives that the state favors or objects to and any specific comments regarding state ARARs or the proposed use of waivers.

9. **Community Acceptance**—This criterion summarizes the public's general response to the alternatives described in the Proposed Plan and in the RI/FS, based on public comments received.

A detailed comparative analysis of the alternatives for each release site group is presented in Section 6 of the OU 3-13 FS (DOE-ID 1997a) and the FS supplement (DOE-ID 1998a). A summary of this analysis for the first seven CERCLA criteria is presented by site release group in the following text and in Tables 10-1 through 10-7. A discussion of CERCLA Criteria 8 and 9 is found in Section 10.8.

10.1 Tank Farm Soils Interim Action (Group 1)

10.1.1 Overall Protection of Human Health and the Environment

Alternative 3 provides the most overall protection of human health and the environment. All three alternatives limit human and ecological receptor exposure to contaminants by maintaining the existing institutional controls, which are a common component of all of the alternatives. Alternatives 1 and 2 do not provide any direct action to limit leaching and transport of contaminants from the surface soils to the perched water. Alternative 3 includes remedies involving engineering controls to limit surface water infiltration into contaminated soils and leaching and transport of contaminants to perched water. Implementation of surface water controls to limit future soil contaminant leaching and transport to the perched water will reduce the future risk to the SRPA. All of the alternatives will provide perched water monitoring to determine if additional degradation of perched water is occurring. Table 10-1 summarizes the comparative analysis of the Tank Farm Soils interim action alternatives.

10.1.2 Compliance with ARARs

All of the proposed alternatives comply with the ARARs and to be considered (TBCs) during the interim action period, which ends in 2008. These alternatives would also comply with the ARARs beyond the interim action period as long as the existing institutional controls are maintained. ARARs concerning monitoring well installation and other construction activities will be met using engineering controls, health and safety practices, and radiological control methods.

10.1.3 Long-term Effectiveness and Permanence

None of the proposed alternatives provide long-term effectiveness or permanence. As interim measures, the period of performance is assumed to be about 8 years (until 2008) or until the final remedy is selected and implemented. The proposed alternatives will minimize human and ecological receptor exposure to contaminants during the interim action period. Alternative 3 will limit further perched water degradation during the interim action period. It is presumed that the final Tank Farm remedy developed under OU 3-14 will provide an effective and permanent long-term solution that mitigates human and environmental exposure risks and limits further perched water degradation.

10.1.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

None of the alternatives provide a reduction of toxicity, mobility, or volume through treatment since treatment will not be implemented during the interim action period. Some reduction in contaminant mass, and thus volume, is achieved indirectly through natural radioactive decay of short-lived radionuclides, such as Cs-137 and Sr-90; however, the contaminant toxicity will remain the same. Reduction in contaminant mobility will be achieved by implementing the surface water controls in Alternative 3 to limit leaching and transport of soil contaminants to the perched water.

10.1.5 Short-term Effectiveness

All of the alternatives can be implemented without significant additional risk to the community or workers. The primary risk to the workers from implementation of Alternatives 2 and 3 involves fugitive dust and toxic substance emissions, which will be controlled with dust suppressants and engineering controls. Alternatives 2 and 3 also pose a very minor risk to workers from direct exposure to radiation and personal injury during construction activities. Sampling of the monitoring wells, proposed in all

Table 10-1. Summary of comparative analyses for the Tank Farm Soils Interim Action, Group 1.

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	N	N	Y
Compliance with ARARs	Y	Y	Y
Long-term Effectiveness	5	5	3
Reduction of Toxicity, Mobility, or Volume	N	N	N
Short-term Effectiveness	3	3	3
Implementability	1	3	3
Net Present Value Cost	$3.4M	$10.0M	$15.1M

5 = least satisfies criterion; 1 = best satisfies criterion; Y = yes, criteria will be met; N = no, criteria will not be met

alternatives, poses very minor risks to personnel. Alternative 3 poses similar risks to workers while implementing the surface water controls. Personal injury and radiation exposure will be minimized through radiological engineering controls and safe work practices to maintain exposures ALARA. An alternative will be protective of the community in the short term as the Tank Farm is not located near a population base and access restrictions will remain in place during the interim action period. All three alternatives will be protective at the time of implementation.

10.1.6 Implementability

All of the proposed alternatives are technically and administratively implementable. None of the alternatives require any special materials, equipment, or personnel that are not readily available at the site. Each of the alternatives can be easily implemented using existing controls along with standard sampling, monitoring, and construction methods that are currently used at the site. Alternative 1 is the easiest to implement since it allows for continuation of the existing activities at the Tank Farm and the INTEC. Alternatives 2 and 3 involve additional monitoring well construction and implementation of surface water controls, which are also readily implemented by personnel at the site. Minor implementability concerns are posed by the underground utilities in and around the Tank Farm while implementing subsurface activities. These risks will be minimized through coordination with operating personnel familiar with the Tank Farm and the adjoining facilities.

10.1.7 Cost

Alternative 1 is the least costly of the proposed Tank Farm interim action alternatives, as it implements current ongoing institutional controls. The cost includes management and oversight, monitoring, analysis and reporting, maintenance, and inspections. Alternatives 2 and 3 both have increased capital and operating and maintenance (O&M) costs over those of Alternative 1 associated with installing monitoring wells, monitoring perched water, and implementing surface water controls. Alternative 3 is the most expensive alternative evaluated because it includes the largest quantity of capital improvements to implement the remedies (i.e., surface grading and drainage improvements). The increased cost for Alternative 3 is reflective of the fact that it provides the greatest overall protection of the three alternatives. The costs for the interim action alternatives are based on an interim action period that ends in 2008. A detailed cost estimate for each alternative is presented in Appendix A of the FS supplement (DOE-ID 1998a).

10.2 Soils Under Buildings and Structures (Group 2)

10.2.1 Overall Protection of Human Health and the Environment

All of the proposed alternatives provide overall protection of human health and the environment during the institutional control period, which ends in 2095. Beyond 2095, only Alternatives 2 and 3 provide long-term protection and satisfy the applicable RAOs. Current workers will be protected by the existing institutional controls proposed in each alternative. Alternative 2 provides long-term protection of human health and the environment by isolating the contaminants with an engineered barrier designed to last for at least 1,000 years and implementing additional institutional controls. The barrier and the additional institutional controls prevent inadvertent exposures to humans or ecological receptors by limiting contaminant accessibility through engineering controls and land use restrictions. The presence of the existing buildings or structures is assumed to provide the functional equivalent of an engineered barrier and will minimize exposures until D&D is completed. Alternative 3 provides the most overall protection of human health and the environment by removing contaminated soils exposed during D&D and disposing them in the proposed ICDF. Removal of the soils will prevent exposure of humans or ecological receptors to soil contaminants. Table 10-2 summarizes the comparative analysis of the Soils Under Buildings and Structures alternatives.

10.2.2 Compliance with ARARs

All of the alternatives meet the ARARs and TBCs during the institutional control period, which ends in 2095. Beyond 2095, only Alternatives 2 and 3 satisfy ARARs. Alternative 2 meets the ARARs using institutional controls and an engineered barrier designed for 1,000 years of protection. Alternative 3 satisfies ARARs through the use of engineering controls while removing the contaminated soils and disposing of the contaminated materials in an engineered disposal facility designed to provide long-term protection of human health and the environment.

10.2.3 Long-term Effectiveness and Permanence

Alternative 1 does not provide any long-term effectiveness or permanence, because the existing institutional controls will end in 2095, and no exposure controls will remain in place. Alternative 2 provides reliable long-term effectiveness and permanence by reducing human or ecological receptor exposure to contaminants beyond 2095. The proposed engineered barrier is designed to provide long-term isolation of these release sites for up to 1,000 years, during which time the residual risk will decrease by natural radioactive decay. Alternative 3 will provide the most long-term effectiveness by removing the contaminated soils exposed during D&D and disposing of them in the proposed ICDF that will be designed for long-term isolation of radioactive materials. The residual risk posed by soils disposed in this engineered disposal facility will naturally decrease by radioactive decay of the short-lived radionuclides.

10.2.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

None of the alternatives reduce the toxicity, mobility, or volume of contaminants through treatment, as treatment is not included in any of the alternatives. Contaminants are indirectly reduced over time by natural radioactive decay under each alternative. Contaminant bioavailability to human and ecological receptors is also reduced by the engineered barrier. Removal and disposal of the soil contaminants in the proposed ICDF will also indirectly reduce the contaminant mobility by long-term contaminant isolation.

Table 10-2. Summary of comparative analyses for the Soils Under Buildings and Structures, Group 2.

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	N	Y	Y
Compliance with ARARs	N	Y	Y
Long-term Effectiveness	5	3	1
Reduction of Toxicity, Mobility, or Volume	N	N	N
Short-term Effectiveness	5	3	5
Implementability	1	1	5
Net Present Value Cost	$6.4M	$9.2M	$8.3M[a]

a. Cost does not include the pro-rata share for construction and operation of the ICDF.

5 = least satisfies criterion; 1 = best satisfies criterion; Y = yes, criteria will be met; N = no, criteria will not be met.

10.2.5 Short-term Effectiveness

Alternative 1 can be implemented without any additional risks to the community, or workers; however, soil contaminants will continue to be accessible to ecological receptors under this alternative. Alternatives 2 and 3 can be implemented without any additional risks to the community, workers, or the environment. Risks to workers and the environment will be increased slightly during barrier construction, or soil excavation, because of worker exposure to contaminated soils, fugitive dust emissions to the environment, and the potential for personal injury accidents. Engineering controls will be used during barrier construction, or soil excavation, to minimize contaminant exposures or releases. Safe work practices will be used to minimize personal injuries. All three alternatives will meet RAOs for the soil pathway during the institutional control period. Alternatives 2 and 3 will be protective at the time of implementation.

10.2.6 Implementability

Alternatives 1 and 2 are technically and administratively feasible and can be easily implemented. Existing institutional controls proposed in Alternative 1 are currently implemented at the site and are easily continued. The additional institutional controls and engineered barrier provided in Alternative 2 have been used at other Superfund sites with similar contaminants and pose no special legal, engineering, or construction concerns. Engineered barrier construction is similar to other types of earthwork, such as highway construction, and requires no special personnel, equipment, or materials. The only significant implementability issue concerns the timing of barrier construction. The barrier cannot be constructed until adjacent buildings or structures have undergone D&D, which may not occur for several decades in the future. Alternative 3 also is readily implemented, but only if the buildings are completely removed during D&D. The timing for implementation of Alternative 3 is also dependent on D&D activities that are projected to extend over the next several decades. In addition, Alternative 3 also depends on the construction of the proposed ICDF.

10.2.7 Cost

Alternative 1 is the least costly of the alternatives because it implements ongoing institutional controls. However, it is also the least protective and effective of the alternatives. Alternative 3 is less costly than Alternative 2, although the cost does not include costs associated with constructing and operating the proposed ICDF. Alternative 2 is the most expensive alternative because of the capital costs involved in constructing the engineered barriers. However, it is easily implemented, effective, and protective of human health and the environment, all of which are reflected in the higher cost. Alternative 3 has the least O&M costs because of the elimination of environmental monitoring costs after the soils are excavated. The O&M costs are based on an institutional control period through the year 2095. A detailed cost estimate for each alternative is presented in Appendix A of the FS supplement (DOE-ID 1998a).

10.3 Other Surface Soils (Group 3)

10.3.1 Overall Protection of Human Health and the Environment

Alternatives 3, 4A, and 4B provide the most overall protection of human health and the environment of the alternatives evaluated because the contaminants will either be permanently isolated or removed and disposed in an engineered disposal facility. Alternatives 1 and 2 temporarily reduce human health risks during the institutional control period, which ends in 2095. However, Alternatives 1 and 2 are not protective of the environment because the contaminants will continue to be accessible to ecological receptors. Alternative 3 provides less overall protection than Alternatives 4A and 4B, since the contaminants cannot be covered in place by an engineered barrier during the operating life of the INTEC. Alternatives 4A and 4B will permanently remove the contaminants from the release sites. Table 10-3 summarizes the comparative analysis of the Other Surface Soils group alternatives.

10.3.2 Compliance with ARARs

All of the alternatives will satisfy the ARARs, except for Alternatives 1 and 2, which will only meet the ARARs during the institutional control period. Alternatives 3, 4A, and 4B will satisfy the ARARs using engineering controls to minimize fugitive dust emissions, health, safety, and radiological practices to limit exposures to workers, long-term containment to isolate the contaminated soils, or soil excavation and disposal to eliminate exposures to humans or the environment.

10.3.3 Long-term Effectiveness and Permanence

Alternatives 1 and 2 do not provide reliable long-term effectiveness or permanence because the existing institutional controls will end in 2095. Land use restrictions limiting land and groundwater use in Alternative 2 will provide some measure of long-term protection if maintained beyond 2095, but these controls may not effectively control potential exposure to contaminants. For Alternatives 1 and 2, natural processes, such as precipitation infiltration, erosion, and biointrusion, may cause a contaminant release to the environment. Containment of contaminated soils using an engineered barrier (Alternative 3) will provide long-term effectiveness and permanence, since the proposed barrier will designed to provide isolation for at least 1,000 years, during which time the residual risk will decrease by radioactive decay. Alternatives 4A and 4B will provide the best long-term protection by excavating contaminated soils to a depth of 3 m (10 ft) and disposing in either an on-Site (the proposed ICDF) or off-Site engineered disposal facility designed for long-term protection and contaminant isolation.

10.3.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 1, 2, 3, and 4A do not reduce the toxicity, mobility, or volume through treatment as no treatment technologies are included in these alternatives. Construction of an engineered barrier under Alternative 3 reduces contaminant mobility by minimizing water that moves through the contaminated soils, reducing leaching and transport of contaminants. Alternatives 4A and 4B limit contaminant mobility at the release site by excavating and disposing of contaminated soils at an engineered disposal site designed to limit contaminant releases to the environment.

Table 10-3. Summary of comparative analyses for the Other Surface Soils, Group 3.

Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4A	Alternative 4B
Overall Protection	N	N	Y	Y	Y
Compliance with ARARs	N	N	Y	Y	Y
Long-term Effectiveness	5	3	3	1	1
Reduction of Toxicity, Mobility, or Volume	N	N	N	Y	Y
Short-term Effectiveness	1	1	3	3	5
Implementability	1	2	3	3	5
Net Present Value Cost	$6.8M	$15.0M	$37.5M	$84.9M	$ 208.4M

5 = least satisfies criterion; 1 = best satisfies criterion; Y = yes, criteria will be met; N = no, criteria will not be met.

10.3.5 Short-term Effectiveness

Alternatives 1 and 2 can be implemented without any additional risks to the community, workers or the environment. Implementing Alternative 1 or 2 will not increase environmental risks that presently exist at the sites. Earthmoving activities associated with Alternatives 3, 4A, and 4B may generate fugitive dust emissions or cause personal injury accidents that pose minor risks to workers or the environment. These risks will be minimized using dust suppressants or other engineering controls, and health, safety, and radiological practices. Transportation of contaminated soils off-Site (Alternative 4B) also poses a minor risk to communities; however, potential exposures due to transportation accidents are considered minimal. Surface soil RAOs will be achieved with all alternatives during the institutional control period. However, only alternatives 3, 4A, and 4B will attain RAOs after the institutional control period. These three alternatives will be protective at the time of implementation.

10.3.6 Implementability

All of the proposed alternatives are technically and administratively feasible because they use proven remedial technologies that are readily available. Alternative 1 is readily implemented because the existing institutional controls are currently ongoing at the site and are easily continued. Alternative 2 is also easily implemented as land use restrictions limiting land and groundwater use are used routinely at Superfund sites. Construction of engineered barriers over the Other Surface Soils release sites, Alternative 3, poses several technical difficulties. Heavy equipment would be required for barrier construction and would be required to operate within an operational radioactive material processing and storage facility without damaging existing tanks, buildings, utilities, or other infrastructure. Continued operation of the INTEC would also be affected significantly due to the presence of these construction activities and the subsequent interference to material handling and traffic flow caused by the barriers.

Alternatives 4A and 4B involve excavation of contaminated soils and either on-Site disposal at the proposed ICDF or treatment and off-Site disposal. Both of these alternatives are implementable as they use standard excavation equipment and disposal at an engineered disposal facility which is similar to a common landfill operation. Alternative 4A will require the procurement, design, and construction of an on-Site soil disposal site southwest of the INTEC facility (see Section 9.3.1.4). Alternative 4B is the most difficult alternative to implement because it requires the removal, treatment, and transportation of large volumes of contaminated soils, great distances off-Site and depends on the availability of off-Site disposal.

10.3.7 Cost

Alternative 1 is the least expensive of the proposed alternatives, but also provides the least long-term effectiveness. Costs increase proportionally for Alternatives 2, 3, 4A, and 4B because of capital cost expenditures, as do the overall protectiveness and effectiveness of each alternative. Alternative 4A, which involves construction design, construction, and operation of an on-Site disposal facility for excavated soils and debris, is designed for INEEL-wide disposal. Alternative 4B, which involves treatment and off-Site disposal, is the most costly alternative. The O&M costs for Alternatives 2, 3, and 4A are based on an institutional control period through the year 2095. A detailed cost estimate for each alternative is presented in Appendix A of the FS supplement (DOE-ID 1998a).

10.4 Perched Water (Group 4)

10.4.1 Overall Protection of Human Health and the Environment

All of the proposed perched water alternatives will provide overall protection of human health and the environment during the institutional control period, which ends in 2095. Alternative 1 will only be protective until 2095. However, excluding Tank Farm contaminant contributions, which are being addressed by OU 3-14, Alternatives 2 and 3 will reduce contaminant flux to the SRPA, resulting in SRPA groundwater MCLs being met. Alternative 2 eliminates exposure to contaminants using land and groundwater use restrictions and minimizing contaminant transport between the surface soils and the SRPA by limiting the available water in the perched zone. The available water will be reduced by closing the existing percolation ponds. Decreased water content in the perched zone will increase the contaminant travel times, allowing for radioactive decay and natural attenuation processes to decrease contaminant concentrations and reduce the residual risk in the perched zone and the SRPA. Alternative 3 only provides minor additional protection of human health and the environment over Alternative 2 by removing contaminant mass and decreasing the water content of the perched zone at an increased rate at contaminant hotspots. Table 10-4 summarizes the comparative analysis of the Perched Water alternatives.

10.4.2 Compliance with ARARs

Alternative 1 does not satisfy the ARARs. Alternatives 2 and 3 meet all of the ARARs if the Tank Farm contaminant contributions are excluded. Plutonium from the Tank Farm soils was predicted to reach the SRPA at concentrations of concern in the future. This predicted migration of plutonium to the aquifer would only occur if current transport assumptions for plutonium isotopes hold true, and no further actions were taken at the Tank Farm (see Section 6 of the RI/BRA for additional information). Remediation of the radionuclide-contaminated soil sources will be addressed in the Tank Farm RI/FS, OU 3-14.

10.4.3 Long-Term Effectiveness and Permanence

Alternative 1 will not provide long-term protection because no active remedial measures will be implemented. The existing institutional controls temporarily reduce human health and environmental risks, but will only be in effect until 2095. After 2095, Alternative 1 provides no long-term protection. Infiltration controls implemented as part of Alternative 2 to control aquifer recharge will provide long-term effectiveness and permanence, prior to and beyond 2095, through restrictions limiting land and

Table 10-4. Summary of comparative analyses for the Perched Water, Group 4.

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	N	Y*	Y*
Compliance with ARARs	N	Y*	Y*
Long-Term Effectiveness	5	1	1
Reduction of Toxicity, Mobility, or Volume	N	N	Y
Short-Term Effectiveness	1	3	5
Implementability	1	3	5
Net Present Value Cost	$7.3M	$20.0M	$259.2M

* = excluding Tank Farm contaminant contributions, reduced contaminant flux to the SRPA will satisfy the MCLs.

5 = least satisfies criterion; 1 = best satisfies criterion; Y = yes, criteria will be met; N = no, criteria will not be met.

groundwater use and by reducing the water available for contaminant transport in the perched zone. Alternative 2 will minimize the perched water contaminant transport rate between the surface soils and the SRPA. Increased transport times will allow for radioactive decay of short-lived radionuclides. Alternative 3 also provides long-term protection of human health and the environment because contaminant transport associated with seepage from the percolation ponds is eliminated. Removing contaminant mass in the perched water and decreasing the water available for contaminant transport by extraction and treatment is not considered effective. Alternative 3 does not provide more overall protection than Alternative 2 because, after recharge sources are eliminated, pumping results in very little water yield and contaminant mass removal.

10.4.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 or 2 do not reduce the toxicity, mobility, or volume of contaminants through treatment, as treatment is not included in these alternatives. Alternative 3 does reduce contaminant volume through treatment by extracting and treating contaminated perched water. Alternatives 2 and 3 indirectly minimize contaminant mobility by reducing the quantity of water available for contaminant transport in the perched zone.

10.4.5 Short-term Effectiveness

All of the alternatives can be implemented without any additional risks to the community, workers, or the environment. Alternative 1 poses no additional risk to workers. Implementation of the aquifer recharge controls and extraction and treatment may pose a slight risk increase by exposure or personal injury to workers performing the construction and treatment activities, but will be mitigated using health and safety plans, radiological controls, and safe work practices. Alternative 1 is protective of human health during the institutional control period, but is not protective of the environment as it doesn't reduce contaminants in the perched water. Alternatives 2 and 3 are protective at the time of implementation, although Alternative 3 might not provide any additional protection in the short-term due to uncertainties of the effectiveness of extraction.

10.4.6 Implementability

All of the alternatives are technically and administratively implementable. None of the alternatives require any special materials, equipment, or personnel that are not readily available at the site or from the local community. Existing institutional controls proposed in Alternative 1 are currently in place at the site and can be easily continued. Alternative 2 is also readily implemented using standard construction methods and requires no special personnel, equipment, or materials. Alternative 2 may pose some implementability challenges, as this alternative requires replacement of the existing percolation ponds, which are currently used by INTEC operations. Alternative 3 also poses additional implementability concerns because of the surface and underground utilities that occur throughout the plant that could be damaged by activities such as installation of perched water extraction wells or construction of holding tanks and transfer lines.

10.4.7 Cost

Alternative 1 is the least expensive alternative evaluated because it only involves continuation of existing institutional controls and perched water monitoring. Conversely, it provides the least overall protection effectiveness and reduction of toxicity, mobility or volume of all the alternatives. Alternative 2 has higher capital costs than Alternative 1 because of the implementation of aquifer recharge controls. The O&M costs for Alternatives 1 and 2 are similar since perched water monitoring will be conducted under each alternative. Alternative 3 is the most costly alternative because it involves construction and operation of perched water extraction wells and a water treatment facility for 25 years. A detailed cost estimate for each Perched Water alternative is presented in Appendix A of the FS supplement (DOE-ID 1998a).

10.5 Snake River Plain Aquifer Interim Action (Group 5)

10.5.1 Overall Protection of Human Health and the Environment

Each of the proposed alternatives temporarily eliminates human health and environmental risks using existing institutional controls. Alternative 1 will not provide human health protection beyond the institutional control period, which ends in 2095. Alternatives 2A, 2B and 3, provide long-term protection through implementation of additional institutional controls such as land use restrictions until groundwater cleanup goals are achieved. These controls would limit land and groundwater use as long as they remain in place. According to conservative groundwater modeling, predictions Alternative 2A may not satisfy MCLs by 2095 (see Figure 10-1). Groundwater monitoring is required to verify that RAOs are achieved. Alternatives 2B and 3 contain contingent active remediation of the SRPA to meet MCLs by 2095, if the COC action level(s) are exceeded. Table 10-5 summarizes the comparative analysis of the SRPA alternatives.

10.5.2 Compliance with ARARs

Alternatives 1 and 2A do not comply with ARARs beyond the institutional control period. Alternatives 2B and 3 are predicted to achieve ARARs before 2095.

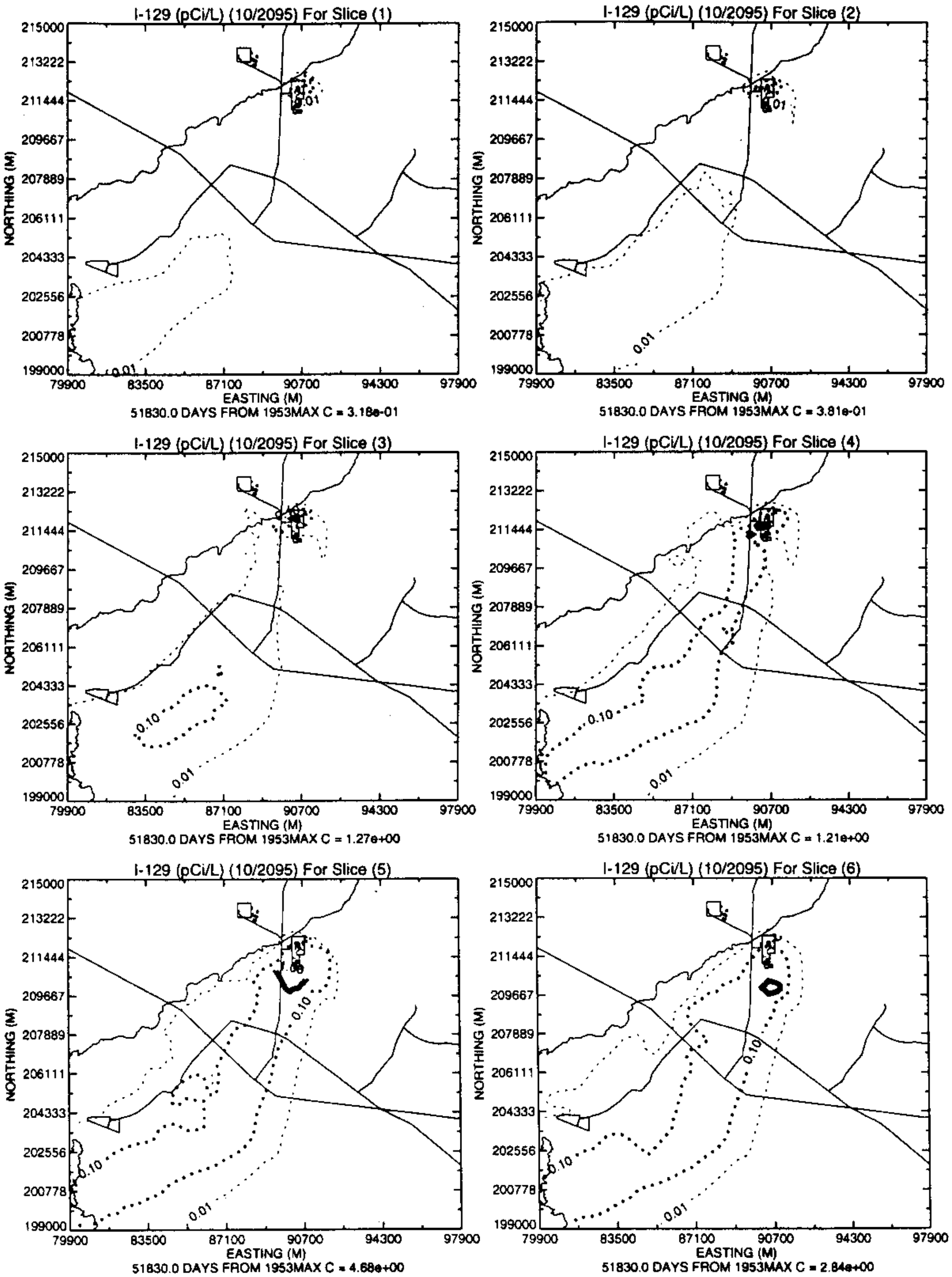


Figure 10-1. Predicted I-129 concentrations for slices 1-10 in 2095.

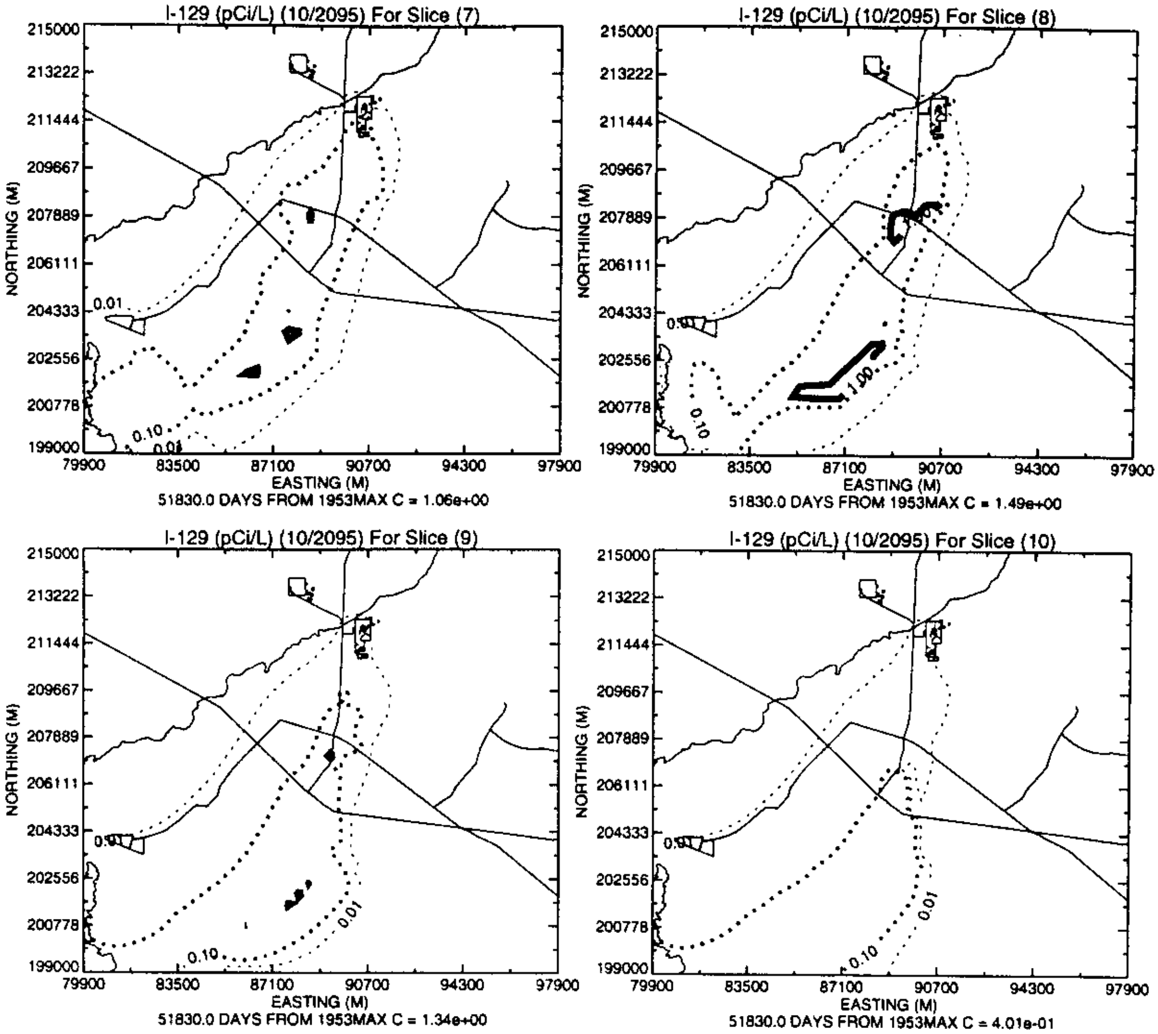


Figure 10-1. (continued).

Table 10-5. Summary of comparative analyses for the Snake River Plain Aquifer Interim Action, Group 5.

Criterion	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3
Overall Protection	N	Y	Y	Y
Compliance with ARARs	N	Y	Y	Y
Long-term Effectiveness	5	3	3	3
Reduction of Toxicity, Mobility, or Volume	N	N	Y	Y
Short-term Effectiveness	1	1	3	3
Implementability	1	1	5	4
Net Present Value Cost	$13.9M	$14.8M	$39.8M	$787.9M

5 = least satisfies criterion; 1 = best satisfies criterion; Y = yes, criteria will be met; N = no, criteria will not be met.

10.5.3 Long-term Effectiveness and Permanence

Alternative 1 does not provide any measure of long-term protection because no remedial actions will be performed, other than existing institutional controls, which end in 2095. Restrictions limiting land and groundwater use proposed in Alternative 2A will provide long-term protection beyond 2095 as long as the restrictions remain in place. Alternative 2A will provide long-term effectiveness by removal of recharge sources under Group 4. Active remediation in Alternatives 2B and 3 will provide long-term effectiveness by removal of COCs from the groundwater. The risk reduction achieved using Alternative 3 does not provide additional long-term benefit compared to Alternative 2A or 2B. Since Alternative 2B achieves the same level of risk reduction at a lower cost, it is considered superior to Alternative 3.

10.5.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2A do not reduce toxicity, mobility, or volume through treatment, as treatment is not included in these alternatives. Alternative 2B reduces both volume and toxicity of contaminants in the SRPA. Alternatives 2B and 3 will reduce contaminant mobility using hydraulic controls and contaminant volume using extraction and treatment.

10.5.5 Short-term Effectiveness

All of the alternatives can be implemented without any additional risks to the community or the environment. Alternatives 2B and 3 pose a minor short-term risk from personal injury to workers during extraction and injection well installation and construction of the treatment facilities. The potential for injury risks will be minimized using health and safety plans and safe work practices. All alternatives provide short-term effectiveness. Alternatives 2B and 3 will be protective by 2095.

10.5.6 Implementability

Alternatives 1 and 2A are technically and administratively implementable. The existing institutional controls are currently implemented at the site and are easily continued. Most of the additional institutional controls proposed under Alternative 2A and 2B have been used at numerous Superfund sites and pose no special implementability concerns. Groundwater extraction, treatment, and injection technologies proposed under Alternatives 2B and 3 pose implementability concerns regarding handling of excessive volumes of extracted water and available groundwater treatment technologies for I-129 and other COCs removal. Groundwater extraction at depths of 183 m (600 ft) can be implemented without any special personnel, equipment, or materials. Alternatives 2B and 3 will also require handling and treatment of millions to billions of gallons of contaminated groundwater. Bench-scale treatability testing may be required to determine the most appropriate treatment and extraction technology for the low concentration contaminants present in the SRPA groundwater. In addition, extraction of contaminated groundwater from the low permeability H-I layer is more technically challenging than aquifer extraction contemplated in Alternative 3.

10.5.7 Cost

Alternative 1 is the least costly of the alternatives evaluated but provides the least overall protection and long-term effectiveness. Alternative 2A is more costly because of additional monitoring costs. Alternatives 2B and 3 cost the most because they include extraction and treatment costs. Alternative 3 extraction and treatment capacity is much larger than 2A, yielding higher costs. Overall protection, long-term effectiveness, and reduction in toxicity, and mobility and volume increase with increased costs. A detailed cost estimate for each alternative is presented in Appendix A of the FS supplement (DOE-ID 1998a).

10.6 Buried Gas Cylinders (Group 6)

10.6.1 Overall Protection of Human Health and the Environment

Alternatives 2 and 3 provide overall protection of human health and the environment. Alternative 1 does not provide overall protection because no effective access controls are in force at these sites. Alternatives 2 and 3 fully satisfy the RAOs for the buried gas cylinder sites. Alternative 3 achieves the RAOs through containment and will be protective for at least 1,000 years. Alternative 3 may be protective beyond 1,000 years, but it was only evaluated for the minimum design life of the barrier. Alternative 2 provides the most overall protection at the buried gas cylinder sites because the hazardous reactive and ignitable gasses will be removed, treated, and disposed in an engineered disposal facility. Table 10-6 summarizes the comparative analysis of the Buried Gas Cylinders alternatives.

10.6.2 Compliance with ARARs

Alternative 1 does not comply with ARARs during the institutional control period. Alternative 2 satisfies all of the ARARs using engineering controls and proper disposal procedures. Alternative 3 complies with all of the ARARs during the barrier's 1,000-year functional design life. Beyond 1,000 years, it is assumed that the waste and the large soil mass comprising the barrier will continue to minimize risks.

10.6.3 Long-term Effectiveness and Permanence

Alternative 1 does not provide any measure of long-term effectiveness or permanence. Alternative 2 will provide the highest degree of long-term effectiveness and permanence. The buried gas cylinders will be removed and treated. The remaining cylinder casings and treatment residue will be disposed in an approved treatment, storage, and disposal facility. Alternative 3 provides a high degree of long-term effectiveness and permanence by containing the waste. The use of the containment barrier would reduce the current risk to human and ecological receptors for the design life of the barrier.

Table 10-6. Summary of comparative analyses for the Buried Gas Cylinders, Group 6.

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	N	Y	Y
Compliance with ARARs	N	Y	Y
Long-term Effectiveness	5	1	3
Reduction of Toxicity, Mobility, or Volume	N	Y	N
Short-term Effectiveness	1	5	3
Implementability	1	3	3
Net Present Value Cost	$6.4M	$1.8M	$8.2M

5 = least satisfies criterion; 1 = best satisfies criterion; Y = yes, criteria will be met; N = no, criteria will not be met.

10.6.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 1 does not reduce the toxicity, mobility, or volume of waste through treatment since treatment is not included in this alternative. Alternative 2 includes treatment to reduce the toxicity, mobility, and volume of the hazardous components in the buried gas cylinders. Alternative 3 does not reduce contaminant toxicity or volume through treatment. Contaminant mobility is reduced through installation of an engineered barrier over the buried gas cylinders, which will minimize contaminant mobility in the event of a release by isolating the cylinders beneath a large mass of earth materials.

10.6.5 Short-term Effectiveness

All of the alternatives can be implemented without any significant additional risk to the community or the environment. The primary risk to the community and the environment from these alternatives involves fugitive dust or toxic air emissions, which will be controlled with dust suppressants and engineering controls. Additional risk may occur to workers while implementing alternatives during characterization, removal, and treatment of the buried gas cylinders. Hazardous gas exposure and occupational injuries will be minimized through the use of personnel trained in industrial hygiene, safe work practices, and health and safety. Alternative 1 provides the greatest degree of short-term effectiveness because remediation will not be conducted to change the current site conditions. Alternative 2 has the least short-term effectiveness because of the possibility for explosion or chemical exposure of workers implementing these alternatives. Alternative 3 poses a minor risk to workers from exposure to hazardous gases and explosive cylinders during placement of the stabilization pad and construction of the engineered barrier. Alternative 1 will not be protective as RAOs will not be achieved. Alternatives 2 and 3 will be protective at the time of implementation.

10.6.6 Implementability

Each of the alternatives retained for detailed analysis is technically and administratively implementable. The necessary personnel, services, and materials are readily available. Alternative 1 only requires a continuation of the existing institutional controls already implemented at the site. Alternative 2 requires specialized construction equipment and materials. Buried compressed gas cylinder retrieval and treatment is an available commercial technology that can be used on the identified contaminants and is readily implemented by a specialty contractor. Alternative 3 is technically and administratively implementable. Alternative 3 requires no specialized construction personnel, equipment, or materials.

Existing institutional controls are currently implemented at the site and are easily continued. Construction of an engineered barrier is similar to other types of earthwork, such as highway construction, and can be readily implemented.

10.6.7 Cost

Alternative 2 is the least costly of the alternatives evaluated, and provides the most overall, long-term protection. Alternatives 1 and 3 are similar in cost and are much more costly than Alternative 2 because these alternatives include 100 years of environmental monitoring, whereas, Alternative 2 does not include environmental monitoring after the buried gas cylinders are removed. Alternative 3 is the most expensive alternative because it includes increased capital costs for constructing an engineered barrier. A detailed cost estimate for each alternative is presented in Appendix A of the FS supplement (DOE-ID 1998a)

10.7 SFE-20 Hot Waste Tank System (Group 7)

10.7.1 Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health and the environment because no active remedial measures will be implemented to limit the threat of contaminant release to the environment. Alternatives 2, 3, and 4 are the only alternatives that fully satisfy the SFE-20 tank system RAOs. Alternative 2 achieves the RAOs through in situ treatment and containment and will be protective for at least 1,000 years. Alternative 2 probably may be protective beyond 1,000 years, but it was only evaluated for the minimum design life of the barrier. Alternatives 3 and 4 provide the greater protection of the SFE-20 tank system alternatives because the radioactive liquids and/or sludges will be removed, treated, and disposed in an engineered disposal facility. Alternative 4 provides the most overall protection of human health and the environment. Table 10-7 summarizes the comparative analysis of the SFE-20 tank system alternatives.

10.7.2 Compliance with ARARs

Alternative 1 does not comply with the ARARs either during the 100-year institutional control period or beyond. Alternative 2 complies with all of the ARARs and TBCs during the barrier's 1,000-year functional design life. Beyond 1,000 years, it is assumed that the solidified waste and the large soil mass comprising the barrier will continue to minimize exposure risks from alpha-emitting radionuclides and satisfy all of the ARARs and TBCs. Alternatives 3 and 4 will satisfy all of the ARARs.

10.7.3 Long-term Effectiveness and Permanence

Alternative 1 does not provide any measure of long-term effectiveness or permanence beyond the institutional control period, which ends in 2095. Alternative 2 provides a high degree of long-term effectiveness and permanence by solidifying and containing the waste. Alternative 3 will provide a high degree of long-term effectiveness and permanence because the tank liquid will be removed, treated and disposed, the tank sludge solidified using grout, and the tank and associated structures filled with grout to prevent future exposures. Alternative 4 will provide the highest degree of long-term effectiveness and permanence because the tank liquid and sludge will be removed, treated, and disposed, and the remaining components of the tank system will be excavated and disposed at the proposed ICDF.

Table 10-7. Summary of comparative analyses for the SFE-20 Tank System, Group 7.

Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Overall Protection	N	Y	Y	Y
Compliance with ARARs	N	Y	Y	Y
Long-term Effectiveness	5	3	3	1
Reduction of Toxicity, Mobility, or Volume	N	Y	Y	Y
Short-term Effectiveness	1	3	5	5
Implementability	1	3	5	5
NPV Cost	$6.4M	$8.7M	$8.5M	$4.6M

5 = least satisfies criterion; 1 = best satisfies criterion; Y = yes, criteria will be met; N = no, criteria will not be met.

10.7.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 1 does not reduce the toxicity, mobility, or volume of waste through treatment since treatment is not included in this alternative. Alternatives 2, 3, and 4 include treatment to reduce the mobility or volume of the radioactive liquid and sludge. The toxicity of the radionuclides is not directly reduced by any of these alternatives.

10.7.5 Short-term Effectiveness

All of the alternatives can be implemented without any significant additional risk to the community or the environment. The primary risk to the community and the environment from these alternatives involves fugitive dust or toxic air emissions, which will be controlled with dust suppressants and engineering controls. Additional risk may occur to workers while implementing the alternative because of radiation exposure during characterization, removal, and treatment of the tank liquids and sludges.

External radiation exposure and occupational injuries will be minimized through the use of personnel trained in radiological controls, safe work practices, and health and safety plans to maintain exposures ALARA. Alternative 1 provides the greatest degree of short-term effectiveness because remediation is not required and will prevent worker-exposure. Alternative 2 poses a minor risk to workers from direct exposure to radiation during grouting of the tank system and construction of the barrier. Alternative 3 and 4 have the least short-term effectiveness because of the higher possibility for external radiation exposure of workers implementing these alternatives. Alternative 1 will be protective during the institutional control period only. Alternatives 2, 3, and 4 will be protective at the time they are implemented.

10.7.6 Implementability

Each of the alternatives retained for detailed analysis is technically and administratively implementable and the necessary personnel, services, and materials are locally available. Alternative 1 is readily implemented, as it requires no change in the existing operations and conditions at the site. Alternative 2 requires no specialized construction equipment or materials. Grouting is a common technology that is routinely used to isolate wastes and is readily implemented. An engineered barrier is also a demonstrated remediation technology that uses standard earth moving methods for construction.

Barriers are routinely used to control exposures and leaching and transport of contaminants. Barriers have been used at numerous Superfund sites. Alternatives 3 and 4 are more difficult to implement than Alternatives 1 and 2 because of the potential for construction workers to be exposed to radiation or occupational injury during the characterization, removal, handling, treatment, or disposal of the tank liquids, sludges, and other components. Engineering controls, health and safety plans, radiation controls, and safe work practices will be used to minimize radiation exposure and reduce personal injury. Treatment of similar tank liquids at the PEW evaporator is routinely conducted and would be reliable for these alternatives. Solidification of the tank system is readily implemented, as grouting is a demonstrated technology that has been used at numerous Superfund sites.

10.7.7 Cost

Alternative 4 is the least costly of the alternatives evaluated for the SFE-20 tank system, and it provides the most long-term effectiveness of the alternatives. Alternatives 1, 2, and 3 are similar in total costs but vary slightly in capital costs. Alternative 4 is much less expensive than the other alternatives because Alternative 4 does not include long-term environmental monitoring for the 100-year institutional control period. Alternatives 2 and 3 cost essentially the same because of higher capital costs. Alternative 2 is the most expensive alternative because it includes capital costs for grouting the tank system and constructing an engineered barrier. A detailed cost estimate for each alternative is presented in Appendix A of the FS supplement (DOE-ID 1998a).

10.8 Modifying Criteria

The modifying criteria, state and community acceptance, are used in the final evaluation of remedial alternatives. For both of these criteria, the factors include the elements of the alternatives that are supported, the factors of the alternatives that are not supported, and the elements of the alternatives that have strong opposition.

10.8.1 State Acceptance

The IDHW has been involved in the development and review of the OU 3-13 RI/FS report, the Proposed Plan (DOE-ID 1998b), and this ROD. All comments received from IDHW on these documents have been resolved and incorporated into these documents accordingly. In addition, IDHW has participated in public meetings where public comments and concerns have been received and responses offered.

The IDHW concurs with the selected remedial alternatives for the sites contained in this ROD and is signatory to the ROD with DOE and EPA.

10.8.2 Community Acceptance

Community participation in the remedy selection process and Proposed Plan reviews includes participation in the public meetings held November 16 through 19, 1998. Community acceptance is summarized in the Responsiveness Summary presented as Appendix A of this document. The Responsiveness Summary includes comments received either verbally or in writing from the public, and the Agencies' responses to these comments. A total of about 55 people not associated with the project attended the Proposed Plan public meetings. The community was generally supportive of the proposed remedial actions. All comments received on the Proposed Plan were considered during the development of this ROD.

11. SELECTED REMEDY

Based on consideration of the requirements of CERCLA, the detailed analysis of alternatives, and public comments, the Agencies have selected the following alternatives for the OU 3-13 release site groups described in this ROD.

11.1 Descriptions of the Selected Remedies

The Agencies have selected a remedy for each release site group based on the alternative analyses presented in the FS (DOE-ID 1997a) and FS supplement (DOE-ID 1998a). For two of the groups, the Tank Farm Soils release sites (Group 1), and the Snake River Plain Aquifer (Group 5), the remedy selected is an interim action. Insufficient data currently exist to fully determine the impact of the Tank Farm contaminated soils to the SRPA and to determine the most cost effective remedial action alternatives. Although the action selected for the SRPA is complete for groundwater outside the current INTEC security fence, further investigation is required to evaluate the appropriate remedial alternatives for contaminated SRPA groundwater directly beneath the INTEC facility. Therefore, the Group 5 Remedial Action is considered interim.

Each of the selected remedies relies, in part, on Institutional Controls. Table 11-1, lists the type of controls that will be implemented for each Group and release site where contamination remains at levels that result in use or access restrictions to prevent an imminent and substantial endangerment to public health or the environment. In general, institutional controls will be designed to limit site access to an annual duration such that exposure to radionuclides and other Contaminants of Concern do not result in an imminent and substantial endangerment to public health or the environment. For each source area, calculations will be performed as part of Remedial Design to determine acceptable dose-based action levels that correspond to the risk-based concentrations identified in Section 8. This information will, at a minimum be noticed to all affected federal, state and local governmental agencies.

For those source areas representing a moderate exposure risk, controls in addition to administrative actions are required. Warning signs will be installed and maintained to warn intruders of the risks of remaining in an area longer than the posted duration. In those cases where only a brief exposure would result in an unacceptable risk and a high risk of exposure exists and active controls like fencing are required in addition to warning signs and administrative controls. The potential exposure threats would be to unauthorized trespassers if current DOE radiological site controls were no longer applied.

The evaluation of exposure duration necessary to represent an unacceptable risk is consistent with the approach used for the Baseline Risk Assessment. The identification of low, moderate and high potential exposure risk will be made in the Remedial Design, consistent with the current and future land use assumptions identified in the Baseline Risk Assessment and in this ROD. For example, if less than a day exposure would represent an unacceptable risk to a trespasser (high-risk potential) the requirement for fencing, warning signs, and administrative controls would be necessary. Conversely, the "No Further Action" Sites would require years of exposure to result in a potential unacceptable hazard and hence, only administrative controls are necessary to be protective.

The effectiveness of the Institutional Controls will be periodically evaluated during 5-year reviews and modified as necessary to meet RAOs. The INEEL Land Use Plan will serve as the tracking mechanism to identify, at a minimum, all CERCLA land areas at INEEL under restriction or control. This planning document may itself become a part of an INEEL Stewardship Plan or equivalent, but any modifications to the INEEL Land Use Plan will be consistent with the requirements of this ROD.

Table 11-1. Institutional controls for OU 3-13 ROD.

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
1—Tank Farm Soils Interim Action	Current DOE operations until final action implemented	Industrial—radiologically controlled area.	Radionuclides and metals Moderate exposure threat	Prevent intrusion into underlying contaminated soils, except for, approved activities pursuant to the FFA/CO. Limit access to only authorized personnel and/or DOE certified radiation workers.	Visible access restrictions (warning signs, provide copies of surveyed maps). Control of activities (drilling or excavating). Publish surveyed boundaries and description of controls in INEEL Land Use Plan.	FFA/CO, 10 CFR 835, "Radiological Worker Protection," DOE Order 5400.5, "Radiation Protection of the Public," ALARA 40 CFR Part 300.	**Periodic inspections by DOE and IDHW/EPA reviews. Frequency to be determined in the remedial action work plan.** ***Note: The Interim Action is expected to last for less than 10 years and be replaced by the final action, OU 3-14.***
2a—Soils Under Buildings and Structures (cap-in-place)	Current DOE operations prior to D&D of building	Industrial—radiologically controlled area.	Radionuclides and metal Low exposure threat	Limit access to only authorized personnel and/or DOE certified radiation workers.	Visible access restrictions (warning signs, provide copies of surveyed maps). Control of activities (drilling or excavating). Publish surveyed boundaries and description of controls in INEEL Land Use Plan.	FFA/CO, 10 CFR 835, "Radiological Worker Protection," DOE Order 5400.5, "Radiation Protection of the Public," ALARA 40 CFR Part 300.	**Require state/EPA notice prior to start of building D&D.** **Periodic inspections by DOE and IDHW/EPA reviews. Frequency to be determined in the remedial action work plan.** ***Note: Building demolition will be performed outside scope of ROD.***

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	Current DOE operations after building D&D-contamination left in place	Industrial landfill—no unauthorized intrusion into capped area. FFA/CO approved O&M activities authorized.	Radionuclides and metal Low exposure threat	Limit direct exposure to underlying radiologically contaminated soil areas by public to <1E-4 risk through shielding provided by building. Limit water recharge activities adjacent to Group 2 buildings. Maintain integrity of cap.	Visible access restrictions (warning signs, provide copies of surveyed maps). Control of activities (drilling or excavating). Publish surveyed boundaries and description of controls in INEEL Land Use Plan. Notice to affected stakeholders (e.g., BLM, F&W, ShoBan Tribal Council, local county governments; State and EPA), including notice of any change in land use designation, restriction, land users or activities.	FFA/CO, 10 CFR 835, "Worker Protection," DOE Order 5400.5, "Radiation Protection of the Public," ALARA 40 CFR Part 300 CERCLA 120(h).	Periodic inspections and reviews. Frequency to be determined in the Remedial Action Work Plan.
	DOE control post operations	Landfill—no unauthorized intrusion into capped area. FFA/CO approved O&M activities authorized.		Maintain integrity of cap.	Visible access restrictions (warning signs). Control of activities (drilling or excavating) Notice to affected stakeholders (e.g., BLM, F&W, ShoBan Tribal Council, local county governments; State and EPA), including notice of any change in land use designation, restriction, land users or activities. Property lease requirements including requirements for control of land-use consistent with the ROD.	FFA/CO, CERCLA Section 120(h)(5),[1] Hall Amendment Section 3154 of the National Defense Authorization Act,[2] DOE order 5400.5, "Property Release Restrictions."	5-year review until determined to not be needed.

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	Post DOE control	Landfill—no unauthorized intrusion into capped area. FFA/CO approved O&M activities authorized.		Maintain integrity of cap.	Notice to affected stakeholders (e.g., BLM, F&W, ShoBan Tribal Council, local county governments; State and EPA), including notice of any change in land use designation, restriction, land users or activities. Property transfer requirements including Finding of suitability to transfer and requirements for control of land-use consistent with the ROD.	FFA/CO, CERCLA Section 120(h)(3),[3] CERCLA Section 120(h)(3)(C)(ii),[4] CERCLA Section 120(h)(3)(A)(iii),[5] CERCLA Section 120(h)(1)-(3),[6] CERCLA Section 120(h)(4),[7] 43 CFR 2372.1,[8] 43 CFR 2374.2,[9] 41 CFR 101-47.202-1,-2,-7,[10] DOE order 5400.5 property release restrictions.	5-year review until determined to not be needed.
2b—Soils Under Buildings and Structures (remaining after removal to and disposal in ICDF)	Current DOE operations	Industrial.	Contaminants removed to 10 ft.	Ensure land-use is appropriate if contamination left in-place >10 ft.	Review and control of activities as applicable.	OU3-13 ROD, FFA/CO, 10 CFR 1021 NEPA Review of Activities.	5-year review until determined to not be needed including review of land use assumptions (OSWER Directive 9355.7-02A) (Supplemental Five-year Review Guidance).
	DOE control post operations	Industrial.	Contaminants removed to 10 ft.	Ensure land-use is appropriate if contamination left in-place >10 ft.	Property lease requirements including requirements for control of land-use consistent with the ROD.	OU3-13 ROD, FFA/CO, 10 CFR 1021 NEPA Review of Activities, CERCLA Section 120(h)(5),[1] Hall Amendment Section 3154 of the National Defense Authorization Act[2] DOE Order 5400.5, "Property Release Restrictions."	5-year review until determined to not be needed including review of land use assumptions.

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	Post DOE control	Industrial to 2095, residential after 2095.	Contaminants removed to 10 ft.	Ensure land-use is appropriate if contamination left in-place >10 ft.	Property transfer requirements including Finding of suitability to transfer and requirements for control of land-use consistent with the ROD.	OU 3-13 ROD, FFA/CO, CERCLA Section 120(h)(3),[3] CERCLA Section 120(h)(3)(C)(ii),[4], CERCLA Section 120(h)(3)(A)(iii),[5] CERCLA Section 120(h)(1)-(3),[6] CERCLA Section 120(h)(4),[7] 43 CFR 2372.1,[8] 43 CFR 2374.2,[9] 41 CFR 101-47.202-1,-2,-7,[10] DOE Order 5400.5, "Property Release Restrictions."	5-year review until determined to not be needed including review of land use assumptions.
3a—ICDF	Same as 2a						
3b—Other Soil Site (contamination remaining at depth >10ft after removal to and disposal in ICDF)	Same as 2b						
4—Perched Water	Current DOE operations	Industrial.		Prevent consumption and use of >MCL &/or >1E-04 risk drinking water.	Control of activities (drilling of wells for drinking).	DOE-ID directive limiting access to prevent groundwater use while INTEC operations continue, and to restrict future groundwater use (through noticing this restriction to local county governments, ShoBan Tribal council, GSA, BLM, etc.) including site access restrictions, and drilling restrictions.	5-year review until determined to not be needed.

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	DOE control post operations	Industrial.		Prevent consumption and use of >MCL &/or >1E-04 risk drinking water.	Control of activities (drilling of wells for drinking). Property lease requirements including finding of suitability to transfer and requirements for control of activities.	OU3-13 ROD, CERCLA Section 120(h)(5),[1] Hall Amendment Section 3154 of the National Defense Authorization Act.[2] DOE-ID directive limiting access to prevent groundwater use while INTEC operations continue, and to restrict future groundwater use (through noticing this restriction to local county governments, ShoBan Tribal council, GSA, BLM, etc.) including site access restrictions, and drilling restrictions.	5-year review until determined to not be needed.

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	Post DOE control (>2095)	Residential.		Prevent drilling through contaminated interbeds and dragging contamination downhole to the SRPA.	Property transfer requirements including finding of suitability to transfer and requirements for control of activities consistent with ROD.	FFA/CO, CERCLA Section 120(h)(3),[3] CERCLA Section 120(h)(3)(C)(ii),[4] CERCLA Section 120(h)(3)(A)(iii),[5] CERCLA Section 120(h)(1)-(3),[6] CERCLA Section 120(h)(4),[7] 43 CFR 2372.1,[8] 43 CFR 2374.2,[9] 41 CFR 101-47.202-1,-2,-7.[10] DOE-ID directive limiting access to prevent groundwater use while INTEC operations continue, and to restrict future groundwater use (through noticing this restriction to local county governments, ShoBan Tribal council, GSA, BLM, etc.) including site access restrictions, and drilling restrictions.	5-year review until determined to not be needed including review of land use assumptions
5—Snake River Plain Aquifer - outside INTEC 1999 fence line	Current DOE Operations	Industrial.		Prevent consumption and use of >MCL &/or >1E-04 risk drinking water.	Control of activities (drilling of wells for drinking).	FFA/CO	5-year review until determined to not be needed.

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	DOE control post operations -applies up to 2095	Industrial.		Prevent consumption and use of >MCL &/or >1E-04 risk drinking water.	Control of activities (drilling of wells for drinking). Property lease requirements including finding of suitability to transfer.	OU3-13 ROD, FFA/CO, CERCLA Section 120(h)(5),[1] Hall Amendment Section 3154 of the National Defense Authorization Act.[2] DOE-ID directive limiting access to prevent groundwater use while INTEC operations continue, and to restrict future groundwater use (through noticing this restriction to local county governments, ShoBan Tribal council, GSA, BLM, etc.) including site access restrictions, and drilling restrictions.	5-year review until determined to not be needed.

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	Post DOE control - applies up to 2095	Industrial (residential after 2095).		Prevent consumption and use of >MCL &/or >1E-04 risk drinking water (NA after 100 years).	Property transfer requirements including finding of suitability to transfer (NA after 100 years).	OU3-13 ROD, FFA/CO, CERCLA Section 120(h)(3),[5] CERCLA Section 120(h)(3)(C)(ii),[4] CERCLA Section 120(h)(3)(A)(iii),[5] CERCLA Section 120(h)(1)-(3),[6] CERCLA Section 120(h)(4),[7] 43 CFR 2372.1,[8] 43 CFR 2374.2,[9] 41 CFR 101-47.202-1,-2,-7.[10] DOE-ID directive limiting access to prevent groundwater use while INTEC operations continue, and to restrict future groundwater use (through noticing this restriction to local county governments, ShoBan Tribal council, GSA, BLM, etc.) including site access restrictions, and drilling restrictions.	5-year review until determined to not be needed.
6a—Buried Cylinders[11] (removal)	Current DOE operations	Industrial.		Prevent access to sites except by authorized workers.	Visible access restrictions (warning signs, provide copies of surveyed maps)	FFA/CO, 10 CFR 835 "Worker Protection"	Periodic inspection until remediation is complete.
	Post-remediation	Unrestricted.		NA- to be remediated.			

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	Current DOE operations after cap construction—contamination left in place	Industrial landfill—no unauthorized intrusion into capped area. FFA/CO approved O&M activities authorized.		Limit water recharge activities adjacent to Group 2 buildings. Maintain integrity of cap.	Visible access restrictions (warning signs, provide copies of surveyed maps). Control of activities (drilling or excavating). Publish surveyed boundaries and description of controls in INEEL Land Use Plan. Notice to affected stakeholders (e.g., BLM, F&W, ShoBan Tribal Council, local county governments; State and EPA), including notice of any change in land use designation, restriction, land users or activities.	FFA/CO, 10 CFR 835, "Worker Protection."	Periodic inspections and reviews. Frequency to be determined in the Remedial Action Work Plan.
	DOE control post operations	Landfill—no unauthorized intrusion into capped area. FFA/CO approved O&M activities authorized.		Maintain integrity of cap.	Visible access restrictions (warning signs). Control of activities (drilling or excavating) Notice to affected stakeholders (e.g., BLM, F&W, ShoBan Tribal Council, local county governments; State and EPA), including notice of any change in land use designation, restriction, land users or activities. Property lease requirements including requirements for control of land-use consistent with the ROD.	FFA/CO, CERCLA Section 120(h)(5),[1] Hall Amendment Section 3154 of the National Defense Authorization Act,[2] DOE order 5400.5, "Property Release Restrictions."	5-year review until determined to not be needed.

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
	DOE control post operations	Landfill—no unauthorized intrusion into capped area. FFA/CO approved O&M activities authorized.		Maintain integrity of cap.	Visible access restrictions (warning signs). Control of activities (drilling or excavating) Notice to affected stakeholders (e.g., BLM, F&W, ShoBan Tribal Council, local county governments; State and EPA), including notice of any change in land use designation, restriction, land users or activities. Property lease requirements including requirements for control of land-use consistent with the ROD.	FFA/CO, CERCLA Section 120(h)(5),[1] Hall Amendment Section 3154 of the National Defense Authorization Act,[2] DOE order 5400.5, "Property Release Restrictions."	5-year review until determined to not be needed.
	Post DOE control	Landfill—no unauthorized intrusion into capped area. FFA/CO approved O&M activities authorized.		Maintain integrity of cap.	Notice to affected stakeholders (e.g., BLM, F&W, ShoBan Tribal Council, local county governments; State and EPA), including notice of any change in land use designation, restriction, land users or activities. Property transfer requirements including Finding of suitability to transfer and requirements for control of land-use consistent with the ROD.	FFA/CO, CERCLA Section 120(h)(3),[3] CERCLA Section 120(h)(3)(C)(ii),[4] CERCLA Section 120(h)(3)(A)(iii),[5] CERCLA Section 120(h)(1)-(3),[6] CERCLA Section 120(h)(4),[7] 43 CFR 2372.1,[8] 43 CFR 2374.2,[9] 41 CFR 101-47.202-1,-2,-7,[10] DOE order 5400.5 property release restrictions.	5-year review until determined to not be needed.
7—Hot Waste Tank System Prior to Excavation[11]	Current DOE operations	Industrial.		Same as 1.			

Table 11-1. (continued).

Group or Source Area	Time Frame	Land Restriction	COCs/and Exposure Threat	Objective	Controls	Regulatory Basis/Authority	Surveillance to Assure Controls in-place
"No Further Action" (NFA) Sites	DOE control post operations	Industrial radiological controlled.		Control land use as protective and consistent with NFA determination.	Property lease requirements including requirements for control of land-use consistent with the ROD.	FFA/CO, CERCLA Section 120(h)(5),[1] Hall Amendment Section 3154 of the National Defense Authorization Act,[2] DOE Order 5400.5, "Property Release Restrictions."	5 year review until determined to not be needed.
	Post DOE control	Industrial to 2095, residential following 2095.		Control land use as protective and consistent with NFA determination.	Property transfer requirements including Finding of suitability to transfer and requirements for control of land-use consistent with the ROD	FFA/CO CERCLA Section 120(h)(3),[3] CERCLA Section 120(h)(3)(C)(ii),[4] CERCLA Section 120(h)(3)(A)(iii),[5] CERCLA Section 120(h)(1)-(3),[6] CERCLA Section 120(h)(4),[7] 43 CFR 2372.1,[8] 43 CFR 2374.2,[9] 41 CFR 101-47.202-1,-2,-7,[10] DOE Order 5400.5, "Property Release Restrictions."	5 year review until determined to not be needed.

1. Notification to states of leases involving contamination.
2. Request concurrence of EPA on leases of NPL sites.
3. Statement in deed that remedial action is complete.
4. If remedial action is not complete, restrictions, response, guarantee, and schedule, budget assurances to be included in deed.
5. Clause allowing U.S. access to property to be included in deed.
6. Notice of information on hazardous substance to be included in deed.
7. Identify uncontaminated parcels of land.
8. Notice of intent to relinquish to DOI with contamination information and protection needs.
9. Transfer to DOI should indicate continuation of DOE responsibility.
10. Report on contamination information and allowed land-use.
11. Use is unrestricted after remediation activities, and institutional controls do not apply.

Periodic institutional control monitoring reports will be prepared as part of the RD/RA submissions, in compliance with the EPA Region 10 policy on the use of Institutional Controls at Federal Facilities. The first monitoring report will be submitted within 6 months of ROD signature. The monitoring reports will be submitted annually thereafter. A brief synopsis of the required institutional controls is also provided in the Group-specific selected remedy descriptions below.

Legacy waste that was generated as a result of previous sampling activities under WAG 3 RI/FS [i.e., investigation derived waste (IDW)] and removal actions will be disposed in the ICDF. Wastes from OU 3-13 RD/RA activities and IDW will be temporarily managed within the WAG 3 AOC under the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553 Temporary Units and 40 CFR 264.554 Remediation Waste Staging Piles). By managing the wastes in the AOC, placement will not be triggered. The wastes will be managed in temporary units and remediation waste staging piles until the ICDF is available to receive then. Wastes treated in temporary units may be subject to LDRs. The final disposition of these wastes will be in the ICDF. The anticipated wastes include: soil cuttings, well purge water, personnel protective equipment, decontamination wastes, and bulk soils and debris.

This ROD also recognizes that contaminated soil sites addressed under this ROD may be disturbed through maintenance or upgrade activities associated with INTEC operations during the period before the CERCLA remedies are fully implemented. These contaminated soils will be considered CERCLA remediation waste, as the removal and subsequent storage or disposal of any contaminated soil represents progress toward cleanup.

For the purpose of selecting final surface soil remedial actions, the WAG 3 AOC (consisting of an area extending across all contaminated soils at WAG 3, as shown in Figure 1-10) will be considered a CERCLA AOC. The AOC allows for the flexibility in moving and staging noncontiguous soils while implementing selected remedial alternatives.

11.1.1 Tank Farm Soils Interim Action (Group 1)

A final remedial action selection decision concerning the Tank Farm Soils release sites has been postponed and will be developed following additional site characterization, risk analysis, and remedial alternative evaluation, which will be presented in a separate OU 3-14 RI/FS. An interim action is selected at the Tank Farm until a final decision is made by the Agencies. The remedy selected for the Tank Farm Soils Interim Action is Alternative 3—Institutional Controls with Surface Water Control. This alternative will assure that public exposure to the contaminated soils will be prohibited and will install engineering controls to reduce water infiltrating into the contaminated Tank Farm soils. Institutional controls include: warning signs; administrative controls to restrict access; inspection and maintenance for the duration of the interim action, projected to last 8 years or until a final risk management decision is made and implemented by the Agencies.

The interim remedy for controlling surface water infiltration includes: surface water run-on diversion channels sized to accommodate a 1 in 25 year, 24 hour storm event; grading and surface sealing the Tank Farm soils or covering the Tank Farm sufficient to divert 80% of the precipitation falling atop the Tank Farm soils area; and exterior building drainage improvements to direct water away from the contaminated areas so that moisture infiltration is minimized and contaminants are not mobilized. The diverted run-on water will be managed as part of the existing surface water drainage management system. Run-off water from the sealed Tank Farm soils will be collected and managed in a lined evaporation pond with leak detection. The evaporation pond will be constructed and used as a best management practice to reduce infiltration in the INTEC area. It will also contain the Tank Farm run-off in the event of an unplanned spill or release.

The goal of this action is to significantly reduce surface water infiltration into Tank Farm soils. Reducing surface water infiltration into these contaminated soils is expected to limit leaching and transport of soil contaminants to the perched water and reduce available water in the perched zone. INTEC-wide monitoring will be performed during the interim action period to evaluate potential changes in water content and quality in the perched water and SRPA, if they occur.

The selected remedy provides an interim solution that reduces the potential for further soil contaminant leaching and transport to the perched water, reduces the available water in the perched zone beneath the Tank Farm, and potentially minimizes further water quality impacts. The Agencies believe this interim action will be protective of human health and the environment while the OU 3-14 Tank Farm RI/FS is being performed. Further, this action will comply with ARARs, be cost effective, and be consistent with the final Tank Farm remedy and the Idaho High Level Waste and Facility Disposition Environmental Impact Statement (HLW & FD EIS) currently being conducted.

11.1.2 Soils Under Buildings and Structures (Group 2)

The selected remedy for the Soil Under Buildings and Structures is Alternative 2—Institutional Controls with Containment. Alternative 2 is a deferred action and consists of implementing institutional controls and soil excavation or capping. The institutional controls include: warning signs and administrative controls to restrict access to the contaminated soils. For those areas capped in place, additional institutional controls will be instituted to prevent future disturbance of the caps. This action assumes that the contaminated soils are currently contained in place due to the presence of the existing buildings and structures. The operation and subsequent demolition of these buildings and structures are outside the scope of this action. However, upon completion of D&D, an evaluation will be performed by the Agencies to determine if the soils, to a minimum depth of 10 ft bgs, contain contaminants exceeding the action levels specified in Table 8-1 of this ROD. If these action levels are exceeded, then the Agencies will either cap these soils in place in compliance with the substantive requirements of the hazardous waste landfill closure requirements or excavate and manage the soils as a Group 3 soil, as described below. If the buildings are demolished and closed in-place as a landfill under the D&D program, an assessment will be performed by the CERCLA program to evaluate the effectiveness of D&D containment to meet the Group 2 RAOs and remediation goals, specified in Section 8. The D&D containment structure would be augmented, as necessary, to meet these goals.

Prior to D&D, and in addition to the institutional controls described above, a process will be established as part of the Group 2 Remedial Design Work Plan, to review the effectiveness of the building(s) as aids in limiting infiltration through the underlying contaminated soils. This evaluation will consist of the following periodic steps being taken:

1. Review Operations maintenance of each building to be sure the buildings are kept in a protective configuration.

2. Examine roof drains/surface drainage system to determine if water is percolating into the contaminated soils or is being diverted somewhere else.

3. Monitor building or structure perimeter to determine if (based on drainage patterns) there is enough moisture to exceed the field capacity of the soils. Determine how much seepage into the soil poses a problem.

4. If there is a seepage problem, upgrade drainage patterns and perform surface modifications as necessary.

The final building or structure and release site configuration will be assessed under the Group 2 CERCLA program to determine if the building or structure will perform as an equivalent engineered barrier. Criteria for this evaluation will be developed during RD/RA.

Alternative 2 is selected because it best meets the balancing criteria of Implementability and short-term effectiveness, given that Alternative 3 is dependent upon the removal of the buildings and structures to be cost-effective. The Agencies believe the selected alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

11.1.3 Other Surface Soils (Group 3)

The selected remedy for Group 3, Other Surface Soils is Alternative 4A —Removal and On-Site Disposal. Alternative 4A consists of excavating contaminated surface soils and backfilling with sufficient clean soils to reduce the risk from external exposure to $< 1 \times 10^{-4}$. Sites will be backfilled and graded for erosion control. Depending on the extent of soil removal at individual release sites, institutional controls will be terminated at each site.

The excavated material will be disposed on-Site or off-Site. On-Site disposal will be an on-Site engineered landfill, the ICDF. The ICDF will be constructed under this alternative. Off-Site disposal will be in accordance with the Off-Site Rule (40 CFR 300.440). Prior to excavation, the life cycle cost effectiveness of on- or off-site disposal and compliance with DOE policy will be evaluated to determine where to dispose the excavated soils.

Based on currently available cost information, all Group 3 soils will be disposed in the ICDF. This approximately 80 acre area (including a buffer zone) will be engineered to be TSCA/RCRA-compliant for the purpose of final placement of WAG 3 CERCLA soils. The ICDF will also be designed to function as an INEEL-wide disposal facility to accommodate disposal of CERCLA soils and debris from other WAGs. A Staging, Storage, Sizing, and Treatment Facility (SSST) will also be constructed and operated to prepare CERCLA wastes (i.e., soils, debris, and aqueous wastes, such as purge and decontamination waters), as necessary, for disposal in the ICDF. It is anticipated that this facility will consist of a storage/staging building, an evaporation pond or equivalent surface impoundment, a waste shredder, solidification/stabilization treatment tanks, and associated systems. The evaporation pond will be designated as a Corrective Action Management Unit (CAMU). The evaporation pond will be designed and constructed to treat ICDF leachate and other aqueous wastes generated during operations. .

The ICDF will be a modular design, containing up to six cells, with a total capacity of 466,000 m^3 (510,000 yd^3). Cells will be constructed as needed. Contaminated soils will be permanently contained in this engineered facility designed for long-term protection of human health and the environment. Institutional controls will be maintained at the ICDF as long as necessary to ensure long-term protection.

The ICDF will reduce the overall areal extent of soil contamination at INTEC and the INEEL, and will achieve cost savings relative to off-INEEL disposal, or on-site management, because the soils will be managed in a central facility. Selection of this alternative implements design and construction of the initial cells of the ICDF sufficient to contain the Group 3 soils.

- Figure 11-1 provides a schematic cross-section of the ICDF facility. A conceptual cross section of an engineered barrier, with an expected 1,000-year design life (i.e., Hanford Barrier), that may be used to cap the ICDF at closure is presented in Figure 11-2. ICDF design, construction, operation, and closure objectives include: Construct the ICDF complex which will include an engineered facility meeting Idaho Hazardous Waste Management Act (HWMA), RCRA Subtitle C, and polychlorinated biphenyl (PCB) landfill design and

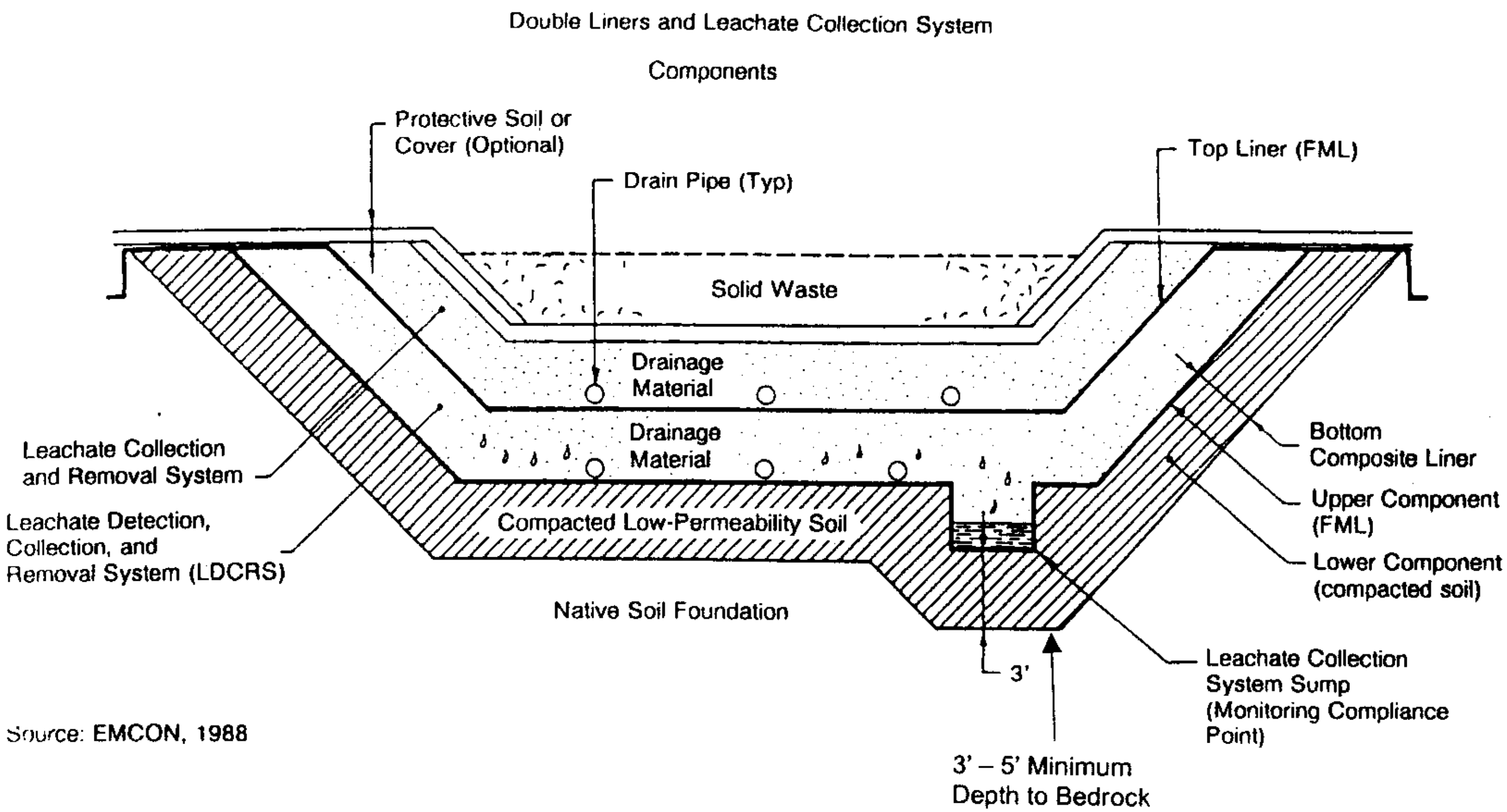


Figure 11-1. Schematic cross-section of the ICDF facility.

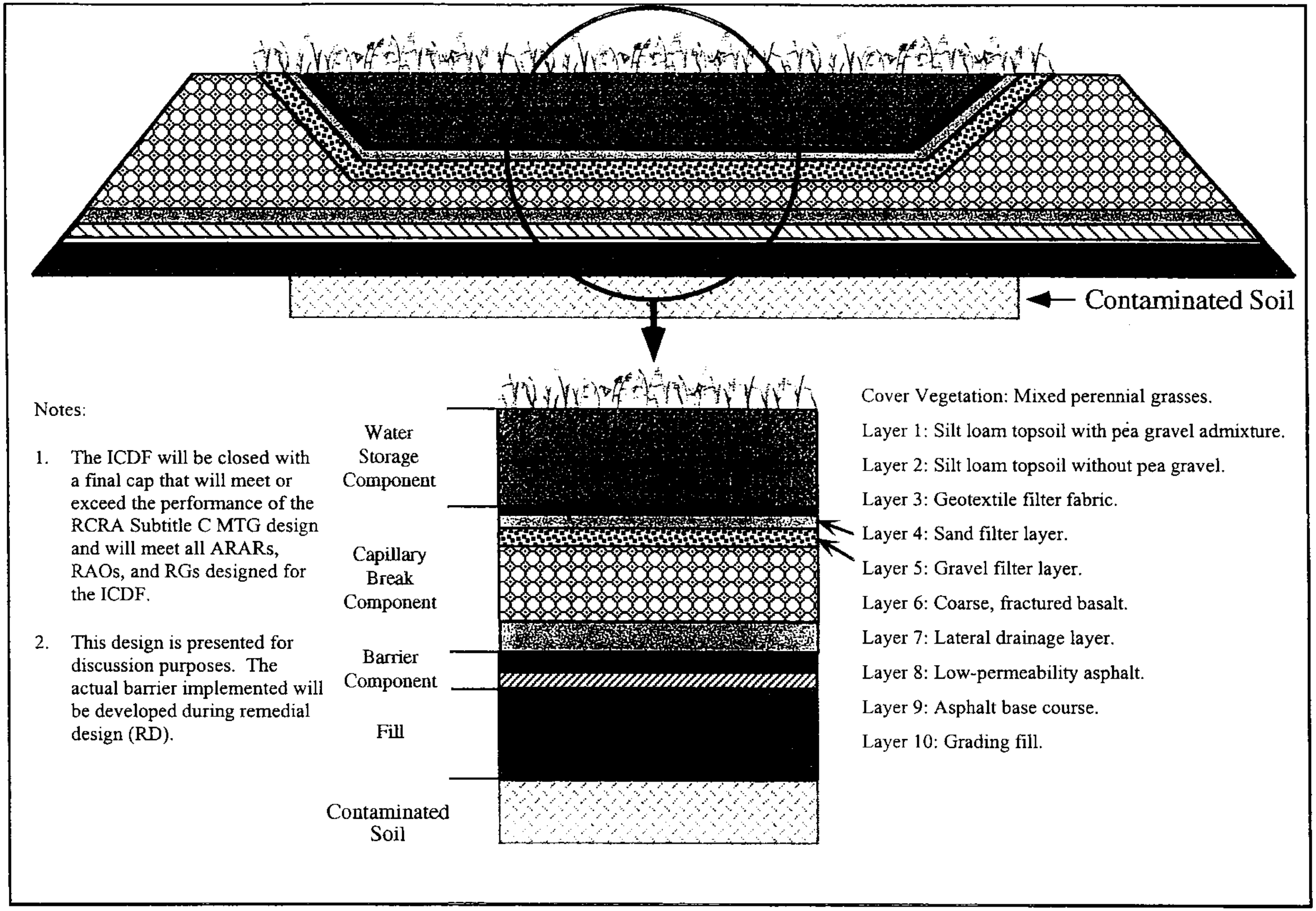


Figure 11-2. Conceptual cross-section of the ICDF cap (typical Hanford Barrier).

construction requirements. The ICDF will be located within the WAG 3 area of contamination (AOC). Design, construction, operational, and closure requirements for the ICDF include:

- Designed to have a total capacity of approximately 466,000 m^3 (510,000 yd^3)
- Engineered to meet IDAPA 16.01.05.008 (40 CFR §264.301) hazardous waste, 40 CFR §761.75 PCB, and DOE Order 435.1 radioactive waste landfill design and operating substantive requirements
- Double leachate collection/detection liner system
- Minimum of 3 feet of compacted clay soils and flexible membrane liner (FML) will serve as the bottom liner
- The cap will be designed to minimize infiltration and run-on and maximize run-off
- Cover designed to protect against inadvertent intrusion for >1,000 years
- Void spaces will be filled to minimize future subsidence.

- Only INEEL on-Site CERCLA wastes meeting the agency-approved ICDF Waste Acceptance Criteria (WAC), to be developed during the remedial design, will be disposed in the ICDF. Wastes will be limited to low level radioactive, PCB solids, hazardous, and mixed low level waste. An important objective of the WAC will be to assure that hazardous substances disposed in the ICDF will not result in exceeding groundwater quality standards in the underlying groundwater aquifer, even if the ICDF leachate collection system were to fail after closure.

- Located in an area meeting hazardous waste, PCB waste and low-level waste (LLW) landfill siting requirements. Through a preliminary evaluation of all relevant decision criteria, the Agencies have determined the Study Area for siting the ICDF to be the CPP-67 Percolation Ponds and adjacent areas to the west. However, the specific ICDF cell locations will be determined through the completion of a comprehensive geotechnical evaluation of the entire Study Area, which shall be reviewed and approved by the Agencies. Siting criteria for the location of the ICDF included:

  - Outside the 100-year flood plain
  - Outside of wetland areas
  - Not in active seismic zones
  - Not in high surface erosion areas
  - Not in an area of high historic groundwater table.

- The construction and operation of an ICDF supporting complex including a facility waste storage, sizing staging, and treatment (SSST) facility in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subparts I, J, and DD). Operations at the facility will include chemical/physical treatment to prepare ICDF wastes to meet applicable Waste Acceptance Criteria and RCRA land disposal restrictions.

- One or more remedial waste staging and storage areas will be utilized to stage and handle remediation waste. The storage area be operated in accordance with the substantive requirements of IDAPA 16.01.05.006.01 and 16.01.05.006.02 (40 CFR 262.34[a][1]).

- Monitoring well construction and sampling wastes generated prior to construction of the ICDF and SSST facility (i.e., purge water and drill cuttings) may be managed and treated using remediation waste staging piles and temporary treatment units in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553 and 40 CFR 264.554).

- Treatment will be accomplished using mobile tankage and physical/chemical treatment and will comply with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subpart J, BB, and CC).

- An evaporation pond will be constructed and designated as a corrective action management unit (CAMU) in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.552 and 40 CFR 264 Subpart K and CC) for purpose of managing ICDF leachate and other aqueous wastes generated as a result of operating the ICDF complex.

- Operate, close, and post-close the ICDF Complex in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subparts G, F, and N) Maintain site access restrictions and institutional controls throughout the post-closure period.

Closure requirements will include:

- Access restrictions to prevent intrusions into the closed area, including the creation of a buffer zone surrounding the capped ICDF and supporting structures

- Access controls, monitoring and maintenance will remain in place for as long as the contents of the landfill remain a threat to human health or the environment if uncontrolled.

The best location to site the ICDF was evaluated using the analytic hierarchy process (AHP) decision analysis technique. Figure 11-3 shows the AHP decision evaluation criteria used in the preliminary ICDF siting evaluation. Based on this evaluation, it was determined that locating the facility within the AOC was the most cost effective and ARAR-compliant location for siting the ICDF. The Agencies have determined the Study Area for siting the ICDF to be the CPP-67 Percolation Ponds and adjacent areas to the west as depicted in Figure 11-4 based on the preliminary geotechnical information. However, the specific ICDF cell locations will be determined through the completion of a comprehensive geotechnical evaluation of the entire Study Area, which shall be reviewed and approved by the Agencies.

The preliminary siting evaluation criteria included:

- Public health and safety (e.g., effects on surface water, effects on groundwater, floodplain)

- Natural environment (e.g., effects on the habitat of rare, threatened or endangered species)

- Technical (e.g., depth to bedrock, underlying soil properties, perched aquifer protection)

- Social Economic environment (e.g., effects on future land use)

- Cultural Environment (e.g., effects on archaeological or heritage sites)

- Community acceptance (e.g., public comments, Citizens Advisory Board comments)

- Cost.

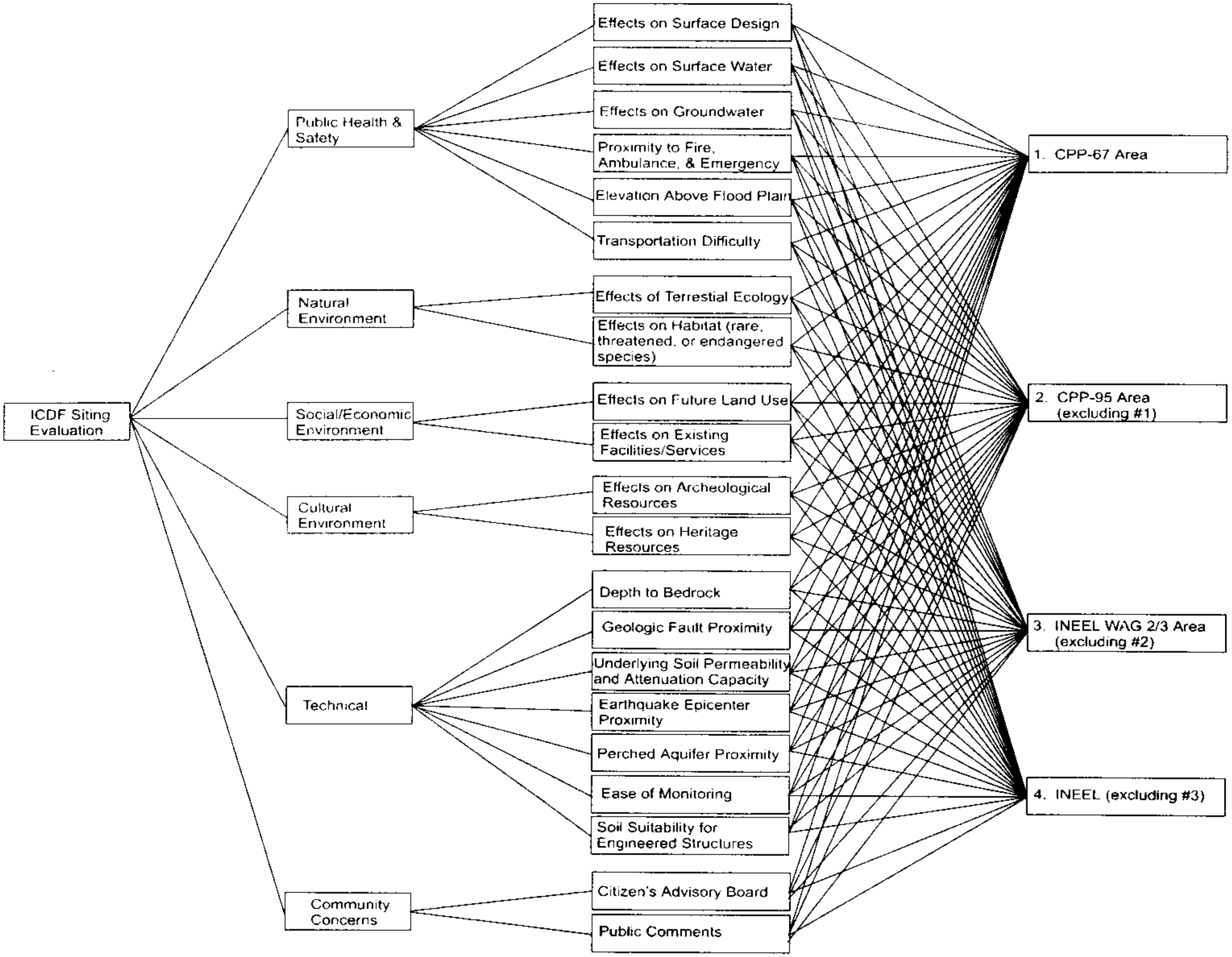


Figure 11-3. Summary of the AHP decision evaluation criteria for the preliminary ICDF siting evaluation.

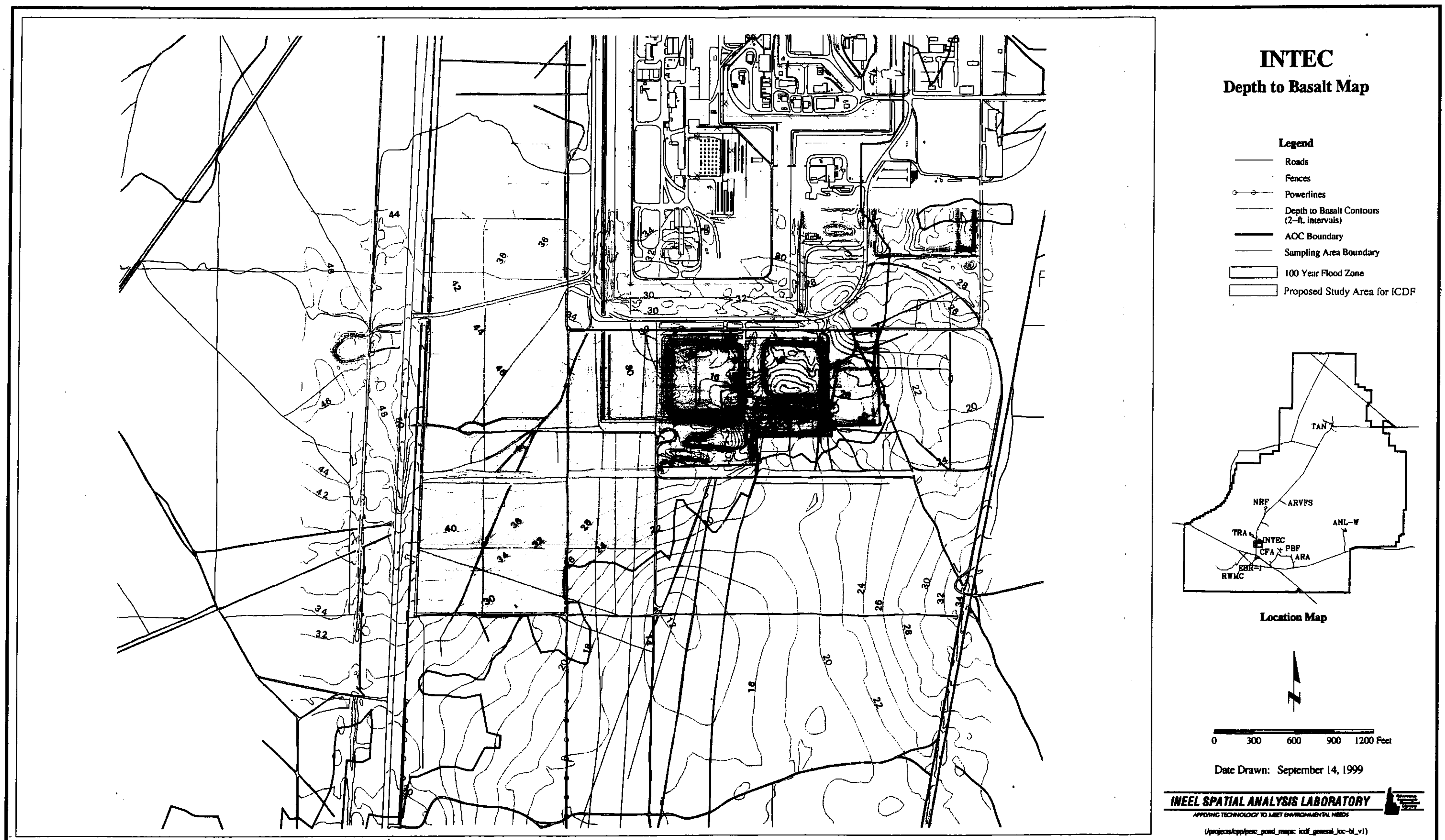


Figure 11-4. Proposed Study Area for the ICDF.

Figure 11-4 shows the proposed Study Area that the ICDF is to be sited in.

In special circumstances (e.g., Site CPP-37b), where a source area is located so as to become part of a D&D or closure cover, the Agencies may elect not to excavate the soil but cap in place in accordance with RCRA/Hazardous Waste Management Act (HWMA) closure standards. The same groundwater protection standards applicable to the ICDF will be met.

Although more costly than Alternative 3, which requires capping each Group 3 site in place, the selected Alternative 4A, reduces the footprint of the WAG 3 restricted area allowing for future development and is expandable to address INEEL-wide CERCLA contaminated media and debris. Further, the consolidation in an engineered landfill with leachate collection will further safeguard the underlying SRPA. The Agencies believe that this alternative ensures long-term protection of human health and the environment, complies with ARARs, is a permanent solution, and is cost-effective.

11.1.4 Perched Water (Group 4)

The selected remedy for the Perched Water is Alternative 2—Institutional Controls with Aquifer Recharge Control. Alternative 2 is comprised of institutional controls in the form of administrative actions to restrict future use of perched water and implementation of remedies to control water infiltration and minimize perched water releases to the SRPA. The institutional controls include:

- Site access restrictions
- Warning signs on wells screened in the perched water
- Locked and labeled wells screened in the perched water
- Well drilling/water usage restrictions
- Radiation surveys
- Environmental monitoring
- General maintenance and upkeep.

The DOE will periodically inspect and repair the warning signs, conduct environmental monitoring, and perform routine maintenance and upkeep, as necessary. Land use controls will remain in place indefinitely to prevent unauthorized drilling through the contaminated perched zone.

Perched water monitoring will include sampling and analysis of existing and new perched water wells to determine changes in the areal extent of perched water (water levels and hydraulic head) and perched water quality. Moisture content and contaminant of concern (COC) concentration(s) will be measured in the perched water zones to determine if water contents and contaminant fluxes are decreasing as predicted. These data will also be used to verify the OU 3-13 vadose zone model and to determine potential impacts to the SRPA. The specific monitoring to determine perched water drain-out will be described in the OU 3-13 Group 4 Post-ROD Monitoring Plan. The monitoring will be performed for a minimum of 20 years after the percolation ponds are removed from service. The perched water zones related to the existing percolation ponds are calculated to drain out in approximately 14 years from the time the ponds are removed from service (OU 3-13 RI/FS, Appendix F). New perched water-monitoring wells will be installed to provide additional perched water monitoring locations. If after 5 years, the perched water zones are not draining out as predicted by the RI/FS model then additional recharge controls will be implemented.

Additional controls may include:

- Lining, or an equivalent, the Big Lost River to minimize river recharge to perched water. A trade study will be performed to determine the most cost-effective method to achieve the recharge reduction objective.

- Curtailing steam condensate discharges to the subsurface

- Removing the existing STP lagoons and infiltration galleries. Substitute facilities that do not discharge to contaminated perched water (e.g., new sewage treatment pond lagoons) would need to be sited and constructed prior to implementing this control.

The additional recharge controls are actions that control sources supplying water to the perched zone. These actions are designed to reduce leaching and transport of soil contaminants to perched water, reduce the water content of the perched zone, and minimize contaminated perched water releases to the SRPA. Computer simulations indicate that removal of the existing percolation ponds from service is the most beneficial method to prevent the COCs in the vadose zone (particularly Sr-90) from reaching the SRPA. Removal of the existing percolation ponds from service addresses approximately 70% of the water recharging the perched water bodies and sufficiently slows the rate of contaminant transport to the aquifer to allow natural radioactive decay to reduce the Sr-90 mass in the vadose zone. This action is expected to prevent perched water contaminant releases to the SRPA, which would cause the MCLs to be exceeded in the SRPA beyond 2095 (FS Supplement, Section 5.3.2 [DOE-ID 1998a]).

The replacement percolation ponds will be constructed at a sufficient distance (approximately 10,200 ft) away from the INTEC Facility so as to no longer remain a recharge source to the contaminated perched water beneath INTEC. The locations of the new percolation ponds were based on the measured presence of perched water at the current percolation ponds and groundwater modeling. The amount of "spread" of water from new percolation ponds in the uppermost perched layer was modeled using the interbed parameters from the OU 3-13 vadose zone modeling (OU 3-13 FS, Appendix F). The new ponds are located so that perched water from them does not spread to the contaminated perched water beneath INTEC. Figure 11-5 shows the proposed location of the replacement percolation ponds. Other factors evaluated in selecting a new location for the percolation ponds include: locating the ponds outside of any rare, threatened, or endangered habitat, and locating the ponds in areas that have been surveyed for cultural and historic artifacts.

The replacement percolation ponds, limited to 80 acres in size, will be subject to applicable permitting requirements. The Agencies believe that sufficient time is provided prior to the removal date to assure that this contingency operation under CERCLA will not be necessary. However, due to the necessity and importance of stopping the recharge to the perched water on or before December 31, 2003, the new percolation ponds will be constructed under this ROD and may operate, as a necessary contingency, pursuant to this ROD during the interim period that applicable permits are sought.

The Group 4 remedy will include:

- Removing the existing percolation ponds from service

- Discontinuing lawn irrigation at the INTEC where necessary.

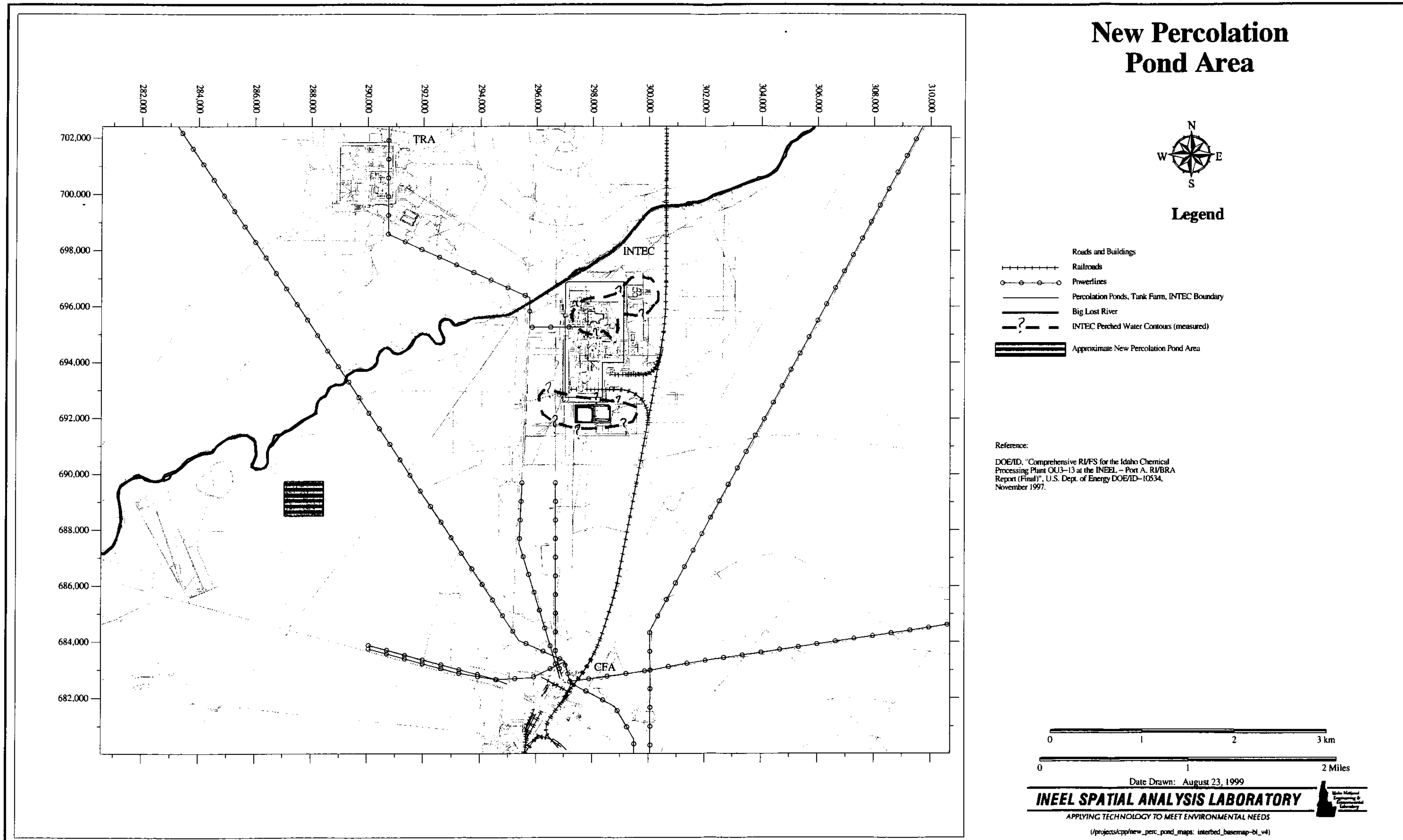


Figure 11-5. Location of replacement percolation ponds.

Additional infiltration controls may include lining or diverting the Big Lost River, repairing leaking fire water lines at the INTEC, curtailing steam condensate discharges to the subsurface, or removing the existing STP lagoons and infiltration galleries. Substitute facilities that do not discharge to the zone of contaminated perched water would need to be sited and constructed prior to implementing this phase.

Five-year reviews of the efficiency of this remedy will be conducted until the Agencies determine that there is no longer a risk posed by vadose zone contaminants leaching to the SRPA. Institutional controls will remain to restrict drilling through the contaminated zone or access to perched water.

Alternative 2 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment. The Agencies believe the selected alternative is protective of human health and the environment, compliant with ARARs, uses permanent solutions, and is cost effective.

11.1.5 Snake River Plain Aquifer Interim Action (Group 5)

The selected SRPA interim action is Alternative 2B—Institutional Controls with Monitoring and Contingent Remediation. This interim action alternative consists of three components:

- Maintaining existing and additional institutional controls over the area of the SRPA contaminant plume to prevent exposure to contaminated groundwater during the time the aquifer is expected to remain above MCLs

- Groundwater monitoring to determine if SRPA groundwater COC concentrations exceed their action levels and if the impacted portion of the aquifer is capable of producing more than 0.5 gpm, which is considered the minimum drinking water yield necessary for the aquifer to serve as a drinking water supply.

- Contingent active pump and treat remediation if the action levels are exceeded and production is greater than 0.5 gpm such that the modeled aquifer water quality will exceed the MCLs after 2095 in the SRPA outside the current INTEC security fence.

Since contaminants from INTEC operations will remain in the SRPA, a five-year review is required by the NCP (40 CFR 300.430[f][4][ii]). Five-year reviews will be conducted until the Agencies determine they are no longer necessary. The five year reviews will evaluate the effectiveness of the alternative and the need for its continuation or to consider a different alternative.

11.1.5.1 Existing and Additional Institutional Controls. Existing institutional controls will prevent the groundwater ingestion exposure route from being completed by preventing direct access to the contaminated SRPA until the year 2095. Institutional controls will remain in place until 2095 and include:

- Area access restrictions

- Land use restrictions to prevent the installation of water supply wells in the SRPA prior to 2095

- A Notice of Agreement with affected federal and local government stakeholders

- Warning signs on wells screened in the SRPA contaminant plume
- Locked and labeled wells screened in the SRPA contaminant plume.

In addition to institutional controls, environmental monitoring and general maintenance and upkeep of monitoring wells will be conducted for as long as it is determined that monitoring is required.

11.1.5.2 Groundwater Monitoring. Groundwater monitoring activities will be conducted throughout the institutional control period to evaluate the concentration and extent of contaminants in the SRPA. Monitoring will cease if the regulators determine there is no unacceptable risk in the aquifer. Monitoring will include sampling of the SRPA using new and existing wells to determine the SRPA aquifer intervals with the highest concentrations of groundwater COCs. The specific groundwater monitoring actions will be described in the OU 3-13 Post-ROD Monitoring Plan that will be developed during RD/RA. A general summary of the groundwater monitoring actions that would trigger subsequent treatability studies and contingent remediation is shown on the decision flow chart in Figure 11-6. Groundwater modeling presented in Appendix B of the FS Supplement (DOE-ID 1998a) suggests that the highest I-129 concentrations occur in the H-I interbed of the SRPA. The modeling accounts for attenuation and dispersion. The H-I interbed is a sedimentary interbed that is located approximately 38 m (125 ft) below the top of the SRPA water table. The water table at INTEC occurs at an approximate depth of 140 m (460 ft) beneath the INTEC. The H-I interbed is about 7.6 m (25 ft) thick and has a low permeability (4 mDarcy). The model also assumed that potential releases of contaminated perched water to the SRPA will be controlled by removing the existing percolation ponds from service.

Additional groundwater modeling and sampling will be conducted to determine the location of COC hotspot (Step 1 in Figure 11-6). Monitoring wells will be installed at the predicted hot spots along the centerline of the predicted plume. Packer tests will be used to determine the zone(s) of highest contamination. These results will be compared to the action levels (Table 8-2). Groundwater quality data will be obtained from the SRPA intervals containing the highest COC concentrations to determine if these concentrations exceed the action level(s) (Step 2 in Figure 11-6). The action levels are based on the modeled maximum concentration of the COCs measured in calendar year 2000 that are expected to yield individual contaminant concentrations above the MCLs in the SRPA outside the current INTEC security fence in 2095. Contaminant transport studies, and refinements to the contaminant transport model will continue during the institutional control and monitoring period. The action levels will be reviewed at each 5-year review and adjusted as necessary to insure that RAOs are being met.

If the action levels are exceeded (Step 3 in Figure 11-6), isopleth maps will be developed using the groundwater quality data. The isopleth maps will be developed (Step 4 in Figure 11-6) to determine if the hot spot(s) is(are) of sufficient volume to provide an unacceptable risk to a hypothetical groundwater user for more than one year (Step 5 in Figure 11-6). The isopleth maps will be prepared to determine if the plume will move past a future receptor such that the exposure duration would be too short to present an unacceptable risk. If the hot spot is small, or if it moves too quickly to present an unacceptable risk, then no further active measure would be pursued, but monitoring would continue and the data and modeling would be reviewed at the 5-year review period.

- If the contaminated aquifer interval exceeds the COC action level(s) and is of sufficient volume to potentially expose a hypothetical groundwater user to an unacceptable risk, representative wells will be selected to determine if the affected portion of the SRPA is capable of producing a sustainable yield (for at least 24 hours continuous pumping) of more than 0.5 gpm (Step 6 in Figure 11-6). The 0.5 gpm pumping rate is based on the minimum amount of drinking water necessary to sustain an average household. The wells that are selected to determine these limits will be screened over the aquifer interval exhibiting the

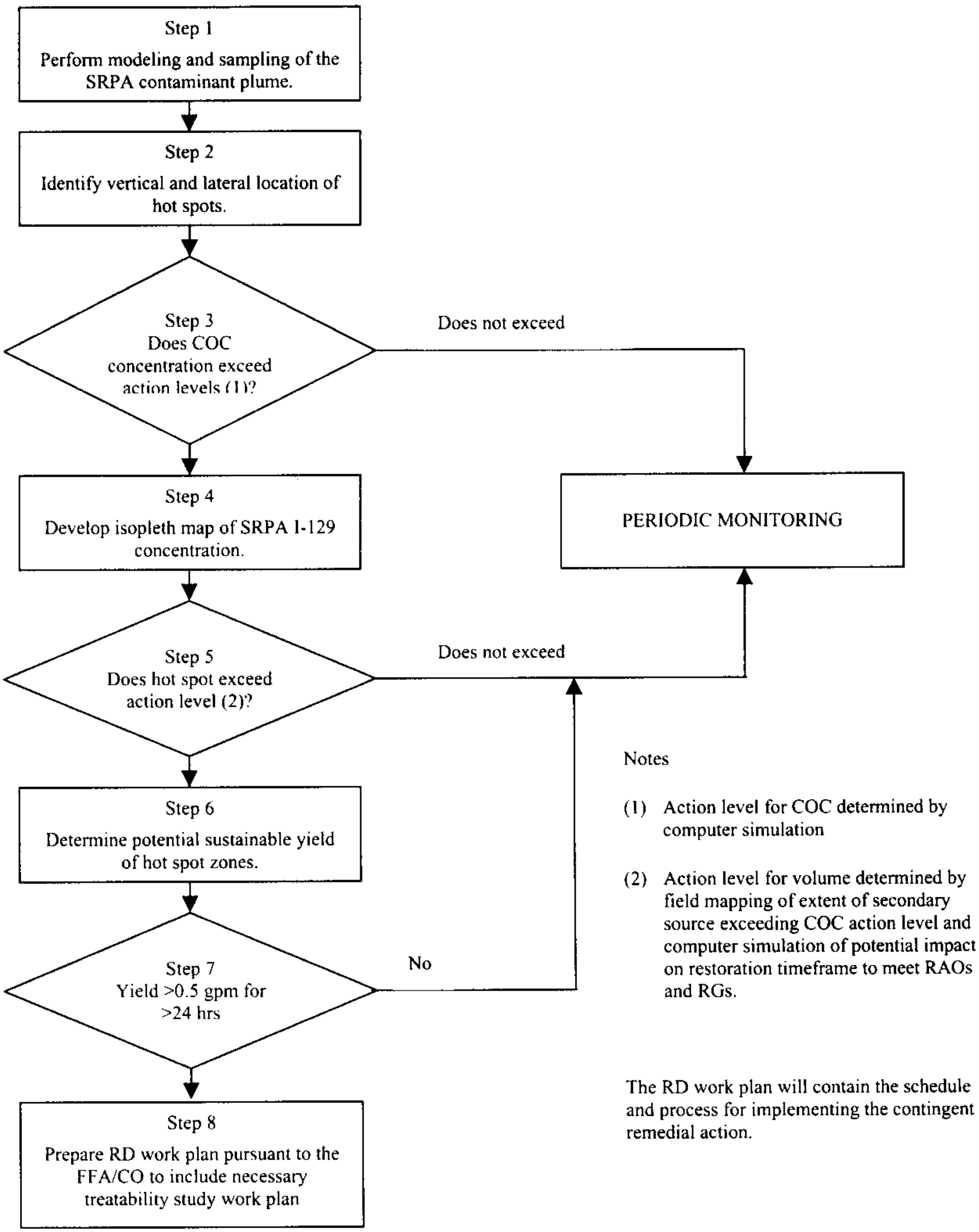


Figure 11-6. SRPA contingent remediation decision flow chart.

highest concentrations of COCs. If the water yield is greater than 0.5 gpm on a sustained basis, and the action level(s) is exceeded (Step 7 in Figure 11-6), then active remedial action will be pursued. If monitoring does not support the need for remedial action, periodic groundwater monitoring will be continued and the data reviewed during each 5-year reviews until restoration is achieved.

- **Treatability Studies and Contingent Remediation**. If all of the above described criteria (Steps 1 through 7 in Figure 11-6) are met for a well screened in the SRPA, treatability studies will be performed (Step 8 in Figure 11-6). The treatability studies may include analytical calculations and/or numerical modeling, pumping tests, and bench- or pilot-scale treatment testing. The treatability studies will determine if long-term pumping from the affected interbed is feasible and whether the COCs exceeding the action level(s) can be cost-effectively removed from groundwater. In addition to I-129 and other COCs the treatability studies will also evaluate the presence of mercury, Sr-90, chromium, Tc-99, and tritium, all of which are known or are predicted to be present in the groundwater plume at significant concentrations. While these contaminants are not long-term risk drivers, they may foul the groundwater treatment system or pose radiological exposure concerns if brought to the surface for treatment. Further monitoring will be performed to define the optimum path forward. The treatability study will be developed during RD if needed. If the treatability studies determine that selectively pumping and treating contaminated groundwater from the affected portions of the SRPA will meet the MCL(s) in 2095, and treatment and recharge or evaporation of treated groundwater is implementable and cost-effective, then Remedial Design and active remediation will be implemented.

Prior to installing a pump and treat system, the COC action limits will be verified or reestablished by additional modeling using the data obtained from the new monitoring wells, the packer tests, and pump/yield/concentration data. The duration of pumping and treatment will also be estimated using the model. If treatability studies determine that pumping the affected SRPA interbed is not technically feasible, then a technical impracticability waiver will be sought through a ROD Amendment.

Active remediation would consist of:

- Contingent pump and treat remedial action will be implemented if groundwater monitoring determines that combined COCs in groundwater exceed their respective action levels in the year 2000 or during subsequent monitoring. The action levels are based on modeling that predicts that individual or combined contaminants will exceed MCLs in the year 2095 for portions of the aquifer that is capable of sustaining a production of rate 0.5 gpm.Components of the pump and treat action include:

  - Installation of extraction wells to remove the zone of maximum contamination or hot spot

  - Above ground, on-site physical/chemical treatment of the extracted water in compliance with ARARs

  - On-site recharge to the SRPA or evaporation of the treated effluent in compliance with ARARs.

The treatability studies will consider the presence of all contaminants. Mercury, Sr-90, chromium, Tc-99, H-3, are known or are predicted to be present in the SRPA at significant concentrations. Although these additional contaminants are not necessarily long-term risk-drivers, they become problematic once brought to the surface for treatment because they may foul the treatment system or may pose radiological exposure concerns, as in the case of Tc-99. In addition, all contaminants must be removed to below MCLs if the treated groundwater is injected into the aquifer.

Although Alternative 2A is less costly than the selected alternative 2B, it does not provide any reduction in toxicity, mobility or volume through treatment and may not meet the Remedial Action Objective of restoring the aquifer to drinking water quality by the year 2095. Therefore, the contingency remedy, Alternative 2B best addresses groundwater modeling concerns regarding aquifer restoration. The Agencies believe the selected alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

11.1.6 Buried Gas Cylinders (Group 6)

The selected remedy for the Buried Gas Cylinders is Alternative 2—Removal, Treatment, and Disposal. The basis of this remedy is the removal and management of buried cylinders from each burial site. Abandonment of the cylinders presents a safety hazard should the cylinders burst from over-pressurization. Alternative 2 consists of:

- Institutional controls (i.e., warning signs) until completion of the buried cylinders removal
- Site characterization using geophysical surveys
- Removing the gas cylinders
- Treating the contents, if necessary
- Recycling or disposing of the gas cylinder containers.

The remedy will consist of two phases. Phase 1 includes initial geophysical surveys of each burial site to determine the extent of the buried cylinders and initial surface soil sampling of burial site CPP-94. The primary threat at the site is safety.

Phase 2 of the remedy consists of excavation, removal, and management of the cylinders at each site. Excavation will be conducted within a containment structure to ensure that accidental contaminant releases to the environment do not occur. Evaluation and management of the cylinders during Phase 2 will consist of the following:

- Removal and disposal or recycling of empty cylinders
- Removal and verification of cylinders with "known" contents
- Removal and sampling of cylinders with unknown contents
- Re-valving or re-containerization of cylinders with inoperable valves followed by sampling of the gases
- Venting of cylinders containing environmentally benign gases (i.e., compressed air, argon, carbon dioxide, helium, nitrogen, and oxygen)
- Treatment of cylinders containing acetylene or hydrofluoric acid having operable valves followed by disposal or recycling of the cylinder

- Treatment of cylinders containing acetylene or hydrofluoric acid having inoperable valves following valve replacement or recontainerization and subsequent disposal or recycling of the cylinder.

A contractor specializing in gas cylinder removal, treatment, and disposal will perform the activities associated with this alternative.

After removal of the cylinders from the burial sites, a post remediation survey of each burial site will be performed to determine earthwork requirements for the final grading. The burial sites will be graded to blend with the surrounding topography. Clean fills for the final grading will be obtained from an onsite borrow source if necessary.

The Agencies may elect to pursue a contingent remedy of capping in place pursuant to the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310) if safety concerns with excavation and removal prevent implementation of the selected remedy.

Alternative 2 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment. The Agencies believe the selected alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

11.1.7 SFE-20 Hot Waste Tank System (Group 7)

The selected remedy for the SFE-20 Hot Waste Tank System is Alternative 4—Removal, Treatment, and Disposal. Alternative 4 consists of:

- Institutional controls (i.e., warning signs) until the removal of the tank liquid and sludge

- Sampling the tank contents

- Removal and ex situ treatment of the tank liquid and sludge

- Excavation and removal of the tank, tank vault, pump pit enclosures and other associated structures

- On-site disposal of the tank and associated structures.

Following characterization, the tank liquid will be removed and treated at the PEW evaporator if it meets the specified waste criteria. The tank sludge will be removed and treated (ex situ) using a suitable grout to solidify and stabilize the contaminants in the sludge. The stabilized sludge will then be drummed and disposed either on-Site or off-site at a suitable engineered disposal facility. Depending on waste characteristics, the remaining components of the tank system will be excavated, removed, and disposed in the ICDF or off-site, depending on whether they meet the ICDF waste acceptance criteria. The excavation will be backfilled to grade with clean soils.

It is assumed that the liquid within the SFE-20 tank will meet the PEW WAC. The liquid contents of the tank are consistent with previous INTEC waste processed through the tank system and discharged to the PEW. However, if the PEW is unable to accept the liquid waste or is unavailable at the time the response action is conducted, a small portable evaporator unit would be utilized on-Site; or the waste would be disposed off-site in accordance with the Off Site Rule (40 CFR 300.440).

Alternative 4 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment and compliance with ARARs. The Agencies believe the selected alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

11.1.8 Future Site Closures Under RCRA and D&D

In addition to the 101 CERCLA sites addressed in this ROD, approximately 79 INTEC facilities will be undergoing closure under RCRA/HWMA and D&D in the future, after this ROD becomes final.

To minimize duplication of resources and in keeping with the RCRA/CERCLA Parity Policy, a periodic review will be conducted to evaluate facility closures outside the scope of this ROD to determine what additional sources have been identified, and what impact of these sources may have on the residual risk at OU 3-13. Plans for upcoming RCRA/HWMA and D&D closures will also be evaluated to determine that the closure plans include an approach that ensures the following:

- Both RCRA/HWMA and D&D closures of INTEC facilities will satisfy RAOs, and will not add significantly to human health or environmental risks.
- Risks to human health and the environment resulting from any residual contamination discovered will be evaluated and minimized in order to be consistent with the RAOs identified previously.

11.1.9 Five-Year Reviews

The CERCLA 5-year review process will be implemented to ensure protection of human health and the environment at sites where contaminants remain in place at levels that do not allow unlimited or unrestricted current or future use as required under 40 CFR 300.430 and CERCLA Section 121. The schedule for 5-year reviews will be included in the RD/RA Work Plan. Five year reviews will continue to be conducted as long as site access or use restrictions are necessary to remain protective of human health and the environment.

Five-year reviews will also assess the effectiveness of Institutional Controls for sites for which "No Further Action" was recommended and ensure that these sites are not adversely impacted by continued INTEC operations. Any new information acquired regarding the nature and extent of contamination at these sites will be considered during each review

11.1.10 Post-Closure Care and Monitoring

Post-closure care and monitoring are included as elements of remedial alternatives for sites where COCs remain in place above risk-based levels. Monitoring and maintenance reports will be considered in 5-year reviews to determine the continued effectiveness of remedies.

11.2 Estimated Costs of Selected Remedies

Tables 11-2 through 11-8 provides the estimated capital and operation costs for each group. The costs presented in these tables are –30 to +50 percent estimates according to EPA guidance. A 100 year operation and maintenance period was costed for all of the final actions. Operation and maintenance costs for the interim actions were calculated for the interim action period. A discount rate of 5 percent was used to calculate the NPV.

11.3 Expected Outcome of Selected Remedy

For all groups, except the Tank Farm and SRPA interim actions, the expected outcome of the selected remedies is that the cumulative risk, for all pathways at these sites will be reduced to less than 1×10^{-4} and other risks will be reduced to a HI less than 2.

The use of industrial health and safety controls and the implementation of DOE radiological control procedures will control worker risk during remedy implementation.

Following the operational control period, the Group 2 Soils Under Buildings and Structures will either be covered by the equivalent of a cap with a 1,000 year design life, or by the overlying buildings. If exposed during D&D activities, contaminated soils will be removed to a minimum of 3 m (10 ft) below grade (if necessary), backfilled with clean fill, and revegetated where appropriate. Where a cap is in place, the area up to the edge of the cap will be available for industrial use. Where soils have been removed, the former soil site will be available for industrial use.

Group 3, Other Surface Soils, will have been excavated and disposed in the ICDF, or suitable off-site facility, and the former release sites will be filled with clean back fill, revegetated where appropriate, and available for industrial use.

The ICDF will remain in place and closed. The supporting facilities will be completely removed and disposed within the ICDF. The ICDF will contain contaminated surface soils from INTEC, and potentially will contain CERCLA wastes from other parts of the INEEL. The cap of the facility will be designed to last 1,000 years, against intrusion from both humans and biota, and minimize infiltration of precipitation through the waste layer. The cap will rise slightly above the surrounding area, and will have a low grade to promote runoff. A 100 m (328 ft) buffer zone will be maintained as part of the exclusion area around the capped area. Institutional Controls will be maintained to prevent unauthorized access to the disposal facility.

Group 4, Perched Water, will have been greatly reduced in areas of saturation, if not completely eliminated. High levels of contamination will remain in place in the subsurface, but these contaminants will be unavailable for either surface exposure or transport to the SRPA. The majority of the contamination is Sr-90, which will decay in place due to its short half-life of approximately 30 years.

Group 5, the SRPA, will meet MCLs outside of the current INTEC security fence by 2095. Institutional controls will be implemented to prevent the use of groundwater inside the current INTEC security fence.

Group 6, Buried Gas Cylinders, will have been removed, and these areas will be available for industrial use.

Group 7, the SFE-20 Hot Waste Tank System, will have been removed, and this area will be available for industrial use.

Table 11-2. Estimated Capital and Operations Costs (6 years) for Tank Farm Soils Interim Action Selected Alternative 3. Costs are in 1997 dollars except as noted.

Cost Elements	Estimated Costs in $
Capital Costs	
FFA/CO Management and Oversight[a]	1,574,000
Remedial Design[b]	235,000
Remedial Action Construction[c]	10,286,000
Total Capital Cost in FY97 dollars	12,096,000
Operation Costs	
Remedial Action Operations[d]	491,000
D & D of Facilities	NA
Surveillance and Monitoring	3,679,000
Total Operation Cost in FY97 dollars	4,170,000
TOTAL PROJECT COST IN FY97 $'s	**16,266,000**
Total Capital Cost in NPV	11,428,000
Total Operation Cost in NPV	3,725,000
TOTAL PROJECT COST IN NPV	**15,153,000**

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Work Plan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

Table 11-3. Estimated Capital and Operations Costs (100 years) for Soils Under Buildings and Structures Selected Alternative 2. Costs are in 1997 dollars except as noted.

Cost Elements	Estimated Costs in $
Capital Costs	
FFA/CO Management and Oversight[a]	6,748,000
Remedial Design[b]	910,000
Remedial Action Construction[c]	524,000
Total Capital Cost in FY97 dollars	8,182,000
Operation Costs	
Remedial Action Operations[d]	9,032,000
D & D of Facilities	NA
Surveillance and Monitoring	676,000
Total Operation Cost in FY97 dollars	9,708,000
TOTAL PROJECT COST IN FY'97 $'s	**17,890,000**
Total Capital Cost in NPV	5,103,000
Total Operation Cost in NPV	4,076,000
TOTAL PROJECT COST IN NPV	**9,179,000**

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

Table 11-4. Estimated Capital and Operations Costs (100 years) for Other Surface Soils Selected Alternative 4A. Costs are in 1997 dollars except as noted.

Cost Elements	Estimated Costs in $
Capital Costs	
FFA/CO Management and Oversight[a]	5,199,000
Remedial Design[b]	1,699,000
Remedial Action Construction[c]	85,056,000
Total Capital Cost in FY97 dollars	91,955,000
Operation Costs	
Remedial Action Operations[d]	11,514,000
D & D of Facilities	NA
Surveillance and Monitoring	8,213,000
Total Operation Cost in FY97 dollars	19,727,000
TOTAL PROJECT COST IN FY97 $'s	**111,682,000**
Total Capital Cost in NPV	76,626,000
Total Operation Cost in NPV	8,283,000
TOTAL PROJECT COST IN NPV	**84,909,000**

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

Table 11-5. Estimated Capital and Operations Costs (100 years) for Perched Water Selected Alternative 2. Costs are in 1997 dollars except as noted.

Cost Elements	Estimated Costs in $
Capital Costs	
FFA/CO Management and Oversight[a]	5,036,000
Remedial Design[b]	3,774,000
Remedial Action Construction[c]	9,445,000
Total Capital Cost in FY97 dollars	18,256,000
Operation Costs	
Remedial Action Operations[d]	8,171,000
D & D of Facilities	NA
Surveillance and Monitoring	2,892,000
Total Operation Cost in FY97 dollars	11,063,000
TOTAL PROJECT COST IN FY97 $'s	**29,319,000**
Total Capital Cost in NPV	15,320,000
Total Operation Cost in NPV	4,645,000
TOTAL PROJECT COST IN NPV	**19,965,000**

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

Table 11-6. Estimated Capital and Operations Costs (100 years) for Snake River Plain Aquifer Interim Action Selected Alternative 2B. Costs are in 1997 dollars except as noted.

Cost Elements	Estimated Costs in $
Capital Costs	
FFA/CO Management and Oversight[a]	5,300,000
Remedial Design[b]	4,302,000
Remedial Action Construction[c]	14,855,000
Total Capital Cost in FY97 dollars	24,457,000
Operation Costs	
Remedial Action Operations[d]	16,141,000
D & D of Facilities	1,647,000
Surveillance and Monitoring	16,911,000
Total Operation Cost in FY97 dollars	34,699,000
TOTAL PROJECT COST IN FY97 $'s	**59,156,000**
Total Capital Cost in NPV	20,701,000
Total Operation Cost in NPV	19,149,000
TOTAL PROJECT COST IN NPV	**39,850,000**

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

Table 11-7. Estimated Capital and Operations Costs (100 years) for Buried Gas Cylinder Sites Selected Alternative 2. Costs are in 1997 dollars except as noted.

Cost Elements	Estimated Costs in $
Capital Costs	
FFA/CO Management and Oversight[a]	922,000
Remedial Design[b]	48,000
Remedial Action Construction[c]	956,000
Total Capital Cost in FY97 dollars	1,926,000
Operation Costs	
Remedial Action Operations[d]	NA
D & D of Facilities	NA
Surveillance and Monitoring	NA
Total Operation Cost in FY97 dollars	NA
TOTAL PROJECT COST IN FY97 $'s	**1,926,000**
Total Capital Cost in NPV	1,834,000
Total Operation Cost in NPV	NA
TOTAL PROJECT COST IN NPV	**1,834,000**

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

Table 11-8. Estimated Capital and Operations Costs (100 years) for SFE-20 Hot Waste Tank System Selected Alternative 4. Costs are in 1997 dollars except as noted.

Cost Elements	Estimated Costs in $
Capital Costs	
FFA/CO Management and Oversight[a]	862,000
Remedial Design[b]	893,000
Remedial Action Construction[c]	3,008,000
Total Capital Cost in FY97 dollars	4,763,000
Operation Costs	
Remedial Action Operations[d]	NA
D & D of Facilities	NA
Surveillance and Monitoring	NA
Total Operation Cost in FY97 dollars	NA
TOTAL PROJECT COST IN FY97 $'s	**4,763,000**
Total Capital Cost in NPV	4,639,000
Total Operation Cost in NPV	NA
TOTAL PROJECT COST IN NPV	**4,639,000**

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

12. STATUTORY DETERMINATION

The selected remedy for each site, including the "No Action" and "No Further Action" sites, meets the statutory requirements of CERCLA Section 121, the regulations contained in the NCP, and the requirements of the FFA/CO for the INEEL. Regulatory compliance for each selected remedy for each group is summarized in the following sections. All remedies meet the threshold criteria established in the NCP (i.e., protection of human health and the environment and compliance with ARARs). CERCLA also requires that the remedy use permanent solutions and alternative treatment technologies to the maximum extent practicable, and that the implemented action must be cost-effective. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as their principal element. For many of the sites contaminated with radionuclides, effective treatment technologies are currently unavailable, and therefore, the preference for permanent solutions cannot be met except through natural radioactive decay processes over time.

12.1 Protection of Human Health and the Environment

As described in Section 11, the selected remedy for each site satisfies the criterion of overall protection of human health and the environment. The selected remedies for each site and the means by which each type of alternative meets this criterion are further described in Section 12.1.1 through 12.1.9.

12.1.1 "No Action" Sites

The Agencies have determined that "No Action" be taken under CERCLA at 34 sites. Ten sites were classified as "No Action" sites with the signing of the FFA/CO. An additional 24 sites were determined to be "No Action" sites through Track 1 or 2 investigations or RI/BRA analysis. "No Action" sites are those sites that have no contaminant source or have a contaminant source with an acceptable risk level (less than 1×10^{-4}) as determined in the BRA (DOE-ID 1997b). Table 4-1 lists the "No Action" sites in OU 3-13.

As a result of the "No Action" decision for these sites, the Agencies have determined that these sites pose no short- or long-term risks to human health or the environment. Therefore, the "No Action" decision provides for overall protection of human health and the environment.

12.1.2 "No Further Action" Sites

The Agencies have determined that "No Further Action" be taken under CERCLA at six sites. Table 4-1 lists the "No Further Action" sites. A "No Further Action" site is a site that has a contaminant source or a potential contaminant source present that does not have an exposure route resulting in risks greater than 1×10^{-4} for the risk scenario evaluated under the assumed site controls. These sites were determined to be "No Further Action" sites through Track 1 or 2 investigations and RI/BRA analysis. The "No Further Action" sites are sites where remedial action is being taken. However, the only remedial action is Institutional Controls.

Short- and long-term protection will be provided for the "No Further Action" sites using institutional controls. The institutional controls will be maintained at these sites until the Agencies determine that access or land use restrictions are no longer needed to prevent potential exposures or the perceived risk is considered acceptable. The institutional controls during the period of DOE operations will include property lease requirements, including control of land use consistent with this ROD. Institutional controls after DOE operations cease will include property transfer restrictions, including a finding of suitability to transfer and requirements for control of land use consistent with this ROD. The institutional controls will be tracked using the INEEL Land Use Plan. The "No Further Action" sites will be reviewed during the CERCLA 5-year review process to verify the effectiveness of the "No Further Action" decisions.

The Agencies believe that these controls will provide overall protection of human health and the environment for the "No Further Action" sites. The institutional controls will be maintained at these sites until an unacceptable risk to human health or the environment no longer exists .

12.1.3 Tank Farm Soils Interim Action Selected Remedy: Alternative 3—Institutional Controls with Surface Water Controls

An interim action was selected for the Tank Farm Soils release sites. A final remedial action will be developed under OU 3-14 following additional site characterization, risk analysis, and remedial alternative evaluation. The interim action will be performed to minimize contaminant exposures to the public and to limit further impacts to soil and groundwater until a final remedy is implemented under OU 3-14. A final remedy decision is anticipated prior to 2008. Based on currently available information, the interim action is not inconsistent with the expected final remedy for the Tank Farm Soils. The selected interim action is designed to prevent short-term exposure to contaminants present at the site and to minimize moisture infiltration that may occur and leach and transport contaminants to the perched water or SRPA.

The selected interim action will provide short-term protection of human health and the environment while the final remedy is developed and selected. Short-term protection will be provided by this alternative through existing and additional institutional controls, including radiological engineering controls and health and safety procedures, which will limit current worker and non-worker access or exposure to contaminated soils. Engineering controls will be used to minimize fugitive dust or toxic emissions during construction activities and provide short-term protection during implementation of the interim action. Additional short-term protection will be provided by surface water controls which will facilitate management of an unplanned spill or release and significantly reduce surface water infiltration into the Tank Farm soils. Some measure of long-term protection is provided by the reduction of surface water infiltration into the Tank Farm soils which will limit expected leaching and transport of contaminants to the perched water and minimally reduce available water in the perched zone. These actions will provide overall protection of human health and the environment by minimizing the potential for environmental releases and future groundwater quality impacts to the SRPA.

The Agencies believe that this interim action best satisfies the 5 balancing criteria and will be protective of human health and the environment while the OU 3-14 Tank Farm RI/FS is performed. Further, this action will satisfy RAOs and will not be inconsistent with the expected final Tank Farm remedy and the HLW & FD EIS currently being conducted.

12.1.4 Soils Under Buildings or Structures Selected Remedy: Alternative 2—Existing and Additional Institutional Controls and Containment

The selected alternative for the Soils Under Buildings and Structures is a deferred action that consists of existing and additional institutional controls and soil capping or excavation. The selected remedy will provide short-term protection of human health and the environment through the implementation of existing and additional institutional controls that reduce the potential for current worker, non-worker, or community access or exposure to contaminated soils. Implementing the remedy will not pose unacceptable short-term risks to the community, workers, or the environment. Engineering controls, radiological engineering controls, and health and safety procedures will be used to minimize any short-term risks to current workers, non-workers, or the community during barrier construction or soil excavation, if necessary. Safe work practices will be used to minimize personnel injury during construction activities.

Long-term protection of human health and the environment will be achieved by containing the contaminated soils beneath the existing buildings, or structures, or capping with an engineered barrier or excavating the contaminated soils should the building or structure be removed and the soils exposed. If the building or structure is removed such that the contaminated soils are exposed, capping or excavation will be implemented to provide long-term protection. The engineered barrier will be designed to limit exposure to contaminated soils and to minimize infiltration of precipitation into the contaminated soils which could potentially leach and transport contaminants to the SRPA for at least 1,000 years. Soils that are excavated will be handled as Group 3 soils. Removal and disposal of the contaminated soils at the ICDF would also provide long-term protection, since the ICDF will be designed to provide isolation for at least 1,000 years.

Closure and D&D plans for the Group 2 buildings and structures will be reviewed by the Agencies, under CERCLA, to ensure that the building or structure end-state satisfies soil and groundwater RAOs and meets ARARs. Decontamination and closure will be completed in a manner that will assure adequate short- and long-term protection of human health and the environment. This will prevent future exposure to contaminated soils and minimize any potential adverse impacts to SRPA groundwater quality above allowable levels for up to 1,000 years, if necessary. Natural radioactive decay will reduce contaminant concentrations to levels that are not a risk to human health or the environment.

Alternative 2 is selected because it best meets the balancing criteria of Implementability and short-term effectiveness, given that Alternative 3 is dependent upon the removal of the buildings and structures to be cost-effective. The Agencies believe that the selected remedy will provide overall protection of human health and the environment and satisfy the RAOs by reducing the potential exposures to less than 1×10^{-4} or a HI less than 1 by eliminating human and environmental exposure pathways.

12.1.5 Other Surface Soils Selected Remedy: Alternative 4A—Excavation and Onsite Disposal in the ICDF

The selected remedy for the Other Surface Soils is excavation and onsite disposal in the ICDF. This remedy will reduce potential exposures to contaminated soils by excavating and disposing the soils in the ICDF. The selected remedy will provide short-term protection of human health and the environment through the implementation of administrative and engineering controls that will limit current worker, non-worker, or community exposures to acceptable levels during soil excavation, transport, and disposal at the ICDF. Short-term protection will be provided during soil excavation using engineering controls to minimize fugitive emissions and radiological engineering controls, health and safety procedures, and safe work practices to prevent exposures or injury. These controls will minimize any short-term risks to workers, non-workers, or the community.

Long-term protection of human health and the environment will be achieved by removing all soils at each release site that exceed the remediation goals to a depth of at least 10 feet below ground and disposing them in the ICDF. The ICDF will be designed for long-term protection and contaminant isolation for at least 1,000 years. Soil excavation and disposal at the ICDF will eliminate the existing surface exposure pathways at the release sites.

The excavated soils will be disposed in the ICDF, an engineered disposal facility, designed for long-term protection and containment. The ICDF will be sited in Site CPP-95 (Figure 11-4). The ICDF footprint will cover no more than 80 acres. Short-term protection of human health and the environment will be provided through the implementation of institutional and engineering controls, radiological controls, health and safety procedures, and safe work practices during construction, operation, and closure of the ICDF to protect workers, non-workers, and the community from exposure to the disposed contaminated soils. Long-term protection of human health and the environment will be provided by the ICDF which will be designed, constructed, operated, and closed to inhibit intrusion by humans and biota, to provide sufficient shielding to minimize external exposure to radionuclide-contaminated soils, and to limit surface water and precipitation infiltration through the contaminated soils to reduce the potential for leaching and transport of soil contaminants to the perched water or SRPA. The final cover on the ICDF will be designed to provide human and biotic intrusion protection for at least 1,000 years.

Construction of the ICDF will disturb the environment. Environmental disturbances will be minimized by performing the construction activities in compliance with ARARs, the INEEL Storm Water Pollution Prevention Plan, and performing a cultural resource evaluation. All soil disturbance activities will be performed in compliance with the INEEL Storm Water Pollution Prevention Plan, including re-vegetation activities.

A preliminary cultural resource evaluation has been conducted for the areas that might be disturbed by the ICDF. If during soil disturbance activities, unusual materials such as arrowheads, obsidian, or bones are discovered, all work will cease and the INEEL Cultural Resources Office will be contacted for assistance. The land that will be disturbed during ICDF construction has been evaluated for biological resources. There are no known wetlands, unique habitats, or areas occupied by Threatened or Endangered species. As such, consultation with the Fish and Wildlife Service will not be necessary.

Although more costly than Alternative 3, which requires capping each Group 3 site in place, the selected Alternative 4A, reduces the footprint of the WAG 3 restricted area allowing for future development and is expandable to address INEEL-wide CERCLA contaminated media and debris. Further, the consolidation in an engineered landfill with leachate collection will safeguard the underlying SRPA. The Agencies believe that the selected remedy will provide overall protection of human health and the environment because the soils will be permanently excavated to a depth of at least 10 feet and disposed in the ICDF which will be designed to provide protection for at least 1,000 years. This remedy will reduce potential exposures to less than 1×10^{-4} or a HI less than 1.

12.1.6 Perched Water Selected Remedy: Alternative 2—Existing and Additional Institutional Controls with Aquifer Recharge Control

The selected remedy for Perched Water is existing and additional institutional controls with aquifer recharge control. Implementation of the selected remedy will pose no additional risks to workers, non-workers, the community, or the environment. Short-term protection during implementation of the selected remedy will be provided by the implementation of institutional and engineering controls, radiological engineering controls, health and safety procedures, and safe work practices. These actions will limit current worker and non-worker exposures to perched water during drilling, well installation, and monitoring.

Long-term protection of human health and the environment will be achieved by institutional controls, including land and groundwater use restrictions, to eliminate future use of perched water as long as an unacceptable risk remains. The estimated yield of wells completed in the perched water further precludes domestic use and provides a measure of long-term protection. Additional long-term protection is provided by the implementation of aquifer recharge controls, to reduce leaching and transport of soil contaminants to the perched zone, to limit the available water content in the perched zone, and reduce the potential for future perched water releases to the SRPA. The remedies will be implemented as necessary to provide long-term protection of SRPA groundwater quality. Perched water does not pose either short- or long-term risks to environmental receptors as it is not accessible to biota.

The selected Perched Water alternative requires removing the existing percolation ponds from service, and constructing alternative service wastewater disposal facilities that will not impact SRPA water quality. The replacement percolation ponds will be constructed approximately 3,109 m (10,200 ft) from the existing percolation ponds so as to no longer recharge the contaminated perched zone beneath the INTEC. Replacement percolation pond construction will involve the usual short-term risks involved with similar earth work projects. These short-term risks, if necessary, will be minimized using engineering and radiological controls, health and safety plans, and safe work practices. If removing the existing percolation ponds does not achieve the necessary moisture reduction in the perched zone, lining the Big Lost River to prevent river recharge to the perched zone will also be considered. Neither current workers nor non-workers will be exposed to contaminants during the construction of the replacement percolation ponds or lining the Big Lost River that would result in excess cancer risks or health effects.

Construction of the replacement percolation ponds will disturb the environment. Environmental disturbances will be minimized by performing the construction activities in compliance with ARARs and the INEEL Storm Water Pollution Prevention Plan, and performing a cultural resource evaluation. All soil disturbance activities will be performed in compliance with the INEEL Storm Water Pollution Prevention Plan, including re-vegetation activities.

A preliminary cultural resource evaluation has been conducted for the areas that might be disturbed by the replacement percolation ponds. If during soil disturbance activities, unusual materials such as arrowheads, obsidian, or bones are discovered, all work will cease and the INEEL Cultural Resources Office will be contacted for assistance. The land that will be disturbed as part of the replacement percolation pond construction activities has been evaluated for biological resources. There are no known wetlands, unique habitats, or areas occupied by Threatened or Endangered species. As such, consultation with the Fish and Wildlife Service will not be necessary.

Alternative 2 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment. The Agencies believe that the selected remedy will provide overall protection of human health and the environment and satisfy RAOs by restricting potential perched water use and reducing water infiltration to minimize future contaminant releases to the SRPA. This remedy will reduce potential risks to human health to less than 1×10^{-4} or a HI less than 1.

12.1.7 Snake River Plain Aquifer Interim Action Selected Remedy: Alternative 2B—Institutional Controls with Monitoring and Contingent Remediation

The selected SRPA remedy is an interim action with existing and additional institutional controls, groundwater monitoring, and contingent remediation. This interim action is a final action for the portion of the SRPA outside the current INTEC security fence. A final action for the portion of the SRPA inside the current INTEC security fence will be developed under OU 3-14. Implementation of the selected remedy poses no additional risks to workers, non-workers, the community, or the environment. Short-term protection will be provided by implementation of institutional and engineering controls, radiological engineering controls, health and safety plans, and safe work practices to limit current worker and non-worker exposures or injuries during SRPA drilling, well installation, and groundwater monitoring. These controls will also protect current workers and non-workers from short-term risks if contingent remediation is implemented. Current workers, non-workers, and the community will also be prevented from ingesting SRPA groundwater using institutional and engineering controls, such as locked wells or groundwater use restrictions.

Long-term protection of human health and the environment will be achieved by maintaining existing and additional institutional controls, such as land and groundwater use restrictions, over the area of the contaminant plume. These restrictions will prevent exposure to contaminated groundwater during the time that the aquifer is expected to remain above the applicable State of Idaho groundwater quality standards. Long-term protection will also be provided by groundwater monitoring to determine if the SRPA COCs exceed their action levels and if the impacted portion of the aquifer is capable of providing sufficient yield to serve as a water source. If these two conditions are met, contingent pump and treat remediation will be implemented to reduce the contaminant concentrations in the impacted portion of the SRPA so that the unacceptable risk is reduced by meeting the applicable State of Idaho groundwater quality standards and federal MCLs.

SRPA groundwater does not pose either short- or long-term risks to environmental receptors as it is not accessible to biota.

Although Alternative 2A is less costly than the selected alternative 2B, it does not provide any reduction in toxicity, mobility or volume through treatment and may not meet the Remedial Action Objective of restoring the aquifer to drinking water quality by the Year 2095. Therefore, the contingency remedy, Alternative 2B best addresses groundwater modeling concerns regarding aquifer restoration. The Agencies believe that the selected remedy will provide overall protection of human health and the environment and satisfy RAOs by restricting potential SRPA groundwater use outside the current INTEC security fence and implementing contingent pump and treat remediation if contaminant action levels are exceeded and the aquifer is capable of producing a sustainable yield. This remedy will reduce potential risks to human health to less than 1×10^{-4} or an HI less than 1.

12.1.8 Buried Gas Cylinders Selected Remedy: Alternative 2—Removal, Treatment and Disposal

The selected alternative for the Buried Gas Cylinders is removal, treatment, and disposal. Implementation of this remedy does not pose any additional significant risk to the community or the environment. Short-term risks to the workers implementing the remedy will be minimized using institutional and engineering controls, health and safety plans, and safe work practices. These actions will reduce physical hazards and exposures to workers to allowable levels during cylinder removal, transportation, treatment and disposal.

Long-term protection of human health and the environment will be achieved by removing all of the cylinders, treating the cylinder contents as necessary, venting non-hazardous contents directly to the atmosphere, and disposing the empty cylinders.

The Agencies may elect to pursue a contingent remedy of capping in place pursuant to the substantive requirement of IDAPA 16.01.05.008 (40 CFR 264.310) if safety concerns with excavation and removal of the cylinders prevent implementation of the selected remedy.

Alternative 2 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment. The Agencies believe that the selected remedy will provide overall protection of human health and the environment and satisfy RAOs because the reactive, ignitable, and potentially hazardous gases will be removed, treated (if necessary), and disposed. This remedy will eliminate the safety hazard posed by the cylinders.

12.1.9 SFE-20 Hot Waste Tank System Selected Remedy: Alternative 4—Existing Institutional Controls, Removing and Treating Tank Liquid and Sludge Contents, and Removing the Tank and Associated Structures

The selected alternative for the SFE-20 Hot Waste Tank System includes existing institutional controls, and removal, treatment, and disposal of the tank liquids and sludges, tank, and associated piping and structures. This remedy can be implemented without any additional short-term risks to the community or the environment. Short-term risks to the workers implementing the remedy will be minimized using institutional and engineering controls, health and safety plans, and safe work practices. These actions will reduce physical hazards and exposures to workers to allowable levels during tank liquid and sludge removal and treatment, and removal, decontamination, and disposal of the tank, piping, and associated structures.

Long-term protection of human health and the environment will be achieved by permanently removing, treating, and disposing of the SFE-20 tank liquids and sludges, tank, piping, and associated structure. Any contaminated soils that may exist beneath the structure at concentrations exceeding the RGs will be excavated and disposed in the ICDF to eliminate future leaching and transport of the soil contaminants to the perched water or SRPA.

Alternative 4 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment and compliance with ARARs. The Agencies believe that the selected remedy will provide overall protection of human health and the environment and satisfy RAOs because the SFE-20 tank system will be permanently removed, treated, and disposed. This remedy will reduce potential risks to human health to less than 1×10^{-4} or a HI less than 1.

12.1.10 Sites Under Other Regulatory Authority

The Agencies have determined that the following six sites are most appropriately dispositioned under other WAGs or INEEL regulatory programs other than CERCLA. These sites, which were investigated and evaluated during the RI/FS include: CPP-38 (asbestos on nine INTEC buildings), CPP-65 (Sewage Treatment Plant lagoons), CPP-66 (Steam Plant fly ash pits), CPP-61 (area within CPP-718 transformer yard), CPP-81 (abandoned pipeline from Calciner Pilot Plant), and CPP-82 (wastewater spills from ruptured pipelines). Sites CPP-61, -81, and –82 will be transferred to OU 3-14 for further evaluation. These sites will be included under the CERCLA 5-year review process to ensure that the necessary actions by the other OUs, WAGs or regulatory programs are performed.

Site CPP-38 consists of transite asbestos on nine buildings at INTEC. A Track 1 decision document was written and demonstrated that the asbestos is a nonfriable form and represents a low risk. Therefore, the Agencies decided that this site would be more appropriately administered and remediated (if necessary) under the INEEL Asbestos Abatement Program. INEEL asbestos management is implemented in accordance with NESHAPs.

Site CPP-65 is the INTEC Sewage Treatment Plant lagoons which treat sanitary waste from 31 INTEC facilities. The Sewage Treatment Plant began operation in 1984 and is currently used. The lagoons include four infiltration/percolation trenches that are used to dispose of treated sanitary wastewater. The lagoons were investigated in the RI/BRA (DOE-ID 1997a, Section 9.3) where it was determined that site CPP-65 is not a significant source of contamination to the groundwater. However; the lagoons appear to contribute water to the perched zone and eventually the SRPA. The water discharged to the lagoons was included as a water-source term in the vadose zone modeling conducted for the RI/BRA. The Agencies have decided that final closure of the Sewage Treatment Plant lagoons would be most appropriately handled under the Idaho Wastewater Land Application Permit Rules (IDAPA 16.01.07). This decision was based on the low concentration of contaminants in the plant effluent and the continued use of the lagoons. However, if additional perched water actions are deemed necessary by the Agencies to further reduce recharge to the perched zone, then the closure and relocation of the Sewage Treatment Plant lagoons will be managed under CERCLA.

Site CPP-66 is the coal-fired steam generation facility fly ash pit located southeast of the INTEC. The pit has been used for the disposal of fly ash produced by the INTEC steam generation facility since 1984. The ash in the pit contains natural radionuclides and metals derived from coal and limestone. Site CPP-66 was evaluated using the Track 1 process in 1993 and recommended for "No Further Action" based on a human health risk evaluation. Subsequently, an ecological risk screening was performed during the OU 3-13 RI/BRA, which suggested that a risk to environmental receptors may exist from the metals present in the ash. The Agencies have determined that the site will be transferred to OU 10-04 for further evaluation and remediation, if necessary.

Site CPP-61 is an area within the CPP-718 transformer yard where a PCB oil spill occurred in the early 1980's. Approximately 1,510 L (400 gal) of PCB oil was spilled. The PCB concentration in the oil was 179 ppm. Most of the spill was contained, however, some spilled oil contaminated the surrounding soil. In 1985, the spill area was cleaned up; approximately 40 drums of soil and debris were removed. A new transformer and concrete pad have been installed over the site. Three soil borings were drilled and soil samples analyzed for radionuclides. The radionuclides found were below risk-based soil concentrations. The Agencies have determined that Site CPP-61 will be transferred to OU 3-14 for further evaluation. This decision is based upon the uncertain amount of PCB contamination that may remain under the concrete pad (WINCO 1992a).

Site CPP-81 is an abandoned line from the 30-cm (12-in.) Calciner Pilot Plant. The line, located approximately 0.6- to 0.9-m (2- to 3-ft) bls, contained simulated calcine that became plugged in the line following a test run. During the fall of 1993, the line was cleaned as part of a time-critical removal action. The line was flushed with hot acid to remove the simulated calcine. No leaks were observed during the removal action indicating that no previous release to the environment had occurred. The final water rinse was analyzed and found to not contain contaminants above toxicity characteristic leaching procedure (TCLP) limits. The Agencies have determined that Site CPP-81 will be transferred to OU 3-14 for further evaluation.

Site CPP-82 is the location of three waste water spills (designated Sites A, B, and C) caused by rupturing of previously abandoned underground lines. The lines were ruptured during excavation activities. In the spill associated with Site A, an estimated 9.4 L (2.5 gal) of low-level radioactive waste escaped; the abandoned line and contaminated soil associated with the leak were removed and disposed. Sites B and C are associated with spills of nonradioactive, nonhazardous waste water; these spills occurred during the repair activities associated with Site A. The Agencies have determined that Site CPP-82 will be transferred to OU 3-14 for further evaluation.

12.1.11 Five-Year Reviews

The remedial actions taken under this ROD will be reviewed under the CERCLA 5-year review process to ensure their protectiveness. Five-year reviews will also ensure that any changes in the physical configuration of any INTEC facility or site (such as D&D) where there is suspicion of a release of hazardous or radioactive substances will be managed to achieve remediation goals established in the ROD. The 5-year reviews will continue as long as contaminants exist at levels which result in restricted or limited site usage.

12.2 Compliance with ARARs

Compliance with action-, chemical-, and location-specific ARARs is described in Sections 12.2.1 through 12.2.7 for the selected remedy for each group. Chemical-specific ARARs are generally health- or risk-based requirements that establish numerical limits on the amounts or concentrations of a particular radionuclide, compound or material that may be discharged to or present in the environment. Location-specific ARARs restrict specific activities occurring in particular locations. Action-specific ARARs restrict specific types of remedy activities or technologies.

The most significant uncertainty at OU 3-13 sites is whether or not RCRA-hazardous materials are present at Soils Under Buildings sites, Other Surface Soils sites, the Buried Gas cylinders, and in the SFE-20 Hot Waste Tank contents and system; as well as in residuals produced while treating SRPA water and the SFE-20 tank contents. Media and materials from these sites will be characterized to facilitate material handling and disposal options. RCRA and IDAPA ARARs that will apply if these materials are determined to be hazardous are cited in the ARARs tables for the selected remedy for each group, with qualifying statements, and are discussed in the following sections.

Investigation derived waste (IDW) from OU 3-13 RD/RA activities and OU 3-14 investigations, including soil cuttings, well purge water, personnel protective equipment, decontamination water, and similar wastes generated during sampling and inspection/maintenance activities will be temporarily managed (not to exceed 1 year) in a staging area under the substantive portions of IDAPA 16.01.05.008 40 CFR 264.544 Remediation Waste Staging Piles). By managing the wastes in this area, placement will not be triggered. If these wastes are treated in temporary units under IDAPA 16.01.05.008 (40 CFR 264.553), they may be subject to LDRs. The final disposition of these wastes will be in the ICDF.

This ROD recognizes that INTEC is an operating facility, it is possible that changes in physical configuration of INTEC may uncover new sites or change the residual risk posed by those sites addressed under this ROD. Any planned disturbance at a site for which action is required under this ROD (including the "No Further Action" sites with institutional controls) will be preceded by appropriate planning documents to be submitted to and concurred on by the Agencies prior to implementation. Newly discovered sites will be subject to remedial action pursuant to the terms and conditions of the FFA/CO.

12.2.1 Tank Farm Soils Interim Action: Alternative 3—Institutional Controls with Surface Water Control.

Compliance with action-, chemical-, and location-specific ARARs for the selected remedy for the Tank Farm Soils Interim Action, Alternative 3, is summarized in Table 12-1. A discussion of the ARARs and TBCs is provided below.

12.2.1.1 Action-Specific ARARs. Site security, inspections, and personnel training will be required during the interim action period. These requirements will be met by institutional and engineering controls, radiological safety measures, and health and safety plans implemented or planned for the site.

State of Idaho Fugitive Dust Emission Rules will apply to any activities that generate fugitive dust. These rules require that reasonable precautions be taken to prevent the generation of fugitive dust from unprotected surfaces, as well as during active operations. Engineering controls will be implemented to meet these rules.

Table 12-1. Compliance with ARARs for Group 1—Tank Farm Soils Interim Action Selected Remedy.

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 1—Tank Farm Soils Interim Action: Alternative 3—Institutional Controls with Surface Water Control			
Action-specific			
IDAPA 16.01.05.008 (40 CFR 264.14)	Site security	Applicable	Applies only if RCRA units are created as part of interim action.
IDAPA 16.01.05.008 (40 CFR 264.15)	General inspection requirements	Applicable	Applies only if RCRA units are created as part of interim action.
IDAPA 16.01.05.008 (40 CFR 264.16)	Personnel security	Applicable	Applies only if RCRA units are created as part of interim action.
IDAPA 16.01.01.650, 16.01.01.651	Idaho fugitive dust emissions	Applicable	Applies during construction of remedies and observation wells; will be met through engineering controls
40 CFR 122.26	Storm water discharges during construction	Applicable	Applies during construction of remedies; will be met though engineering controls.
40 CFR 61.92 40 CFR 61.93	NESHAPS for Radionuclides from DOE Facilities, Emission Monitoring and Emission Compliance	Applicable	Applies during construction of remedies; will be met though engineering controls.
IDAPA 16.01.01.585, 16.01.01.586	Rules for Control of Air Pollution in Idaho	Applicable	Applies during construction of remedies; will be met though engineering controls.
IDAPA 16.01.05.008 [40 CFR 264.310(b)(5)]	Run-on and run-off controls	Applicable	Run-on to and run-off from RCRA hazardous soils, if present, will be controlled during the interim action period.
IDAPA 16.01.05.008 (40 CFR 264.553)	Temporary units	Applicable	Applies to the soil stockpiles derived from grading and sealing the Tank Farm or from construction of the diversion channels
IDAPA 16.01.05.008 (40 CFR 264.554)	Remediation waste staging piles	Applicable	Applies to the soil stockpiles derived from grading and sealing the Tank Farm or from construction of the diversion channels
Chemical-specific			
None identified			
Location-specific			
None identified			

Table 12-1. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers.	TBC	Substantive design and construction requirements will be met to protect workers.
DOE Order 5400.5	Exposures to public will be ALARA	TBC	Substantive design and construction requirements will be met to keep public exposures ALARA

Storm Water Discharges during Construction Rules require control of contamination that discharges into waters of the United States. These rules will be met by administrative and engineering controls on construction activities.

NESHAPs for radionuclide emissions from DOE facilities applies to construction or other activities that may suspend radionuclides in fugitive dust. The radiation dose to the public produced by these activities will be estimated and included in the annual INEEL calculations and reports. If radionuclides associated with fugitive dust releases exceed acceptable standards, then the need for additional measures will be evaluated and implemented as appropriate.

IDAPA Rules for Control of Air Pollution in Idaho apply because they also address releases or emissions of toxic and/or carcinogenic constituents to the atmosphere, which may occur during construction activities. Engineering and administrative controls would be used to maintain fugitive emissions below allowable levels.

IDAPA/RCRA rules for controlling run-on and run-off will be met through engineering and administrative controls, if Tank Farm soils are determined to be RCRA hazardous. Ground surfaces will be graded to reduce the potential for flooding during precipitation or snowmelt events. Building roof drains will be improved to divert potential run-on away from areas of suspected contamination.

If any hazardous waste contaminated soils or water are generated as part of the interim action, they will be temporarily managed according to the substantive requirements of IDAPA16.01.05.008 (40 CFR 264.553 [Temporary Units] and 40 CFR 264.554 [Remediation Waste Staging Piles]). Wastes treated in the Temporary Units my be subject to LDRs.

Tank Farm soils that may be contaminated while grading and sealing the Tank Farm soils and constructing the surface water diversion system will be managed in temporary storage units or remediation waste staging piles and disposed in the ICDF as necessary. These soils will be required to meet the substantive requirements of IDAPA HWMA rules.

12.2.1.2 Chemical-Specific. No chemical-specific ARARs were identified for this alternative.

12.2.1.3 Location-Specific. No location-specific ARARs were identified for this alternative.

12.2.1.4 TBCs. DOE Orders 435.1 and 5400.5 provide guidance on radiological human health and environmental protection, on cleanup and management of residual radioactive material, and the release of property. Radiation exposures to the public, workers, and the environment will be kept as low as reasonably achievable (ALARA) as required by these orders.

12.2.2 Soils Under Buildings and Structures Selected Remedy: Alternative 2—Institutional Controls with Containment

Compliance with action-, chemical-, and location-specific ARARs for the selected remedy for the Soils under Buildings or Structures, Alternative 2, is summarized in Table 12-2. A discussion of the ARARs and TBCs is provided below.

Action-Specific. Site security, inspections, and personnel training will be required during the institutional control period if the soils are capped in place. These requirements will be met by the institutional and engineering controls, radiological safety measures, and health and safety plans implemented or planned for the site. Idaho Fugitive Dust Rules and Rules for Control of Air Pollution,

Table 12-2. Compliance with ARARs for Group 2—Soils under Buildings and Structures Selected Remedy.

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 2—Soils Under Buildings and Structures: Alternative 2—Institutional Controls with Containment			
Action-specific			
IDAPA 16.01.05.008 [40 CFR 264.14(a), (b), (c)]	Site security	Applicable	Applies if the soils are capped in place with an engineered barrier
IDAPA 16.01.05.008 [40 CFR 264.15(a),(c)]	General inspection requirements	Applicable	Applies if the soils are capped in place with an engineered barrier
IDAPA 16.01.05.008 [40 CFR 264.16(a)(1),(c)	Personnel training	Applicable	Applies if the soils are capped in place with an engineered barrier
IDAPA 16.01.01.650, 16.01.01.651	Idaho fugitive dust emissions	Applicable	Applies during construction; will be met during barrier's 1000-year estimated design life.
IDAPA 16.01.01.585, 16.01.01.586	Rules for Control of Air Pollution in Idaho	Applicable	Will be met during construction by administrative and engineering controls.
40 CFR 61.92 40 CFR 61.93	NESHAPS for Radionuclides from DOE Facilities, Emission Monitoring and Emission Compliance	Applicable	Airborne releases will be minimized by overlying building and/or structure, by administrative and engineering controls during construction, and subsequently by the barrier.
40 CFR 122.6	Storm water discharges during construction	Applicable	Will be met during construction through administrative and engineering controls
IDAPA 16.01.05.008 (40 CFR 264.553)	Temporary units	Applicable	Applies for soils or liquids (i.e., purge water) that are excavated and managed on-site
IDAPA 16.01.05.008 (40 CFR 264.554)	Remediation waste staging piles	Applicable	Applies for soils that are excavated and managed on-site
IDAPA 16.01.05.008 (40 CFR 264.97)	General groundwater monitoring requirements	Applicable	Substantive requirements will be met to detect future releases from the Group 2 sites which are left in place.
IDAPA 16.01.05.008 [40 CFR 264.309 (a) and (b)]	Surveying and recordkeeping	R&A	Applies if the soils are capped with an engineered barrier; substantive requirements will be met.

Table 12-2. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
IDAPA 16.01.05.008 [40 CFR 264.310(a)1-5]	Landfill closure requirements	Applicable	Applies if the soils are capped with an engineered barrier; substantive requirements will be met.
IDAPA 16.01.05.008 [40 CFR 264.310(b)(1)(4)(5)(6)]	Landfill post-closure requirements	Applicable	Applies if the soils are capped with an engineered barrier; substantive requirements will be met. 40 CFR 264.97 will be used to meet the requirements of 40 CFR 264.310(b)(4)
Chemical-specific			
IDAPA 16.01.05.006 (40 CFR 262.11)	Hazardous waste determination	Applicable	Applies to soils that are excavated and that may require pretreatment to meet ICDF waste acceptance criteria; applies to soils where a hazardous waste determination has not been made.
IDAPA 16.01.05.005 (40 CFR 261.20 through 24)	Hazardous waste characteristics identification	Applicable	Applies for hazardous waste contaminated soils that are excavated and disposed off-site
Location-specific			
None identified			
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers	TBC	Substantive design and construction requirements will be met to keep radiation exposures ALARA
DOE Order 5400.5	Exposures to the public will be kept ALARA	TBC	Substantive design and construction requirements will be met to keep public exposure ALARA.

NESHAPs, storm water discharges during construction, and DOE Orders 435.1 and 5400.5 apply as previously described for Group 1.

If the building or structure is removed so that contaminated soils are exposed, they will either be capped with an engineered barrier or will be excavated as Group 3 soils and disposed in the ICDF. If the soils are capped with an engineered barrier, the substantive requirements of the hazardous waste landfill closure and post-closure regulations, including surveying and recordkeeping and DOE Orders 435.1 and 5400.5 will apply. These requirements will be met by designing, constructing, and maintaining the cap so that the hazardous waste landfill closure and post-closure performance standards are met. Groundwater monitoring will be required for soils that remain in place to determine if soil contaminants are leached and transported to the perched water or the SRPA.

If the exposed soils are excavated and disposed in the ICDF, the action-specific ARARs for the Other Surface Soils will apply. These ARARs will be met as described for the Other Surface Soils in Section 12.2.3.

Excavated soils may be temporarily (not to exceed 1 year) managed within the AOC under the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553 and 40 CFR 264.554). Soils or liquids treated in the Temporary Units may be subject to LDRs.

12.2.2.1 Chemical-Specific. RCRA hazardous waste characteristics identification is required to facilitate handling and management of newly generated hazardous waste contaminated soils that will be shipped and disposed off-site. Soils that are only being consolidated within the WAG 3 AOC are not subject to RCRA hazardous waste characterization, but will be subject to Waste Acceptance Criteria evaluation if disposed in the ICDF.

12.2.2.2 Location-Specific. No location-specific ARARs were identified for this alternative.

12.2.2.3 TBCs. Exposures to the public will be kept ALARA as required by DOE Orders 435.1 and 5400.5. Engineering and administrative controls used under DOE's ALARA program will reduce public exposures to allowable levels during barrier construction or soil excavation. The final site configuration will be designed, constructed, maintained, and monitored in the post-closure period to meet DOE Orders 435.1 and 5400.5 performance objectives.

12.2.3 Other Surface Soils Selected Remedy: Alternative 4A—Removal and On-Site Disposal

Compliance with action-, chemical-, and location-specific ARARs for the selected remedy for Other Surface Soils, Alternative 4A, is summarized in Table 12-3. A discussion of the ARARs and TBCs is provided below. ARARs discussed for this alternative relate both to excavation and disposal of the Other Surface Soils, and to the design, construction, operation, closure and post-closure of the ICDF, which is implemented under this alternative. The Group 3 soils consist of release sites with low-level radioactive and mixed waste soils. Sites CPP-92, -98, and –99 are boxed mixed waste soils. Site CPP-97 is a stockpile of mixed waste soils.

12.2.3.1 Action-Specific. Action-specific ARARs for this alternative relate both to excavation and transportation of Other Surface Soils to the ICDF; and to the design, construction, operation, closure and post-closure of the ICDF. Site security, inspections, and personnel training will be required at the ICDF or for soils that are capped in place. These requirements will be met by institutional and engineering controls, radiological safety measures, and health and safety plans implemented or planned for the site.

Table 12-3. Compliance with ARARs for Group 3—Other Surface Soils Selected Remedy.

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 3—Other Surface Soils: Alternative 4A—Removal and Onsite Disposal			
Action-specific			
IDAPA 16.01.01.650, 16.01.01.651	Idaho fugitive dust emissions	Applicable	Will be met during construction through administrative and engineering controls.
IDAPA 16.01.01.585 IDAPA 16.01.01.586	Rules for the control of air pollution in Idaho	Applicable	Will be met using administrative and engineering controls
40 CFR 61.92 40 CFR 61.93	NESHAPs for Radionuclides from DOE Facilities, Emission Monitoring and Emission Compliance	Applicable	Will be met using administrative and engineering controls
40 CFR 122.26	Storm water discharges during construction	Applicable	Will be met during excavation and disposal through engineering controls.
IDAPA 16.01.05.006 (40 CFR 262.11)	Hazardous waste determination	applicable	Applies if the soils disposed outside of the WAG 3 AOC; applies to soils where a hazardous waste determination has not been made
IDAPA 16.01.05.008 (40 CFR 264.553)	Temporary units	Applicable	Applies to temporary (< 1 year) storage or treatment units
IDAPA 16.01.05.008 (40 CFR 264.554)	Remediation waste staging piles	Applicable	Excavated soils can be temporarily staged prior to disposal in the ICDF without triggering LDRs or MTRs
IDAPA 16.01.05.011 (40 CFR 268)	Land disposal restrictions	Applicable	Applies only to soils from sites CPP-92, CPP-97, CPP-98, and CPP-99 or soils that have triggered placement
IDAPA 16.01.05.011 (40 CFR 268.49)	Alternative LDR treatment standards for contaminated soils	Applicable	Applies only to soils from sites CPP-92, CPP-97, CPP-98, and CPP-99 or soils that have triggered placement.
Chemical-specific			
IDAPA 16.01.05.005 (40 CFR 261.20 through 24)	Hazardous waste characteristics identification	Applicable	Applies if the soils are excavated and consolidated to facilitate their management and for soils that are treated or placed in a long-term storage unit
40 CFR 761.50(a)(5)	PCB disposal requirements	Applicable	Applies to PCB-contaminated soils and debris.
40 CFR 761.50(b)(3)	PCB remediation waste	Applicable	Applies to PCB-contaminated soils and debris.

Table 12-3. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
40 CFR 761.50(b)(7)	PCB radioactive waste	Applicable	Applies to PCB-contaminated soils and debris.
40 CFR 761.50(b)(8)	Porous surfaces	Applicable	Applies to PCB-contaminated soils and debris.
40 CFR 761.50(d)(4)	Disposal requirements for PCBs	Applicable	Applies to PCB-contaminated soils and debris.
Location-specific			
None			
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers	TBC	Substantive requirements will be met for excavation, handling, and transport of radionuclide contaminated soils to the ICDF to project workers.
DOE Order 5400.5	Exposures to the public will be kept ALARA	TBC	Will be met by administrative and engineering controls during excavation of contaminated soils, and construction, operation, and closure of the ICDF.
Group 3—Other Surface Soils: Alternative 4A—ICDF Design, Construction and Operation for Group 3 Soils			
Action-specific			
IDAPA 16.01.01.650, 16.01.01.651	Idaho fugitive dust emissions	Applicable	Will be met during construction through administrative and engineering controls.
IDAPA 16.01.01.585 IDAPA 16.01.01.586	Rules for the control of air pollution in Idaho	Applicable	Will be met using administrative and engineering controls
40 CFR 61.92 40 CFR 61.93	NESHAPS for Radionuclides from DOE Facilities, Emission Monitoring and Emission Compliance	Applicable	Will be met using administrative and engineering controls
40 CFR 122.26	Storm water discharges during construction	Applicable	Will be met during excavation and disposal through engineering controls.
IDAPA 16.01.05.008 [40 CFR 264.14(a), (b), (c)]	Site security	Applicable	Applies to either soils capped in place or consolidated in the ICDF.
IDAPA 16.01.05.008 [40 CFR 264.15(a),(c)]	General inspection requirements	Applicable	Applies to either soils capped in place or consolidated in the ICDF.
IDAPA 16.01.05.008 [40 CFR 264.16(a)(1),(c)]	Personnel training	Applicable	Applies to either soils capped in place or consolidated in the ICDF.

Table 12-3. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
IDAPA 16.01.05.008 (40 CFR 264.92)	Groundwater protection standard	Applicable	Substantive parts of regulations will be met
IDAPA 16.01.05.008 (40 CFR 264.93)	Hazardous constituents	Applicable	Substantive parts of regulations will be met
IDAPA 16.01.05.008 (40 CFR 264.95)	Point of compliance	Applicable	Substantive parts of regulations will be met
IDAPA 16.01.05.008 (40 CFR 264.97)	General groundwater monitoring requirements	Applicable	Substantive parts of regulations will be met
IDAPA 16.01.05.008 (40 CFR 264.98)	Detection monitoring program	Applicable	Substantive parts of regulations will be met
IDAPA 16.01.05.008 (40 CFR 264.114)	Disposal and decontamination of equipment, structures, and soils	Applicable	All equipment will be decontaminated before leaving the ICDF.
IDAPA 16.01.05.008 (40 CFR 264.301)	Landfill design and operating requirements	Applicable	ICDF will be designed to meet minimum technology requirements or equivalent.
IDAPA 16.01.05.008 [40 CFR 264.309(a) and (b)	Surveying and recordkeeping	Applicable	Substantive requirements will be met
IDAPA 16.01.05.008 [40 CFR 264.310(a)(1)(2)(3)(4)(5)]	Landfill closure requirements	Applicable	Substantive requirements will be met
IDAPA 16.01.05.008 [40 CFR 264.310(b)(1)(4)(5)(6)]	Landfill post-closure requirements	Applicable	Substantive requirements will be met
IDAPA 16.01.05.008 [40 CFR 264.18(a) and (b)]	Landfill location standards	Applicable	Substantive requirements will be met
IDAPA 16.01.05.008 (40 CFR 264.302)	Landfill action leakage rate	Applicable	Substantive requirements will be met
IDAPA 16.01.05.008 (40 CFR 264.553)	Temporary units	Applicable	Applies for soils or liquids that are managed on-site
IDAPA 16.01.05.008 (40 CFR 264.554)	Remediation waste staging piles	Applicable	Applies for soils that are excavated and managed on-site
40 CFR 761.75(b)(1)(2)	PCB landfill design requirements	Applicable	Applicable for PCB-contaminated soils; Substantive requirements will be met
40 CFR 761.79(a) and (b)	PCB container and moveable equipment decontamination requirements	Applicable	Applicable for PCB-contaminated soils; Substantive requirements will be met
IDAPA 16.01.05.008 (40 CFR 264.192)	Design and installation of new tank systems or components	Applicable	Applies to the SSST.
IDAPA 16.01.05.008 (40 CFR 264.601)	Miscellaneous units environmental performance standards	Applicable	Applies to the SSST.
IDAPA 16.01.05.008 (40 CFR 264, Subpart I)	Use and management of containers	Applicable	Applies to the SSST.
IDAPA 16.01.05.008 (40 CFR 264, Subpart DD)	Containment buildings	Applicable	Applies to the SSST.

Table 12-3. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
IDAPA 16.01.05.008 (40 CFR 264.1052 through 1062)	Air emissions standards for equipment leaks	Applicable	Applies to the SSST.
IDAPA 16.01.05.008 (40 CFR 264.1082 through 1088)	Air emission standards for tanks, surface impoundments, and containers	Applicable	Applies to the SSST and evaporation pond.
IDAPA 16.01.05.008 (40 CFR 264.221)	Surface impoundment design and operating requirements	Applicable	Applies to the SSST and evaporation pond.
IDAPA 16.01.05.008 (40 CFR 264.552)	Corrective action management units (CAMUs)	Applicable	Applies to the evaporation pond.
IDAPA 16.01.05.006 (40 CFR 262.34[a][1])	Hazardous waste accumulation time	Applicable	Applies to the SSST.
IDAPA 16.01.05.008 (40 CFR 264, Subpart F)	Releases from solid waste management units	Applicable	Applies to closure and post-closure of ICDF Complex.
IDAPA 16.01.05.008 (40 CFR 264, Subpart G)	Closure and post-closure	Applicable	Applies to closure and post-closure of ICDF Complex.
Chemical-specific			
IDAPA 16.01.05.005 (40 CFR 261.20 through 24)	Hazardous waste characteristics identification	Applicable	Applies to soils received from outside the WAG 3 AOC
Location-specific			
16 USC 469 et seq. 36 CFR 65	National Archeological and Historical Preservation Act	Applicable	Will be met during siting new excavations/construction in previously undisturbed areas
25 USC 3001	Native American Graves Protection and Repatriation Act	Applicable	Will be met during siting new excavations/construction in previously undisturbed areas
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers	TBC	Substantive requirements will be met in designing, constructing, and operating the ICDF to protect workers
DOE Order 5400.5	Exposures to the public will be kept ALARA	TBC	Will be met by administrative and engineering controls during excavation of contaminated soils, and construction and operation of the ICDF; and by the capping system after closure.

Table 12-3. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 3—Other Surface Soils: Alternative 4A—ICDF Operations for Non-INTEC Soils and Debris			
Action-specific			
IDAPA 16.01.05.011 (40 CFR 268)	Land disposal restrictions	Applicable	Will be met for off WAG 3 wastes by treating remediation wastes from outside the WAG 3 AOC to be disposed of in the ICDF as required.
IDAPA 16.01.05.011 (40 CFR 268.49)	Alternative land disposal restrictions treatment standards for contaminated soil	Applicable	Will be met by treating remediation wastes from outside the WAG 3 AOC disposed of in the ICDF as required.
Chemical-specific			
IDAPA 16.01.05.005 (40 CFR 261)	Identification and listing of hazardous waste	Applicable	Substantive requirements will be met for soils received from outside the OU 3-13 AOC.
IDAPA 16.01.05.006 (40 CFR 262.11)	Hazardous waste determination	Applicable	Will be met for off WAG 3 materials prior to excavation by characterizing wastes from outside the WAG 3 AOC.
40 CFR 761.50(a)(5)	PCB disposal requirements	Applicable	Applies to PCB-contaminated soils and debris.
40 CFR 761.50(b)(3)	PCB remediation waste	Applicable	Applies to PCB-contaminated soils and debris.
40 CFR 761.50(b)(7)	PCB radioactive waste	Applicable	Applies to PCB-contaminated soils and debris.
40 CFR 761.50(b)(8)	Porous surfaces	Applicable	Applies to PCB-contaminated soils and debris.
40 CFR 761.50(d)(4)	Disposal requirements for PCBs	Applicable	Applies to PCB-contaminated soils and debris.
Location-specific			
None			
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers	TBC	Substantive requirements will be met for excavation, handling, and transport of off-AOC radionuclide contaminated soils to the ICDF to protect workers
DOE Order 5400.5	Exposures to the public will be kept ALARA	TBC	Will be met by administrative and engineering controls during excavation of contaminated soils, and construction and operation of the ICDF; and by the capping system after closure.

Compliance with Idaho Fugitive Dust Rules will require dust suppression during both earth-moving activities at the Other Surface Soils sites, and during ICDF construction, operations and closure. Compliance with NESHAPs will require air modeling to ensure that no member of the public will receive greater than an effective dose equivalent (EDE) of 10 mrem/yr (40 CFR 61.92) at the INEEL boundary from all INEEL activities including earth-moving activities at the Other Surface Soils site, and from ICDF construction, operations, closure and post-closure. Regulatory notification levels will be partially based upon the results of the modeling.

IDAPA Rules for Control of Air Pollution in Idaho apply because they also address releases or emissions of toxic and/or carcinogenic constituents to the atmosphere, which may occur during soil excavation, movement and consolidation. Engineering and administrative controls to be defined during remedial design will be used to maintain emissions below allowable levels. Storm Water Discharge During Construction Rules requiring control of contamination that discharges into waters of the United States would be met by administrative and engineering controls on construction activities, to be defined during remedial design.

The majority of soils excavated from WAG 3 for disposal at the ICDF will not be subject to Hazardous Waste Determination Requirements (IDAPA 16.01.05.006 [40 CFR 262.11]), Land Disposal Restrictions (LDRs) (IDAPA 16.01.05.011 [40 CFR 268]), or Alternative LDR Treatment Standards for Contaminated Soil (IDAPA 16.01.05.011 [40 CFR 268.49]), since they will be placed directly in the ICDF because WAG 3 is considered one single AOC for purposes of disposal at the ICDF. However, any soils that may require treatment to meet the Waste Acceptance Criteria prior to placement in the ICDF are subject to LDRs. LDRs apply to contaminated soils at sites CPP-92, -97, -98, and –99. If wastes are received from areas outside the WAG 3 AOC for disposal at the ICDF, they will be required to meet the ICDF waste acceptance criteria and LDRs.

The construction and operation of an ICDF supporting complex includes a facility waste storage, sizing staging, and treatment (SSST) facility in accordance with the substantive requirements of IDAPA 16.01.05.008, Subparts I, J, X, and DD). Operations at the facility will include chemical/physical treatment to prepare ICDF wastes to meet applicable Waste Acceptance Criteria and RCRA land disposal restrictions.

One or more remedial waste staging and storage areas will be utilized to stage and handle remediation waste. The storage area be operated in accordance with the substantive requirements of IDAPA 16.01.05.006.01 and 16.01.05.006.02 (40 CFR 262.34[a][1]).

Monitoring well construction and sampling wastes generated prior to construction of the ICDF and SSST (i.e., purge water and drill cuttings) may be managed using temporary remediation waste staging piles and temporary treatment units in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553 and 40 CFR 264.554). Treatment will be accomplished using mobile tankage and physical/chemical treatment and will comply with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subpart J, BB, and CC).

An evaporation pond will be constructed and designated as a corrective action management unit (CAMU) in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.552 and 40 CFR 264 Subpart K and CC) for purpose of managing ICDF leachate, purge waters, and other aqueous wastes generated as a result of operating the ICDF complex.

The ICDF Complex will be operated, closed, and post-closed in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subparts G, F, and N). Site access restrictions and institutional controls will be maintained throughout the post-closure period.

An area within the INTEC fence will be designated as the remediation waste storage/treatment area for OU 3-13 remediation wastes. This area will be utilized under the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553), Temporary Units, and IDAPA 16.01.05.008 (40 CFR 264.554) remediation waste staging piles. These regulations apply specifically to remediation wastes. Wastes treated or temporarily stored in TUs or in remediation waste staging piles are not subject to LDRs as long as they are managed within the area of contamination.

Specific sections of RCRA Standards for Owners and Operators of Hazardous Waste TSDFs apply to the ICDF (Table 12-3). Substantive portions of general facility standards (IDAPA 16.01.05.008 [40 CFR 264 Subpart B]) including IDAPA 16.01.05.008 [40 CFR 264.14 (Site Security)] will apply, and will be met during the institutional control period by maintaining all required controls on entry including fences and signs.

Specific sections of IDAPA 16.01.05.008 [40 CFR 264 Subpart F (Releases From Solid Waste Management Units)] cited in Table 12-3 apply to the ICDF, including groundwater protection standards, hazardous constituents, point of compliance, general groundwater monitoring requirements, and detection monitoring program. These will be met by developing and implementing a facility monitoring plan specific for the ICDF during remedial design.

Specific sections of IDAPA 16.01.05.008 [40 CFR 264 Subpart N (Landfills)] and IDAPA 16.01.05.005 [40 CFR 261.75 (b)] cited in Table 12-3 apply to the design, construction, operation, closure and post-closure of the ICDF. Not all of these sections will apply if the ICDF is used exclusively for a CERCLA onsite action, in particular those containing exclusively administrative requirements, including record keeping. All substantive requirements stated in the referenced sections will be met, and the methodology for compliance will be described in detail during remedial design for the ICDF.

The equipment decontamination section of IDAPA 16.01.05.008 [40 CFR 264 Subpart G (Closure and Post-closure)] applies to closure and post-closure of the ICDF. Additionally, Sections IDAPA 16.01.05.008 [40 CFR 264.310(a)(1)(2)(3)(4)(5) and 40 CFR 264.310(b)(1)(4)(5)(6) from Subpart N] apply to final closure of the landfill. The specific performance standards cited will be met, and the methodology for compliance will be described in detail during remedial design for the ICDF. The IDAPA 16.01.05.008 [40 CFR 264.309(a) and (b)] requirements for surveying and record keeping also apply. All substantive requirements stated in the referenced sections will be met, and the methodology for compliance will be described in detail during remedial design for the ICDF.

12.2.3.2 Chemical-Specific. RCRA hazardous waste characteristics identification is required to facilitate handling and management of hazardous waste contaminated soils. PCBs waste regulations will apply to all PCB-contaminated soils received from both within and outside of the WAG 3 AOC. The substantive requirements of the PCBs regulations will be met during soil excavation and disposal. The ICDF will be designed and constructed to satisfy the PCB landfill requirements. Equipment used to handle PCB-contaminated soils will be decontaminated to satisfy the substantive PCB equipment decontamination requirements.

12.2.3.3 Location-Specific. Location-specific ARARs for this alternative relate primarily to new excavation, construction, or operations activities, including those required for the ICDF, in previously undisturbed areas. All of these ARARs will be met through the siting process for new facilities. The substantive requirements of the RCRA location standards [IDAPA 16.01.05.008 (40 CFR 264.18(a) and (b))] will be met. Archeological and Native American cultural resources will be protected by performing all activities in accordance with the National Archeological and Historical Preservation Act, and the Native American Graves Protection and Repatriation Act. No endangered species are known to be present at the proposed ICDF Study Area.

The siting evaluation study discussed in Section 11 evaluated the proposed Study Area for the ICDF against the siting criteria found at IDAPA 16.01.05.008 (40 CFR 264.18), 40 CFR 761.75 (b)(1), 19 CFR 61, 40 CFR 257.3 in addition to other criteria. The ICDF proposed Study Area was determined to meet the criteria.

12.2.3.4 TBCs. Exposure to the public will be kept ALARA as required by DOE Orders 435.1 and 5400.5 during excavation and disposal of the Other Surface Soils in the ICDF. The ICDF will be designed, constructed, operated, and closed to keep public exposures ALARA and to meet DOE performance objectives. Engineering and administrative controls used under ALARA will minimize public exposures to allowable levels during construction and operation of the ICDF.

12.2.4 Perched Water Selected Remedy: Alternative 2—Institutional Controls with Aquifer Recharge Control

Compliance with action-, chemical-, and location-specific ARARs for the selected remedy for the Perched Water, Alternative 2, is summarized in Table 12-4. A discussion of the ARARs and TBCs is provided below.

12.2.4.1 Action Specific. Site security will be required during the institutional control period. These requirements will be met by institutional and engineering controls, radiological safety measures, and health and safety plans implemented or planned for the site.

Idaho Fugitive Dust Emission rules, Rules for the Control of Air Pollution in Idaho, and NESHAPs would apply and would be met using engineering and administrative controls for all new construction.

If the Big Lost River is lined, or otherwise modified, the substantive requirements of Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, the Idaho Stream Channel Protection Act, and the Idaho Stream Channel alteration rules will be met as required.

The Agencies have not performed the analyses required under 40 CFR 230.10 and 11 to modify the Big Lost River channel. Prior to any stream alteration, the Agencies will provide their evaluation to the public through a Fact Sheet and Explanation of Significant Differences (ESD).

Action-specific requirements for discharges diverted from the Percolation Ponds will be met by the selected discharge alternative. Regulatory compliance will be described in the percolation pond replacement permit applications. If a permit is not obtained by the required time, the CERCLA program will design, construct, and operate replacement percolation ponds until a permit is obtained.

12.2.4.2 Chemical-Specific. Perched water that is stored or treated is subject to a hazardous waste determination (IDAPA 16.01.05.006 [40 CFR 262.11]). The annual limits for radionuclide effluent concentrations are applicable if the Big Lost River is lined. Although perched water releases to the SRPA may impact SRPA groundwater quality, compliance with IDAPA groundwater quality standards in the perched zone is not applicable. Perched water is not a drinking water source, and no excess human health or environmental risks will result from non-compliance with the Idaho groundwater water quality standards. Compliance with groundwater quality standards will be addressed under the selected remedy for the SRPA discussed in Section 12.2.5.

12.2.4.3 Location Specific. No location-specific ARARs are identified for Alternative 2. Location-specific requirements for discharges diverted from the Percolation Ponds will be met by the selected discharge alternative. Regulatory compliance will be described in the percolation pond replacement permit applications.

Table 12-4. Compliance with ARARs for Group 4—Perched Water Selected Remedy.

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 4—Perched Water: Alternative 2—Institutional Controls with Aquifer Recharge Control			
Action-specific			
IDAPA 16.01.05.008 (40 CFR 264.14)	Site security	Applicable	Applies to the institutional controls
40 CFR 230.10 and 11	Substantive requirements of 404(b)(1) specifications of disposal sites for dredged or fill material	Applicable	Applies only if the Big Lost River channel is modified
Executive Order 11990	Protection of wetlands	Applicable	Applies only if the Big Lost River channel is modified
Executive Order 11988	Floodplain management	Applicable	Applies only if the Big Lost River channel is modified
Rivers and Harbors Act	Section 10 of the Rivers and harbors act of 3 March 1899	Applicable	Applies only if the Big Lost River channel is modified
IDAPA 37.03.09	Idaho Well Construction Standards	R&A	Applies to perched water monitoring
IDAPA 16.01.05.008 (40 CFR 264.114)	Disposal or decontamination of equipment, structures, and soils	Applicable	Applies to drilling, sampling, or treatment equipment that contacts perched water
IDAPA 16.01.01.650, 16.01.01.651	Idaho Fugitive Dust Emissions	Applicable	Will be met through administrative and engineering controls during construction
IDAPA 16.01.01.585, 16.01.01.586	Rules for the Control of Air Pollution in Idaho	Applicable	Will be met through administrative and engineering controls during construction
40 CFR 61.92, 61.93	NESHAPS for Radionuclides from DOE Facilities, Emission Monitoring and Emission Compliance	Applicable	Will be met through administrative and engineering controls during construction
IDAPA 37.03.07.030	Idaho stream channel alteration rules	Applicable	Applicable only if the Big Lost River is determined to be a continuously flowing water body; relevant and appropriate if the Big Lost River is determined to be an intermittent river

Table 12-4. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
IDAPA 16.01.05.008 (40 CFR 264.533)	Temporary units	Applicable	Applies to temporary tankage or treatment that may be required for purge or decontamination waters.
IDAPA 16.01.05.008 (40 CFR 264.554)	Remediation waste staging piles	Applicable	Applies to drill cuttings that may be generated during monitoring well installation.
Chemical-specific			
IDAPA 16.01.05.006 (40CFR 262.11)	Hazardous waste determination	Applicable	Applies to perched water that is stored and treated.
10 CFR 20 Appendix B, Table 2	Annual limits for radionuclide effluent concentrations	R&A	Only clean liner material will be used if the Big Lost River is lined
Location-specific			
None identified			
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers	TBC	Substantive requirements will be met in designing, construction, and sampling perched water wells.
DOE Order 5400.5	Exposures to the public will be kept ALARA	TBC	Will be met by administrative and engineering controls.

12.2.4.4 TBCs. DOE Orders 435.1 and 5400.5 provide guidance on radiological human health and environmental protection requirements, on cleanup and management of residual radioactive material, and the release of property. Radiation exposures to the public, workers, and the environment will be kept ALARA as required by these orders. These performance objectives will be met through monitoring, and administrative and engineering controls to minimize exposures to contaminated perched water.

12.2.5 Snake River Plain Aquifer Interim Action Selected Remedy: Alternative 2B—Institutional Controls with Monitoring and Contingent Remediation

Compliance with action-, chemical-, and location-specific ARARs for the selected remedy for the Snake River Plain Aquifer Interim Action, Alternative 2, is summarized in Table 12-5. A discussion of the ARARs and TBCs is provided below.

12.2.5.1 Action Specific. IDAPA Rules for Control of Air Pollution in Idaho apply to releases or emissions of toxic and/or carcinogenic constituents to the atmosphere, which may occur during soil excavation, movement and consolidation, or during groundwater treatment system operation. Engineering and administrative controls would be used to maintain emissions from soils below allowable levels. Any groundwater treatment system would be designed and operated to meet emissions limits.

State of Idaho Fugitive Dust Emission rules would apply to any activities generating fugitive dust. These rules require that all reasonable precautions be taken to prevent the generation of fugitive dust from unprotected surfaces, as well as during active operations.

National Emissions Standards for Hazardous Air Pollutants for radionuclide emissions from DOE facilities applies to these activities because radionuclides may be suspended with fugitive dust during soil movement and consolidation. The radiation dose to the public will be estimated and included in the annual INEEL calculations and reports. If radionuclides associated with fugitive dust releases exceed acceptable standards (10 mrem/yr to the public), then the need for additional measures will be evaluated and implemented as appropriate.

Storm Water Discharge During Construction Rules requiring control of contamination that discharges into waters of the United States would be met by administrative and engineering controls on construction activities, to be defined during remedial design.

If contingent groundwater remediation is implemented, the treated groundwater will either be discharged to the intermittent Big Lost River with downstream recharge of the SRPA or placed in a percolation pond. Federal and state surface water discharge requirements and wastewater land application ARARs will apply, depending on which disposal alternative is selected. The disposal alternative will be determined during RD.

Substantive portions of Treatment Standards for Miscellaneous Units (IDAPA 16.01.05.008 [40 CFR 264.601]) will likely apply to any system used to treat extracted SRPA water, if contingent remediation is implemented. Standards will be met by designing, constructing, operating and closing the system so as to prevent releases to soil, groundwater, surface water or air that would result in adverse effects on human health and the environment. The remedial design report will identify specific measures to control releases. The treatment system will also need to address all COCs which are present in the groundwater.

Table 12-5. Compliance with ARARs for Group 5—Snake River Plain Aquifer Interim Action Selected Remedy.

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 5—Snake River Plain Aquifer: Alternative 2B—Institutional Controls with Monitoring and Contingent Remediation			
Action-Specific			
IDAPA 37.03.09.025	Idaho Well Construction Standards	Applicable	Applies to SRPA monitoring.
IDAPA 16.01.05.008 (40 CFR 264.114)	Disposal or decontamination of equipment, structures, and soils	Applicable	Applies to drilling, sampling, and treatment equipment that contacts SRPA groundwater.
IDAPA 16.01.01.585, 16.01.01.586	Rules for the Control of Air Pollution in Idaho	Applicable	Will be met by treatment system.
IDAPA 16.01.01.650, 16.01.01.651	Idaho Fugitive Dust Emissions	Applicable	Will be met for contaminated drill cuttings.
40 CFR 61.92, 61.93	NESHAPs for Radionuclides from DOE Facilities, Emission Monitoring and Emission Compliance	Applicable	Will be met using engineering and administrative controls.
40 CFR 125	NPDES		Applies if contingent remediation is implemented and treated groundwater is discharged to the Big Lost River.
10 CFR 20, Appendix B, Table 2	Annual limits for Effluent Concentrations	Applicable	Applies if treated water is discharged.
40 CFR 122.26	Storm Water Discharges During Construction	Applicable	Substantive requirements will be met.
IDAPA 16.0105.008 (40 CFR 264.601)	Treatment Standards for Miscellaneous Units	Applicable	Specific requirements will be clarified and met in 10% design.
IDAPA 16.01.07.300	Wastewater land application permit requirements	applicable	Applies if treated waste water is discharged to a percolation pond; substantive requirements will be met.
IDAPA 16.01.02.400	Rules governing point source discharge	Applicable	Applies to treated waste water is discharged to the Big Lost River.
IDAPA 16.01.02.401	Point source wastewater treatment requirements	Applicable	Applies if treated wastewater is discharged to the Big Lost River.
Chemical-specific			
IDAPA 16.01.05.006 (40 CFR 262.11)	Hazardous waste determination	Applicable	Applicable to groundwater that will be stored long term or treated

Table 12-5. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
IDAPA 16.01.11.200(a) (40 CFR 141) for:	Groundwater Quality Standards (Primary drinking water standards)	Applicable	This ARAR will be met in the restoration timeframe (2095) in the SRPA contaminant plume outside of the current INTEC security fence. Any recharge to the SRPA will be limited to concentrations so that this ARAR will be met in 2095.
Gross alpha particle activity (including radium-226, but excluding radon and uranium)			
Combined beta/photon emitters			
Combined Radium-226 and radium 228			
Strontium-90			
Tritium			
Location-specific			
None identified			
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers	TBC	Substantive requirements will be met to protect workers.
DOE 5400.5	Exposures to the public will be kept ALARA	TBC	Substantive ALARA requirements will be met to protect the public.

OU 3-13 RD/RA and OU 3-14 monitoring well construction and sampling wastes generated prior to the construction of the ICDF and SSST will be managed and treated with the WAG 3 AOC in remediation waste staging piles and temporary units in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553 and 40 CFR 264.554). Treatment will be accomplished using mobile tankage and physical/chemical treatment and will comply with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subparts J, BB, and CC). The final disposition of these wastes will be in the ICDF. The anticipated wastes include soil drill cuttings, monitoring well purge water, personnel protective equipment, and decontamination wastes.

12.2.5.2 Chemical-Specific. The groundwater quality standards promulgated under IDAPA 16.01.11.200(a) are applicable to the specific contaminants cited in Table 12-5. Computer modeling predicts that all of these contaminants will meet the groundwater quality standards by 2095.

If the COCs action level(s) are exceeded in selected monitoring wells as described in Section 11.1.5 within the SRPA contaminant plume outside the current INTEC security fence in the year 2000, then contingent remediation will be implemented.

Treated SRPA groundwater will be returned to the aquifer through land recharge in accordance with the Idaho Wastewater Land Application ARARs if a recharge impoundment is used, or in accordance with NPDES/SPDES ARARs if the treated effluent is discharged to the Big Lost River, which recharges the aquifer downstream of the INTEC facility.

It is possible that the ICPP groundwater contains listed hazardous waste at detectable concentrations. If this is found to be the case, implementation of remedies under this ROD may be impacted as the groundwater will be determined to contain listed hazardous waste. If so, the Agencies may elect to amend this ROD to include requirements to delist low concentrations of hazardous waste and/or constituents contained in extracted groundwater and sediments.

12.2.5.3 Location-specific. No location-specific ARARs are identified for the selected alternative.

12.2.5.4 TBCs. DOE Orders 435.1 and 5400.5 provide guidance on radiological human health and environmental protection requirements, on cleanup and management of residual radioactive material, and the release of property. Radiation exposures to the public, workers, and the environment will be kept ALARA as required by these orders. These performance objectives will be met through monitoring, and administrative and engineering controls to minimize exposures to contaminated SRPA groundwater.

The DOE Order 5400.5 requirement that the treatment technology be selected based on an evaluation of potential technologies will be met through treatability studies and a focused feasibility study for the groundwater treatment system. The most cost-effective technology that meets ARARs will be selected.

12.2.6 Buried Gas Cylinders Selected Remedy: Alternative 2—Removal, Treatment and Disposal

Compliance with action-, chemical-, and location-specific ARARs for the selected remedy for the Buried Gas Cylinders, Alternative 2, is summarized in Table 12-6. A discussion of the ARARs and TBCs is provided below.

Table 12-6. Compliance with ARARs for Group 6—Buried Gas Cylinders Selected Remedy.

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 6—Buried Gas Cylinders: Alternative 2—Removal, Treatment, and Disposal			
Action-specific			
IDAPA 16.01.01.650, 16.01.01.651	Idaho fugitive dust emissions	Applicable	Will be met during excavation and disposal using dust suppression
IDAPA 16.01.01.585, 16.01.01.586	Rules for control of air pollution in Idaho	Applicable	Will be met during treatment of tank contents
40 CFR 122.26	Storm water discharges during construction	Applicable	Will be met through engineering controls during excavation and construction
IDAPA 16.01.05.008 (40 CFR 264.114)	Disposal or decontamination of equipment, structures, and soils	Applicable	Applies to equipment used to treat or handle hazardous materials in the cylinders
40 CFR 300.440	Procedures for Planning and Implementing Offsite Response Actions	Applicable	Applies only to offsite disposal of the cylinder contents
IDAPA 16.01.05.005 (40 CFR 261.20 through 24)	Hazardous waste characteristics identification	Applicable	Applies for hazardous waste contaminated soils that are excavated and managed on-site
IDAPA 16.01.05.005 [40 CFR 261.7(a)(1), (b)(2)]	Residues of hazardous waste in empty containers	Applicable	Applicable to empty containers and compressed gas cylinders
IDAPA 16.01.05.008 (40 CFR 264.170 through 179)	Use and Management of Containers	Applicable	Substantive requirements will be met for treatment, storage, disposal and transportation of RCRA hazardous cylinder contents or hazardous waste contaminated soils
IDAPA 16.01.05.011 (40 CFR 268)	Land disposal restrictions	Applicable	Applies only to the treatment and disposal of hazardous waste contaminated soils
IDAPA 16.01.05.011 (40 CFR 268.49)	Alternative LDR treatment standards for contaminated soil	Applicable	Applies only to the treatment and disposal of hazardous waste contaminated soils
IDAPA 16.01.05.008 (40 CFR 264.553)	Temporary units	Applicable	Applies to the storage and treatment of hazardous remediation media
IDAPA 16.01.05.008 (40 CFR 264.554)	Remediation waste staging piles	Applicable	Applies to the staging of hazardous remediation soils/debris

Table 12-6. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
IDAPA 16.01.05.008 (40 CFR 264 Subpart X)	Miscellaneous units	Applicable	Applies to hazardous wastes that are stored, treated or disposed.
IDAPA 16.01.05.008 (40 CFR 264 Subpart J)	Tank systems	Applicable	Applies to hazardous wastes that are stored, treated or disposed.
IDAPA 16.01.05.008 (40 CFR 264 Subpart BB)	Air emission standards for equipment leaks	Applicable	Applies to hazardous wastes that are stored, treated or disposed.
IDAPA 16.01.05.008 (40 CFR 264 1080 through 1082)	Air emission standards for tanks, surface impoundments, and containers	Applicable	Applies to hazardous wastes that are stored, treated or disposed.
IDAPA 16.01.05.008 (40 CFR 264.310)	Landfills	Applicable	Applies only if cylinders are capped in place.
Chemical-specific			
IDAPA 16.01.05.005 (40 CFR 261)	Identification of Hazardous Waste	Applicable	Applies of soils containing hazardous waste area encountered
Location-specific			
None identified			
TBCs			
None identified			

12.2.6.1 Action Specific. Idaho Fugitive Dust Emission regulations, and regulations for Storm Water Discharges During Construction apply and substantive provisions will be met as described previously. Substantive Portions of Rules for Control of Air Pollution in Idaho will be met by characterizing the tank contents, and designing and using treatment systems that will not result in releases to the atmosphere exceeding allowable levels.

Although the gases in the buried gas cylinders are not thought to be hazardous, if hazardous substances are discovered in the cylinders these will be removed from the cylinder and treated to meet hazardous waste treatment requirements. However, a hazardous waste residue remaining in an empty container is not subject to regulation under IDAPA 16.01.05.005 (40 CFR Parts 261) through IDAPA 16.01.05.009 (40 CFR 265), or IDAPA 16.01.05.011 (40 CFR Part 268), IDAPA 16.01.05.012 (40 CFR 270), or 40 CFR 124 [IDAPA 16.01.05.005 (40 CFR 261.7(a)(1))]. A container that has held a hazardous waste or substance that is a compressed gas is considered empty when the pressure in the container approaches atmospheric IDAPA 16.01.05.005 [40 CFR 261.7(b)(2)]. The requirements of IDAPA 16.01.05.005 (40 CFR 261.7) will be met by determining that the internal pressure of the compressed gas cylinders is at atmospheric pressure, and therefore termed empty. Hazardous waste residues in empty gas cylinders are not considered hazardous waste and can be disposed accordingly.

Hazardous waste treatment residuals resulting from treatment of the compressed gas cylinder contents, if necessary, will be containerized. The use and management of hazardous waste containers will be applicable. The substantive requirements of these regulations will be met as specified.

If hazardous wastes are present in the compressed gas cylinders have leaked to the underlying soils, the LDRs will apply. The LDRs requirements for hazardous waste contaminated soils will be met by either a Contained in policy decision or by treating the contaminated soils to meet LDRs.

The Agencies may elect to pursue a contingent remedy of capping in place pursuant to the substantive requirement of IDAPA 16.01.05.008 (40 CFR 264.310) if safety concerns with excavation and removal of the cylinders prevent implementation of the selected remedy.

The CERCLA Procedures for Planning and Implementing Offsite Response Actions under 40 CFR 300.440 apply, and will be met for off-site shipment and disposal of any solid or hazardous wastes by shipping any hazardous wastes or hazardous waste treatment residuals derived from the cylinders to a RCRA Subtitle C permitted facility, provided the waste is acceptable to the receiving facility's authorizing state.

12.2.6.2 Chemical Specific. If a hazardous waste is determined to have been released to the soils, the soils will be subject to hazardous waste characteristics identification in IDAPA 16.01.05.005 (40 CFR 261). Soils determined to be hazardous will be disposed in the ICDF. Soils that are determined to be listed will be delisted using a no-longer contained in determination and disposed in the ICDF.

12.2.6.3 Location Specific. None identified.

12.2.6.4 TBCs. Radioactive waste management procedures will be used to protect workers (DOE Order 435.1) and to keep exposures to the public ALARA (DOE Order 5400.5).

12.2.7 SFE-20 Hot Waste Tank System Selected Remedy: Alternative 4—Removal, Treatment and Disposal

Compliance with action-, chemical-, and location-specific ARARs for the selected remedy for the SFE-20 Hot Waste Tank System, Alternative 4, is summarized in Table 12-7. A discussion of the ARARs and TBCs is provided below.

12.2.7.1 Action-Specific. Idaho fugitive dust emissions rules, Idaho rules for the control of air pollution, and NESHAPs requirements will be met using institutional and engineering controls during excavation and disposal of either on-site of off-site actions

The SFE-20 Hot Waste Tank System was previously closed and abandoned in 1976, and, therefore, was not used as a RCRA tank storage unit. As such, excavation and removal of the SFE-20 tank system is considered consolidation of a land disposal unit. Excavated tank system components and underlying soils will be managed as remediation waste within the AOC. The liquid and sludge wastes will be removed and solidified/stabilized prior to disposal in the ICDF. Since the tank system components and other wastes occur within the WAG 3 AOC and are considered remediation waste, they can be disposed in the ICDF without triggering LDRs or MTRs. The wastes will be managed in remediation waste staging piles within the AOC prior to disposal at the ICDF. Any tank system components that are treated in the SSST will be subject to LDRs. Liquid wastes that are treated to meet the ICDF Waste Acceptance Criteria will also be subject to LDRs.

If the SFE-20 tank components and waste are determined to be hazardous and are removed, treated, and disposed off-site the CERCLA Procedures for Planning and Implementing Offsite Response Actions under 40 CFR 300.440 apply. The criteria specified for the off-site response actions will be met by shipping remediation wastes only to a permitted RCRA Subtitle C facility that prevents releases of hazardous waste, hazardous constituents or substances to groundwater, surface water, soil or air. The wastes will only be shipped if they meet, or can be treated to meet, the receiving facility's waste acceptance criteria.

12.2.7.2 Chemical-Specific. Tank liquids, sludges, and underlying contaminated soils will be characterized to determine if hazardous constituents or characteristics are present. The results of the hazardous waste characterization will be used to facilitate proper management and disposal of these materials at either the ICDF or off-site. Asbestos regulations cited in Table 12-7 apply, and will be met by managing asbestos debris generated during demolition and removal of the tank vault, pump pit and associated structures in accordance with all substantive provisions of the regulations.

12.2.7.3 Location-Specific. There are no location specific ARARs.

12.2.7.4 TBCs. DOE Orders 435.1 and 5400.5 provide guidance on radiological human health and environmental protection requirements, on cleanup and management of residual radioactive material, and the release of property. Radiation exposures to the public, workers, and the environment will be kept ALARA as required by these orders. These performance objectives will be met through monitoring, and administrative and engineering controls to minimize exposures.

Specific EDE limits to the public defined in DOE Order 5400.5 will be met through monitoring, and administrative and engineering controls as required during excavation and construction in contaminated areas.

Table 12-7. Compliance with ARARs for Group 7—SFE-20 Hot Waste Tank System Selected Remedy.

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
Group 7—SFE-20 Hot Waste Tank System: Alternative 4—Removal, Treatment, and On-Site Disposal			
Action-specific			
IDAPA 16.01.01.650, 16.01.01.651	Idaho Fugitive Dust Emissions	Applicable	Will be met using engineering controls during tank waste and system removal
40 CFR 61.92, 61.93	NESHAPs for Radionuclides from DOE Facilities	Applicable	Will be met using engineering controls during tank waste and system removal
IDAPA 16.01.01.585, 16.01.01.586	Rules for the Control of Air Pollution in Idaho	Applicable	Will be met using engineering controls during tank waste and system removal
IDAPA 16.01.05.008 [40 CFR 264.193(b)]	Secondary containment and detection of releases	Applicable	Applies if hazardous wastes are pumped or transferred to a treatment system.
IDAPA 16.01.05.008 (40 CFR 264.553)	Temporary units	Applicable	Applies to any tank components or soils that are excavated
IDAPA 16.01.05.008 (40 CFR 264.554)	Remediation waste staging piles	Applicable	Applies to any tank components or soils that are excavated
IDAPA 16.01.05.008 (40 CFR 264 Subpart X)	Miscellaneous units	Relevant and Appropriate	Applies to liquids or sludges that are removed from the tank
IDAPA 16.01.05.011 (40 CFR 268)	Land disposal restrictions	Applicable	If placement is triggered, LDRs will apply.
IDAPA 16.01.05.011 (40 CFR 268.49)	Alternative LDR Treatment Standards for Contaminated Soil	Applicable	If placement is triggered, LDRs will apply.
Chemical-specific			
IDAPA 16.01.05.005 (40 CFR 261.20 through 24)	Hazardous waste characteristics identification	Applicable	Applies only to hazardous liquids or sludges in the tank or underlying soils that may have been impacted by a release
IDAPA 16.01.05.006 (40 CFR 262.11)	Hazardous waste determination	Applicable	
40 CFR 61 Subpart M, 61.145, 61.150; 61.156	Asbestos regulations	Applicable	Substantive requirements will be met
Location-specific			
None identified			

Table 12-7. (continued).

Alternative/ARARs citation	Description	Applicable, or Relevant and Appropriate (R&A), or TBC	Comments
TBCs			
DOE Order 435.1	Radioactive waste management performance objectives to protect workers	TBC	Substantive requirements will be met by administrative and engineering controls during excavation, removal, treatment and disposal of the tank system and contents.
DOE Order 5400.5	Exposures to the public will be kept ALARA	TBC	Will be met by administrative and engineering controls during excavation, removal, treatment and disposal of the tank system and contents.

12.3 Cost Effectiveness

Table 12-8 summarizes the comparison of costs of the OU 3-13 remedial alternatives. In all cases, the alternative that most cost-effectively protects human health and the environment, and meets ARARs, was selected for implementation under this ROD. Each remedial action selected is cost effective in that the costs were determined to be proportional to the overall effectiveness of the remedy. The Agencies have determined that each remedial action adequately protects human health and the environment and complies with ARARs. The comparison of cost-effectiveness between alternatives is described below for each site grouping.

12.3.1 Tank Farm Soils Interim Action (Group 1)

Alternative 3 (the selected alternative) is the most expensive, because it contains the largest amount of capital improvements to the site. It is the only alternative that will reduce contaminant transport to the SRPA and facilitate meeting water quality ARARs.

12.3.2 Soils Under Buildings and Structures (Group 2)

Alternative 2 (the selected alternative) is the most expensive alternative, because it includes both institutional controls and capital costs for containment, while Alternative 1, the least expensive, includes no active remediation. Alternative 3 is a contingency remedy that will only be implemented in the event that contaminated soils are excavated during D&D of the buildings and structures. Alternative 2 is easily implemented, effective, and protective of human health and the environment.

12.3.3 Other Surface Soils (Group 3)

The costs for each alternative progressively increase from Alternative 1 (Existing Institutional Controls), with the lowest overall cost, to Alternative 4B (Excavation, Ex Situ Treatment, and Off-Site

Table 12-8. Comparison of costs[a] of alternatives[b] for WAG 3.

Site/Grouping	Alternative 1	Alternative 2	Alternative 3	Alternative 4A	Alternative 4B
Tank Farm Soils Interim Action	$3.4M	$10.0M	**$15.1M**		
Soils Under Buildings and Structures	$6.4M	**$9.2M**	$8.3M	NA	NA
Other Surface Soils	$6.8M	$15.0M	$37.5M	**$84.9M**	$244.6M
Perched Water	$7.3M	**$20.0M**	$259.2M	NA	NA
Snake River Plain Aquifer Interim Action	$13.9M	$14.8M (2A)[c]	**$39.8M**(2B)	$787.9M (3)	NA
Buried Gas Cylinders	$6.4M	**$1.8M**	$8.2M	NA	NA
SFE-20 Tank	$6.4M	$8.7M	$8.5M	**$4.6M**(4)	NA

a. All costs are in millions (M) of dollars, calculated as net present value (NPV). A discount rate of 5%, per EPA guidance, was used to calculate the NPV.

b. Costs for the selected alternative are shown in bold.

c. The number in parentheses following the cost refers to the alternative number for the specific group.

Disposal), with the highest cost of the five alternatives evaluated. However, as the cost of each alternative increases from Alternative 1 through Alternative 4B, so does the level of overall protection and long-term effectiveness. Alternative 1, while the least expensive, provides the lowest level of protection after the institutional control period is over, and is least effective in the long-term. Alternative 4B provides the greatest level of protection and long-term effectiveness by removing the contaminated material from the site, treating it, and permanently disposing of it off-Site. Additionally, the toxicity, mobility and volume of the contaminated soils will be reduced by this alternative. Similarly, Alternative 4A (Excavation and On-Site Disposal) provides a significant level of protection and effectiveness by consolidating the contaminated soil in one location and containing it in an engineered and monitored facility. Neither the toxicity nor the volume of the contaminated soil is reduced by this alternative, however. Comparing Alternative 4A to 4B for all criteria but cost indicates that Alternative 4A is slightly more effective overall than Alternative 4B. However, the additional effectiveness provided by Alternative 4B compared with its significant cost makes Alternative 4A the more reasonable alternative.

12.3.4 Perched Water (Group 4)

Alternative 2 (the selected alternative) is more expensive than Alternative 1, because aquifer recharge controls are included. Alternative 2 is much less expensive than Alternative 3, which would add perched water pumping and treatment but would not significantly improve protection of human health. Alternative 2 is the least expensive alternative considered that is protective of human health after 2095 and meets ARARs. Environmental receptors are not exposed to the perched water.

12.3.5 Snake River Plain Aquifer Interim Action (Group 5)

Alternative 2B (the selected alternative) is more expensive than 1 and 2A, since it includes both the existing and additional controls defined for those alternatives, as well as contingent groundwater pumping and treatment to remove COCs. The treatment system will need to address all COCs which are present in SRPA groundwater, but are not predicted to be above risk-based levels following institutional control. It is much less expensive than Alternative 3, which would incorporate much higher pumping rates, but with no significant increase in human health protection. Alternative 2B is the least expensive alternative considered that is predicted to meet MCLs after 2095 and meets all other ARARs. Environmental receptors are not exposed to SRPA water.

12.3.6 Buried Gas Cylinders (Group 6)

Alternative 2 (the selected alternative) is the least expensive alternative considered, because all hazardous materials will be removed from the site and no long-term monitoring or institutional controls will be required. Alternative 2 is the least expensive alternative that is protective of human health and the environment and meets ARARs.

12.3.7 SFE-20 Hot Waste Tanks System (Group 7)

Alternative 4 (the selected alternative) is the least expensive alternative considered, because all hazardous materials will be removed from the site and no long-term monitoring or institutional controls will be required. Alternative 4 is the most cost-effective alternative that is protective of human health and the environment and meets ARARs.

12.4 Utilization Of Permanent Solution And Alternative Treatment Technology To The Maximum Extent Practicable

The selected remedies in this ROD represent the maximum extent to which permanent solutions and alternative treatment technologies can be used in a practicable manner at OU 3-13. Of those alternatives that are protective of human health and the environment and comply with ARARs, the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and considering State and community acceptance.

The Tank Farm Soils Interim Action, Alternative 3, is not a permanent solution and does not use alternative treatment technologies. Because current information regarding the nature and extent of contamination at the Tank Farm is inadequate to support selection of a final remedy, a separate RI/FS for the Tank Farm is underway. The Tank Farm is now referenced as a separate operable unit, OU 3-14. The OU 3-14 RI/FS will further investigate contamination at the Tank Farm and develop alternatives for a final remedy. Use of a permanent solution or alternative treatment technologies will be considered in the development of alternatives in the Tank Farm RI/FS.

The selected remedy for the Soils under Buildings and Structures, Alternative 2, is a permanent solution but does not use alternative treatment technologies. Since the contaminated soils will remain isolated onsite for up to 1,000 years, the selected remedy will result in a permanent solution for the release sites. The sites will be covered with natural earthen materials to isolate the contaminated soils and prevent exposure to humans or the environment. The barrier system will be designed to prevent future exposure for up to 1,000 years, which will allow natural radioactive decay to reduce contaminant concentrations over time to levels that are not a risk to human health or the environment. The barrier design will also minimize contaminant migration by inhibiting water infiltration. Long-term isolation will provide an effective permanent solution for these sites. Although treatment technologies exist for the nonradionuclide COCs, arsenic, mercury, and chromium, the primary COCs at these sites are radionuclides. Effective treatment technologies for radionuclides are currently unavailable. The treatment technologies evaluated were determined not to be practicable because they were ineffective, difficult to implement, or very costly. Therefore, the use of alternative treatment technologies also cannot be met except through natural radioactive decay over time.

The selected remedy for the Other Surface Soils, Alternative 4A, provides a permanent solution because the contaminated soils will be permanently removed and contained at the ICDF. Contaminated soils present at the release sites will be excavated to a minimum depth of 10 feet below ground and disposed in an engineered facility designed for long-term isolation and protection. Although treatment technologies exist for the nonradionuclide COCs, mercury, lead, and chromium, present at some of these sites, the primary COCs at these sites are radionuclides. The treatment technologies evaluated were determined not to be practicable because they were ineffective, difficult to implement, or very costly. Therefore, the use of alternative treatment technologies will not be met.

The selected remedy for the Perched Water, Alternative 2, provides a permanent solution but does not use alternative treatment technologies. Alternative 2 is comprised of existing and additional institutional controls to restrict perched water use and implementation of initial phased remedies to control water infiltration and perched water releases to the SRPA. The proposed initial phased remedies are permanent actions that control sources supplying water to the perched zone. These actions are designed to reduce leaching and transport of soil contaminants to perched water, to reduce the volume of water in the perched zone, and to minimize the potential for perched water releases to the SRPA. The low yield of the perched zone limits implementation of active remediation. The inability to implement active remediation because of perched zone characteristics eliminates the need for alternative treatment technologies. Therefore, this remedy will not meet the statutory requirement for alternative treatment technologies.

The Snake River Plain Aquifer Interim Action, Alternative 2B, is not a permanent solution and does not use alternative treatment technologies unless active remediation is implemented. The SRPA action outside the current INTEC security fence is a final action. SRPA groundwater actions inside the current INTEC security fence, if needed, will be addressed in OU 3-14. If groundwater remediation is implemented, treatability studies will be implemented to evaluate and select appropriate treatment technologies. Alternative treatment technologies will be considered in the treatability studies. Active groundwater remediation would provide a permanent solution by removing groundwater from the zone of maximum contamination. Because current information regarding the nature and extent of contamination at the SRPA inside the current INTEC security fence is inadequate to support selection of a final remedy, a separate RI/FS that includes this portion of SRPA will be implemented. Further evaluation of the SRPA inside the current INTEC security fence will be deferred to OU 3-14. The OU 3-14 RI/FS will further investigate contamination in the SRPA inside the current INTEC security fence and develop alternatives for a final remedy. Use of a permanent solution or alternative treatment technologies will be further considered in the development of alternatives in the OU 3-14 RI/FS.

The selected remedy for the Buried Gas Cylinders, Alternative 2, provides a permanent solution and uses treatment technologies, where necessary, as the principal remedy. Alternative 2 consists of the excavation and permanent removal of the gas cylinders, treatment of the tank contents, if necessary, and recycling of the gas cylinders. Excavation will be conducted to minimize the potential for any gas releases to the environment. The gases in the cylinders will be vented to the atmosphere if they are benign or treated using a method suitable for a particular gas. The specific treatment methods will be selected during RD/RA.

The selected remedy for the SFE-20 Hot Waste Tank System, Alternative 4, provides a permanent solution and uses treatment technologies, where necessary, as the principal remedy. Alternative 4 will permanently remove the tank and associated structures for disposal on-Site. The tank liquid will be removed and treated at the PEW Evaporator. The tank sludge will be removed and treated ex-situ using a suitable grout to solidify and stabilize the contaminants in the sludge. The sludge will be drummed and either disposed on-Site or off-Site at a suitable engineered disposal facility. Depending on waste characteristics, the remaining components of the tank system will be permanently excavated, removed, and disposed at either the ICDF or off-Site, depending on the ICDF waste acceptance criteria.

12.5 Preference for Treatment as a Principal Element

This ROD meets the statutory requirement to utilize permanent solutions and treatment technologies to the maximum extent practicable, given the nature and extent of contamination present at OU 3-13. OU 3-13 COCs are primarily radionuclides. Treatment technologies exist to reduce radionuclide mobility, and the volumes of radionuclide-contaminated media, however no viable technology exists to reduce radionuclide toxicity. The Group 1, 2, and 3 radiologically contaminated soils which represent principal threat wastes will not be treated under this action. Natural radioactive decay is the only means by which toxicity reduction occurs. Technologies to reduce mobility and volume (soil washing, groundwater pump and treat) of contaminated media were considered in this FS and utilized to the extent they were determined to be technically feasible and cost-effective.

Risks presented by Soils under Buildings and Structures were determined to be most cost-effectively addressed through containment in situ, since they are presently under buildings and structures, and are almost exclusively contaminated with radionuclides. Containment of radionuclides, either in situ or at an engineered facility, will effectively provide isolation from the environment, allowing for radioactive decay to continue while inhibiting exposures to human and ecological receptors. However, containment is not considered treatment, since no technologies to permanently reduce toxicity, mobility or volume are directly implemented.

Treatment of radionuclide-contaminated soils at the Other Surface Soils sites to reduce volume prior to disposal was not found to be cost-effective. Disposal at the proposed ICDF, without treatment, was determined to have equivalent long-term effectiveness, higher short-term effectiveness and lower cost.

Groundwater pumping and treatment was selected as a contingent remedy to reduce mobility and volume of COCs in the SRPA, if action levels are exceeded before 2095. Both pumping and treatment aspects of this alternative would require treatability study evaluation prior to implementation. The treatment study will also need to address tritium and mercury that are present in SRPA groundwater, but are not predicted to exceed risk-based levels following institutional control.

Hazardous constituents in gases at the Buried Gas Cylinder sites will be treated by neutralization or other means to render them non-hazardous. Immobilization by grouting to reduce radionuclide mobility was selected for the SFE-20 tank contents only. These are regarded as relatively permanent treatment technologies.

12.6 Five-Year Review

The entire area of INTEC covered by this ROD will be included in a single periodic 5-year review. The CERCLA 5-year review process will ensure the protectiveness of the remedial actions taken under the ROD where contaminants remain at the sites that requires access controls or land use restrictions. Five-year reviews will also ensure that any changes in the physical configuration of any INTEC facility or site where there is suspicion of a release of hazardous or radioactive substances (such as D&D) will be managed to achieve remediation goals established in the ROD. As part of the 5-year review process, the Agencies will periodically review the protectiveness of their decisions and adjust to updates in public protectiveness levels.

13. DOCUMENTATION OF SIGNIFICANT CHANGES

CERCLA Section 117(b) requires that an explanation of any significant changes from the preferred alternative originally presented in the Proposed Plan be provided in the ROD. A few changes have been made in the ROD that are different than presented in the Proposed Plan. Although the changes may not be considered significant, they are included in this section of the ROD to accurately reflect changes since the Proposed Plan was issued.

13.1 New Sites

Four new sites have been identified in this ROD using the FFA/CO new site inclusion process. These sites are described below, as well as the OU 3-13 release site group each site has been placed in for remediation.

13.1.1 CPP-96—Tank Farm Interstitial Soils

Release site CPP-96 is a new Group 1 site that consolidates all of the previously defined Tank Farm Soils release sites and the intervening Tank Farm interstitial soils that occur within the boundaries of CPP-96 that were not previously identified as release sites. The previously defined Tank Farm Soils release sites included within Site CPP-96 include: CPP-15, -16, -20, -24, -25, -26, -27, -28, -30, -31, -32, -33, -58, and –79. Site CPP-96 will be subject to the Group 1 Interim Action under this ROD. Site CPP-96 will be further investigated under OU 3-14 where a final remedy for this site will be selected.

13.1.2 CPP-97—Tank Farm Soil Stockpiles

This site includes two stockpiles of soil located in the northeast corner of INTEC. The stockpiles were generated during the high-level liquid waste Tank Farm upgrade project. Potential contaminants contained in the stockpiled soils include radionuclides and suspected PEW listed wastes. These soils will be remediated using the selected remedy for Other Surface Soils. The Tank Farm Soil Stockpiles are included in OU 3-13, Group 3.

13.1.3 CPP-98—Tank Farm Shoring Boxes

This site consists of 118 boxes of contaminated shoring material. The boxes contain wood and metal shoring material from the Tank Farm. These boxes will be remediated using the selected remedy for Other Surface Soils. The shoring boxes are included in OU 3-13, Group 3.

13.1.4 CPP-99—Boxed Soils

Consists of 59 boxes of soils staged near the CPP-92 Waste Storage Facility. These soils were generated during the Tank Farm upgrade project and the CPP-604 Egress Tunnel project. The boxed soils are similar to the boxed soils in site CPP-92, and will be remediated using the selected remedy for Other Surface Soils. The boxed soils are included in OU 3-13, Group 3.

13.2 Sites Included in Other Programs or Other OUs

In the Proposed Plan, four sites (CPP-37, -38, -65, and -66) were directed to other programs. One of those sites (CPP-37) has been split into two sub-sites (CPP-37a and -37b) that will be remediated under this ROD.

- Site CPP-37a, a former seepage pit receiving runoff from the Tank Farm will be addressed under Group 3, Other Surface Soils. A presumptive remedy of excavate and dispose at the ICDF will be implemented. This site was discussed in the Proposed Plan as part of "sites to be transferred to other programs."

- Site CPP-37b (former construction landfill inside the fence) will be addressed as a Group 3 soils site. This site was discussed in the Proposed Plan as part of "sites to be transferred to other programs."

- Site CPP-66 Fly Ash Pit was discussed in the Proposed Plan as part of "sites to be transferred to other programs." This site has been moved to OU 10-04 for further evaluation of ecological risk.

- Sites CPP-61, -81, and –82 previously identified as "No Further Action" (CPP-61) and "No Action" (CPP-81 and 82) sites in the Proposed Plan, have been determine to require additional information to make a decision. These site are transferred to OU 3-14 for further evaluation.

13.3 Other Changes

- The Agencies reviewed the site characterization data for Site CPP-41 and decided that the site should be split into two sites that will be designated CPP-41a and CPP-41b. The Agencies have decided in this ROD that Site CPP-41a has insufficient data to make a "No Further Action" decision. Site CPP-41a will be included in this ROD as a Group 2 site. The Agencies have decided that the risks posed by Site CPP-41b are less than 1×10^{-4} or an HI <1 and that this site requires "No Action".

- The Proposed Plan indicated that "No Action" or "No Further Action" be taken at 51 sites. After further review of the "No Action" and "No Further Action" decisions, the Agencies have decided in this ROD that 11 of these sites have insufficient data to support either "No Action" or "No Further Action." These 11 sites will be managed as follows:

  - Sites CPP-16, -24, and –30 will be included within the new Group 1 - Tank Farm Interstitial Soils consolidation site CPP-96.

  - Sites CPP-41a, -60, -68, and –86 will be included within Group 2 - Soils Under Buildings or Structures.

  - Site CPP-85 has been closed in place as part of the WCF closure. The WCF was closed under an approved HWMA closure plan. The WCF will be included with the Group 2 Soils Under Buildings and Structures sites in the CERCLA 5-year reviews.

  - Sites CPP-61, -81, and –82 will be transferred to OU 3-14 for further evaluation.

- As part of the Agencies review of the "No Action" and "No Further Action" site decisions, the Agencies have decided that 34 of the release sites evaluated under OU 3-13 meet the RAOs established under this ROD and require "No Action." Ten sites were previously designated as "No Action" sites under the FFA/CO. The Agencies have also decided that six of the release sites have existing or potential contaminant sources but do not have an exposure route under current site conditions. The Agencies have designated these sites as "No Further Action".

- The SRPA remedy will be implemented as an interim action under OU 3-13. The decision for the SRPA outside the current INTEC security fence is a final action under this ROD. The final remedy for the SRPA inside the current INTEC security fence will be determined under OU 3-14.

- Fifteen legacy waste soil samples from previous INTEC site investigations will be placed in the ICDF for permanent disposal.

- Site CPP-67 Percolation Ponds

  - The Proposed Plan discussed the need to close the existing percolation ponds to eliminate recharge to the perched water zones (Group 4). The Proposed Plan did not specify the location of the replacement percolation ponds. The location of the replacement percolation ponds is selected under this ROD and is shown on Figure 11-5. A wastewater land application permit will be submitted for the replacement percolation ponds on or before 2001, and the existing ponds will stop receiving water by December 31, 2003. If the new wastewater land application permit (WLAP) cannot be in place to support this date, then the ponds will be replaced under CERCLA authority, and the CERCLA ER program will finalize design and authorize construction.

- The Agencies have determined that lining the Big Lost River may be a necessary second step to reduce recharge to the perched water. Therefore, relocation of the river is no longer being considered. The Agencies will do additional environmental and cost analyses to determine if lining the Big Lost River is necessary.

- Site CPP-48 (French Drain South of CPP-633) was previously included in the Proposed Plan as a "No Further Action" site based on the results of the RI/BRA. However, under the COCA, Site CPP-48 retained a RCRA land disposal unit (LDU) designation. Under the FFA/CO, units retaining an LDU designation will be remediated under CERCLA. As a result, Site CPP-48 will be remediated under the selected remedy for Group 3. This will simplify closure of this site.

- The WCF has been closed under an approved HWMA closure plan and a post-closure monitoring and maintenance plan is required. In order to reduce the duplication of effort for monitoring and maintenance of the WCF, maintain consistency with the publicly-noticed WCF closure plan, and acknowledge the RCRA/CERCLA parity policy these requirements will be addressed under this ROD as ARARs. The WCF will be included during the CERCLA 5-year reviews with the Group 2 Soils Under Buildings and Structures sites and will address the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310). Additionally these requirements will be incorporated into the post-ROD monitoring plan for OU 3-13.

- Through a preliminary evaluation of all relevant decision criteria, the Agencies have determined the Study Area for siting the ICDF to be the CPP-67 Percolation Ponds and adjacent areas to the west as depicted in Figure 11-4 based on the preliminary geotechnical information. However, the specific ICDF cell locations will be determined through the completion of a comprehensive geotechnical evaluation of the entire Study Area, which shall be reviewed and approved by the Agencies.

- OU 3-13 RD/RA and OU 3-14 monitoring well construction and sampling wastes generated prior to the construction of the ICDF and SSST will be temporarily (not to exceed 1 year) managed and treated within the WAG 3 AOC in remediation waste staging piles and temporary units in accordance with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.553 and 40 CFR 264.554). Treatment will be accomplished using mobile tankage and physical/chemical treatment and will comply with the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264 Subparts J, BB, and CC). The final disposition of these wastes will be in the ICDF. The anticipated wastes include soil drill cuttings, monitoring well purge water, personnel protective equipment, and decontamination wastes.

- This ROD recognizes that the INTEC facility is an operating facility. As such, periodic maintenance and upgrade activities will be conducted during the implementation of the remedial actions under this ROD. Prior to conducting any site disturbance activities, the Agencies will be notified of the extent of any disturbance and provided a plan for agency approval that includes the necessary corrective actions that will be performed to ensure that the remedies identified in this ROD remain operational and functional. A formal system for notification and approval of disturbances to OU 3-13 sites will be developed during remedial design.

14. RESPONSIVENESS SUMMARY

In accordance with CERCLA Sections 113(k)(2)(B)(I-V) and 117, a series of opportunities were made available for public information and participation throughout the OU 3-13 investigation and decision process. The Proposed Plan, describing the Agencies preferred remedies for OU 3-13 was released for public review and comment on October 18, 1998. Public review of the Proposed Plan took place between October 23 and December 22, 1998, which included an automatic 30-day extended comment period. An additional 30-day extension, until February 12, 1999, was requested and granted. Public meetings were also held in Idaho Falls, Twin Falls, Boise, and Moscow, Idaho on November 16, 17, 18, and 19, 1998. Written comment forms were available in the Proposed Plan and at the public meetings. A court reporter was also present at the public meetings to record transcripts of the discussions and public comments. The Responsiveness Summary was prepared by the Agencies to provide responses to both written and verbal comments received during the public comment period and at the formal comment session of the meetings. The Responsiveness Summary is included as Appendix A to this ROD.

15. REFERENCES

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Appendix A

Operable Unit 3-13 Responsiveness Summary

Public Comments and Responses on the OU 3-13 Proposed Plan

OVERVIEW

The Idaho Nuclear Technology and Engineering Center (INTEC), formerly known as the Idaho Chemical Processing Plant (ICPP), constitutes the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13, at the Idaho National Engineering and Environmental Laboratory (INEEL). There have been 99 releases or potential release sites (95 discussed in the Proposed Plan) and 15 OUs identified at INTEC. Operable Unit 3-13 is the latest investigation completed and represents the INTEC comprehensive remedial investigation/feasibility study (RI/FS), including the 18 sites not previously assessed. Selected remedies were chosen for the 99 sites contained in this Record of Decision (ROD)

Forty of these sites were determined in the comprehensive RI/FS to have contamination that poses a potential risk to human health and the environment and that requires remedial action to reduce or eliminate those risks. During the RI/FS and Proposed Plan, these 40 contaminated sites were grouped into the following seven remedial action groups: (Tank Farm Soils [Group 1], Soils Under Buildings and Structures [Group 2], Other Surface Soils [Group 3], Perched Water [Group 4], Snake River Plain Aquifer [Group 5], Buried Gas Cylinders [Group 6], and SFE-20 Tank System [Group 7]). This grouping was done on a media or geographical location basis. Additionally, four sites have recently been added to WAG 3 that are similar to other WAG 3 sites within the remedial action groups requiring remediation. These sites have been added to the appropriate remedial action group (Site CPP-96 has been added to Group 1 and Sites CPP-97, -98, and -99 have been added to Group 3) and will be remediated using the same remedial action alternatives. For these seven remedial action groups, remedial action alternatives were evaluated, and preferred alternatives were selected. Also, there are two sites (CPP-38 and CPP-65) that will be remediated or closed under other regulatory programs and one site (CPP-66) that has been transferred to WAG 10 for further evaluation. One site (CPP-48), a proposed "No Action" site, has been determined to require additional action and will be part of Group 3. In addition to the 46 sites in the remedial action groups, two other sites requiring a remedial action, and one-transferred site, 50 sites were determined to pose an acceptable risk to human health and the environment and were identified by the Agencies as "No Action" and "No Further Action" sites.

A Proposed Plan that summarized the results of the RI/FS and presented the preferred remedial alternatives was released by the Agencies for public review on October 16, 1998. The initial Public review of this document took place between October 23, 1998, and December 22, 1998, which included an automatic 30-day extension to the comment period. Comments were received from 10 of the 55 people who attended the formal portions of the 4 public meetings. Written comments were received from 19 persons or groups. An additional 30-day review period (to February 12, 1999) was requested and used by 5 persons or groups to submit written comments. Public meetings were held in Idaho Falls, Twin Falls, Boise, and Moscow, Idaho on November 16, 17, 18, and 19, 1998, respectively.

This Responsiveness Summary responds to both written and verbal comments received during the comment period and meetings. Generally, support for the selected alternatives for each remedial action group was mixed.

BACKGROUND ON COMMUNITY INVOLVEMENT

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 113(k)(2)(B)(I-V) and 117, a series of opportunities were available for public information and participation in the remedial investigation and decision process for OU 3-13, WAG 3 of INTEC (ICPP), from 1991 to present. For the public, the activities included receiving fact sheets that briefly discussed the status of the investigations to date, *INEEL Reporter* articles and updates, a Proposed Plan, and focus group interaction, along with teleconference calls, briefings, presentations, and public meetings.

During the week of October 18, 1998, the U.S. Department of Energy, Idaho Operations Office (DOE-ID) issued a news release to more than 100 media contacts concerning the beginning of the a 30-day public comment period pertaining to the WAG 3 OU 3-13 Proposed Plan. This period began on October 23, 1998; however, the comment period was automatically extended by the Agencies an additional 30 days in anticipation of large public interest. During the extended comment period, a request to extend the comment period was received. As a result, the extended comment period ended on February 12, 1999. Additionally, two "update fact sheets" were distributed to approximately 700 citizens on the INEEL Community Relations Plan mailing list. The first "update fact sheet" was distributed in November 1997 and the second was mailed out in September 1998. The purpose of the documents was to keep citizens appraised of the development during the RI/FS and to include a schedule of the investigation and announce the approximate dates that the public meetings would take place. These fact sheets also offered technical briefings to those interested in the WAG 3 investigation. The news releases gave notice to the public that WAG 3 INTEC (ICPP) supportive documents were available in the Administrative Record section of the INEEL Information Repositories located in the INEEL Technical Library in Idaho Falls, Albertson Library on the campus of Boise State University, and the University of Idaho Library in Moscow. Copies of the Proposed Plan were mailed to about 700 members of the public on the INEEL Community Relations Plan mailing list for review and comment. In addition, public meetings were held at Idaho Falls, Twin Falls, Boise, and Moscow, Idaho, on November 16, 17, 18, and 19, 1998, respectively. Written comment forms were available at the meetings, and a court reporter was present at each meeting to record transcripts of the discussions and public comments. A total of 34 citizens provided formal comments; of these, 10 provided verbal comments and 24 provided written comments.

This Responsiveness Summary has been prepared as part of the ROD. All formal verbal comments, as given at the public meetings, and all written comments, as submitted are included in the Administrative Record for the ROD. Those comments are annotated to indicate which response in this Responsiveness Summary addresses each comment. The ROD presents the selected alternative for each remedial action group along with the decisions on the "No Action" and "No Further Action" for the remaining sites. The preferred alternatives, in the Proposed Plan, were selected in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (the National Contingency Plan [NCP]). The decisions presented in the ROD are based on the information contained in the Administrative Record. Additionally, the Administrative Record is available on the Internet at http://ar.inel.gov/home.html.

SUMMARY

Comments and questions raised during the public comment period on the Proposed Plan for the WAG 3 comprehensive RI/FS for OU 3-13 at INTEC (ICPP) are summarized below. The public meetings were divided into an informal question and answer session and a formal public comment session. The meeting format was described in published announcements, and reviewed with meeting attendees at the beginning of each meeting. The informal question and answer session was designed to provide immediate responses to the public's questions and concerns. Many questions were answered during the informal period of the public meetings on the Proposed Plan. Although this Responsiveness Summary does not respond to issues and concerns raised during the informal part of the public meetings, the Administrative Record contains complete transcripts of these meetings, which include the Agencies' responses to these questions, issues, and concerns.

Comments received during the formal comment session of the meetings are addressed by the Agencies in this Responsiveness Summary. The public was requested to provide their comments in writing, verbally during the public meetings, or by recording a message using the INEEL's toll-free number.

More than 25 individuals and/or groups provided oral and written comments on *the Proposed Plan for Waste Area Group 3 at the Idaho Chemical Processing Plant*. The U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the State of Idaho agreed to extend the comment period an additional 30 days twice, giving the public an unprecedented 90 days to provide comments. The WAG 3 Proposed Plan garnered the most public interest of any Environmental Restoration (ER) project since Pit 9 was first discussed in 1992.

About one-third of the Commentors agreed with the preferred alternatives. Another one-third thought the Agencies were not taking enough cleanup actions. While a third still thought the Agencies should take little or no action at the INTEC facility.

What makes the WAG 3 Proposed Plan unique is the national interest the document, and preferred alternatives, generated. All members of Idaho's Congressional Delegation provided written comments. The comments received were beneficial in our development of this ROD. Of principal concern to the Delegation was the siting of a site-wide contaminated soil repository at the INTEC facility, the INEEL CERCLA Disposal Facility (ICDF), which lies about 450 feet above the Snake River Plain Aquifer (SRPA).

A majority of public comments also focused on the site-wide soil repository. The major concern was the long-term protection of the sole-source SRPA. Many members of the public worried about: future contaminant migration from the soil repository; the proposed location of the repository; and ensuring that applicable or relevant and appropriate requirements (ARARs) are met.

Many public comments also addressed existing groundwater contamination beneath the INTEC facility. Some Commentors stated that the Agencies were not going far enough in implementing remediation to quickly reduce contamination. Others commented that the Agencies should let dilution and natural attenuation occur to reduce the groundwater contamination. Still, others questioned the hydrogeological assumptions made in the Proposed Plan and RI/FS. These comments focused on the relationship of the percolation ponds to the perched water contamination, and on the relationship of the perched water bodies to groundwater contamination.

In general, protection of the SRPA was a significant concern to regional news media. Editorials ran in the Twin Falls *Times-News, Wood River Journal* (Hailey), and *Idaho Statesman* (Boise), criticizing the proposed soil repository for leaving contaminants over the SRPA.

LISTING OF COMMENTORS AND COMMENT NUMBERING

All of the formal comments submitted by the public in either written or oral form were tabulated, summarized briefly and assigned a comment number. If the Commentor affiliation is unknown or the Commentors are expressing their individual opinion, "Concerned Citizen" is shown as the affiliation. An index of the comments and the page number that the comment appears on is provided at the end of this Responsiveness Summary. Comments are indexed based on the initials of the author (U for unknown) and identified as either written (W) or public meeting along with location (TI for Idaho Falls meeting, TT for Twin Falls, TB for Boise and TM for Moscow). Table 1 presents the Commentors, their affiliation, initials code, and comment type (written or public meeting) for the Commentor's comments.

Table 1. Authors of the comments on the Proposed Plan, their affiliation, and codes used for comment numbering.

Name	Affiliation	Commentor's Initials	Comment Type
Mr. Jobe	Coalition 21	LJ	TI
Beatrice Brailsford	Snake River Alliance	BB	TI
Peter Rickards	Concerned Citizen	PR	TT
David Kipping	Snake River Alliance	DK	TT
Margaret McDonald Steward	Snake River Alliance	MMS	TT
Pamela Allister	Snake River Alliance	PA-SRA	TB
Pamela Allister	Concerned Citizen	PA	TB
Steve Ramono	American Ecology, Inc.	SR	TB
Chuck Broscious	Environmental Defense Institute	CB	TM
Jeff Jones	Concerned Citizen	JJ	TM
Chuck Rice	INEEL Citizens Advisory Board	CAB	W
Albert Taylor	Concerned Citizen	AT	W
Paul Randolph	Concerned Citizen	PaR	W
Chuck Broscious	Environmental Defense Institute	CB-W	W
Thornton Waite	Concerned Citizen	TW	W
Shannon Ansley	Concerned Citizen	SA	W
Robin VanHorn	Concerned Citizen	RV	W
Representative, Helen Chenoweth	Idaho First Congressional District	HC	W
Jack Lemley	Lemley and Associates	L	W
John Commander	Coalition 21	C21	W
Chris Coperfield	Concerned Citizen	CC	W
Margret McDonald Steward	Snake River Alliance	MMS-W	W
David Hensel	Concerned Citizen	DH	W
Anonymous	Concerned Citizen	A	W
Robert Bobo	Consultant to Shoshone-Bannock Tribes	SBT	W
Beatrice Brailsford	Snake River Alliance	SRA	W
James McCarthy	Concerned Citizen	JM	W
Christinna ?	Concerned Citizen	C	W

Table 1. (continued).

Name	Affiliation	Commentor's Initials	Comment Type
Frank Priestley	Idaho Farm Bureau Federation	IFBF	W
Representative Mike Simpson, and Senators Larry Craig and Mike Crapo	Idaho Congressional Delegation	MS	W
Barbara Robertson	Concerned Citizen	BR	W
Richard Kuehn	Concerned Citizen	RK	W
Unknown	Concerned Citizen	U	W
Beatrice Brailsford	Snake River Alliance	SRA2	W

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ACRONYMS

AIP	Agreement in Principle
ANL-W	Argonne National Laboratory-West
AOC	area of contamination
ARARs	applicable or relevant and appropriate requirements
BLR	Big Lost River
CAB	Citizens Advisory Board
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
COCs	contaminants of concern
D&D	decontamination and dismantlement
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy, Idaho Operations Office
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ESD	explanation of significant differences
FFA/CO	Federal Facility Agreement and Consent Order
FS	feasibility study
FSS	feasibility study supplement
HEU	Highly Enriched Uranium
HI	hazard index
HLW	high level waste
HWMA	Hazardous Waste Management Act

IC	Institutional Control
ICDF	INEEL CERCLA Disposal Facility
ICPP	Idaho Chemical Processing Plant
Idaho HLW & FD EIS	Idaho High Level Waste and Facilities Disposition Environmental Impact Statement
IDW	investigation derived waste
IDWH/DEQ	Idaho Department of Health and Welfare/Division of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LDR	Land Disposal Restriction
LLW	low-level waste
M&O	management and operations
MCLs	maximum contaminant levels
MLLW	mixed low-level waste
MTRs	Minimum Technical Requirements
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Priority List
NPV	Net Present Value
NRC	Nuclear Regulatory Commission
NSI	New Site Identification
NWCF	New Waste Calcining Facility
OMB	Office of Management and Budget
OU	operable unit
PCB	polychlorinated biphenyl
RAO	remedial action objective

RCRA	Resource Conservation and Recovery Act
RI/BRA	remedial investigation/baseline risk assessment
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
SBW	Sodium Bearing Waste
SNF	Spent Nuclear Fuel
SRPA	Snake River Plain Aquifer
SRS	Savannah River Site
STP	Sewage Treatment Plant
STP	Site Treatment Plan
TAN	Test Area North
TAP	
TBC	to be considered
TCLP	toxic characterization leaching procedure
TI	Technical Impracticability
TRA	Test Reactor Area
TRU	transuranic
TSCA	Toxic Substances Control Act
USGS	United States Geological Survey
WAC	waste acceptance criteria
WAG	waste area group
WIPP	Waste Isolation Pilot Plant
WLAP	wastewater land application program

SUMMARY OF COMMENTS WITH RESPONSES

Comments presented during the public comment period on the Proposed Plan for the INTEC Comprehensive RI/FS are given below. The public meetings were divided into a presentation, an informal question-and-answer session, and a formal public comment session. The meeting format was described in published announcements, and meeting attendees were reminded of the format at the beginning of the meeting. The informal question-and-answer session was designed to provide immediate responses to the public's questions and concerns. Several questions were answered during the informal period of the public meetings on the Proposed Plan. This Responsiveness Summary does not attempt to summarize or respond to issues and concerns raised during the informal part of the public meetings. However, the Administrative Record contains complete transcripts of these meetings, which include the Agencies' responses to these informal questions.

Comments received during the formal comment session of the meetings and written comments received during the public comment period are addressed by the Agencies in this Responsiveness Summary. The public was requested to provide their comments in writing, orally during the public meetings, or by recording a message using the INEEL's toll-free number. The comments below are printed and occasionally summarized. Edits made were to correct minor spelling, editorial errors, and elimination of non-comment related information. In those cases where written comments were received that were difficult to read, a best attempt to interpret the comment is provided. Copies of the originally written comments are provided in the Administrative Record file for INTEC.

The comments made on the Proposed Plan, from the formal part of public meetings and written, have been grouped into various subject categories. These comments have been grouped into four general categories: A: WAG 3 Cleanup and Public Participation, B: The CERCLA Process at WAG 3, C: Release Site Groups at WAG 3, and D: Other Issues. Each of these major categories has subcategories for the specific comment topics. These subject categories and corresponding comments are presented below. For each comment, a response has been developed and is presented following the comment.

A. WAG 3 CLEANUP AND PUBLIC PARTICIPATION

A.1. Overall Goals and Structure of the INEEL ER Program

Comment 1 : A concern was expressed that the Agencies are looking at the risks associated with leaving the identified sites in place or remediating them, but are not considering the other contaminated sites which are still at the INTEC and thus, not looking at the "whole" picture. [TW-W]

Response: We are looking at source areas on a case by case basis and extending from the individual unit to the OU and to the WAG 3 as a whole. The scope of the WAG 3, OU 3-13 is defined as the known or suspected release sites identified in the Federal Facility Agreement and Consent Order (FFA/CO) and supporting documents. Although we will be revisiting selected aspects of the WAG 3 investigation under the OU 3-14 RI/FS, our evaluation of source areas listed under the FFA/CO, did address the potential cumulative effects of each "source area" on INTEC as a whole. Consideration of the ultimate fate and disposition of buildings and structures at INTEC is not part of the scope for OU 3-13. The Idaho High Level Waste and Facilities Disposition Environmental Impact Statement (Idaho HLW & FD EIS) is currently considering options for the disposition of INTEC facilities associated with the generation, treatment, or storage of high level waste (HLW). In addition, the Idaho HLW & FD EIS is also considering the other facilities at INTEC for their impact on the cumulative risk. With this in mind, the Idaho HLW & FD EIS should complement the WAG 3 RI/FS in addressing the "whole picture." Refinements to the risk calculations will continue as sites are remediated and facilities and structures closed. Other programs (e.g., Hazardous Waste Management Act [HWMA], Governor's Agreement, [TAP]) oversee other elements of INEEL environmental management. Together, along with DOE-ID decontamination and dismantlement (D&D) planning, these programs should achieve a protective end state for the future.

Comment 2 : A concern was expressed that the Agencies seem to lack of a comprehensive decision process. "Where will we be when we get there? What is this site going to be like when we're through cleaning up?" If it's leaving soil in place that you folks are proposing to put in an engineered landfill, and how do those two decisions relate? Down the road we are going to have a lot of bits and pieces? By the time of WAG 10 we will have made a lot of our commitments. There is no overall controlling philosophy for what is going on at the different WAGs. [BB-TI]

Response: The scope of the WAG 3, OU 3-13 is limited to known or suspected release sites identified in the FFA/CO. The process followed is a consistent one, applied for all INEEL WAG decisions made to date. We do look at site-wide issues, but the hazards and potential hazards occur at the "source" level. Our decision process is based on identification and response to threats posed on a source-by-source basis. A case in point is the ICDF where we do attempt to look at the INEEL-wide needs through the creation of a site-wide CERCLA disposal facility. WAG 10 is intended to evaluate the cumulative impacts within the SRPA from the overlapping groundwater plumes as a result of INEEL activities and to make a final assessment of ecological risks and impacts. As such, decisions can be made at the individual WAGs and then be rolled into WAG 10 for analysis of cumulative risks. In addition, the remedial actions taken on the SRPA are intended to ensure the aquifer meets acceptable risk concentrations and drinking water maximum contaminant levels (MCLs) for future residents, and workers are protected from drinking water which exceeds MCLs, or risk-based concentrations. For the SFE-20 Tank System, complete removal, treatment, and disposal is the most cost effective and risk reducing option evaluated. As for the ultimate disposition of waste remaining in the INTEC Tank Farm tanks, the decision is expected to be made in the ROD for the Idaho HLW & FD EIS, and the HWMA closure process.

Comment 3 : A Commentor identified that as a visitor through the Chemical Processing Plant when under construction around 50 years ago, he was interested in the clean up process now going on. "It's too bad so many mistakes were made in past years. I think your recommendations are the best available. Please continue to protect the Snake River Aquifer from ANY serious contamination." [AT-W]

Response: We thank the Commentor for his thoughts on the cleanup of INTEC. One of the primary goals of the OU 3-13 project is to ensure the portion of the SRPA, a sole source aquifer, impacted by INTEC operations meets acceptable risk concentrations and drinking water MCLs for future residents, and workers are protected from drinking water that exceeds MCLs, or risk-based concentrations.

Comment 4 : A Commentor requested, "Simply get all the crap off of and out of the Aquifer! Please!" [PaR-W]

Response: We appreciate the comments and are committed to protecting potential future users of the SRPA from INEEL activities. One of the primary goals of the OU 3-13 project is to ensure the portion of the SRPA, a sole source aquifer, impacted by INTEC operations meets acceptable risk concentrations and drinking water MCLs for future residents, and workers are protected from drinking water which exceeds MCLs, or risk-based concentrations.

Comment 5 : A concern was expressed to the Agencies of the importance of the SRPA, not only the economic value, but the related perceptual value. [SR-TB]

Response: Although the Commentor is correct in that perceptions were not formally analyzed in the RI/FS evaluation, impacts from perceptions can be assessed through our Community involvement process. In addition to informal and formal public comment opportunities, an Idaho-Citizens Focus Group and the INEEL Citizens Advisory Board (CAB) both provided their input. Community input is an important factor in our decision process.

Comment 6 : A concern was expressed that the Agencies' decisions about the Tank Farm were not made. These other decisions will limit the soil clean-up options as will the cleanup of dozens of buildings at the Chem Plant. The plan doesn't address how or when to decontaminate those buildings. We won't even know what waste will be allowed in the ICDF until after it's approved. "Where will we be when we get there? What will be left behind?" [PA-SRA-TB]

Response: The scope of the WAG 3, OU 3-13 is defined as the known or suspected release sites identified in the FFA/CO. In the case of the Tank Farm, the proposed interim action will not be inconsistent with the final action and will not limit the cleanup options. Consideration of the ultimate fate and disposition of buildings and structures at INTEC is not part of the scope for OU 3-13. The OU 3-13 ROD and Idaho HLW & FD EIS ROD will be linked together for the purpose of restoring the area of INTEC to an acceptable risk. The scope of the Idaho HLW & FD EIS does not cover facilities and structures outside of INTEC. Analysis and decisions on the non-INTEC facilities and structures will be covered in future documents. Also, although the D&D program is not part of OU 3-13, new sites can be added to the FFA/CO if found to present an unacceptable risk to human health and the environment.

In the case the ICDF, the waste acceptance criteria will be developed during the remedial design. Candidate materials for disposal in the repository were identified and evaluated (see Appendix C of the *Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL Part B, FS Supplement Report* (DOE/ID-10619), which is contained in the Administrative Record). The waste acceptance criteria, developed in the remedial design, will limit the material acceptable for disposal such that the repository will not adversely impact the SRPA or surface receptors. Information concerning the schedules and approaches are contained in the INEEL 2006 Plan. Also, conceptual issues and approaches are contained in the DOE End State Planning document.

Comment 7 : A concern was expressed that the Agencies adopt a site-wide policy that active radioactive disposal facilities overlying the SRPA are permanently closed during the initial 5-year period covered by the department's upcoming INEEL management and operation (M&O) contract. This policy direction should be prominently featured in the final Request for Proposals issued by the department. [HC-W]

Response: We believe the Commentor is referring to the existing on-site low-level waste (LLW) disposal facility located at the Radioactive Waste Management Complex (RWMC), which is not part of the WAG 3 decision process. With regards to the new M&O contract, the Agencies are fully committed to environmentally sound management practices. Given the subject matter, this comment was also forwarded to the Source Evaluation Board working on the new M&O contract for consideration.

Comment 8 : A Commentor was concerned that tremendous pressure would exist to bury other, heterogeneous wastes at the new facility after it was built. The cumulative effect of these factors merits analysis. [L-W]

Response: Non-CERCLA wastes <u>will not</u> be placed within the ICDF and further, would be subject to state and federal permitting requirements outside the scope of this ROD. The waste acceptance criteria (WAC) for the ICDF will factor in the cumulative effects of the wastes that will be placed within the landfill and establish limits to safeguard the aquifer. This approach is consistent with our method for determining if an unacceptable risk exists under our baseline risk assessment, in the RI/FS.

Comment 9 : One Commentor recommended that we adopt a comprehensive, INEEL-wide policy of minimizing further burial of radioactive and mixed wastes over the SRPA, and pursue alternatives to the accelerated use and full utilization of remaining RWMC Subsurface Disposal Area burial capacity. [L-W]

Response: This comment relates to waste management practices at the INEEL and the future use of the RWMC. The proposed Plan and this ROD address the most cost-effective remedial action for past practice source areas at WAG 3. The ICDF will provide safe management for INEEL CERCLA waste. The RWMC also overlies the SRPA and is operated to dispose of low-level radioactive waste. The ICDF will accept soil and debris contaminated with both radionuclides and hazardous constituents. Disposal of the Toxic Substances Control Act (TSCA) and RCRA wastes require stringent engineering controls that the ICDF will incorporate.

Comment 10 : A concern was expressed that the Agencies' plan on the Chem Plant cleanup seems fine in and of itself. The problems lie mainly in that it doesn't address the difficult cleanup problems, nor does there seem to be an overall view of what the final outcome for the whole site will be. For example, the tank farm and the soil under it are considered in the Environmental Impact Statement (EIS). This will be a daunting and expensive cleanup project. Will there be money for this project? Where and when does it fit in the final outcome—a clean INEEL? [DH-W]

Response: It is recognized that cleaning up will be a complex and difficult task. The Proposed Plan summarized the information contained in the Remedial Investigation/Baseline Risk Assessment (RI/BRA) Report (DOE/ID-10534), Feasibility Study (FS) Report (DOE/ID-10572), and the Feasibility Study Supplement (FSS) Report (DOE/ID-10619), which can be found in the Administrative Record. The final cleanup of INTEC will result in an acceptable risk (1 in 10,000 cumulative carcinogenic) for both the SRPA (also restored to safe drinking water standards) and surface receptors. The Idaho HLW & FD EIS will evaluate the treatment of the waste in the tanks and evaluate the disposition of facilities associated with the generation, treatment, storage, and disposal of HLW. Concerning the funding issue, sufficient funding will be requested from Congress to complete the cleanup activities. The decision to fund cleanup activities lies with Congress and the President. As facilities are closed and dispositioned, the impacts will be factored into the cumulative risk for INTEC. Waste Area Group 10 will evaluate the cumulative impacts to the SRPA from across the entire INEEL.

Comment 11 : A concern was expressed to the Agencies that CERCLA requires 5-year reviews of decisions, even if they are not interim actions. How many such reviews are contemplated for each OU at the Chem Plant? [SRA-W]

Response: As long as a CERCLA area requires restricted or limited access or use to safeguard human health and the environment, reviews at least every 5 years are required. The entire area of INTEC (ICPP), covered by the scope of the ROD, would be included into a single periodic review. These 5-year reviews will apply to both access and use restrictions. In addition, these reviews will continue until the Agencies determine that they are no longer necessary.

Comment 12 : A question was asked, "Are there individual facilities or OUs that are covered both by Resource Conservation and Recovery Act (RCRA) and by CERCLA? Will the CERCLA ROD incorporate RCRA concerns?"[SRA-W]

Response: The Agencies are committed to minimizing the duplication of work between the HWMA (i.e., RCRA) and CERCLA programs. Toward this end the FFA/CO incorporates RCRA corrective action and

CERCLA remedial action under a single process. In addition, considering the general equivalency of the RCRA/HWMA closure and post-closure process to the FFA/CO remedial actions, the Agencies will make every attempt to incorporate the monitoring and maintenance of closed units (e.g., Old Waste Calciner) under this action, if requested by the authorized program.

Comment 13 : A concern was expressed that at Page 49, 1st partial paragraph, of the Proposed Plan, hints that CERCLA may be a permanent program at the INEEL. "When does the FFA/CO end and the RCRA Corrective Action process begin? Routine operational releases should not be included as new sites under the FFA/CO. They must be addressed through a spill cleanup, or if a SWMU, through RCRA Corrective Action. Once the RODs are written for OU3-14 and WAG 10, the CERCLA process at ICPP should be complete, except for the "'5-year" reviews and ongoing remediation. There should be no "new sites" under CERCLA." [C-W]

Response: The CERCLA and RCRA corrective action at INEEL is an ongoing program. The program is responsible for assessing the risk from releases and potential releases of hazardous substances on the INEEL. Following assessment of this risk, the sites are restored to acceptable risk-based levels. Ongoing releases from RCRA/HWMA permitted operations are not addressed under the FFA/CO, but instead under the permit. Routine operational releases are not part of the FFA/CO. If the operational releases represent an unacceptable risk to human health and the environment, and are not under a RCRA/HWMA permit, additional actions under the FFA/CO may be necessary and undertaken. When newly identified contaminated areas (release sites) are discovered, the information is compiled and placed into the system for consideration as a "New Site" under the FFA/CO.

Comment 14 : A request was made that the Agencies compare the "risk" posed by tank farm soil with the "risk" posed by pits and trenches. [SRA-W]

Response: Risks are compared against a national standard (the NCP) as to acceptable risk, 10E-4 to 10E-6 cumulative carcinogenic and a hazard index (HI) >1. If risks are found outside this range, remedial action is necessary. Comparing the risks from the INTEC Tank Farm soils against the waste in the pits and trenches at the RWMC, would identify that both areas are outside the acceptable risk range and require remedial action to be protective of human health and the environment.

A.1.1 Results/Outcomes of the ER Program

Comment 15 : A Commentor summarized the preferred alternatives for managing contaminated soils contained in the Proposed Plan. [SRA-W]

Response: The Commentor's summary was correct. Contaminated soil will be capped by this action, either within the ICDF, or under an existing building or contained in place.

Comment 16 : A concern was expressed to the Agencies that, when the INEEL "cleanup" is done, an enormous amount of nuclear contamination will remain above the Snake River Aquifer and we won't know the cumulative extent of the remaining peril until most of the predicted cleanup resources are gone. [SRA-W]

Response: The resources available to address nuclear contamination are indeed limited at INEEL and other federal facilities. However, we believe that the actions we have selected represent an appropriate balance between cost and effectiveness. One of our goals is to reduce the footprint of contaminated areas on INEEL we will need to restrict access to and monitor indefinitely. Another goal is to clean up the aquifer so that it is available to future generations.

Comment 17 : A concern was expressed that neither the tank farm nor the surrounding soil is covered in the current plan. Decisions about the waste tanks themselves have yet to be made; those decisions may limit the soil cleanup options. Further, there are dozens of buildings at the Chem Plant, and some are highly contaminated. The current plan doesn't address how or when to decontaminate those buildings. We won't even know what waste will be allowed in the ICDF until after it's approved. Many of the specific concerns grow out of the general lack of a clear end state or end time for Chem Plant operation, remediation, and closure. [SRA-W]

Response: The Commentor is correct that highly contaminated areas at INTEC are located within the Tank Farm area. The tanks and the waste in the tanks in the Tank Farm are being addressed under the Idaho HLW & FD EIS. Although the waste in the tanks is not covered in the Proposed Plan, the soils in the Tank Farm area are covered and are contained in Group 1 (Tank Farm Soils). We do not have a complete understanding of the threat posed to the underlying groundwater by the contaminated soil column at the Tank Farm. This is why we are implementing an interim action for the Tank Farm Soils. Concerning decisions made regarding the tanks and tank waste impacting the soils remediation, this is an issue that will be factored into the remedial action alternatives evaluation, in the OU 3-14 RI/FS. For the ICDF, the soils and debris that will be accepted will be limited to minimize the threat to the SRPA. Some soils and debris will likely require pretreatment prior to disposal in the repository or off-site disposal. At this time there is not an approved final end-state developed for INTEC.

Comment 18 : A concern was expressed on how much residual risk had been left site-wide after cleanup? What will be the cumulative risk left at the Chem Plant? [SRA-W]

Response: Remediation under the CERCLA program is directed at restoring the environment to an acceptable risk level (10E-4 to 10E-6 cumulative carcinogenic). Cleanups that have occurred and will occur under this ROD are designed to reduce the risk from the 99 source areas to an acceptable level. Site-wide cumulative risk is being evaluated under WAG 10 for impacts on the ecological receptors and the SRPA from INEEL operations and activities.

Comment 19 : A request was made to describe how much nuclear waste from the Chem Plant cleanup will likely leave Idaho. [SRA-W]

Response: Both the transuranic (TRU) and HLW from INTEC cleanup under this ROD will be transported off-site for disposal. We do not estimate this to be a large volume. The wastes contained within the High Level Tanks and Calciner Bins are a subject of the Governor's Agreement and not addressed under this action.

Comment 20 : A Commentor exclaimed, "Cleanup this nuclear hazard ... Now! With most of Superfunds monies going to lawyers over litigation, it is no wonder that when all is said and done, there is more said than done! However, with two facts clear to anyone concerned about their quality of life in Idaho: i.e., (1) 200 million dollars over budget on cleanup, (2) 26 months behind schedule on cleanup." [RK-W]

Response: The Agencies are committed to expeditious cleanup at INEEL. These cleanups are funded through agency (DOE) appropriations by Congress. Implementation of federal facility remedial actions, like that under the FFA/CO, do not generally involve litigation. The remedial action that the Commentor is referring to, the Pit 9 project, has experienced difficulties with sub-contractors. Measures have been taken to address those problems and fulfill the requirements of this earlier ROD.

A.2. Public Participation and Community Relations

Comment 21 : A Commentor stated that providing drafts of proposed plans is a constructive process that extends the comment period beyond the traditional "decide, announce, defend" mode formerly used by DOE. [CB-W]

Response: The Agencies used a different approach for the development of the OU 3-13 Proposed Plan. The approach included using a focus group and the INEEL CAB for review and comment during the development of the OU 3-13 Proposed Plan.

Comment 22 : A Commentor appreciated the fact that we are spending so much time and energy going into the communities and appreciated the presentations as was clear, concise, speedy, and very understandable. [PA-SRA-TB]

Response: We thank the Commentor for the comment. A considerable amount of effort was expended to develop the presentations that would answer some of the questions the public would have on the information in the Proposed Plan.

Comment 23 : A Commentor thought that it's great that the Agencies went out and tried to spread to the public and get the public involved and let them know what's going on. [JJ-TM]

Response: We thank the Commentor for the comment. The Agencies are committed to informing the public on the risks and alternatives being considered to remediate the contamination areas.

Comment 24 : A Commentor requested an extension of the comment period. [HC-W]

Response: Due to the expected public interest in the Proposed Plan for the ICPP, we initially held a 30-day comment period with a 30-day extension which started October 23rd, 1998 ended December 22nd, 1998. The Commentor was unable to participate during the first extension and was very concerned that members of the public be given additional time to submit comments. Due to these unusual circumstances, we extended the comment period until February 12th, 1999.

Comment 25 : A Commentor requested that each participating agency carefully weigh the public's input before final remedy selection. [L-W]

Response: The Agencies have continued to support a strong public involvement process to include many briefings before the INEEL CAB, Community Focus Group and two 30-day extensions to the public comment period. Comments received from the community are evaluated and factored into the decision making (remedial alternative selection) through the modifying criteria of "community acceptances." In addition, the comments received along with responses are contained in this Responsiveness Summary, which is part of the ROD.

Comment 26 : A Commentor offered a comment based on professional experience observing the diminished influence of science in our society, public mistrust of government handling of radiation safety issues, and the information revolution which has forever ended the days when programs such as this could be implemented with little public attention. It is essential that the Department work within the decision environment, and undertakes environmental restoration actions based on permanent solutions that will stand the tests of time and scrutiny. The Commentor believed that the proposed approach to SRPA protection fell short of this standard. [L-W]

Response: We recognize the importance of public participation and deliberate execution of well founded responses. Our decision environment is highly dependent on involvement by Stakeholders and the public.

The process followed is that established nationally for the cleanup of National Priorities List (NPL) sites and incorporates scientific and engineering services, compatible with the state of the practice. Our contingency action for the drinking water aquifer will assure that the aquifer is restored to drinking water standards and available for future generations.

Comment 27 : A Commentor felt that the Agencies are trying to approach and describe the problems presented by the pollution at the Chem Plant in a refreshingly real world fashion. [SRA-W]

Response: We thank the Commentor for their complement.

Comment 28 : A Commentor felt that the Agencies were opening a legal dump for plutonium and requested that an EIS scoping process be used to identify the total amount of plutonium being buried. [PR-TT]

Response: Evaluation of the ICDF was conducted as part of a CERCLA investigation and decision making process. It is the Agencies' position that CERCLA is functionally equivalent to the National Environmental Policy Act (NEPA) process. As such, no additional scoping or NEPA is required for the ICDF. Also, the ICDF would be restricted to the acceptance of waste with TRU-constituents at a total maximum concentration of <10 nCi/g.

Comment 29 : The INEEL CAB recommended that the Agencies more seriously consider comments submitted by the Board informally (not just formal recommendations) and through discussions. [CAB-W]

Response: The Agencies regret that the INEEL CAB felt that its comments were not fully incorporated in the Proposed Plan. We believe that the issue related primarily to the identification of the specific location of the ICDF in the Proposed Plan. At the time of the public comment period, the Agencies had not completed a siting evaluation on the best location for the ICDF. We did suggest in the Proposed Plan that the location was in the vicinity of the existing Percolation Ponds within the area of contamination (AOC). We have only completed a portion of the siting evaluation, which is included in this ROD.

Comment 30 : The INEEL CAB appreciated the opportunity to be involved in this document throughout its preparation. The Board, primarily through our High Level Waste Committee, was provided with ample information and with the opportunity to ask questions and make suggestions on the plan at various stages. This experience contrasted with the CAB's earlier experience evaluating other proposed plans. [CAB-W]

Response: We appreciate the comment. The approach to developing the Proposed Plan for OU 3-13 was different that used in developing previous Proposed Plan at the INEEL. In addition to working with the INEEL CAB, a citizen's focus group reviewed and commented on a draft version of the Proposed Plan. By working with both the INEEL CAB High-Level Waste Committee, issues were addressed prior to finalizing the Proposed Plan. We felt that this was helpful in taking a complex project, OU 3-13, and being able to present the information to the public in an understandable way.

Comment 31 : A Commentor thanked us for extending the comment period, and for releasing the plan for public comment. While efforts (as indicated below) at public relations have a long way to go, the effort made thus far is commendable. [U-W]

Response: We thank the Commentor. The comment period was extended to allow for additional public comment on the Proposed Plan. In addition to the Proposed Plan, meetings on the Proposed Plan were held in Idaho Falls, Twin Falls, Boise, and Moscow, Idaho to inform and received input from the public.

A.3. Content and Organization of the Proposed Plan

Comment 32 : A Commentor felt that a great deal of effort was made with this particular plan. I think it's one of the most clearly and easily read plans that I have had to tackle on my late night journeys through these documents. [PA-SRA-TB]

Response: We thank the Commentor for the comment. A considerable amount of effort was expended to try and summarize the information contained in the OU 3-13 RI/FS into summary discussions for the Proposed Plan, which were understandable. It appears that we were successful.

Comment 33 : A Commentor felt that the Proposed Plan was certainly an improvement over the draft plan, and thought that it pointed to the usefulness of including the public and the Stakeholders earlier in the process, so as to try to encourage ironing out problems prior to getting into a formal thing that gets out on the street, and by that time most everybody is kind of into a locked position of what they've decided, they present it, and then they defend it. [CB-TM]

Response: A different approach than used in the past was used for the development of the OU 3-13 Proposed Plan. The approach included using a focus group and the INEEL CAB for review and comment during the development of the OU 3-13 Proposed Plan.

Comment 34 : A Commentor felt that the document did not give basic information that a member of the public could use to make an informed decision about whether the Agencies were really addressing the problem. [CB-TM]

Response: The Proposed Plan is only a summary document on the information contained in the RI/BRA, FS, and FS Supplemental Reports. The detailed information on the contaminant concentrations, risks, and alternative evaluations is contained in these documents. Additional information for the release sites at INTEC is contained in the Track 1 and Track 2 documents. All of these documents are contained in the Administrative Record.

Comment 35 : A Commentor recommended listing and definitions of acronyms used in the Plan. [C21-W]

Response: We are sorry for the confusion concerning acronyms and definitions. Many of the acronyms and concepts in the Proposed Plan were discussed in the sidebars of the document. Documents in the future may include a table showing the acronyms along with complete words. In addition, the concepts will continue to be discussed in either a table or sidebars.

Comment 36 : A Commentor recommended providing a list of key references. [C21-W]

Response: The key references for the OU 3-13 Proposed Plan were included in the text on Page 2, Paragraph 4. In the future, more attention will be given to pointing the readers to where additional information can be found, either by highlighting or a table.

Comment 37 : A Commentor recommended the addition of a simplified method for enabling the readers to understand the relationships between "group numbers," "operable units," and "CPP numbers" as used throughout the Plan. [C21-W]

Response: We agree with the Commentor. The use of group numbers, OUs, and CPP numbers was confusing. With the development of the FFA/CO, WAG 3, INTEC, was divided into individual release sites. These release sites were assigned the CPP numbers. The release sites were then grouped into OU numbers based on type of release, location of release, and other criteria. The OU and CPP numbers were used in assessing the risk individually and as a whole for WAG 3. As a result of the risk assessment, not all release sites presented an unacceptable risk and were eliminated from further consideration. In developing the FS, the unacceptable risk release sites were grouped by the expected remedial actions into the group numbers. This was done to simplify and reduce the number of sites being discussed. In the future, a better attempt will be made to simplify and explain the release sites within a WAG.

Comment 38 : As a member of the focus group that helped INEEL devise a "publicly readable" document, a Commentor appreciated the time and effort that had gone into the Proposed Plan. It was indeed readable, "user friendly," and visually, the best WAG Cleanup Plan I've yet seen. However, the contents of the plan left the reader with feelings of uncertainty, of reading a plan published in a hurry without enough solid science and technology to back up the plan, and without a clear definition of what cleanup really means. [MMS-W-W]

Response: We are sorry that the Commentor was left with the feeling that the Proposed Plan was inadequate. The Proposed Plan was a summary of the information in the RI/FS for OU 3-13. There is a balance between detailed and summary information in order to produce a Proposed Plan that presents sufficient information without being excessively lengthy and complex. We will endeavor, in future Proposed Plans to reduce the uncertainty for the reader while remaining user friendly.

Comment 39 : A Commentor felt that we'd know more if contaminants of concern (COCs) were listed by level of concern rather than more or less alphabetically. Attaching half-lives (when applicable) would be appropriate. As it is, it's difficult to see whether 2095 has anything other than an administrative value. [SRA-W]

Response: A list of COCs has been included in this ROD showing how the contaminants rank from a level of concern. In addition, the half-lives, where applicable, of the various COCs are presented in the ROD. The use of the year 2095 relates primarily to what the Agencies believe to be a reasonable time frame that governmental ownership of the land will remain. Beyond this time it is difficult to predict what land use pressure may exist and unless there are other factors to consider, we assume that residential use is a reasonable scenario unless other extenuating circumstances exist.

Comment 40 : A Commentor found no complete discussion of the ICDF and wanted a more complete discussion on the ICDF. Included should be: details of construction; where waste would come from; how much waste; and how much of the cost would be assigned to WAG 3. [C21-W]

Response: Only a summary level discussion of the ICDF was contained in the Proposed Plan. For evaluation purposes in the FS and Feasibility Study Supplement (FSS) Reports, a conceptual remedial alternative concerning on-site disposal was developed. This conceptual alternative was evaluated for risk (surface and groundwater) impacts along with other criteria including cost. Additional details concerning construction, wastes, and cost of the ICDF is contained in the ROD. More discussion on the design parameters are found in this ROD. The actual design and construction details of the ICDF will be developed in the remedial design. Information on the candidate wastes and volumes can be found in Appendix C of the FSS Report. Concerning the ICDF costs assigned to WAG 3, the bottom of Table 11 (page 48) of the Proposed Plan presented both the total cost (all WAGs) and the cost for WAG 3 only.

Comment 41 : A Commentor felt that at Page 12, Table 1, of the Proposed Plan, the values given appeared to be the predicted peak aquifer concentrations for the year 2095, not the year 2095 and beyond. With the exception of I-129, all the values are inconsistent with the values given in the RI report. [JM-W]

Response: We assume the Commentor was referring to Page 18, Table 1. The concentrations shown are for year 2095 and not as stated in the Proposed Plan (2095 and beyond). These concentrations were presented and used for the evaluation of cleanup criteria (MCLs and risks). In addition, some of the values presented in the Proposed Plan are less than presented in the RI/BRA Report. For the RI/BRA, the values that were presented were the maximum contaminant concentrations at various time intervals without respect to spatial locations. This resulted in contaminants from multiple locations to be added together, resulting in over prediction of impacts.

Comment 42 : A Commentor questioned why the term "mostly" was used at Page 36, Snake River Plain, and 1st paragraph. "The COCs are mostly radionuclides and mercury." What other contaminants were of concern? [C-W]

Response: We are sorry that this is confusing in the Proposed Plan. The correct list of COCs for the SRPA are radionuclides and mercury. Other contaminants like Chromium listed on Page 15 is a result of evaluating the cumulative impacts on the SRPA from both INTEC (ICPP) and the Test Reactor Area (TRA).

Comment 43 : A Commentor questioned how, as stated at Page 36 of the Proposed Plan, additional monitoring can limit exposure? [C-W]

Response: We are sorry for the confusion. Monitoring of the groundwater does not limit exposure. Additional institutional controls will be used to control the usage of the contaminated groundwater and thus, limit exposure. Monitoring only provides a measure of contaminant levels.

Comment 44 : A Commentor was not clear on the difference between costs projected in Net Present Value versus "97$"s. [TW-W]

Response: Net Present Value (NPV) estimates are calculations of the costs taking into account the amount of money necessary today to pay for the project over the lifetime of the project when considering the expected inflationary factors. The total shown in "97$"s is the estimated cost prior to NPV calculation and is presented to provide an estimate of what the costs would be to DOE future budgets, assuming that the project is completed within a one year implementation timeframe. The use of NPV comes from the NCP and is used to provide a consistent and comparable basis used in cost estimating for decision-making purposes across the United States. For the NPV cost estimates presented, a timeframe of 100 years was used in the calculations.

Comment 45 : The INEEL CAB recommended the use of simplified formats and nomenclature in future Proposed Plans. [CAB-W]

Response: We agree that information presented to the public should be understandable and presented in a logical manner. The information on remediation of INTEC (ICPP) is complex, interrelated, and subject to interpretation. The OU 3-13 Proposed Plan presented information contained in the RI/BRA, FS, and FSS Reports. This information was summarized during the development of the Proposed Plan. For future projects, that are not as complex, a simplified format and nomenclature could be for the Proposed Plans.

Comment 46 : A Commentor recommended that the Agencies use the format employed in the Proposed Plan for WAG 1. [CAB-W]

Response: The Proposed Plan mentioned in the comment was developed after the OU 3-13 Proposed Plan and the amount of information contained and presented in the OU 3-13 Proposed Plan was considerably more than that contained in the WAG 1 Proposed Plan. Converting the OU 3-13 Proposed Plan to the format used for WAG 1 would have resulted in a much longer Proposed Plan. We agree that for simpler projects, the WAG 1 format should be used.

Comment 47 : A Commentor recommended the addition of graphics or maps to enhance the reader's ability to understand the terms used in the Proposed Plan [CAB-W]

Response: We recognize the confusion resulting from the use of the group numbers, OUs, and CPP numbers throughout the Proposed Plan. In the FFA/CO, INTEC (WAG 3) was divided into 13 OUs. Within each of these OUs, a number of release sites were listed using the CPP numbers. For the risk assessment conducted at INTEC, the RI/BRA Report and scoping investigations (Track 1 and 2 investigations), the release sites were evaluated on an individual basis (site by site using the CPP numbering system). At the conclusion of the RI/BRA, many release sites were found to present an acceptable risk and were not carried forward for remedial action under the FS Report. With the reduced number of sites for the FS, the group numbers were developed based on expected remedial actions, geographic location, and other factors.

Comment 48 : The INEEL CAB recommended that DOE-ID embrace Secretary Richardson's recent suggestion to communicate with "plain language." [CAB-W]

Response: We thank the CAB for their comment. INEEL Proposed Plans and Fact Sheets are generally written to be understandable by the general public. We recognize this as a continuing responsibility.

Comment 49 : A Commentor noted that the discussion of average flow rates in the SRPA could easily result in a conclusion that the contaminant plume is moving at the same linear rate as the water. Plain language would enhance the public's ability to more fully understand the issues that challenge the agency. [CAB-W]

Response: For certain contaminants like tritium (H-3), the movement of the contaminant is at the speed of groundwater. This is because the contaminant does not adsorb to the solid media (basalt) while moving with the groundwater. Other contaminants like Sr-90 adsorb and desorb as the groundwater move through the area. This results in the leading edge of a contamination plume moving with the groundwater. However, the concentrations at the leading edge are not necessarily at a concentration presenting a risk. It is recognized that this is a difficult topic to describe at a summary level.

Comment 50 : A Commentor questioned why the term Contaminants of Concern didn't seem to be carefully followed throughout the Proposed Plan. [U-W]

Response: The COCs for each of the groups are presented for the entire group. Within the various remediation groups, the COCs are dependent upon the location of contamination within the group. In the case of Group 5, the COCs outside of the INTEC fence are a subset of the entire set of COCs. Remedial actions will be undertaken to deal with the COCs at the spatial location of the remediation. As the remediation for group 5 under this ROD is dealing with outside of the INTEC fence, the two COCs are I-129 and Sr-90. Both of these contaminants will be considered in the remedial design and remedial action activities.

Comment 51 : A Commentor questioned the use of OU's, group numbers, and CPP numbers simultaneously as it was extremely confusing. [U-W]

Response: The use of group numbers, OUs, and CPP numbers was confusing. In the FFA/CO, the release sites are referred to by both OU numbers and release site numbers. For evaluation in the RI/BRA, risks at individual release sites were evaluated. In the FS, the sites presenting unacceptable risks were grouped together into the remedial action groups.

Comment 52 : A Commentor questioned the use of techno-babble, in a plan presented to the Public. [U-W]

Response: In the Agencies' opinion, considerable effort was expended in writing the Proposed Plan with a minimum amount of technical jargon for this very complex remediation project.

Comment 53 : A Commentor questioned the frequent bad grammar, punctuation, and so forth as abundant evidence that the INEEL either didn't care to hire a technical editor, or didn't bother letting the editor complete the job. [U-W]

Response: In trying to simplify a very complex project into understandable and summary information, some concepts may not have been fully or completely explained. The Agencies did employ professional technical editing and a public focus group in its development of the Proposed Plan.

Comment 54 : A Commentor suggested Proposed Plans and other public documents be carefully edited for clarity, accuracy, and conciseness, the readers are far less likely become so immediately exasperated that they scrutinize every part of the presentation to pounce on every possible problem. [U-W]

Response: We are sorry for the difficulty the Commentor had with understanding the plan. WAG 3 is a very complex site. Great effort was made to simplify and summarize highly technical concepts in layperson terms. Since the readership of the Proposed Plan has a wide range of backgrounds, the tradeoffs between too much information, versus too little detail, makes meeting the needs of all readers quite challenging. The science and analysis backing up the plan are the best available. The Proposed Plan, which is a summary document of the information in the RI/FS, presented a very complex project in a simplified and straightforward manner.

Comment 55 : A Commentor stated that in the Evaluation of Site Risks section of the Proposed Plan, the entire section was very unclear. [U-W]

Response: The Proposed Plan is a summary of the information contained in the RI/FS along with recommendations concerning selection of remedial action alternatives (preferred alternatives). The Proposed Plan summarized the information and referred the reader back to the RI/BRA for additional information, if necessary, for the risk assessment. Without summarizing and referencing the RI/BRA, the Evaluation of Site Risk section would have been considerably longer without presenting additional summary information.

Comment 56 : A Commentor asked why at Figure 9, page 13, of the Proposed Plan, didn't we label the injection well and the ICPP main stack? [U-W]

Response: We recognize that additional labeling (injection well and main INTEC stack) could have been added to the graphic. However, this graphic was intended to present in a simplified manner, the various pathways for exposure that exist at INTEC. Unfortunately, the Agencies believed that a simplified profile of the INTEC with the stack depicted was self-explanatory.

Comment 57 : A Commentor stated that the conceptual model graphic is lovely, and except for the incomplete labeling and too-small size, very informative. [U-W]

Response: We feel that the graphic presented a good conceptual representation of how the various exposure pathways are related to the contamination in the surface soils, perched water, contaminated groundwater. In addition the graphic presented a depiction of how the contamination can migrate.

Comment 58 : A Commentor stated, "Page 48, Table 11. The first heading is "Soil Group." That is wrong. The first group reads "Tank Farm." That is wrong. Under recommended alternatives, listing any for Group 1 is misleading. Only an interim action is described in the text. Under recommended alternatives, listing number 2 for Group 2 is misleading. The text indicates that Alternative 2 OR Alternative 3 may be selected, depending on discoveries made during D&D." [U-W]

Response: The Commentor is correct. "Soil Group" is a misleading heading. "Remedial Action Group" would have been a more accurate and clearer heading. However, the Tank Farm Soils (Group 1) are included within this ROD as a remedial action group. For Group 2, the selected remedy (recommended in the Proposed Plan) is Alternative 2. Alternative 3 for Group 2 would only be implemented if D&D removes the structure.

A.4. Current and Future Activities at INTEC

Comment 59 : A Commentor stated that it was extremely unlikely that the INTEC would ever become a residential area, if only due to the lack of water and the location. This was an assumption which is too conservative and which drives the conclusions to expensive alternatives. [TW-W]

Response: The use of the 100-year future residential scenario serves as our point of departure for making risk-based decisions that will affect the future use of the land for many generations. Beyond 100 years, it is difficult to predict what land use pressure may exist. Unless other extenuating circumstances exist (e.g., proximity to closed facilities requiring perpetual care) the assumption of future residential use provides a level of cleanup that assures the remedy will remain protective.

Comment 60 : A Commentor stated that "Institutional memory is short and if the past is any guide, people in the future may use contaminated resources for some time and make investments before they discover the contamination. They will then be faced with wrenching decisions of whether to abandon their investments or live with what would normally be unacceptable risk or pursue remediation that, in many cases, may be far more costly than the original remediation and waste management solutions." [BB-TI]

Response: As part of the implementation of the alternatives in the OU 3-13 ROD, a commitment is made to develop an "Institutional Control (IC) Plan." The approach to institutional controls for each Group is discussed in Section 11 of the ROD. The IC Plan will be developed during remedial action activities. This IC Plan will discuss the contaminated areas and the controls and periodic evaluations that will be placed on the areas over the long-term. In addition, the IC Plan discusses what will be required to release the areas for future developments or uses. This should minimize the impacts to future investments concerning the use of various areas.

Comment 61 : A Commentor stated their personal concern about the percolation ponds and about the use of the millions of gallons of water that are, basically, sucked up out of the aquifer, dispersed through this DOE facility and then dropped back down into the aquifer, pushing contaminants along. The Commentor believed that until cleanup was accomplished in a satisfactory way, DOE should not begin another mission of any great extent at INEEL, particularly if it used the natural resources of water or the natural resources that are involved in generating electricity for these enterprises. [PA-TB]

Response: We share the Commentor's concern regarding the percolation ponds and their affect on the migration of contaminants based on their present location. This is why this action will require the shutdown of the ponds at their current location and care will be taken to eliminate future contaminant loadings to the aquifer.

Comment 62 : A Commentor stated concerns about the ongoing work of the plant after the cleanup and continued waste being put into the environment and aquifers. [JJ-TM]

Response: The ICDF will be used to contain and control waste from impacting the SRPA and surface receptors from many of the identified release sites. In addition, actions are planned to ensure that portion of the SRPA, a sole source aquifer, impacted by INTEC operations meets acceptable risk concentrations and drinking water MCLs for future users.

Comment 63 : A Commentor questioned what operations will occur at the ICPP in the future, specifically concerning uses for ICPP 691? [SRA-W]

Response: As the HLW at INTEC is required to be "road ready" by 2035, it was assumed that all treatment of the HLW was completed by 2035. Most of the operations planned at INTEC prior to 2095 will deal with the treatment of both the liquid waste in the Tank Farm and the waste in the calcine bins. In addition, activities dealing with spent nuclear fuel will occur until 2035. A period of 10 years was assumed to be needed for the disposition of the necessary INTEC facilities, which results in the year 2045. Depending on the decisions made for the Idaho HLW & FD EIS, the timeframes for the disposition of INTEC facilities could change. Currently, there is not a mission for the CPP-691 Facility. However, future activities at INTEC will consider the use of CPP-691 to accomplish the future activity in the decision.

Comment 64 : A Commentor questioned, "Where are we when we get there?" [MMS-TT]

Response: The Commentor is correct in that contaminated soils will be left behind at INTEC following the completion of cleanup activities. However, completion of the cleanup activities will result in the consolidation of contaminated soils restoring many existing contaminated areas to an acceptable risk level for both short-term and long-term impacts.

Comment 65 : A Commentor questioned why the use of the year 2095, and the 100 years figure. Where do these numbers come from? What are their significance? The Commentor noted that 100 years from now is 2099, not 2095. [U-W]

Response: The year 2095 and 100 years numbers are derived from the *Long-Term Land Use Future Scenarios for the Idaho National Engineering Laboratory.* In this future land use document, the area of INTEC was assumed to remain under federal control until 2095. Beyond 2095 the future land use document does not define the future land use at INTEC. Based on this future land use document, remediation of the INTEC area needs to be completed by 2095.

Comment 66 : A Commentor questioned what is the actual basis for the future resident evaluation, which assumes that people will be clamoring to build houses out here in 100 years? The Commentor further asked if the Agencies could produce regional economic forecasts, local county/city/real estate association formulations, demonstrations, surveys, or plans that clearly document that such an interest and/or need exists? [U-W]

Response: In developing the *Long-Term Land Use Future Scenarios for the Idaho National Engineering Laboratory* document with various interested parties and groups, no consensus could be reached concerning the use of the INEEL beyond 2095. Based on this, risk assessment scenarios (current and 100 year future occupational along with 100-year future residential) were developed. These land use scenarios were used in the baseline risk assessment. This does not mean that INTEC will be used starting in 2095 for future residential development, but these are reasonably conservative assumptions to ensure that the remedial action is protective to future generations.

Comment 67 : A Commentor questioned that if no evidence exists to forecast a land scarcity so pressing as to require use of current INEEL areas for future suburbs, it seems that institutional controls would be much, much cheaper and far, far more realistic than removal. [U-W]

Response: The use of the 100-year future residential scenario serves as our point of departure for making risk-based decisions that will affect the future use of the land for many generations. Beyond 100 years, it is difficult to predict what land use pressure may exist. Unless other extenuating circumstances exist (e.g., proximity to closed facilities requiring perpetual care) the assumption of future residential use provides a level of cleanup that assures the remedy will remain protective.

A.5. WAG 3 Remediation Planning and Costs

Comment 68 : A Commentor recommended that a cost comparison be done between a Plan, based on a high radiation dose and current Plan. "The public should be informed of the cost differential. If the public is informed of the cost associated with little or no risk benefit, we do not believe they would approve the expenditure of millions of dollars on radiation protection that provides no measurable benefit." [C21-W]

Response: For sites listed on the NPL, cleanup must proceed to achieve an acceptable risk range listed in the NCP. Comparing the cleanup cost of a non-protective cleanup versus a protective cleanup is inappropriate. Only protective Alternatives are evaluated which meet this goal and the most cost-effective alternative selected. While there is some controversy over what constitutes an acceptable radiation risk, our best evidence supports the current approach of the linear no-threshold theory. This forms the basis for the protective levels established to protect our air and drinking water and is nationally accepted. As part of our 5-year review process, we will periodically review the protectiveness of our decisions and adjust to any updates in published protectiveness levels.

Comment 69 : A Commentor questioned why the Plan does not mention the fate of "IDW" still present at ICPP. [C-W]

Response: The Commentor is correct. A small amount of investigation derived waste (IDW) is remaining at INTEC. A section was added to this ROD to address the disposition of the existing IDW. The new section in the ROD also discusses the disposition of IDW that will be generated under the OU 3-14 RI/FS.

Comment 70 : A Commentor stated that the O&M costs for leaving VES-SFE-20 in place will not be increased significantly due to the fact that it is adjacent to CPP-603. Although it is shown to be a significant cost over time, it will not be significant since it will be done in conjunction with CPP-603 surveillance costs. [TW-W]

Response: The evaluation undertaken under OU 3-13 is of past practice sites (e.g., spills and abandoned sites). Other programs are currently evaluating operating and closing facilities to ensure that the public and environment are protected. The closure of CPP-603 is outside the scope of this action and therefore, the costs projected for VES-SFE-20 do not assume potential cost savings that may be realized.

Comment 71 : The Commentor asked about the remediation of Group 7 being completed well before any substantive action is taken on the main Tank Farm? [DK-TT]

Response: The Commentor is correct. The major portion of the remediation for the INTEC Tank Farm will occur after 2008. Remediation of the Group 7 SFE-20 Hot Waste Tank System will be completed will before the HLW tank at the Tank Farm.

Comment 72 : A Commentor stated "quit talking about nuclear waste clean up at INEEL and do it!" [RK-W]

Response: The CERCLA process at the INEEL is a carefully engineered and structured program that leads to specified cleanup and risk reductions. The process consists of: (1) evaluation of risks, (2) evaluation of response actions to reduce risk to acceptable levels, (3) selection of the response action, including public input on the selection process, and (4) implementation of the response action. This ROD has selected the response action to be implemented for the various contaminated areas at INTEC. Implementation of the various response actions will begin following approval (signature) of this ROD.

Comment 73 : A concern was expressed that "cleanup is being planned out of context with the previous operations. Although it is appropriate to indicate that the old mission of chemical processing in ICPP has forever ceased, it is dangerous to forget what went on there-the source of the waste and contamination. We have learned through involvement with other organizations and operations at other DOE sites that the cleanup of nuclear materials processing facilities requires careful planning, based on a detailed technical understanding of the conditions at the facility. For example the stabilization and cleanup of the PUREX and B-plant at Hanford (WA) was based on significant detailed knowledge of the operations of the facilities. The public had information on historic air emissions (including the Green Run), throughput of spent fuel and output of plutonium and uranium (including but not limited to HEU) and HLW. This information was useful for providing certain specific technical information useful in planning the cleanup, as well as providing a general sense (with factual support) of the operations leading to the existing problems (recent or historic, batch/campaign or steady state, etc.)." [SRA2-W]

Response: We understand the Commentor's concern with using appropriate information in the planning of cleanup activities. Cleanup operations are planned using the available information including information from previous operations. It is not necessary to know every operation that was conducted at a release site to plan the cleanup activities. Appropriate summary information is sufficient for planning purposes. During the implementation of remedial actions, planning includes actions to deal with the uncertainties. General information as to activities conducted at INTEC are discussed in Section 1 of the RI/BRA Report. This information discusses the major activities and facilities at INTEC. Discussion on the sources of contamination are discussed in the Sections 8 through 26 of the RI/BRA Report. Additional information is contained in the various Track 1 and Track 2 documents. The planning of remedial actions is based on the best available information. Information on historic air emissions can be found in the various monitoring report published at the INEEL.

B. THE CERCLA PROCESS AT WAG 3

Comment 74 : A Commentor felt that at Page 20, Alternative Development, 1st paragraph, if actual technologies are modified after the ROD during remedial design, those modifications must be examined to see if they require an ESD or ROD amendment as described in CERCLA guidance on preparing CERCLA Decision documents. The Public has reviewed and commented on the Plan. Significant modifications after the ROD would diminish, or negate, the public participation process. [C-W]

Response: The Commentor is correct. If the alternative is modified or changed following the approval of the ROD, an Explanation of Significant Difference (ESD) or ROD Amendment would be required. Whether an ESD or ROD Amendment would be required depends to the significance of the change. Representative technologies were evaluated in the FS and FSS Reports and then discussed in the Proposed Plan. Some changes to the alternatives were made following the Proposed Plan and subsequent public comment. These changes are discussed in the Section 13 (Documentation of Significant Changes) of this ROD. If it was determined that an ESD was the appropriate level of change to documentation, the ESD would be developed along with a fact sheet to inform the public of the changes. For a significant enough change, a ROD Amendment would be developed along with a Proposed Plan and subsequent public comment period to inform the public of the changes. Neither of these types of changes to the ROD would diminish nor negate public participation.

B.1. The Comprehensive RI/FS

Comment 75 : A Commentor stated that the Natural Resources Defense Council petition to Nuclear Regulatory Commission July 28,1998 that legally challenges DOE's attempt to change HLW to "incidental" LLW should be reviewed and considered. [CB-W]

Response: Tank Farm source areas are identified with spills of HLW and Sodium Bearing Waste (SBW). However, we are not excavating Tank Farm contaminated soils under this action. There is no need to refine our definitions at this time. Under the Tank Farm RI/FS, the issue of waste classification will be further evaluated. Decisions concerning the waste classification may also be made under the Idaho HLW & FD EIS ROD.

Comment 76 : A Commentor felt that there is information in the WAG 3 RI/BRA document to indicate that there is no provable impact on the perched water from the percolation pond discharges. In fact, the data suggests there is no impact. This information is successfully buried in the 800 or so pages of the document. In addition, the model created for that study has not been field calibrated, regardless of what the author says. It should be done, verified, and peer reviewed before we spend anymore $$$$ to recycle or build new percolation ponds.

The Commentor also strongly recommend that additional evaluations be done (i.e., tracers put in the ponds and looked for in tank farm wells, increased sampling of tank farm wells to verify a chemical connection). To put it bluntly, there are many within the company who recognize this issue and have questioned the players with no logical resolution. [SA-W]

Response: Approximately 70% of the infiltrating water, which contribute to the observed perched water, is from Percolation Pond discharges. The model used for the simulation was calibrated, based on observed field data (e.g., water elevations, chloride, and Sr-90). It is the best information currently available on which to make a reasonably conservative judgement. We believe that our decision process is consistent with national and state guidance. Given the overall uncertainty in transport mechanism at the INTEC facility and the fact that we can control the anthropogenic water, it has been determined that moving the percolation ponds is certainly "best management" practice. Our position is supported not only by the public, but was supported by an external peer review of the vadose zone program at the INEEL.

Concerning additional work at the Tank Farm, we are in the process of developing a Work Plan for conducting additional studies to better assess fate and transport questions for contaminants at the Tank Farm soils. This investigation will focus on obtaining data to quantify the overall uncertainty in model predictions, concerning Tank Farm soils. Also, we will obtain necessary data required for the purposes of calibrating the transport model in terms of concentrations as the existing model was calibrated to perched water elevations. This additional characterization may use tracers, if appropriate, to help quantify the migration paths of subsurface solutes. In addition, we will monitor vadose zone state variables to determine in-situ moisture flux and direction. However, even these studies will not answer the entire uncertainty issue at the INTEC facility because of the temporal variability in recharge from natural sources such as underflow, overflow, overland flows, rain, snow, and snowmelt.

Comment 77 : A Commentor inquired about the transport assumptions for the vadose zone that were used in the evaluations and modeling. [SRA-W]

Response: In conducting the computer modeling for the vadose zone, a number of assumptions were used. The retardation coefficients for the various contaminants were based on default values that have been used for other INEEL evaluations. The vadose zone was assumed to be a homogeneous material with the surface soils, basalt layers, and major interbeds contained within the vertical column. Average (non-varying) properties were used throughout the horizontal and vertical dimensions for the various materials in the vadose zone. Known sources of water, both manmade and natural were also considered in the modeling. A summary discussion of the baseline risk assessment modeling is contained in Section 6 of the RI/BRA Report. The detailed discussion, including modeling parameters and assumptions, for the baseline risk assessment is contained in Appendix F of the RI/BRA Report. The modeling in support of the FS and FSS Reports are contained in Appendix B of each document. The modeling used in the FS and FSS Reports used the same assumptions and approach as used in the RI/BRA Report.

Comment 78 : A Commentor felt that in order to understand the full range of cleanup issues at the Chem Plant, the department should provide a detailed historic description of the operations conducted at the Chem Plant. [SRA2-W]

Response: A summary of the operations and activities conducted at INTEC was presented in Section 1 of the RI/BRA Report, which is part of the Administrative Record. This summary information discuss the major activities and operations that were conducted at INTEC. In addition, several of the major facilities were described in this section. For CERCLA investigation and evaluation purposes, this summary level of information was sufficient to conduct evaluations and make decisions.

B.1.1 General Comments on the RI/FS

Comment 79 : A Commentor stated that the entire cleanup plan reeks of "cart before the horse" and that the cleanup plan doesn't appear to be very technically thought out. [MMS-W-W]

Response: The Proposed Plan is a summary of the various remedial investigations and feasibility studies conducted for INTEC. In the evaluation of both risk and remedial alternatives, the information that was collected from the Track 1, Track 2, and OU 3-13 remedial investigation were utilized. Although this information is not perfect, there was sufficient information to conduct the risk evaluations and evaluate remedial action alternatives. As INTEC will continue to operate for many years prior to final closure, remedial alternatives were developed and considered this issue during the evaluations. Most of the relevant information and evaluations can be found in the RI/BRA, FS, and FSS Reports. Additional information for the release sites at INTEC (ICPP) is contained in the Track 1 and Track 2 documents. All of these documents are contained in the Administrative Record.

Comment 80 : A Commentor referred to Page 16, SFE-20, 1st paragraph in asking that an identification of whether the waste in the tank is a RCRA listed or characteristic waste be provided. The Commentor felt that if the characterization of the waste is not known, a more through investigation should be preformed. The Commentor also stated that "the 1984 investigation was not a CERCLA preliminary investigation" and "don't characterize it as such." The Commentor also requested that statements be made concerning whether the vault has leaked and that the site be removed from the Proposed Plan until further characterized. [C-W]

Response: The waste in the SFE-20 Tank is not suspected of having listed waste. There may be contaminants in the tank waste that have sufficient concentrations for the waste in the tank to be classified as RCRA characteristic. Further, detailed, characterization of the tank contents is the first activity in the selected remedy (Alternative 4:Removal, Treatment, and Disposal). We agree that the 1984 investigation was not a CERCLA activity. However, data from non-CERCLA investigations is routinely used in the INEEL CERCLA risk assessment and alternative evaluation activities. During the 1984 investigation, there was evidence that water had infiltrated into the vault, which shows that water leaked into the vault and could leak out of the vault. Based on the available information and analysis conducted, there is sufficient information to select a remedy for this site.

Comment 81 : A Commentor referred to Page 37, Alternative 2B, 2nd paragraph concerning the sampling location in the aquifer for the quarterly samples and whether the samples would be diluted with less-contaminated portions of the aquifer above or below that which bears the highest I-129 concentrations. The Commentor stated a fear that the Agencies would take their samples, declare that action levels are met, due to dilution, and then decide that remedial action is not required. The Commentor also wanted to know when the investigation and evaluations would be completed on the aquifer. The Commentor requested that this OU be removed from the ROD pending further investigation and evaluation. [C-W]

Response: We disagree with the Commentor. During construction of the monitoring wells, samples will be collected and analyzed from various zones within the aquifer to determine the zone or zones with highest concentrations. Monitoring would continue in the zone or zones with the highest concentrations, which can yield water at a rate of at least 0.5 gpm. An adequate and complete RI/FS was conducted for OU 3-13. The OU 3-13 RI/FS is sufficient to make decisions concerning the contaminated portion of the SRPA outside of the INTEC fenceline. The active remediation portion of the selected remedy (Alternative 2B: Institutional Controls with Monitoring and Contingent Remediation) is only implemented depending on the monitoring results obtained. A Final interim action on the INTEC groundwater plume in the SRPA outside of the INTEC fenceline is included in this ROD. The final action on the INTEC groundwater plume inside the INTEC fenceline will be selected under OU 3-14.

Comment 82 : A Commentor stated that "Based on the comparisons given in Appendix F of the RI report, the perched water Sr-90 concentrations are over predicted (by the computer model) by factors of 10,000 to 100,000 (it is difficult to tell for sure with the huge log scale used). In addition, the predictions show plutonium concentrations of hundreds of pCi/L in the perched water. This is not supported by the perched water data. Based on these predictions, there is huge uncertainty in the models predicted Sr-90 or plutonium concentrations in the aquifer. Any decisions made based on these predictions are being made under essentially unbounded uncertainty." [JM-W]

Response: For certain perched water wells, away from major source terms, large over-predictions in the concentrations for contaminants occur. However, near large source terms, Sr-90 concentration predictions are within a factor of 10. It is recognized that plutonium is over-predicted based on the available sampling data. Plutonium mobility is one of the major issues to be resolved under the Tank Farm RI/FS (OU 3-14). Predicted concentrations of Sr-90 in the SRPA match the measured concentrations within reasonable limits. Under OU 3-13, an interim action is being undertaken on the SRPA area outside of the INTEC fenceline, with the final action to occur under OU 3-14. Operable Unit 3-14 may attempt to quantify the uncertainty in the modeled concentrations.

Comment 83 : A Commentor stated that "As shown in the vadose zone model transport calibration and Sr-90 predictions, contaminants are laterally spread much further in the computer model than is supported by the available data. This vadose zone lateral spreading has been assumed to be conservative in that it allows water to spread in the model from the percolation ponds and Big Lost river to the area under the tank farm and accelerate the transport of contaminants from the upper perched water to the aquifer. However, this overestimate of lateral spreading means there is an underestimate of vertical movement of water and contaminants. Therefore, it is possible that the vadose zone contaminant travel time to the aquifer has been underestimated in the model thereby underestimating the future risk in the aquifer (in particular for Sr-90)." [JM-W]

Response: The Commentor is correct. It is recognized that the Sr-90 is laterally spread in the model more than is observed in the measured values shown. The true lateral spreading of water is maintaining the saturation front of the subsurface (vadose zone). Minor impacts on the upper perched water zone results from the lateral spreading, but a major impact (effect) is modeled in the deep perched water. The largest source terms are in the Tank Farm Soils (Group 1) and the impacts on the SRPA within the fenceline will be further refined under OU 3-14.

Comment 84 : A Commentor stated that "The inconsistencies between the computer model predictions (that decisions are based on) and the observed movement of contaminants in the perched water must be clearly acknowledged. The uncertainty in the predicted aquifer risk should be quantified or the results should be qualified in the strongest terms. The risk assessment uncertainty has not been sufficiently stated in this Proposed Plan or in the supporting documentation for the Proposed Plan. [JM-W]

Response: There are recognized differences between the modeling and measured results. These differences are shown graphically in Appendix F of the RI/BRA Report, which is part of the Administrative Record. There are predicted impacts on the aquifer from the surface and near surface source terms, but the major impact currently and in the near future is from the use of the injection well. Aquifer impacts from the major source term in the Tank Farm Soils will be refined under the OU 3-14. The Proposed Plan is a summary document. In addition, uncertainty was not quantified in the risk assessment for OU 3-13.

Comment 85 : A Commentor felt that on Page 14, Perched Water, 2nd paragraph a statement should have been made concerning the perched water having been contaminated with RCRA listed waste. A Commentor requested that the specific Idaho Groundwater Quality Standards be identified and that the time frame for impacts on the aquifer be identified. The Commentor also inquired about the evidence that the perched water is a transport pathway between surface soils and the deep aquifer. Also, the Commentor was concerned about the K_ds used for the contaminants absorbed/adsorbed onto surficial soil and layers of soil in the basalt when dealing with infiltrating water. The Commentor requested that a statement be made concerning whether the perched water presents a risk to the aquifer from the contaminants already in the perched water or from additional contaminants leached from soil percolating surface water. [C-W]

Response: Given the leaks that have occurred in the Tank Farm, listed hazardous wastes are present in the perched aquifer. Hazardous constituents and characteristic hazardous waste was injected into the perched water and aquifer through the injection well. Additional information concerning this subject is available in the Administrative Record, specifically Appendix G of the FS Report. The Idaho Groundwater Quality Standards being referred to in the Proposed Plan are the Safe Drinking Water standards applied to the SRPA. The perched water is not a viable source of water for consumption, but does represent a threat to the SRPA. The intent of this remedial action is to restore the SRPA impacted by INTEC operations to usability by 2095 outside of the INTEC fence line. Inside of the INTEC fence line will be addressed under OU 3-14. With water being the mechanism that transports contaminants through both the unsaturated and saturated zones, the perched water is a transport mechanism for the contamination to the SRPA. It is recognized that the INTEC injection well failed and backup into the unsaturated zone. The residual contamination from these failures can not explain the existing contamination in the SRPA without the additional contamination being transported through the perched water and into the SRPA. Default Track 1 and Track 2 K_ds were used for the modeling parameters when dealing with contamination in the surficial sediments and interbed materials. Based on the information contained in the RI/BRA, FS, and FS Supplement Reports, the perched water does represent a threat to the SRPA without remedial action being taken to mitigate the risks.

Comment 86 : A Commentor had a concern about whether the contaminants found in the perc pond water posed a threat. The Commentor also was concerned about the inventory of contaminants in soil/basalt above the perched water. The Commentor had a question concerning the K_ds used in evaluating the impacts from the perc pond wastewater on the aquifer. Also, the Commentor inquired about which of the contaminant(s) in the soil/basalt are a threat and over what time frame. [C-W]

Response: Yes, there are contaminants found in the water being discharged into the existing percolation ponds. However, there are questions concerning the concentrations of the contaminants in the water. Sampling activities are being conducted to resolve the COCs and concentration issues with the water. Recent sampling results indicate that the contamination levels are below the MCLs for the primary contaminants of concern. Tens and thousands of years into the future.

B.1.2. Inclusion of Sites in the RI/FS

Comment 87 : A Commentor stated that "The Plan notes that the CPP-37 gravel pits and CPP-66 Fly-ash Pit (which both sounds innocuous) will be closed under Idaho Solid Waste Rules (IDAPA 16.01.06). However, the Site Treatment Plan and the Remedial Investigation/Feasibility Study (RI/FS) show the Gravel Pits as a mixed waste discharge site with a volume of 84,393 cubic meters of waste dumped in the two pits. The RI/FS lists seven radionuclides in pit #1 and eight radionuclides in pit #2. The RI/FS lists the Fly-ash Pit with four radionuclides and RCRA listed hazardous waste contaminates. [INEL-95/0056@3-22] Similarly, DOE wants to close the CPP-65 Sewage Lagoon under Idaho Waste Water Land Application Rules, yet the RI/FS lists the site as having contaminates in the lagoon wastewater. [3-22] These waste sites must be remediated under the same RCRA requirements as the other mixed hazardous/radioactive waste sites." [CB-W]

Response: Site CPP-65 and CPP-66 are not being addressed under this ROD as we believe that other regulatory programs are better able to address proper closure. A review of the INEEL Site Treatment Plan (STP) was conducted. It was found that these sites are not part of the STP. Both Sites CPP-37a and CPP-37b are being addressed as part of Group 3 (Other Surface Soils) under this ROD. Release Site CPP-66 was transferred to WAG10 for further ecological risk evaluation and remedial action, if necessary. The sewage lagoons (CPP-65) will be closed in accordance with the permit requirements.

Comment 88 : A Commentor felt that "There are a number of sites in this Plan which are not properly characterized." The Commentor stated that these sites should be removed from the Plan and subsequent ROD until characterization is complete. [C-W]

Response: We do not understand what sites the Commentor is referring to. All sites were characterized, either from process knowledge, interviews, or actual sampling and analysis. Investigations under the FFA/CO have followed a tiered approach. The approach started with Track 1 investigations along with analysis and then preceded through Track 2 investigations and analysis. These Track 1 and Track 2 investigations were then factored into the RI/FS Work Plan and further investigations were conducted where necessary. Some characterization activities will take place as part of the various remedial actions.

Comment 89 : A Commentor felt that on Page 14, Other Surface Soils, 1st paragraph, "Soil which is currently stored in boxes and which was not generated during CERCLA investigation or removal activities (CPP-92), should not be included in this Group." The Commentor stated that "This waste is no different than any other waste generated by the INEEL during routine maintenance or upgrade activities. The INEEL has facilities and dispose of such routine waste. It should not be included in CERCLA simply because it simplifies, and may reduce, regulatory compliance requirements. Including this kind of soil in the CERCLA program allows the INEEL a way to circumvent the RCRA disposal requirements, which might otherwise attach to the soil. Remove boxed soils, which did not originate from the CERCLA program from this Group. [C-W]

Response: We disagree with the Commentor. The soils in the Site CPP-92 were included in the FFA/CO through the New Site Identification (NSI) process. In order to add the site to the FFA/CO, concurrence was obtained from both the EPA and Idaho Department of Health and Welfare/Division of Environmental Quality (IDHW/DEQ) along with DOE. Also, the waste that was generated and placed into the boxes originated from CERCLA release sites. Lastly, the boxed soils at Site CPP-92 are subject to HWMA/RCRA ARARs, particularly hazardous waste determinations and land disposal restrictions and storage ARARs. No RCRA requirements were 'circumvented.'

B.1.3. Classification of Contaminants

Comment 90 : A Commentor felt that DOE failed to correctly categorize the other waste as mixed low-level (MLLW) which requires either approved treatment or disposal in a permitted RCRA Subtitle C hazardous waste dump. [CB-W]

Response: An evaluation of whether the wastes are subject to RCRA disposal requirements in a RCRA Subtitle C landfill was made in the Feasibility Study Supplement Report, which is part of the Administrative Record.

Comment 91 : A Commentor stated that "Two of the contaminated soil sites (CPP-28 and CPP-79) have transuranic (TRU) elements that cumulatively exceed the TRU definition of 100 nCi/g. This waste must go to a Nuclear Regulatory (NRC)/Environmental Protection Agency (EPA) approved geologic ICDF specifically permitted for TRU waste. Since this contamination resulted from over 100 leaks in the high-level liquid and calcine waste pipes, and acknowledged in DOE's work plan document as HLW, a legitimate case can be make that it still HLW and subject to Nuclear Regulatory Commission disposal regulations." [CB-W]

Response: Tank Farm source areas are identified with spills of HLW and SBW. However, we are not excavating Tank Farm contaminated soils under this action. There is no need to refine our definitions at this time. Under the Tank Farm RI/FS, the issue of waste classification will be further evaluated. Decisions concerning the waste classification may also be made under the Idaho HLW & FD EIS ROD. In addition, there were not over 100 releases of waste at INTEC associated with the HLW operations or facilities.

Comment 92 : A Commentor stated that trying to get the Agencies to properly characterize the waste has been an ongoing effort. The Commentor also stated that without proper characterization, disposal of the waste would not meet the basic requirements for disposal. In addition, the Commentor felt that previous disposal activities have been illegal. [CB-TM]

Response: An evaluation of whether the wastes are subject to RCRA Subtitle C was made in the FSS, which is part of the Administrative Record. It was determined that there was a significant amount of INEEL CERCLA soils and debris having contaminants other than and in addition to radionuclides. Management of the non-radionuclides is subject to the RCRA requirements. We are unaware of any 'illegal' disposal actions taken under the FFA/CO or under previous RODs. We have characterized contaminated media and wastes to the extent necessary to properly manage them. At Test Area North (TAN) groundwater, when we learned that the waste was a listed hazardous waste, we voluntarily modified the ROD through an ESD to achieve compliance.

Comment 93 : A Commentor felt that the gravel pits were mixed waste based on the site treatment plan and that the waste would need to be dealt with as a RCRA listed waste. The Commentor also felt that the flyash and the sewage lagoons had similar issues and could not be written off as "No Action Sites." In addition, the Commentor stated that further explanation is required in the document. [CB-TM]

Response: The gravel pits, flyash pit and sewage lagoons do not appear in the INEEL STP. The STP only deals with waste that has been generated and requires treatment under RCRA for dealing with the hazardous components. These sites are under the CERCLA program and were assessed for risk. Both the human health and ecological risks were determined to be acceptable for the gravel pits and sewage lagoons. Remedial action on the gravel pit will be undertaken in Groups 2 (closed pit) and 3 (open pit). For the flyash pit, the human health risk was determined to be acceptable, but presented a potential ecological risk. This site was transferred to WAG 10 for further ecological risk evaluation and remediation, if necessary. Closure of both the sewage lagoons will occur under other programs. The Proposed Plan is a summary document and does not have the detailed information and rationale. Additional information can be found in the RI/BRA, FS, and FSS along with this ROD.

Comment 94 : A Comment stated that "There are a number of environmental media at ICPP which are known to be contaminated with RCRA listed waste. They include the tank farm perched water system, the aquifer, and several soil wastes. There are other soil wastes that may be contaminated with RCRA listed wastes. It would be a good idea to address these problems through a risk-based delisting in the ROD. By establishing risk-based delisting concentrations in the ROD, then media meeting those concentrations could be managed as non-listed (though they might still exhibit a characteristic of hazardous waste). This would simplify issues of AOC and LDR at the ICDF, if it is built." [C-W]

Response: The Commentor is correct. There are areas at INTEC that have been contaminated with waste having listed waste constituents. Delisting of the waste is not being pursued under this ROD. Delisting would not change how the waste is managed on-site. In addition, delisting decisions under the ROD would not apply to off-site shipments.

Comment 95 : A Commentor stated that "None of the SFE-20 Hot Waste Tank System (Group7) (CPP-69) cleanup alternatives offered in the ICPP plan meet regulatory requirements." The Commentor also stated that the classification of the waste in the SFE-20 Hot Waste Tank concerning TRU constituent was not correct. [CB-W]

Response: Preliminary information supports that concentrations of TRU may be high enough to require disposal of the Tank's contents at Waste Isolation Pilot Plant (WIPP). However, due to the radiological hazards and access controls, we have not completed characterization of this tank and do not know how this waste will be classified at this time. As we have elected to excavate and remove the tanks and its contents in full compliance with all applicable regulations, we must disagree with the Commentor concerning our commitment to comply with regulatory requirements.

Comment 96 : A Commentor felt that the waste in the SFE-20 tank system was not adequately characterized. [CB-TM]

Response: Preliminary information supports that concentrations of TRU may be high enough to require disposal of the Tank's contents at WIPP. However, due to the radiological hazards and access restrictions, we have not completed characterization of this tank, which would be required even if we elected to leave the tank in place. In addition, because the tank contents have not been completely characterized, whether the contents of the tanks are mixed waste has not been determined. Under evaluation of alternatives, we concluded that Alternative 4 (Removal, Treatment, and Disposal), which includes characterization activities, best satisfies the evaluation criteria. In addition, as we have elected to excavate and remove the tank and its contents in full compliance with all applicable regulations, we must disagree with the Commentor concerning our commitment to comply with regulatory requirements.

Comment 97 : A Commentor felt that the Tank Farm soils are transuranic waste. The Commentor also inquired as to whether additional sampling would be conducted and if it would change the waste classification. The Commentor also stated that if the Tank Farm soils have sufficient concentrations of TRU constituents to be classified as TRU waste the soils would require disposal at a transuranic, deep geologic repository. [CB-TM]

Response: Some of the data from sampling activities in the Tank Farm indicate that there may be soils with sufficient concentrations of neptunium (Np), plutonium (Pu), and americium (Am) isotopes to be classified as TRU (i.e., greater than 100 nCi/g). Additional sampling is being planned under the Tank Farm RI/FS (OU 3-14) to determine the concentrations and classifications of the soils. Based on the new and existing information, risks to the environment would be determined and remedial alternatives developed. If the soils are excavated and are classified as TRU, disposal in a deep geological ICDF would be the disposal location. For alternatives that do not excavate (generate waste) the soils, the soils left in place would not be subject to disposal at a deep geological ICDF, but would be required to meet a performance objective considering the impacts on the SRPA and surface receptors.

B.2. Risk Assessment

Comment 98 : A Commentor felt that the definition of clean that the Department of Energy is using is a far cry from what the general public would determine as clean. The Commentor felt that imploding a contaminated building above contaminated soil, and then capping it would not meet most peoples definition of clean as the amount of contamination that was there before the implosion process began, will be there when the capping is completed. [MMS-W-W]

Response: The use of 1 in 10,000 is the upper end of the National Contingency Plan risk range. A risk of 1 in 1,000,000 is considered the point of departure for additional consideration concerning risks. In compliance with the NCP, INEEL is using the upper limit in making the risk management decisions concerning the need for remedial action. For the CERCLA program, restoration activities are directed at restoring an area to an acceptable risk. At the INEEL, an acceptable risk has been defined as 1 in 10,000, due to the background contaminant concentrations that represent a 1×10^{-5} risk. Therefore, some contamination remains following the cleanup activities, but the residual is considered acceptable from a risk perspective. There are several alternatives evaluated in the final disposition of facilities, with "imploding" and leaving the building in place being one of the alternatives. Criteria (risk to the SRPA, risk to surface receptors, worker risk, cost, implementability, etc.) are evaluated in selecting the building disposition alternative. If the environmental risks (aquifer and surface) are in the acceptable range for the alternative, leaving the building in place with the contaminated soil beneath may be a viable alternative. Closure decisions and approaches are within the purview of the HWMA/RCRA closure plans for the interim status unit, not the CERCLA OU 3-13 ROD. Alternatives for consideration in the HWMA/RCRA closure plans are being evaluated in the Idaho HLW & FD EIS. As part of the remedial alternative for the building, an engineered barrier (cap) may be necessary to reduce the risks to acceptable levels. It is true, that for some facility closure, with implosion, that the amount of contaminants remaining will be the amount that was present before facility disposition. This would be considered a viable alternative provided that the SRPA is not adversely impacted. Actions are being taken to reduce impacts to the SRPA to acceptable levels and then all future actions will need to be within the cumulative acceptable risk range.

Comment 99 : A Commentor agreed with the risk assessment approach established, and the specific objectives of the Proposed Plan. [C21-W]

Response: Thanks, we appreciate the comment. The risk assessment was prepared in accordance with the EPA national guidance. Standard or default assumptions along with 95% upper confidence concentrations were used to assess the risks. Following the risk assessment, remedial alternatives were developed and evaluated to mitigate and/or reduce the risks to acceptable levels. This information is then summarized into the Proposed Plan along with a recommended (preferred) alternative.

Comment 100 : A Commentor inquired concerning Page 47, Table 10, what the cumulative risk at INTEC would be if all of these sites were included into the calculations. The Commentor stated that "Risk should be calculated across ICPP from all of the CERCLA sites, not just those chosen for inclusion in the Proposed Plan." The Commentor also requested that the cumulative risk from all CERCLA sites at INTEC be stated. [C-W]

Response: The cumulative risk at INTEC for the CERCLA release sites was determined to be unacceptable. The baseline risk assessment considered all of the known CERCLA release sites. The release sites presented in Table 10 of the Proposed Plan are release sites that individually do not have an unacceptable risk and do not significantly affect the cumulative risk for CERCLA sites at INTEC. It should be noted that an individual will chronically have exposure to soil at only one location, but that individual will breathe air and drink groundwater that potentially can be affected by contaminants from all of the sites. This results in the risk assessment essentially evaluating the cumulative risk from all of the sites. Section 27 of the RI/BRA Report presents the cumulative risk assessment results.

Comment 101 : A Commentor could not find a section on the uncertainty in the risk assessment, in the Proposed Plan. Particularly, the uncertainty in the groundwater risk predictions and whether the uncertainty can be quantified. The primary source of this uncertainty is the uncertainty in the Sr-90 and plutonium inventory released to the environment, the rate at which the Sr-90 and plutonium is moving from the surface sediments to the underlying basalts, and the transport through the vadose zone to the aquifer. [JM-W]

Response: There was no uncertainty discussion in the Proposed Plan. The Proposed Plan is a summary document containing information found in the RI/BRA, FS, and FSS Reports. A qualitative discussion of the uncertainty in the modeling is contained in Section 6 and Appendix F of the RI/BRA Report. Most of the uncertainty in the source terms for Sr-90 and plutonium is in the Tank Farm Soils (Group 1), which will be further investigated and evaluated in the Tank Farm RI/FS (OU 3-14). In addition, the analysis presented in the RI/BRA, FS, and FSS did not attempt to quantify the uncertainty as this would require a considerable additional amount of data and subsequent analysis.

Comment 102 : A Commentor questioned whether some sites in this Plan present a real risk to human health/environment. If they don't, they should be removed from the Plan or a viable risk should be demonstrated. [C-W]

Response: We are not sure which sites the Commentor refers to. Release sites without an unacceptable risk were recommended for "No Action" or "No Future Action" depending on the condition of the source term for the release site.

Comment 103 : A Commentor wondered, since the proposed ICDF will be outside the 100-year floodplain and thus will be acceptable under both RCRA and TSCA, how long will the radioactive portion of the waste present a risk to the environment? DOE Order 5820.2A requires a risk assessment for the radionuclide portion of the waste. What are the results of this risk assessment? [C-W]

Response: In the evaluation of the materials for potential disposal in the ICDF, some waste could remain sufficiently radioactive to present an unacceptable risk to human health receptors for approximately 800 years. This information is presented in the RI/BRA, FS, and FSS Reports. In addition, the ICDF will be designed, constructed, operated, and closed to not adversely impact the SRPA or surface receptors. Additional risk analysis will be conducted under remedial design activities. The specific WAC will be developed with agency concurrence during remedial design.

B.2.1. Human Health Risk Assessment

Comment 104 : A Commentor was concerned that DOE is not using "maximum" contaminant data. For instance, the Snake River Aquifer risk assessment -90 levels used by DOE is 8.1 yet DOE's own sampling data in the RI/FS shows 14 aquifer monitoring wells that exceed the MCL including USGS-047 with Sr-90 levels over 60 pCi/L. [INEL-95/0056; D-19] DOE additionally fails to acknowledge aquifer tritium contamination in excess of the MCLs. DOE's use of arbitrarily low or averaged sample data results in unreliable and non-conservative risk assessments. [CB-W]

Response: There are a number of aquifer wells near the INTEC facility that currently measure concentrations of radionuclides exceeding the MCLs. In assessing the risk to a hypothetical future resident, the maximum contaminant concentrations predicted by the computer modeling were used. The MCL for radionuclides, beta and gamma emitters is 4mrem/yr from all sources. The MCLs listed are calculated as if they were the only radionuclide present. Tritium, Sr-90 and I-129 all exceed MCLs today. However, the reasonable timeframe that we would expect before the aquifer may serve as a drinking water source in the vicinity of the ICPP by future residential users is year 2095. MCLs for this year 2095 future use scenario, are modeled to be within acceptable levels for all but Iodine-129 and Sr-90. The 8.1 pCi/L Sr-90 referred to by the Commentor is the predicted value, rather than a measured value.

Comment 105 : A Commentor thought the Proposed Plan for the clean up for the contaminated soils in the groundwater appeared to be well done under the overall conservative assumptions in the regulations by which they have to abide. The major concern was with the estimate and the calculations, in that overly conservative values have been used due to using a linear- and no-threshold approach, which has been shown to be incorrect.

The Commentor pointed to recent scientific values of at least 5 rem -- and there are actually two more recent values of 10 and 20 rem that have been reported instead of the 15 mR would lead to much lower cost figures for accomplishing a cleanup. Therefore, they felt that either these higher figures should be used, or at least evaluated as an alternative cost estimate basis. [LJ-TI]

Response: Although this issue is controversial, we must conclude that based on the limited data concerning low dose epidemiological studies, the epidemiological data base is of very limited value in assessing dose response relationships. Based on the assessment of our experts and others, no alternate-dose response relationship appears to be more plausible than the linear non-threshold model on the basis of present scientific knowledge. For radiation protection purposes, the weight of evidence causes us to continue to conclude that the risk from radiation increases linearly with the dose, in the low dose range above natural background radiation levels.

Comment 106 : The measure of acceptable risk to human health as being 1 in 10,000 is very conservative. However, we can accept that criterion if the risk assessment is done in an acceptable science-based manner. Our major concern is that the risk assessment values calculated in this plan are based upon a nonscientific hypothesis. All risk calculations are based on the "linear-no-threshold" hypothesis, which links risks of cancer to radiation doses down to zero. There is no scientific evidence to support this theory. In fact the Council of Scientific Society Presidents has stated that radiation levels below 10 rem per year are not clearly linked to an increased risk of cancer for adults. Therefore following recommendations are offered on the Proposed Plan. [C21-W]

Response: The use of 1 in 10,000 is the upper end of the NCP risk range. A risk of 1 in 1,000,000 is considered the point of departure. The INEEL is using the upper limit in making the risk management decisions concerning the need for remedial action.

Although this issue is controversial, we must conclude that based on the limited data concerning low dose epidemiological studies, the epidemiological data base is of very limited value in assessing dose response relationships. Based on the assessment of our experts and others, no alternate-dose response relationship appears to be more plausible than the linear non-threshold model on the basis of present scientific knowledge. For radiation protection purposes, the weight of evidence causes us to continue to conclude that the risk from radiation increases linearly with the dose, in the low dose range above natural background radiation levels.

Comment 107 : A group of Commentors recommend that risk calculations be done based upon more scientific criteria. For example: Take the Federal Limit on Public Radiation Exposure from the NRC General Public Limit of 0.1 rem/yr as the baseline or threshold for zero risk of cancer for the public. Take the Federal Limit on Worker Radiation Exposure of 5.0 rem/yr as the baseline for zero risk of cancer to a worker. [C21-W]

Response: Within the EPA regulations, a dose of 15 mRem/yr is considered the maximum allowable exposure for the general population. This dose roughly corresponds a risk of 3 in 10,000. Because there currently is not a better theory on radiation dose effect than the linear-no-threshold hypothesis, risks are calculated with zero risk at zero dose. A dose of 0.1 rem/yr (100 mRem/yr) would correspond to a risk of 7 in 10,000 and a dose of 5.0 rem/yr (5,000 mRem/yr) would correspond to a risk of 3 in 100. Both of these doses are considerably over the EPA standard and would be considered an unacceptable risk. In addition, the EPA is considered the primary organization responsible for determining risks to human health and the environment.

Comment 108 : Regarding the human health risk assessment portion of the Proposed Plan, page 17, a Commentor questioned, "what happened to the future resident beyond 2095? [C-W]

Response: We are sorry for the confusion. The risks to workers both current and future (2095 and beyond) were analyzed in addition to the future resident (2095 and beyond). There were not any release sites that had an unacceptable risk to workers, either current or future, that did not also have an unacceptable risk to the future resident. Based on this, the need to take remedial action for release sites was specified using the future resident. It should be noted that for all land use scenarios (current and future worker along with future resident) an unacceptable risk was defined as 1 in 10,000. Also, workers are additionally protected with worker controls that were not taken into account in assessing the risks.

Comment 109 : A Commentor stated, "but you promise to clean it up. And if I haven't died from trace exposure to atomic waste in my aquifer I just may live to see it. [RK-W]

Response: The CERCLA program is committed to cleaning up the contaminated areas at the INEEL, including contaminated soils. This ROD has selected remedial actions to remediate various areas located at INTEC. The risk numbers calculated by CERCLA methods are the probability that an exposure will lead to a tumor. The exposure is calculated based on a number of factors resulting in a chronic dose. This chronic dose is evaluated as being received over many years (30 years for residential scenario). Even if the exposure results in a tumor, the tumor will not necessarily lead to a fatal cancer. No off-site impacts from the INEEL that result in unacceptable risk to the public were discovered by the OU 3-13 RI/FS.

B.2.2. Ecological Risk Assessment

Comment 110 : A Commentor wanted to know how the Agencies propose to address ecological risks such that species ranging the entire INEEL will be protected. [C-W]

Response: For the ecological risk evaluation (screening level risk analysis) conducted at WAG 3 or INTEC, evaluations were done on an individual release site basis. These ecological risk evaluations used both actual uptake factors and hypothetical uptakes (based on similar species) for ecological receptors. These ecological risk evaluations resulted in some sites having a potential ecological impact. Release sites without a potential ecological impact were eliminated from ecological concerns. Many sites at WAG 3 had a potential ecological risk at the same release site as an unacceptable human health risk. For release sites having both an unacceptable human health and potential ecological risk, the remediation of the site to human health standards will also be designed to address the potential ecological risk issues. Some sites had a potential ecological risk without an unacceptable human health risk. For these sites, the remediation levels are designed to reduce the contamination to levels below the concentrations resulting in a potentially unacceptable ecological risk. One site, CPP-66: Fly Ash Pit, is being deferred to WAG 10 to address the potential ecological risk impacts from the release site. In addition, a final INEEL-wide ecological risk assessment, including the impacts on populations, will be conducted under the WAG 10 RI/FS.

Comment 111 : A Commentor stated the ecological risk assessment method and results are misrepresented and this section needs to be clarified. For example, the first step of the ERA process is a background and EBSL screening, however an additional (much less conservative) assessment is then performed on those sites that are not eliminated by this screen. This information needs to be included or the paragraph rewritten, since currently it gives the impression that the preliminary screen is the only step performed. More importantly is the inclusion of an appropriate discussion concerning the additional site and contaminate elimination step requested by the DOE-ID, EPA, and IDHW. Based on the results of the ERA, those sites that had hazard quotients (HQs) greater than 1.0 (27 sites) were eliminated as a concern by the risk managers if the soil concentrations (at the 95% UCL or max [which ever was lower]) was less than 10X background or if the HQ was less than 10. This eliminated all but 16 sites of the 27 sites (as well as multiple contaminants). Of these 16 sites, 4 were solely an ecological risk. This needs to be more clearly stated in the text since it gives the impression that of the 27 sites, 4 were solely an ecological risk and this is not the case. The statement that the remaining 64 sites do not pose risk to ecological receptors should be rewritten to state that the remaining 64 sites were eliminated as a concern to ecological receptors by the risk assessment process. Due to the uncertainty in the risk assessment process (also true of human health) it is not responsible to state that "no risk" (implying zero risk) is posed. [RV-W]

Response: No changes were made to the final Proposed Plan to address this issue. The ecological risk evaluation in this ROD was written and expanded upon the Proposed Plan to address this comment.

B.3. Remedial Action Objectives

Comment 112 : A Commentor was concerned that the RAO of 2E-4 is consistent neither with NCP nor the statement on page 17 of this Plan which states that: "...total excess risk may not exceed one in 10,000." achieved by adding the risks from groundwater and soil. The RAO should be to reduce the risk at the site, from all pathways to acceptable levels. In addition, CERCLA identifies 1E-4 as the point at which remediation is required, not the point at which it stops. Ideally remediation, once begun, should reduce risk to as close to 1E-6 as is possible within the CERCLA decision making criteria. Strongly suggest the RAO be modified to comply with the NCP. [C-W]

Response: The NCP defines the acceptable risk range as 1×10^{-4} to 1×10^{-6}. The RAO is to reduce the risk from all pathways to within this risk range for the residential scenario. Due to the fact that the risk from background radiation at the INEEL is approximately 1×10^{-5}, it has been determined appropriate to remeidate to the upper end of the NCP risk range. In addition, this RAO is using a residential scenario for the INTEC, which is a conservative assumption.

Comment 113 : A Commentor felt it is not a reasonable presumption that a person might build a house inside the current, ICPP fence, but drill a drinking water well outside the current fence. Thus establishing RAOs for the groundwater outside the fence only while allowing people to live within the fence is not acceptable or consistent. Choose - where will people live and get drinking water, inside or outside the fence? Be consistent!! If this results in different, less aggressive, remedial actions inside the fence, that is acceptable, just make it clear to the public. [C-W]

Response: The Commentor is correct. There is an apparent inconsistency in the approach for groundwater discussed in the Proposed Plan. Due to this inconsistency issue, the remedy for the SRPA has been changed to an interim action the area outside of the INTEC fenceline. The final action on the SRPA, including the area inside the INTEC fenceline, will be evaluated and the decision made under the OU 3-14 RI/FS project.

Comment 114 : Reserved.

Response:

Comment 115 : A Commentor questioned whether the proposed 100 year RAO will adequately protect the future value of regional groundwater resources and the economic activities they support. [L-W]

Response: The remedial action objective (RAO) of year 2095 is based on our prediction that government control of INEEL may end and uncontrolled development may occur unless we commit to additional remedial controls. This scenario is used in our risk assessment process rather than assume that we will maintain all of INEEL as a government facility in perpetuity. Areas like the ICDF will have these remedial controls placed on the ICDF area. It will be designed, constructed and maintained as long as the threat to human health and the environment persists. These controls will include periodic reviews that the remedy remains protective, land use restrictions, cap maintenance and other tangible physical controls as necessary . Our commitment to the SRPA is that it be restored by the year 2095 so that it is available for use in the future economic development of the area.

Comment 116 : A Commentor questioned whether the goals of the current plan were: 1) that the Chem Plant be clean enough for people to live there by 2095; 2) and that the contamination levels then in the Snake River Aquifer be low enough for people to get water nearby? [SRA-W]

Response: The Commentor is correct. Our goal is to restore soil areas where excavation will take place and the underlying aquifer so that future users will not be at an unacceptable risk. The ICDF and other capped soil areas will be maintained so as to prevent future access. Also, there are areas at INTEC that will not be clean enough for people to live or work unrestricted by 2095. For these areas, engineering and institutional controls will continue to be maintained until the risk is acceptable.

Comment 117 : A Commentor asked why the proposed MCL for I-129 is approximately 20 pCi/L or more than 4 times the computer model predicted peak I-129 concentrations after year 2095. The Commentor recognized that 20 pCi/L was not the legal standard but was of the understanding it is the current scientific standard. The Commentor wanted clarification to the public that the proposed groundwater remedial action is based on groundwater action level concentrations that are significantly below the MCL supported by the scientific community. The Commentor noted the EPA proposed the MCL of 20 pCi/L been recognized by the U.S. Government's own scientist as more appropriate than the 25 to 30 year old legal standard of 1 pCi/L. [JM-W]

Response: The Commentor is incorrect. At one time, a method for calculation of the MCLs resulting in the I-129 MCL of 20 pCi/L was proposed. This approach was **not promulgated**. New proposed MCLs have been proposed by the EPA and the proposal includes a MCL for I-129 MCL of 1 pCi/L. These new standards are expected to become effective by November 2000. In addition, the I-129 MCL of 1 pCi/L is derived from the 4 mRem/yr dose MCL under the Safe Drinking Water Act.

B.4. Compliance with ARARs

Comment 118 : A Commentor was concerned that the Agencies have been vague about the definition of AOC for WAG 3 and other WAGs. The "AOC" has varied, depending on what was "convenient" at the time. As an example, refer to the removal action conducted for the electrical system upgrade. For that removal action, the AOC was defined very strictly around each OU. Now the Agencies want to make it much broader. This is not consistent. Also, the area proposed for the ICDF cannot be part of the AOC since it is not part of "continuous or contiguous" contamination associated with WAG 3. The ICDF cannot be considered part of the WAG 3 AOC. [C-W]

Response: The definition of the AOC is consistent with being within the "continuous or contiguous" area of contamination at INTEC. Release Site CPP-95 (ICPP Windblown Plume) has a contaminated area extending both south and north of INTEC. The areal extent of CPP-95 used in establishing the AOC is the area that is not available for free release or unrestricted used due to the existing contamination. Existing institutional controls (access restrictions, land use restrictions, and radiological monitoring) must remain in place until 2095 for the site to become available for free release or unrestricted used. Based on the restriction on the land use for CPP-95 and that the other sites in WAG 3 requiring remediation are within the areal extent of CPP-95, the restricted portion of CPP-95 is defined as the AOC. The areal extent of the AOC is presented with Figure 2-1 for Appendix C of the FSS Report. This is a large area of continuous or contiguous contamination and includes the location of the ICDF. Removal actions do not have the ability to establish an AOC outside of the scope of the project and are generally conducted on limited scope or area. This ROD is making decisions for all of the known release sites at INTEC and is determining the WAG 3 AOC.

Comment 119 : A Commentor wanted to know what kind of air emission controls will be in place during Chem Plant cleanup, particularly soil movement? [SRA-W]

Response: Various controls and actions will be used during the remedial actions to control air emissions. These controls and actions, such as dust suppression, will be applied to all remedial actions, including soil movement as appropriate and necessary. Also, short term risk concerns for workers, the community, and the environment will be further addressed at part of the remedial design and cleanup activities to ensure protectiveness.

Comment 120 : A Commentor noted perched water under ICPP is considered to be "waters of the state" and is covered by Idaho Water Quality Standards, ARARs for this OU. Alternative 2 does very little to actively pursue compliance with these requirements, these ARARs. Please do not boldly state that Alternative 2 meets all of the ARARs. It does not. The Agencies are lying to the public again. [C-W]

Response: The selected remedy for Group 4 (Perched Water) consists of reducing recharge to the perching zones. This remedy will ensure that in the future, insufficient quantities of water in the contaminated zones are available for drinking water purposes. During the drainout period, the perched zones will be institutionally controlled to ensure the perched water is not utilized for drinking water purposes. Additionally, this remedy will reduce the flux of surface contamination to the regional aquifer. Since much of the contaminant mass in the vadose zone at INTEC is adsorbed to sedimentary material, rather than soluble in the perched water itself, actively pumping and treating these perched zones offers little additional long-term benefit, at significantly increased expense. This issue was openly discussed during the public meetings for cleanup of OU 3-13. The selected remedy is consistent with the provisions of the Idaho Groundwater Quality Rule and meets ARARs.

Comment 121 : A Commentor noted, regardless of the alternatives selected, clean-up activities must be done in compliance with all mandated requirements. Most of the activities involved in WAG 3 are located within previously disturbed areas within the fenced area of INTEC. Historic structures are present within the study area, and a complete assessment of effect will need to be completed. This is required under Section 106 of the National Historic Preservation Act,(36 CFR 800.2(o)(1)) [SBT-W]

Response: Compliance with Section 106 will be achieved as will compliance with all applicable or relevant and appropriate requirements.

Comment 122 : A Commentor pointed out that groups 1, 3, 6, and 7 include preferred alternatives which require surface-water control, and/or soil excavation. These actions may disturb cultural resources during excavation. In that case, all work must halt if buried cultural resources are encountered, and notification made to the LIMITCO Cultural Resources Staff so that they can work with the Tribes in assessing the resources, mitigating the damages as necessary, and authorizing continuance of excavation. Group 2, Soils Under Buildings: The D&D of all buildings must be done in compliance with Section 106 of the Historic Preservation Act, as stated above. Soils from the borrow area need to be closely monitored to insure that cultural deposits are not inadvertently introduced into the construction area. If deposits are found, a stop-work policy should be put into place and notification made to the proper technical groups as outlined in the Agreement in Principle (AIP) between the Shoshone Bannock Tribes and the DOE. For Groups 3, 4, and 5: selection and construction of the disposal areas will need to be carefully considered. The areas will need to be surveyed for cultural resources that may be present, which would require substantial testing. This is especially true if the Big Lost River is diverted or lined because of the historical importance of the river to the Tribes. [SBT-W]

Response: Performing an archeological survey prior to any site disturbance is a long practiced requirement at INEEL. If cultural resources are encountered, work will be halted or moved from the affected location until proper precautions can be taken to protect invaluable cultural resources.

Comment 123 : A Commentor noted that because of the proposed use, the facilities will be very long term. The effect to cultural resources, in the event they are present in the area, would also be long term. Many of these resources are a non-renewable testament to the Shoshone-Bannock history, or are resources that still have considerable importance to the Tribes. After the areas have been closely inspected prior to construction, close monitoring during construction will be required to insure that cultural resources are not damaged or destroyed. Mitigation of damage to cultural resource sites will need to be coordinated with the Shoshone Bannock Tribes and contractors as outlined in the AIP. [SBT-W]

Response: Performing an archeological survey prior to any site disturbance is a long practiced requirement at INEEL. If cultural resources are encountered, work will be halted or moved from the affected location until proper precautions can be taken to protect invaluable cultural resources. The location of the ICDF is in a partially disturbed area. The Group 3 soils are in already disturbed areas. Also, both of these areas are within the existing archeological survey zones. This will help to minimize cultural resource impacts.

Comment 124 : A Commentor noted that where the preferred alternative calls for the removal, storage and treatment of contaminated water, it should be kept in mind that this action might indirectly affect cultural resources. The full scope treatment and storage plan will need to be reviewed and commented on. The feasibility of cleaning up water resources will need to be demonstrated, and assurances given that the process of cleaning up perched and aquifer waters will not cause more problems and contamination than currently exist. [SBT-W]

Response: If necessary to restore the aquifer to drinking water quality, the groundwater extraction and treatment system will be sited so as to minimize the impact to cultural resources. Implementation of the contingency action for aquifer cleanup, will only be in response to clear evidence that: (1) extraction and treatment is necessary to meet the aquifer restoration timeframe; and (2) treatment technology can cost-effectively remove the hazardous contaminant (i.e., I-129) from the groundwater. Disposal of the treated groundwater will also be such as to minimize the impact on cultural resources and comply with ARARs.

Comment 125 : A Commentor suggested reasons against siting a new disposal site at the Chem Plant is found in the NRC's 10 CFR Part 61 regulations for land disposal of radioactive waste, which should be included with other Applicable or Relevant and Appropriate ("ARARs"). RCRA subtitle C requirements do not apply to LLW Under Part 61, "The primary emphasis in disposal site suitability is given to isolation of wastes, a matter having long-term impacts, and to disposal site features that the long-term performance objectives of Subpart C of this part are met, as opposed to short-term convenience or benefits10 CFR 61.50(a). This same primary emphasis appears in the joint NRC-EPA siting guidelines. NRC's regulations go on to note that "*The disposal site must designed to complement and improve, where appropriate, the ability, of the site's characteristics to assure that the performance objectives of Subpart C of this part will meet 10 CFR 61.51(a)(4).*" [L-W]

Response: The Commentor is correct. RCRA Subtitle C requirements do not apply to disposal of LLW. However, the design criteria for a RCRA Subtitle C disposal facility are more conservative and prescriptive. DOE Order 435.1 was added as a To Be Considered (TBC) ARAR to deal with the LLW issue. In addition, the Commentor apparently cited an incorrect section of the Code of Federal Regulations (CFR). The correct citation is 10 CFR 61.51(a)(3).

Comment 126 : A Commentor felt that the ICDF is a transparent attempt by the Agencies to avoid treating mixed waste to LDR standards prior to disposal. Please describe how a groundwater monitoring system would be designed to detect releases from the ICDF when the "background" concentrations of contaminants is already high? Where would the upgradient '"clean" well(s) be located? Where would the downdgradient wells be located so that on contamination from the ICDF would be detected? [C-W]

Response: The ICDF is not an attempt to avoid treating and appropriately disposing of mixed and other hazardous wastes. INEEL CERCLA waste (soil and debris) from within the AOC would not necessarily require treatment prior to disposal. The in-AOC waste would be required to meet the acceptance criteria for the ICDF. If treatment is necessary for in-AOC waste to meet the acceptance criteria (stabilization for subsidence or leaching control), the waste would be treated prior to disposal. INEEL CERCLA waste from outside the AOC, would be required to meet the requirements of Phase IV of the Land Disposal Restrictions (LDRs) regulations. For OU 3-13 soils and debris, which have triggered placement, treatment to the Phase IV LDRs will be required prior to disposal in the ICDF. The monitoring network for ICDF will be designed and evaluated during the development of the remedial design. In addition, the monitoring network will be designed to detect releases from the ICDF. Wastes to be disposed of in the ICDF would be pre-treated as necessary to minimize leachate generation in the ICDF landfill environment. The LDR restrictions were enacted to assure that wastes disposed in landfills not leach and contaminate the underlying aquifer. The WAC and pre-treatment requirements required for the ICDF will achieve this goal.

Comment 127 : A Commentor wanted it made clear to the public, that if the ICDF is determined to be within the WAG 3 AOC, that RCRA hazardous waste may be placed into the facility without treatment to meet LDRs. [C-W]

Response: We agree. Discussion is contained in the ROD that states WAG 3 CERCLA wastes, which are consolidated within the AOC, will not be required to meet LDRs. INEEL CERCLA waste material from outside of the AOC will be required to meet the Phase IV LDRs. In addition, only waste from INEEL CERCLA remedial or removal projects will be considered for disposal in the ICDF and these wastes will be required to meet the acceptance criteria.

B.5. Development of Alternatives

Comment 128 : A Commentor felt that it does not make sense to dig up contaminated materials and bury them somewhere else.[TW-W]

Response: The goal of the OU 3-13 project is to reduce the risk posed by the OU 3-13 sites to acceptable levels. Leaving wastes in place would require perpetual long term monitoring and maintenance. Removal of the contaminated soil and debris will result in being able to use the area for other future purposes. Removal of the contamination and appropriate disposal will result in a larger reduction in risk than leaving the waste in place. Based on this we concluded that removal and disposal of contamination best satisfied the evaluation criteria.

Comment 129 : A Commentor felt that under "Alternative Development Evaluation and Recommendations", the alternatives and costs are meaningless without quantitative information on the risk reduction that will result from implementing the action. What are the taxpayers buying with this money? In all the gray cost margin boxes, please include the estimated risk reduction information next to the cost of the alternative. The risk reduction information should include both the initial estimated risk and the estimated risk after implementation of the alternative. It is absolutely impossible to make an informed decision on which alternative is most appropriate without knowing the predicted risk reduction. [JM-W]

Response: The alternatives in the FS and FSS Reports were developed and evaluated to reduce the risks to acceptable levels. Alternatives were not developed to reduce the risks to different levels below and including acceptable levels given the existing background contaminant concentration alternatives were not developed. All of the alternatives selected in this ROD will reduce the risk to acceptable levels. A quantitative risk reduction analysis would be useful if cleanups were being considered at different levels or points of compliance.

B.6. Implementation of Alternatives

Comment 130 : A Commentor recommended that for Group 2 the contaminated dirt should be left in place. The Commentor thought this is logical, but in other instances, such as VES-SFE-20, you intend to perform total removal. This is not consistent. If you can indeed leave Group 2 soil in place, it follows that you should be able to leave VES-SFE-20 and other contamination in place. [TW-W]

Response: Group 2 represents a unique problem for managing contaminated soils at INEEL. These areas are still in operation and located under structures. We could have chosen to wait several decades for the determinations to be made on the above ground structures. However, we have elected to establish a performance standard at this time. The end state of these contaminated soils will be to provide sufficient protection to the underlying groundwater and future site users. As for the SFE-20 Tank System, the most cost effective and risk reducing alternative is Alternative 4. Based on this we concluded that Alternative 4 (Removal, Treatment, and Disposal), best satisfied the evaluation criteria.

Comment 131 : A Commentor wondered, how long are engineered barriers assumed to last? The engineered barrier for the soil under buildings will be designed to last 1,000 years, but how does that relate to the length of time residual contamination will pose a hazard? [SRA-W]

Response: The design life of engineered barriers is based on the material used in the construction. The contaminants at INTEC will present an unacceptable risk for a significant period of time (beyond 2095). Based on this, the engineered barriers will be constructed using native or natural materials having useful properties in the geological timeframes (1,000+ years). For most of the radioactive contaminants expected to be disposed in the ICDF, a 1,000-year design will result in greater than one millionfold decrease from the initial concentration, due to radioactive decay. For non-radioactive metal contaminants, these will remain hazardous indefinitely. Contaminants will not be placed in the landfill which have a high potential to leach to groundwater. Cap maintenance to prevent future intrusion will continue as long as an unacceptable risk remains. The engineered barriers (caps) will be designed to remain effective to at least the amount of time that the contamination present would present an unacceptable risk.

Comment 132 : A Commentor asked, "will any of the caps or covers proposed for the Chem Plant require maintenance? Please describe this effort fully." [SRA-W]

Response: Yes, there will be monitoring and maintenance activities for the engineered barriers (caps) following the construction activities. A strong post-closure monitoring and maintenance program is required to insure that any landfill contains the disposed wastes. The final cover will be designed to minimize maintenance needs. Requirements for the monitoring and maintenance plans will be developed as part of the remedial design process.

B.6.1. Environmental Monitoring

Comment 133 : A Commentor wondered, since the preferred Alternative 2 calls for continuing existing environmental monitoring. What monitoring is currently underway? I know of no groundwater monitoring, in particular, which is intended, or capable, of detecting releases from any particular unit. How will the lack of such monitoring be deemed protective of human health and the environment? This Alternative is a "feel good" alternative because it makes the public feel good - because they don't know enough to realize they've been hoodwinked again. This alternative, as worded, is not acceptable. [C-W]

Response: Environmental monitoring for Group 2 soils where the hazard is based on surface exposure is a periodic evaluation of what exposures workers and the public are exposed to in and around the Group 2 buildings. A detailed post-ROD monitoring plan will be developed during remedial design/remedial action.

Comment 134 : A Commentor stated that "Most of the Alternative include continued "environmental monitoring." The fact is few, if any, of these sites are currently subject to site-specific environmental monitoring. Your portrayal that they are is misleading, at best, and a damned lie, at worst. The INEEL cannot detect contaminant releases from any specific site, and would be lucky to detect additional releases from the ICPP as a whole." [C-W]

Response: Discussion of the proposed type of environmental monitoring for the various remedial action groups is included within this ROD. We recognize the difficulty in detecting releases at INTEC. A monitoring plan is being developed to conduct the long-term monitoring at INTEC. This monitoring plan will address the issue of releases from specific locations at INTEC.

Comment 135 : A Commentor when referring to Page 43, Alternative 1 stated that "There is no site-specific environmental monitoring, to my knowledge, at this site. Don't state there is; it's a lie." [C-W]

Response: The environmental monitoring referred to for this non-selected alternative would have consisted of monitoring the perched water wells in the immediate area. In addition, two additional monitoring wells clusters would have been constructed next the SFE-20 Tank System and monitored to identify releases.

Comment 136 : A Commentor was unsure what the Proposed Plan meant in the Evaluation of Site Risks section. Environmental monitoring. What will this consist of? Is any such program currently carried out at these sites? If a specific environmental program now exists, what budget is it under? [U-W]

Response: Environmental-monitoring activities can consist of various types of monitoring (air exposure, direct exposure, and groundwater contamination). The environmental monitoring for each of the remedial action groups, if necessary, is different. Additional details concerning the environmental monitoring for the remedial action groups can be found in various sections of the ROD. Many of the sites requiring remedial action are not currently monitored for releases to the environment. Currently, there are several programs conducting environmental monitoring at the INEEL. Each of these monitoring programs has different criteria and purposes along with budgets.

B.6.2. Institutional Controls

Comment 137 : A Commentor wanted to know how long are institutional controls (e.g., fences, regulatory restrictions) assumed to last? Page 19 says residences might be built at ICPP after 2095 but that water supply wells will be prohibited within the current fence. How will that prohibition be maintained? By whom? How does the current ICPP fence relate to the I-129 plume? [SRA-W]

Response: Institutional controls will be maintained long after the 2095-restoration timeframe has passed for areas where an unacceptable risk remains. Whether fencing will be required or other controls are sufficient to prevent unauthorized access to these areas is under review and will be part of the remedial design process. It is recognized that other actions may be necessary to deal with the contamination in the SRPA within the INTEC fence and therefore an interim action will be implemented on the SRPA. This will allow for actions to be taken to deal with the contamination outside the fence and additional investigation along with remedial action alternative evaluation to be conducted in support of the Tank Farm RI/FS. Land use and other restrictions will be placed on the areas requiring long-term institutional control and will be maintained by DOE or another government agency. The area of the I-129 plume that currently presents an unacceptable condition (exceeds drinking water standards) extends both inside and outside of the INTEC (ICPP) fence downdgradient to approximately the Central Facilities Area (CFA). The institutional controls to be implemented under this ROD are contained in Section 11 of the ROD. These institutional controls are presented in tabular format for each of the remedial action groups.

Comment 138 : A Commentor wondered how the Agencies would implement institutional controls over engineered barriers or design a combination of the two? [SRA-W]

Response: Selection of institutional and engineering controls is determined during the development of the remedial action alternatives for evaluation purposes. Additional controls, both institutional and engineering, may be applied during the remedial design process. Combinations are factored into the alternative as necessary. The ICDF will consist of a combination of institutional controls and physical (engineering) barriers. Institutional controls, like land use restrictions are a necessary part of the remedial action. Prevention of biointrusion and material degradation are not institutional controls, but these issues are addressed by physical (engineering) controls.

Comment 139 : A Commentor felt it was unclear how land use restrictions can be, or will be, imposed and documented. This BLM property is currently under DOE control. Will DOE provide a legal description of restricted property to the BLM? How will BLM control the restricted property? Please describe, in the ROD, how land use restrictions will be accomplished. [C-W]

Response: This ROD contains a description of institutional controls to be implemented. A detailed IC plan will be developed during remedial design to describe the controls that will be placed on the land beneath and surrounding the CERCLA release site area at INTEC.

C. RELEASE SITE GROUPS AT WAG 3

C.1. Group 1: Tank Farm Soils

Comment 140 : A Commentor wondered if the cost of tank farm soil remediation included in the current ICPP cleanup cost estimates? [SRA-W]

Response: The cost of final remediation of the Tank Farm soils is not included in the cost estimates. Under this ROD for the Tank Farm Soils (Group 1), an interim action is selected. The Tank Farm Soils cost estimate only reflects the scope of items described in the interim action alternative evaluation and scope discussion in the cost estimate. For the final action on the Tank Farm Soils, cost estimates will be developed for the remedial action alternatives that will be developed and evaluated for Tank Farm RI/FS (OU 3-14).

Comment 141 : A Commentor recommended that DOE move quickly in making its final risk management decision for the Tank Farm Soils. [CAB-W]

Response: We support the need for action where feasible. However, under the OU 3-13 RI/FS, evaluation of the INTEC Tank Farm Soils was done using the limited information from the scoping investigations (Track 1 and Track 2 studies) and process knowledge. With this limited knowledge the final action the Tank Farm would have had a very large associated contingency (hundreds of millions of dollars). Based on this, it was decided to consider an interim action on the Tank Farm Soils for the near future and collect the necessary information to make a decision without such a large uncertainty. Collecting and analyzing data along with the decision making activities is being conducted under the OU 3-14 Tank Farm RI/FS.

Comment 142 : A Commentor noted that the Proposed Plan states that a final risk management decision is anticipated for the Tank Farm Soils in 2004. The Commentor wondered why it will take that long to make that decision and recommend DOE move quickly to safely manage the risks posed by the Tank Farm Soils. [CAB-W]

Response: We appreciate that we need to expedite the cleanup process where feasible. However, the tank farm soils interim action will reduce the risk to the environment and in particular the SRPA. Even if a final action would have been selected under this ROD, the implementation of the alternative would have been phased in over a long period of time. The final part of the action would likely occur around 2045, following D&D of the area around the Tank Farm. The actions taken under the interim action will be continued, along with other activities to reduce the impact on the environment, until the final activities are implemented. This approach means that we will manage the risk at the Tank Farm safely and efficiently. Insufficient information was collected prior to and during the OU 3-13 RI/FS to make a final decision without a very large contingency and uncertainty. In order to collect the necessary information, develop and analyze alternatives, and conduct the decision making activities, a new RI/FS is being undertaken. This RI/FS (OU 3-14 Tank Farm RI/FS) will collect and analyze samples from within the Tank Farm. In addition, the results from the Idaho HLW & FD EIS will be considered in the remedial alternatives developed and analyzed. Recent evaluations on the scope, schedule and budget for the OU 3-14 RI/FS indicate that it will take more time than expected when the Proposed Plan was released. A final risk management decision for OU 3-14 is now expected to be completed prior to 2008.

Comment 143 : A Commentor had questions regarding Group 1 Tank Farm Soils: If only an interim action is currently contemplated, why is this site group/OU group/CPP group included in this Proposed Plan? [U-W]

Response: An interim action was selected for the INTEC Tank Farm to reduce the impact on the perched water and SRPA. In the evaluation of risks to the groundwater, the largest source of contamination was identified as the INTEC Tank Farm. As the contamination is migrating vertically downward, reducing the driving mechanism (water) will increase the travel time and decrease to impact on the groundwater. The interim action selected is intended to significantly reduce the amount of water driving the contamination into the groundwater. As such, the sites within the INTEC Tank Farm group are included in this ROD.

Comment 144 : A Commentor had questions regarding Group 1 Tank Farm Soils. It is stated that "non-radionuclide contaminants may be present." Why don't we know? Weren't the RI, BRA, FS, or FS supplement completed? Or were they incomplete? If so, why? If no, why isn't the characterization of contaminants fully presented here? If the complete characterization of the Tank Farm Soils has to be deferred to the OU 3-14 RI/FS, as stated on page 13, why not just pull this whole group out of this document? [U-W]

Response: Within the INTEC Tank Farm, there is incomplete knowledge concerning the contaminants, both radionuclide and non-radionuclide, and their corresponding concentrations. Previous sampling efforts in the INTEC Tank Farm have generally not analyzed for non-radionuclides. The RI/BRA, FS, and FSS Reports were complete documents. These documents identified the data gaps in the existing knowledge. To fill in the data gaps and make a more informed and better decision on the INTEC Tank Farm. A RI/FS project is being planned to resolve the data gaps, evaluate remedial action and eventually select the final remedy for the INTEC Tank Farm group.

C.1.1. Group 1 Description

Comment 145 : A Commentor pointed out that Tank Farm Soils: Site CPP-33, listed as a Tank Farm Soils Group site on page 12, is not shown in Figure 4. [U-W]

Response: The Commentor is correct in that Site CPP-33 was left off of figure 4. Site CPP-33 is part of remedial action group 1 (INTEC Tank Farm area). For future documents, additional effort will be expended to insure that sites listed in text match the figures.

C.1.2. Group 1 Alternatives

Comment 146 : A Commentor felt that grading to control surface water is an activity which should have been conducted as soon as there was reason to believe that surface water infiltration presented a risk. However, the Agencies have not demonstrated, through published/measured K_ds and measured infiltration rates, that surface percolation is a risk-driver at this site. Therefore selection of this alternative in a ROD is premature. It would better fit a removal action than a ROD. [C-W]

Response: The infiltrating water requiring control is not only from the Tank Farm fenced area. Additional water impacts comes from the drains located on the building and structures in and surrounding the Tank Farm. Reducing the infiltration of water through the Tank Farm Soils will increase the travel time of the contaminants in the soils, irregardless of the contaminant specific retardation factor (K_d). This reduction in infiltration will subsequently reduce the impacts on both the Perched Water and SRPA. Under this ROD, an interim action on the Tank Farm Soils is being undertaken. The final action on the Tank Farm Soils will be evaluated and selected under the OU 3-14 project. There is no need to undertake or consider a removal action to implement the interim action for the Tank Farm Soils when the activities are part of this ROD.

Comment 147 : A Commentor was concerned the interim solution is, in essence, capping it, putting some dirt on it, bury it. That's the first step. Question: Is that going to be the first step towards a defacto cap and fill approach? It's not at all clear that's the right thing to do for the Tank Farm and to leave the soil in place, capped over. [DK-TT]

Response: The proposed Tank Farm interim action is not a capping solution. The goal of the interim action is to reduce the amount of water infiltrating through the soils within the Tank Farm area. Reduction of the infiltration is not necessarily the first step in a defacto capping approach. The OU 3-14 RI/FS will evaluate a range of remedial action alternatives.

Comment 148 : A Commentor was concerned that the interim solution will turn out, migrate into the final solution. You made it very, very clear that this is merely an interim solution and does not in any way affect whatever the final solution will be made. [DK-TT]

Response: The proposed Tank Farm interim action is not a final action. Interim actions that are taken cannot be inconsistent with the final remedy. The OU 3-14 RI/FS will evaluate a range of remedial action alternatives.

Comment 149 : A Commentor wondered, are they going to cap around the Tank Farm, basically? And that's 80 percent reduction of rainfall? I thought the Tank Farms were leaking not just the piping and are the pipes leaking now. [PR-TT]

Response: In the development and evaluation of the proposed interim action, capping around the Tank Farm was not considered. Sealing the surface of the Tank Farm is a necessary component of the remedial action. In addition, rerouting of the drainage from the various buildings in the Tank Farm area may be necessary to reduce the infiltration. The evaluation, for the Tank Farm interim action, focused on a goal of reducing to infiltration in the Tank Farm by 80%. The remedial design will further evaluate the infiltration issue and determine the specifics for the implementation. Concerning the leakage issue, there is no evidence that the tanks have leaked or are leaking. The known releases are only from the transfer lines and valve boxes. Actions have been taken to correct the leaking lines and valve boxes and to prevent future releases.

Comment 150 : A Commentor wanted to emphasize the fact that they didn't want to see an interim action on the Tank Farms get to far -- I don't want it to get past the point of no return where you put so much time and so much money into this action that it becomes the final solution when it really shouldn't be the final solution. [MMS-TT]

Response: We agree with the Commentor. An interim action under CERCLA can not be inconsistent with the final action for the site or OU. The evaluation of alternatives for the Tank Farm RI/FS will begin with the continuation of the interim action for the Tank Farm and build upon the interim action.

C.2. Group 2: Soils Under Buildings and Structures

Comment 151 : A Commentor noted that several spills, in addition to CPP-80, included both RCRA listed and characteristic waste. The soils must be managed as listed waste, and possibly as characteristic waste. This is important so that people understand how much hazardous waste is proposed for disposal at the proposed ICDF. [C-W]

Response: The ICDF will be designed and constructed to be compliant with the requirements of a RCRA Subtitle C facility. Volume estimates for the INEEL CERCLA hazardous and mixed waste candidate materials (soils and debris) are presented in Appendix C of the FSS Report.

Comment 152 : A Commentor wanted to know, if the sites are inaccessible and poorly characterized how were the COCs in the sidebar determined? How are the Agencies sure risk even exists at those sites that have not been sampled? Those sites which have not been characterized and determined to present a risk to human health and the environment should be removed from this Proposed Plan and discussed in the future when COCs, risk, and fate and transport are better understood. [C-W]

Response: The analysis and evaluation conducted on the soils under building sites (Group 2) were based on what information was available. The general characteristics of the material (waste) released to the environment was known. In addition, an approximate volume of material released was known. For the evaluation of risk and remedial actions, the COCs used were the constituents contained in the waste released. The risks were evaluated based on the mass (concentrations and volumes) of the COCs. As such, there was sufficient information available to evaluate the release site risk and remedial action alternatives.

Comment 153 : A Commentor quoted from the Proposed Plan that, "...source releases are not well defined" and wanted the Agencies to "stop this nonsense until they are well defined and appropriate remedial alternatives can be proposed and debated!! Remove this site and preferred alternative from this Proposed Plan." [C-W]

Response: We disagree with the Commentor. The analysis and evaluation conducted on the soils under building sites (Group 2) were based on what information was available. The general characteristics of the material (waste) that released to the environment was known. In addition, an approximate volume of material released was known. For the evaluation of risk and remedial actions, the COCs used were the constituents contained in the waste released. The risks were evaluated based on the mass (concentrations and volumes) of the COCs. As such, there was sufficient information available to evaluate the release site risk and remedial action alternatives.

Comment 154 : A Commentor stated that he was "just curious, the soils under the building, that's sort of totally different from the Tank Farm situation. And then quantity-wise, I mean, it just seems like you're not going to excavate those because the Chem Plant is there to stay, it seems. And quantity-wise do we have any quantity of what those materials amount to? Are you going to look at stabilizing them, or what are you looking at?" [PR-TT]

Response: The Commentor is correct in that the soils under the buildings are being treated differently than the Tank Farm soils. The 4 sites within this group are relatively small sites located beneath currently operating facilities. The amount of contaminated soil for the 4 sites within this group is estimated to be approximately 1600 yds^3. Ultimate disposition (D&D) for the facilities above these sites has not been determined. Decisions concerning the D&D of these facilities may result from the analysis being conducted for the Idaho HLW & FD EIS and the RCRA/HWMA closure plans for Interim Status Units. In order for the soils within this group to be removed, the building would need to be removed. Should the facilities be left in place, an engineered containment structure (Cap) may be constructed over the site, if necessary, to prevent the contamination from leaching and migrating the SRPA. Currently, in-situ stabilization is not anticipated for these sites unless it is necessary prevent leaching and subsidence. If the buildings were removed, the contaminated soil would be removed and disposed.

Comment 155 : A Commentor made the following observations on Group 2: To even consider it seems premature. We're kind of putting the cart before the horse. We're making decisions now on how the soils are going to be dealt with when no decision has been made and how the building is going to be dealt with. It seems to me the logical thing to do is to decide what's to be done with the building, probably on a case-by-case basis. What are we going to do with 603? Are we going to tear it down? Cap it over? Take the pieces away, whatever? And then having made that decision, we'll have -- we can say, "What are we going to do about the soils?"
[DK-TT]

Response: The Commentor is correct in that a decision concerning the disposition of the soils under the buildings are being made prior to the decision on the disposition of the facilities. The known scope of the FFA/CO for WAG 3 was evaluated within the OU 3-13 RI/FS for a comprehensive evaluation. The sites within Group 2 are identified scope in the FFA/CO. Ultimate disposition (D&D) for the facilities above these sites has not been determined. Decisions concerning the D&D of these facilities may result from the analysis being conducted for the Idaho HLW & FD EIS and the RCRA/HWMA Closure Plans for Interim Status Units. Currently, there are several alternatives (removal [i.e., clean closure], risk based closure [partial removal], and landfill [capping]) being evaluated for various facility dispositions under the Idaho HLW & FD EIS. In order for the soils within this group to be removed, the building would need to be removed. Should the facilities be left in place, an engineered containment structure (Cap) will be constructed over the site to prevent the contamination from leaching and migrating the SRPA. If the buildings were removed, the contaminated soil would be removed and disposed. The Agencies believe sufficient information is available to select the contingent remedy.

Comment 156 : A Commentor offered the following recommendation regarding Group 2 C Soils under Buildings and Structures. Again, characterization is incomplete. I suggest it be completed before being presented to the public. [U-W]

Response: For the Soils Under Buildings group, there is incomplete knowledge concerning the contaminants, both radionuclide and non-radionuclide, and their corresponding concentrations. Development of the source terms evaluated was based on process knowledge. This process knowledge involved the waste stream released along with an estimate of the volume. For two of the sites (CPP-87 and -89), sampling data was also used in the development of the source terms. Additional characterization activities will be conducted during the D&D of the various facilities. This additional information will be used in the planning of final D&D activities.

C.2.1. Group 2 Description

Comment 157 : A Commentor questioned, "please define the difference between hazardous and radioactive releases." [U-W]

Response: Hazardous releases are releases of waste containing non-radionuclide contaminants. Metal and organic contaminants are considered to be hazardous constituents. Radioactive releases are releases of waste containing radionuclide constituents. For many releases both hazardous and radioactive constituents are present in the waste material.

C.2.2. Group 2 Alternatives

Comment 158 : A Commentor questioned, "I guess I just want to stress for the scoping, again, to quantify -- I mean, the list goes to plutonium-239 and through the whole gamut, there, of the soil under the building group. I was a little confused there, but it does look -- since you're moving the stuff out of the wet area, so to speak, that you couldn't actually go down and excavate the soil. Is that being studied?" [PR-TT]

Response: The wet area, CPP-603 is divided into a wet side and a dry side. The spent nuclear fuel is being removed from the wet side. The site of concern is beneath the dry side of CPP-603. Removal of the spent nuclear fuel from the dry side is expected to be completed prior to 2035. The D&D of the CPP-603 facility is not part of OU 3-13. However, further analyses of cumulative impacts from the CPP-603 building will receive consideration by the HLW & FD EIS.

Comment 159 : A Commentor felt that it's not clear that even if the building is dismantled completely and taken away, that all buildings will be dealt with -- the soil will be dealt with in the same way. So, if I were doing it, I would just strike Group 2 from the plan entirely because, in fact, no decision has been made. You're saying that when some other decision was made, we're going to apply this decision we've made now. That doesn't make any sense. [DK-TT]

Response: The Commentor is correct in that decisions under the OU 3-13 project will be made prior to the decisions concerning the facility being made. The known scope of the FFA/CO for WAG 3 was evaluated within the OU 3-13 RI/FS for a comprehensive evaluation. The sites within Group 2 are identified scope in the FFA/CO. Ultimate disposition (D&D) for the facilities above these sites has not been determined. Decisions concerning the D&D of these facilities may result from the analysis being conducted for the Idaho HLW & FD EIS and RCRA/HWMA Closure Plans for Interim Status Units. Should the facilities be left in place, an engineered containment structure (Cap) will be constructed over the site to prevent the contamination from leaching and migrating to the SRPA. If the buildings were removed, the contaminated soil would be removed and disposed.

Comment 160 : A Commentor felt that the alternative for Group 2 soils is the No Action Alternative because no action is going to be done as a result of this decision. I mean, if we accept the recommended alternative, what is going to happen? The answer is, absolutely nothing until some other things happen. And if we tear the building down, haul it away, it's not clear that digging up the soil is the right thing. Maybe entombing it and capping it is the right thing. That's not clear. They're related items. You can't make a decision like that. So we're making decisions which could be wrong decisions. [DK-TT]

Response: It appears that we confused the Commentor. The preferred alternative is not a No Action Alternative, but a staged alternative. The first part of the alternative would consist of establishing and implementing the monitoring requirements and implementing the other controlling actions. The second part of the alternative would be the construction of the engineered containment structure (cap) over the contaminated site to prevent the contamination from leaching and migrating to the SRPA following the D&D of the facility, if the facility is closed in place. If the buildings were removed, the contaminated soil would be removed and disposed. Concerning whether it is the right thing to do to remove the contaminated soil if available, it is more cost-effective and risk reducing to remove and dispose of the contaminated soils. Ultimate disposition (D&D) for the facilities above these sites has not been determined. Decisions concerning the D&D of these facilities may result from the analysis being conducted for the Idaho HLW & FD EIS, and RCRA/HWMA Closure Plans for Interim Status Units. Based on the evaluations conducted, construction of an engineered containment structure (cap) appears to be the correct decision if the building is left in place following completion of the D&D. However, if new information became available, changes to the alternative could be considered and implemented as necessary.

Comment 161 : A Commentor wanted the heading for Group 2 Soils to clearly identify the contingent nature of the decision. [U-W]

Response: Alternative 2 is the selected remedy under this ROD. The selected D&D alternative for these facilities have not been selected at this time. If the facility were removed during the D&D activities, the soils would be excavated and disposed in an appropriate disposal facility. This contingency was discussed in the Proposed Plan (Alternative 3).

Comment 162 : A Commentor had a question regarding the Soils under Buildings and Structures. What is the anticipated cost of implementing Alternative 2 AND then Alternative 3, after D&D? Will money be available to cover later need for Alternative 3? Will it be WAG 3 money, or will it be D&D money? Or some other fund? [U-W]

Response: The selected remedy is an "either or," not a "both" selected remedy. Implementation of the remedial action would be initiated following the D&D activities. If Alternative 2 is implemented, the cost would be $17.9M. For Alternative 3, the cost would be $13.0M.

C.3. Group 3: Other Surface Soils

Comment 163 : A Commentor had a question regarding a statement in the Proposed Plan that states, "some sites (e.g., CPP-36 and -91) have contamination greater than 10 feet bgs. Are there more? If so, list them. If not, why vaguely say "some" when the specific number is actually known. [U-W]

Response: Yes, many of the sites have contamination below 10 feet. Both Sites CPP-36 and -91 were specifically pointed out as they have significant contamination present below the 10 feet depth. However, most of the sites do not have significant contamination below 10 feet. A description of the nature and extent of contamination (including depth of contamination) at these soil sites is included in Section 5 of this ROD.

C.3.1. Group 3 Description

Comment 164 : A Commentor noted that "nonradionuclide contaminants" are included in the COCs. Please state whether these soils are contaminated with RCRA listed waste or exhibit a characteristic of hazardous waste. This is important to determine how much hazardous waste is being proposed for disposal in the ICDF. [C-W]

Response: The COCs were developed from a risk assessment standpoint. Some release sites may have concentrations of "nonradionuclide contaminants" high enough to qualify as RCRA characteristic waste. In addition, some release sites have listed waste code issues. The sites with the listed waste code issues are presented in Appendix G of the FS Report. Also, Appendix C of the FSS Report contains information on the candidate materials for disposal in the ICDF, including "nonradionuclide contaminants."

Comment 165 : A Commentor had a question regarding whether soils pass or fail TCLP? Is lead greater than 400 ppm? [C-W]

Response: Sampling analysis conducted under the CERCLA program generally analyzed for total constituent concentrations. This analysis is not the same as the Toxic Characteristic Leaching Procedure (TCLP) sampling analysis conducted for hazardous waste characterization processes. There is a method to convert total metal analysis results to TCLP results for initial characterization. Under this method, there are release sites at INTEC that are potentially RCRA characteristic. Future sampling analysis would be conducted for final waste characterization. None of the release sites under this ROD have concentrations of lead at or exceeding 400 mg/kg.

C.3.2. Group 3 Alternatives

Comment 166 : A Commentor had a question regarding Other Surface Soils (Group3). The preferred Alternative 4-A is to excavate contaminated surface soils to a depth of ten feet. A review of the RI/FS Appendix C borehole sample data for Strontium-90 and Cesium-137 shows that DOE's arbitrary ten foot depth would leave most of the contamination in place because it goes down generally to thirty feet. Unfortunately, there is not sample data for all of the sites in this group (and there should be), but at least four sites need to go to around 15 feet and four sites need to go to about 30 feet in order to recover the bulk of the contamination. Stopping at ten feet is not acceptable and is not supported by the data. To cite an example, CPP-36 has 50,000 pCi/g of Sr-90 and 200,000 pCi/g of Cs-137 at fifteen feet of depth. [INEL-95/0056] A fixed health base cleanup standard is needed and then require DOE keep digging until the samples show that the contaminates do not exceed the standard is needed. [CB-W]

Response: It is recognized that there is contamination at depths below 10 feet. The 10 feet excavation depth was selected based on the residential scenario, which assumed a basement excavated to 10 feet, for evaluation in the RI/BRA Report. This assumption was also used in the development of cost estimates and evaluations for the FS Report. Using this information, an excavation to 10 feet will result in protection for potential surface receptors. The residential basement scenario is also protective of future industrial or commercial construction. However, some sites have large amount of contamination below 10 feet. During the remedial design, the actual approach and excavation depths, which may go below 10 feet, will be determined to ensure that the SRPA is protected from the contaminants. Although the remedial design may call for excavation to depth greater than 10 feet, we believe that the volume estimates are reasonable for evaluation purposes.

Comment 167 : A Commentor felt, whether these wastes are disposed of at the DOE site, or whether they are disposed of at the private disposal site, both of those options we believe should be looked at and whatever option that is selected, that disposal site should not be over the Snake River aquifer. [SR-TB]

Response: Both disposal at an on-site and off-site facility were evaluated. In the case of the off-site disposal facility, a commercial disposal facility was used for the evaluation. Although the area evaluated for the on-site disposal site is over the SRPA, the facility would be designed, constructed, operated, and closed so as to not adversely impact the aquifer. In addition, disposal in the on-site facility was determined to be much more cost-effective, without presenting unacceptable risk to the aquifer versus off-site disposal.

Comment 168 : A Commentor offered, "In relation to looking at the cost of disposal for public versus private disposal, we received the explanation earlier that off-site disposal would be markedly more expensive than an on-site solution. Suggest look at what the actual costs of these other off-site options for disposal might be. Particularly, if you're looking at comparing a newly developed DOE on-site disposal facility, which would include all the engineering work, all the contractor work, all the coordination among contractors and among government Agencies, essentially that it be a fully loaded cost estimate, not simply the cost of disposal once the place was opened and ready to accept waste. That it really be a fully loaded cost, to consider all the development expenses including the government Agencies involved, if those costs then become paired against private sector options and also existing DOE facility options." [SR-TB]

Response: Both disposal at an on-site and off-site facility were evaluated. In the case of the off-site disposal facility, a commercial disposal facility was used for the evaluation. For the off-site disposal facility, the actual DOE cost of previous disposal activities, such as the disposal fee and transportation costs, along with other cost items were considered in the cost estimate. The on-site disposal cost estimate considered the cost of design, construction, operation, closure, and monitoring (i.e., fully loaded cost estimate) of the disposal cells for the ICDF. Following the development of the cost estimates, on-site and off-site were compared. The cost estimates, along with the assumptions, are contained in Appendix A of the FSS Report, which is contained in the Administrative Record. Generally, the disposal cost at other DOE facilities is comparable or higher than disposal at commercial disposal facilities. However, waste acceptance criteria allows the other DOE facilities to accept waste that is not acceptable at commercial disposal facilities.

Comment 169 : A Commentor recommended that the Agencies reject any alternative that would involve the disposal of cleanup materials on the site over the sole source aquifer. Propose using an off-site commercial company. [SR-TB]

Response: We thank the Commentor for the comment. Both disposal at an on-site and off-site facility were evaluated. In the case of the off-site disposal facility, a commercial disposal facility was used for the evaluation. Although the area evaluated for the on-site disposal site is over the SRPA, the facility would be designed, constructed, operated, and closed to not adversely impact the aquifer. In addition, disposal in the on-site facility was determined to be much more cost-effective without increased risk to the aquifer versus off-site disposal.

Comment 170 : A comment about the 10-foot basement scenario. "In the plan, again, there is a limit, in writing, of 10 feet. You've told us otherwise here orally, but what we go by is what is in writing and what we can cite, so there needs to be -- I think the whole plan needs to be written, rewritten, and resubmitted to show your true intent about what you're going to do with this stuff and that you're not going to stop at

10 feet just because it's 10 feet. You're only going to stop when you reach a level that won't continue to impact the perched water or the aquifer below whatever global limitations you've got there." [CB-TM]

Response: It is recognized that there is contamination at depths below 10 feet. The 10 feet excavation depth was selected based on the residential scenario, which assumed a basement excavated to 10 feet, for evaluation in the RI/BRA Report. This assumption was also used in the development of cost estimates and evaluations for the FS Report. Using this information, an excavation to 10 feet will result in protection for potential surface receptors. However, some sites have large amount of contamination below 10 feet. During the remedial design, the actual approach and excavation depths, which may go below 10 feet, will be determined to ensure that the SRPA is protected from the contaminants. Although the remedial design may call for excavation to depth greater than 10 feet, we believe that the volume estimates are reasonable for evaluation purposes.

Comment 171 : One Commentor recommended that we refine off-site waste disposal cost estimates based on input requested from the various commercial disposal service providers. Respondents should be provided with updated volume and waste type projections for all INEEL waste streams reasonably likely to require disposal, and be asked to identify closure, post-closure care, general and administrative overhead and other fees included in their estimates. Verify that full life-cycle costs (including closure, post-closure care and monitoring, general and administrative expenses, etc.) are included in cost estimates for on-site DOE disposal. This will allow meaningful comparison with "fully loaded" off-site disposal costs. To further promote "apples to apples" comparisons, costs for Chem Plant disposal alternative should explicitly present the cost of an on-site facility sized to handle the same 83,000 cubic yards of waste analyzed for off-site burial. I believe that these analytical refinements will reveal a much smaller differential between on-site and off-site disposal costs. [L-W]

Response: The cost estimates performed in the Feasibility Study do reflect actual costs from previous DOE disposal activities. These estimates are preliminary, order of magnitude estimates and will be refined as remedial design progresses. The estimates conform with Office of Management and Budget (OMB) Circular A-94 guidelines and the NCP for comparison of life-cycle alternative costs.

Comment 172 : A Commentor noted CPP-36 and -91 have contamination that reaches to the basalt, about 40-ft bgs. Thus the risk from this soil can be attributed to direct exposure only for that soil which is between 0-10 ft bgs. Is there another, viable, risk pathway for the soil below 10 ft bgs? If not, the proposed remedial action need not address the deeper soil contamination. [C-W]

Response: It is recognized that there is contamination at depths below 10 feet. The 10 feet excavation depth was selected based on the residential scenario, which assumed a basement excavated to 10 feet, for evaluation in the RI/BRA Report. This assumption was also used in the development of cost estimates and evaluations for the FS Report. Using this information, an excavation to 10 feet will result in protection for potential surface receptors. The residential basement scenario is also protective of future industrial or commercial construction. However, some sites have large amount of contamination below 10 feet. During the remedial design, the actual approach and excavation depths, which may go below 10 feet, will be determined to ensure that the SRPA is protected from the contaminants. Although the remedial design may call for excavation to depth greater than 10 feet, we believe that the volume estimates are reasonable for evaluation purposes.

Comment 173 : A Commentor asked, since soil will be excavated to a depth of 10 feet and covered with "clean" fill and no mention is made that this alternative will, or will not, be protective of groundwater. Contamination, at depth, seems to be a threat to groundwater at the tank farms. Why is similar contamination not a threat to groundwater at these sites? [C-W]

Response: It is recognized that there is contamination at depths below 10 feet. The 10 feet excavation depth was selected based on the residential scenario, which assumed a basement excavated to 10 feet, for evaluation in the RI/BRA Report. This assumption was also used in the development of cost estimates and evaluations for the FS Report. Using this information, an excavation to 10 feet will result in protection for potential surface receptors. However, some sites have contamination below 10 feet. Groundwater fate and transport modeling from the Group 3 sites indicated that groundwater risk from these sites is acceptable. However, during the remedial design, the actual excavation depths may go below 10 feet. Although the remedial design may call for excavation to depth greater than 10 feet, we believe that the volume estimates are reasonable for evaluation purposes.

Comment 174 : A Commentor wanted the Agencies to consider above ground containment. Basically, I want you to include in your impact statement and scoping studies the Nevada study that came out last year on the transportation of plutonium into the water supply. The actual individual doses of plutonium if inhaled, resuspended, pumped up, integrated, and inhaled. I think, if you study it correctly, you will see that containment above ground in barrels not only provides jobs for the INEEL, but it is the total best way to contain it. It seems to me you're always in these cleanup projects ignoring the fact that the material would require 240,000 years [10X half-life] for plutonium management. [PR-TT]

Response: Containment of the waste above ground is a possible option that was not studied. There are a number of factors that limit the cost effectiveness and risk effectiveness of above ground storage. As the waste being considered for the ICDF is a large volume with relatively low concentrations, a very large facility would need to be constructed. In addition, the waste would have to be packaged and monitored periodically. Both of these operation would increase the amount of exposure that workers would receive. In addition, there would be an increase in the amount of exposure to the public. With containment above ground, the containers would be required not to leak any material and this would require periodic repackaging. Based on these issues, containment in an above ground facility eliminated from detailed analysis in the feasibility study.

Concerning the material used in the EIS, relevant documents used in the development of the analysis and decision making will be included into the Administrative Record. Evaluation of the ICDF is being conducted as part of a CERCLA investigation and decision making process and with CERCLA being functionally equivalent to the NEPA process, no additional scoping or NEPA is required for the ICDF.

Regarding the time required for the risk from plutonium to become acceptable, the ICDF would be designed to protect the SRPA for both short and long-term impacts. In the case of surface receptors, the engineered containment structure (cap) would be designed and constructed to last for at least 1,000 years. Also, there would be long-term surveillance and monitoring to detect releases from the disposal cells. This would allow for corrective actions to be implemented to correct problems, if necessary.

Comment 175 : Another Commentor added that "not everybody would agree that things up above ground is a safer configuration. It's subject to fire, floods, personnel exposure doing inspections. So if you integrated exposure over time, it's going to be much greater than that which is buried, and they have no exposure pathways." [A-TT]

Response: We agree with the Commentor.

Comment 176 : A Commentor wondered, since at some sites, the contamination extends downward through 40 feet., why is only10 feet going to be cleaned up? [U-W]

Response: The Commentor is correct in pointing out that there is contamination below 10 feet. An excavation depth of 10 feet was used for the residential basement scenario in the RI/BRA evaluations. In developing and analyzing the alternatives for the FS, the 10 feet depth was used. This 10 feet depth is protective for surface receptors. During the remedial design, the actual approach and excavation depths, which may go below 10 feet, will be determined to ensure that the SRPA is protected from the contaminants. Although the remedial design may call for excavation to depth greater than 10 feet, we believe that the volume estimates are reasonable for evaluation purposes.

C.3.3. INEEL CERCLA Disposal Facility (ICDF)

Comment 177 : A Commentor wanted to know, if this disposal facility is built, radioactive, mixed and toxic wastes would likely be directed there not only from INEEL but DOE facilities in other states as well. This concern is bolstered by my understanding that DOE is actively considering a regionalized disposal system, using two or three federal sites to be selected from a short list that includes INEEL. The contemplated disposal site would be very large, covering 54 acres with a capacity of more than 13 million cubic feet of waste. (By comparison, the eleven western states using the Richland, Washington commercial low-level radioactive waste disposal facility now ship about 100,000 cubic feet of waste per year). [L-W]

Response: We cannot emphasize enough that the ICDF is only for INEEL CERCLA cleanup waste disposal. These wastes already exist above the "sole source aquifer" and if not addressed will present a unacceptable risk if the INEEL land is developed for private use in the future. Waste acceptance criteria will be developed as part of the remedial design process. Only wastes which do not pose a threat of exceeding drinking water standards, or exceed a 1 in 10,000 excess carcinogenic risk in the underlying aquifer, whichever is more stringent, will be permitted to be disposed in the engineered landfill. WAG 3 CERCLA wastes that cannot be safely managed on INEEL will be disposed of in an off-site disposal facility in full compliance with state and federal laws and regulations. Generation of LLW in Western States is not relevant to CERCLA disposal at the INEEL INTEC. The referenced site in Richland Washington would not be suitable for the mixed LLW addressed in this ROD since it does not meet the rigorous design standards contemplated for the ICDF.

Comment 178 : A Commentor felt that the idea for an ICDF should be scrapped. That the Agencies, would site the facility above a sole source aquifer is ludicrous. Such a facility cannot be made "safe" for the many hundreds of years necessary for the radionuclides to decay. It cannot be made "safe" for the hazardous and polychlorinated biphenyl (PCB) wastes which will not decay and which will eventually leak and reach the aquifer. The double liners and leachate collection system merely delay the inevitable. [C-W]

Response: We disagree with the Commentor. The ICDF can be designed, constructed, operated, and closed while remaining protective of the SRPA. The ICDF would be designed to not adversely impact the SRPA. Waste materials (soils and debris) from INEEL CERCLA projects would be required to meet the acceptance criteria for ICDF. If treatment is necessary to meet the acceptance criteria, the waste would be treated prior to disposal. The engineered barrier (cap) will be designed to provide the long-term protection of both the surface receptors and the SRPA, even if the bottom liners were to fail.

Comment 179 : A Commentor noted the facility capacity is expected to be 510,000 yd^3. CERCLA is expected to use about 466,000 yd^3. What waste is expected to fill the remaining, seemingly excess, capacity? I trust that only CERCLA-related waste will be admitted to the facility. [C-W]

Response: For evaluation and analysis purposes, six disposal cells were considered. Both percolation ponds were included and evaluated as if retrofitted into two of the disposal cells. The remaining four disposal cells were all of the same size and shape. All six disposal cells were necessary to handle the potential candidate materials (soil and debris) and results in the excess capacity. The ICDF would be constructed and operated one cell at a time. As the operating cell is approaching capacity, the next disposal cell would be constructed. Waste materials from only INEEL CERCLA projects would be acceptable for the ICDF, provided that the waste meets the acceptance criteria.

Comment 180 : A Commentor noted the first paragraph gives an estimated volume of 82,000 yd^3 The third paragraph estimates a total volume of CERCLA waste at 466,000 yd^3 . Subtracting, one finds that the Agencies plan on placing about 384,000 yd^3 of waste from other sites. Please provide details of what these other sites might be. [C-W]

Response: The volume estimate of 82,000 yd^3 is for the soils contained in Group 3 (Other Surface Soils). In the evaluation of the ICDF, other INEEL CERCLA wastes (soils and debris) were considered. All of the candidate waste materials are discussed in Appendix C of the FSS Report. These other candidate waste materials could potentially come from the other WAGs at the INEEL. Only waste materials from INEEL CERCLA remedial and removal actions would be acceptable for disposal in the ICDF, provided that the waste meets the acceptance criteria.

Comment 181 : A Commentor noted that protection of this highly productive resource [SRPA] is essential to the future of Idaho's agricultural economy, as well as being a major source of drinking water for hundreds of thousands of Idaho citizens. Surely a better alternative could be secured for disposition of radioactive and chemical waste produced at the Idaho National Engineering and Environmental Laboratory. [IFBF-W]

Response: There are contaminated soils, both dispersed and uncontained, throughout WAG 3 and other locations on the INEEL that present a risk to the SRPA since the contamination currently exists in an uncontrolled environment. Based on this, contaminated soils at WAG 3 would require some type of remedial action to reduce the impact on the SRPA. As a result, remedial action alternatives are required to address the risks. Several alternatives, including the ICDF, were considered for the management of the INEEL CERCLA waste (soil and debris). These alternatives considered both on-site and off-site disposal along with containment in place. For the ICDF alternative, the soils would be excavated and disposed of in a engineered disposal facility. The engineered facility, ICDF, would consist of RCRA compliant disposal cells, which include lined cells with leachate collection and significant groundwater monitoring systems designed to provide protection of the SRPA. Based on the evaluation of the alternatives, it was determined that the on-site disposal of the INEEL CERCLA waste at the ICDF would be the most cost effective, while being protective of the environment, with the SRPA in particular. The ICDF is to manage only INEEL CERCLA waste.

We share the Commentor's sentiments that the SRPA is a resource is of immense importance to the state's agricultural economy, as well as providing the sole source of drinking water to residents along the plain. We also wholeheartedly agree that activities at the INEEL must be protective of human health and the environment, and comply with all applicable environmental laws and regulations. The comment expresses concern regarding the level of protectiveness of current and proposed disposal practices for radioactive material at the INEEL. Stringent waste acceptance criteria will be developed as part of the remedial design process. Only wastes which do not pose a threat of exceeding Idaho drinking water standards in the underlying aquifer will be permitted to be disposed in the engineered landfill. WAG 3 CERCLA wastes that cannot be safely managed on INEEL will be disposed of in an off-site disposal facility in full compliance with state and federal laws and regulations.

Comment 182 : A Commentor recommended that when you open the 26-acre plutonium dump, low level as it may be, it is better in the long run to simply contain this material in barrels, at this point they estimate 400 years, at which point you can rebarrel them. It is cheaper. It just takes so little inspection to keep this stuff above ground. What I think you-all are is in denial of that eventual end point. You are systematically looking for closure on these cleanup projects as opposed to admitting that we have to contain this material above ground. [PR-TT]

Response: Containment of the waste above ground is a possible option that was not studied. There are a number of factors that limit the cost effectiveness and risk effectiveness of storage above ground. As the waste being considered for the ICDF is a large volume with relatively low concentrations, a very large facility would need to be constructed. In addition, the waste would have to be packaged and monitored periodically. Both of these operations would increase the amount of exposure that workers would receive. In addition, there would be an increase in the amount of exposure to which the public could be exposed. With containment above ground the containers would be required not be leak any material and this would require periodic repackaging. Based on these issues, containment in an above ground facility does not make since from a risk or economical standpoint. For disposal in an engineered disposal facility, the material would be contained and not require continued repackaging or inspection. However, there would be long-term surveillance and monitoring to detect releases from the disposal cells. This would allow for corrective actions to be implemented to correct problems, if necessary.

Comment 183 : A Commentor wanted assurance that there will not be waste brought in from outside of INEEL to go in under any circumstances. [DK-TT]

Response: The only wastes that will be candidates for the ICDF will be from INEEL CERCLA projects. In addition, the authorization for disposal at the ICDF from other WAGs would need to be in the WAGs respective RODs, which will be subject to same the community involvement activities as OU 3-13.

Comment 184 : A Commentor recommended that the ROD include much more detailed information about the ICDF. [CAB-W]

Response: The Proposed Plan contained only summary level information concerning the remedial action alternatives. In the FS and FSS Reports, the details concerning the alternatives were presented. For the ICDF, additional information is contained in this ROD dealing with the conceptual alternative, implementation, and other considerations. The remedial design will contain the detailed information concerning the design and construction of the ICDF.

Comment 185 : A Commentor recommended that the ROD outline the exact location and size of each of the six cells planned for the ICDF and describe how each will be constructed, used, and closed. [CAB-W]

Response: This ROD identifies the area adjacent to the current percolation ponds as the location selected for the ICDF. The exact location and design along with sizing will be developed during the remedial design activities. This ROD discusses the criteria that will be used to determine compliance with the requirements during the construction, operation, and closure activities for the ICDF.

Comment 186 : The INEEL CAB recommends that the ICDF be constructed, filled, and closed using the phased approach referred to in presentations to the Board. We would like to see the ICDF to be as small and manageable as possible, yet we noted no description of the phased approach in the Proposed Plan. We recommend that the ROD include detailed information about how the phased approach will be implemented. [CAB-W]

Response: The use of a phased approach is included into this ROD. Under this ROD, the expected INEEL capacity needed will be constructed. Selection of disposal in the ICDF for non OU 3-13 soils and debris will be covered under other CERCLA decision documents. The remedial design will define the actual design with a goal of minimizing the area used for the ICDF disposal cells. Also, this ROD discusses both the general approach and how the phased approach will be implemented for the ICDF.

Comment 187 : A Commentor wanted to know why is the area near INTEC selected as the proposed location, as opposed to another location on the INEEL? What administrative and engineering controls would be utilized to prevent possible future contamination of the Snake River Aquifer, and how would you know if that contamination originated from the new disposal facility or existing sources of contamination underneath or near the INTEC. [MS-W]

Response: This ROD is dealing with contaminated soils and debris from INTEC. An evaluation was performed concerning the use of a centralized disposal facility for dealing with all INEEL CERCLA soils and debris. This evaluation is presented in the FSS Report. The largest volume of contaminated soil and debris are located at INTEC. Based on this, an area at INTEC was selected for the disposal facility. In addition, there was a desire to limit the location of the ICDF to areas that have already been contaminated from past practices at the INEEL. The disposal facility will be engineered to prevent unacceptable impacts on the SRPA. From the engineering (design) work, the waste acceptance criteria would be developed. Administrative controls would be implemented to ensure that the waste disposed in the facility would be within the acceptance criteria. A monitoring network will be developed for the disposal facility to monitor contaminant migration directly beneath the disposal facility. In addition, monitoring would be conducted upgradient of the disposal facility. This would allow for determining whether the contamination is from the disposal facility or from the INTEC area.

Comment 188 : A Commentor want to know why is the area near INTEC selected as the proposed location, as opposed to another location on the INEEL? What administrative and engineering controls would be utilized to prevent possible future contamination of the Snake River Aquifer, and how would you know if that contamination originated from the new disposal facility or existing sources of contamination underneath or near the INTEC. [MS-W]

Response: This ROD is dealing with contaminated soils and debris from INTEC. An evaluation was performed concerning the use of a centralized disposal facility for dealing with all INEEL CERCLA soils and debris. This evaluation is presented in the FSS Report. The largest amount of contaminated soil and debris are located at INTEC. Based on this, an area at INTEC was selected for the disposal facility. In addition, there was a desire to limit the location of the ICDF to areas that have already been contaminated from past practices at the INEEL. The disposal facility will be engineered to prevent unacceptable impacts on the SRPA. From the engineering (design) work, the waste acceptance criteria would be developed. Administrative controls would be implemented to ensure that the waste disposed in the facility would be within the acceptance criteria. A monitoring network will be developed for the disposal facility to monitor contaminant migration directly beneath the disposal facility. In addition, monitoring would be conducted upgradient of the disposal facility. This would allow for determining whether the contamination is from the disposal facility or from the INTEC area.

Comment 189 : A Commentor wanted the Agencies to describe the types of waste that you anticipate would be disposed in this cell, and what types would need to be sent to off site facilities. Also, what is your estimate of the hazard to workers as a result of operating this facility? What is the cost comparison for on site disposal versus off site disposal at a commercial facility or other off site facility; and finally, are you accepting waste from off the INEEL for disposal at this facility? [MS-W]

Response: Waste material generated as a result of INEEL CERCLA projects are being considered as candidate material for disposal. This includes both contaminated soils and debris. Appendix C of the FSS Report (DOE/ID-10619) discusses the waste considered for disposal. Within the candidate materials are wastes that preliminarily are categorized as hazardous, low-level radioactive, mixed low-level radioactive waste. Only waste that meets the acceptance criteria would be disposed in the disposal cells. Materials not meeting the acceptance criteria would require other disposal facilities, generally off-site. Hazards to workers implementing the operation of the disposal facility would be controlled to be within the applicable radiation (DOE Orders) and non-radiation (OSHA) standards. In the evaluation of alternatives, both on-site and off-site disposal were considered as alternatives. The cost of off-site disposal was estimated to cost approximately 3 times as much ($477 million additional) for off-site disposal at a commercial disposal facility for all candidate materials. For the waste material considered in OU 3-13, the cost of off-site was estimated to cost approximately 3 times as much ($154 million additional) for off-site disposal at a commercial disposal facility. Evaluation of the cost of disposal at an off-site DOE facility, such as the Nevada Test Site, was not conducted. However, a major cost component for off-site is disposal is the transportation costs associated with transporting the waste to the off-site disposal facility. As such, the cost of disposal at another DOE facility would be much greater than disposal in the new on-site disposal facility. **No waste** from off the INEEL will be considered for disposal in the ICDF.

Comment 190 : A Commentor wanted to express concern over the plans for a radioactive waste disposal site above the SRPA. I am totally opposed to this plan because of the potential environmental damage it could do and the health hazards it may generate. [BR-W]

Response: Protection of the SRPA is of major importance. The ICDF can be designed, constructed, operated, and closed while remaining protective of the SRPA. Limits will be place on materials that are acceptable for disposal in the ICDF. Waste materials (soils and debris) from INEEL CERCLA projects meeting the acceptance criteria would be candidate materials for disposal in the ICDF. If treatment is necessary to meet the acceptance criteria, the waste would be treated prior to disposal. For waste that cannot meet the acceptance criteria (with treatment), off-site disposal would be utilized.

Comment 191 : A Commentor wanted to know why can't the waste proposed to be sent to the ICDF be sent instead to the RWMC? Does it have to do, specifically, with (a) cost? Or (b) concentration? Or (c) specific contaminants contained (how could they be less dangerous at ICDF than at RWMC?) Or (d) RWMC capacity? Doesn't RWMC have capacity for more waste? [U-W]

Response: Some of the waste anticipated to be disposed of at the ICDF could be disposed at the RWMC. However, much of the waste volume considered for ICDF has RCRA issues (listed or potentially characteristic). The RWMC is not designed to meet RCRA Subtitle C standards, or permitted to accept listed hazardous waste. Also, the RWMC will be closing prior to completion of the remedial actions generating the waste considered for the ICDF. The RCRA issue is being dealt with for ICDF by the design being a facility meeting, or exceeding, the RCRA Subtitle C minimum technical requirements. The cost of packaging LLW without disposal at the RWMC is greater than the total cost of disposal at the ICDF. The waste acceptance criteria will be determined during remedial design. Once the design is completed, the waste acceptance criteria may be developed and fate and transport modeling will be conducted to ensure that ARARs are met and that the facility will not result in exceeding drinking water standards at the SRPA, or a 1 in 10,000 excess cancer risks, whichever is more stringent.

Comment 192 : A Commentor asked, if the ICDF (as presented here, a plan so vague and unprotective it can be most succinctly described as a crazy idea) isn't built, will the Group 3 waste (and other WAG 3 waste, and other INEEL waste) be sent to the RWMC? If not, why not, exactly? Wouldn't the cost of storage at RWMC be cheaper than transporting to a commercial off-site facility and paying their fee? [U-W]

Response: The ICDF has been selected as the remedial action for Group 3. If the ICDF had not been selected, some waste, including some WAG 3 wastes, could potentially be disposed of at the RWMC, provided that the waste meets the acceptance criteria. Waste with RCRA issues (listed or characteristic) **cannot** be disposed of at the RWMC.

C.3.3.1 ICDF General Comments

Comment 193 : A Commentor felt that there remain major uncertainties related to the siting location of the ICDF and the waste acceptance criteria. [CB-W]

Response: The ICDF will be designed and constructed to be protective for the SRPA and surface receptors. Additionally the facility will be designed to meet, or exceed, the Minimum Technical Requirements (MTRs) for a RCRA Subtitle C hazardous waste landfill. Materials being disposed of in the ICDF will be required to meet the WAC, which will be developed to be protective of the SRPA for both short and long-term impacts. Part of the remedial design activities will involve the siting of the disposal cells in the selected ICDF area. The site selection activities will consider relevant technical, regulatory, and financial factors. Based on these criteria, the best location(s) will be selected for the disposal cells in the ICDF area. The waste acceptance criteria will be finalized following the remedial design and may result in limits of disposal activities and masses or may require pretreatment of selected wastes prior to disposal.

Comment 194 : A Commentor stated, "Obviously, one of the more important things within the current plan that is a departure from the draft is a commitment to construct the subtitle C RCRA compliant ICDF. That is a major step forward, and we're very encouraged by that." [CB-TM]

Response: An evaluation of whether the wastes are subject to RCRA Subtitle C was made in the FSS Report, which is part of the Administrative Record. It was determined that there was a significant amount of INEEL CERCLA soils and debris having contaminants other than and in addition to radionuclides. Management of the non-radionuclides is subject to the RCRA requirements. Based on this, it was decided that a facility that would be compliant with the RCRA Subtitle C requirements would be needed to manage and dispose of the soil and debris wastes. With this information and analysis, the construction of a disposal facility compliant with RCRA Subtitle C requirements became the preferred alternative.

Comment 195 : A Commentor noted that under the Plan's off-site disposal alternative, only about 2.2 million cubic feet of generally homogeneous soil wastes would require burial. Leveraging this much smaller burial need to justify building 13 million cubic feet of disposal capacity for an unspecified mix of heterogeneous wastes from multiple locations is particularly imprudent, given the high value groundwater resource placed at risk. [L-W]

Response: The 2.2 M ft^3 referred to by the Commentor relates to WAG 3 soils only. If no other soils except WAG 3 soils were disposed of at the ICDF, it would still be cost effective to do this consolidation. This conclusion is supported by information available in the Administrative Record. Consolidation improves our ability to retain administrative controls over one large area versus numerous smaller areas resulting in economies for small and large volumes.

Comment 196 : One Commentor recommended that we reject the currently preferred alternative of building a new disposal facility at Chem Plant or other location overlying the SRPA. A commercial radioactive waste disposal facility could not be licensed here, and the government should not adopt a lower standard for protection of this vulnerable, high-value natural resource. If necessary, excavated wastes can be stored pending identification of a permanent sound solution. [L-W]

Response: Based on our evaluation the most cost effective solution which is protective of the aquifer is Alternative 4a (ICDF), based on the design requirements and stringent waste acceptance criteria that will be applied for this action. Given the type of waste that will be accepted by the ICDF, we see no impediments to a privatized mixed low-level facility at this location in compliance with state and federal siting and design laws if in the future a new facility is needed for other waste disposal.

Comment 197 : A Commentor wanted to know exactly which other release sites at INEEL might be allowed to dispose of material at the ICDF, and what type of contaminants and media might be disposed from these other sites? [U-W]

Response: This ROD has selected an on-site disposal facility for WAG 3. Future Records of Decision may specify on-site disposal as the selected remedy and the ICDF will be expanded as necessary. The ICDF will be constructed to dispose of both soils and debris. Potential candidate materials along with waste type are found in Appendix C of the FSS Report.

C.3.3.2. ICDF Siting

Comment 198 : A Commentor remarked that dumping the waste on top of the ground and mounding the cover over it will result in the cap eroding over the long-term which again is unacceptable. DOE must designate another location for the ICDF that is not near a flood plain and preferably not over the aquifer. DOE's own study has identified at least two such sites where the Lemi Range meets the Snake River Plain [CB-W]

Response: Waste will not be placed into the ICDF by placing the waste on the ground and then mounding over the waste. The ICDF will consist of disposal cells where waste will be disposed and traceability of wastes will be maintained. Following filling of a disposal cell, the cell will be closed by constructing an engineered containment barrier (Cap) over the cell, which would be designed to control erosion, infiltration, and intrusion. The proposed location of the ICDF is not within the floodplain. A siting evaluation was conducted as part of this ROD to identify the best on-site location for the ICDF. This evaluation looked at siting criteria developed for solid waste, hazardous waste, PCB waste and LLW landfills. The two locations identified in a previous study, which are not over the SRPA on the INEEL, have other problems (near fault lines, on the side of a mountain, etc.), making them unsuitable. In addition to location, the ICDF will be designed, constructed, and operated to maintain protection of the SRPA.

Comment 199 : A Commentor was concerned that water sample data at the ICPP already showed massive migration of pollution into the groundwater and that the choice to locate it at the ICPP was misguided. [CB-W]

Response: There is a contaminated groundwater plume beneath the INTEC (ICPP), which was primarily a result of the use of an injection well, which introduced contaminants directly into the SRPA. Use of the injection well was discontinued in 1986 and the injection well was permanently closed using a pressured grouting technique in 1989. Restoring the aquifer to drinking water quality will be addressed by the Group 5 (Snake River Plain Aquifer) remedial alternative. The potential impact to the SRPA from the ICDF is dependent upon the design, construction, operation, and closure of the landfill. In addition, the ICDF will be restricted in both the types of contaminants and wastes that it can accept. As a result, we feel that construction of the ICDF at INTEC is an appropriate location.

Comment 200 : A Commentor stated that given the type of hydrogeologic environment, it would be impossible to meet the established federal requirements under the NRC 10 CFR, part 61, regulations governing commercial disposal of low-level radioactive waste on INEEL. [SR-TB]

Response: Unfortunately, we must disagree with the Commentor and apologize for the length of our response. However, this is a very important concern to the Agencies and deserves a detailed response. Under 10 CFR 61, a disposal facility can be constructed at INEEL over a sole source aquifer, provided it meets the criteria in the regulation. Although 10 CFR 61 is not considered an ARAR for this project, we have considered the substantive requirements in developing our siting evaluation. The relevant sections concerning siting criteria are contained in Subpart D (10 CFR 61.50), under which there are 11 criteria that must be satisfied. The criteria and how the ICDF will meet the criteria are discussed below.

Criteria 1: "...site suitability is given to isolation of waste, a matter having long-term impacts, and to disposal site features that ensure that the long-term performance objectives ... are met ..." As the ICDF will be designed, constructed, operated, and closed to not adversely impact the environment (SRPA and surface receptors) this criterion is satisfied. Both short and long-term impacts are being considered.

Criteria 2: "site shall be capable of being characterized, modeled, analyzed, and monitored." In conducting the RI/FS, the site was characterized, modeled, and analyzed. Additional characterization, modeling, and analysis will be conducted during the remedial design and development of the waste acceptance criteria. Monitoring of the site is a part of the operation and long-term management of the site.

Criteria 3: "... site should be selected so that projected population growth and future developments are not likely to affect the ability to meet the performance objectives ..." The proposed location for the ICDF is not currently near a residential or non-governmental industrial population and is located in an area of existing contamination (i.e., CPP-95).

Criteria 4: "Areas must be avoided having known natural resources which, if exploited, would result in failure to meet the performance objectives ..." The area of the ICDF will be controlled and restricted. In addition, the impacts on the aquifer will be minimized to not adversely impact the aquifer. There are **no** known natural resources that, if exploited, would impact the ability of the ICDF to meet this performance objectives.

Criteria 5: "... site must generally be well drained and free of areas of flooding or frequent ponding. Waste disposal shall not take place in a 100-year floodplain ..." The proposed area is not located within the 100-year floodplain. Also, the proposed area is not subject to flooding or ponding of water. In addition, the facility will be designed, constructed, operated, and closed, to minimize and mitigate the future impacts of potential flooding and ponding.

Criteria 6: "Upstream drainage areas must be minimized to decrease the amount of runoff which could erode or inundate waste disposal units." The proposed location is not near an upstream drainage area. In addition, the facility will be designed, constructed, operated, and closed, to minimize and mitigate the erosion and inundation of the disposal cells.

Criteria 7: "... site must provide sufficient depth to the water table that ground water intrusion, perennial or otherwise, into the waste will not occur." The depth of groundwater in the proposed area is approximately 460 feet below ground surface. Further, the location chosen is not inundated with perched water so no ground water intrusion into the waste fill will occur.

Criteria 8: "... hydrogeologic unit used for disposal shall not discharge groundwater to the surface within the disposal site." The proposed area currently has a discharge of groundwater near the proposed ICDF area (INTEC percolation ponds). However, as part of this ROD, these discharges will be discontinued prior to start of ICDF land filling operations. An alternate disposal system for the percolation ponds will be constructed, which will not impact the ICDF or perched water areas. In addition, the facility will be designed, constructed, operated, and closed, to prevent the discharge of groundwater to the surface within the disposal site area.

Criteria 9: "Areas must be avoided where tectonic processes such as faulting, folding, seismic activity, or vulcanism may occur with such frequency and extent to significantly affect the ability to meet the performance objectives ..." The proposed location for the ICDF is not near faults, folds, or other seismic and vulcanism areas that would occur with sufficient frequency or extent to impact the ability of the ICDF to meet the performance objectives.

Criteria 10: "Areas must be avoided where surface geological processes such as mass wasting, erosion, slumping, landsliding, or weathering occurs with such frequency and extent to significantly affect the ability to meet the performance objectives ..." The proposed area for the ICDF is a relatively flat area which is not subject to mass wasting, slumping, or landslides. For the ICDF, only the engineered containment structure (cap) is proposed to be above ground level and subject erosion or weathering. The facility would be designed, constructed, operated, and closed, to minimize and mitigate the effects of erosion and weathering to allow the ICDF to meet the performance objectives.

Criteria 11: "site must not be located where nearby facilities or activities could adversely impact the ability of the site to meet the performance objectives ... or significantly mask the environmental monitoring program." Activities at the INTEC facility will not impact the ability of the ICDF to meet its performance objectives. In fact, the location of the ICDF facilitates the cleanup and consolidation of contaminated soils and debris within the INTEC facility thus promoting continued use of INTEC.

Based on the above discussion, the Agencies believe that the ICDF will be able to meet the requirements of 10 CFR 61 and will provide the same level of restriction and protection as a commercial facility would be required to demonstrate. The ICDF design, construction, operation, to include stringent WAC, and its closure will cost-effectively reduce the footprint of contaminated soils at INEEL, freeing up much of the land for future unrestricted development.

Comment 201 : A Commentor stated that the INEEL CERCLA disposal facility at the Chem Plant is recognizably within the 100-year flood plain and will be located below the surface so that the wastes will be at an elevation that is going to be vulnerable to flooding even within the 100-year scenario. [CB-TM]

Response: The engineered containment barriers (Caps) for the ICDF will be designed to control erosion against floodwaters. Also, the proposed location is not within the 100-year floodplain. Further, the facility will be lined and capped to isolate wastes and remain protective of the SRPA for both short and long-term impacts.

Comment 202 : A Commentor stated that he objected to the ICDF because of the potential for future erosion over the long term. Also, as the 100-year flood assumes 7,260 cubic feet per second in the Big Lost River and the 500-year flood assumes 9,680 cubic feet per second, which is 34 percent more, the idea of putting -- of locating, of siting the ICDF in that region made no sense at all. [CB-TM]

Response: In deciding where to most cost-effectively site the ICDF, the Agencies performed a siting evaluation which is summarized in the ROD. The majority of the wastes we anticipate disposing of in the ICDF are relatively short-lived radionuclides, like Cs-137 and Sr-90 contaminated soil and debris. The concentrations of these contaminants will decrease by over five orders of magnitude (~1/200,000) within approximately 500 years from the date of disposal. The engineered containment barriers will be designed to control erosion, infiltration, and intrusion. In addition, we will evaluate historic high water elevations and potential future climatic events in our design assumptions to minimize eventual landfill leachate generation.

Comment 203 : A Commentor stated that the logical thing, from their point of view, was to site the ICDF off the aquifer but on the INEEL real estate. He identified sites at the base of the Lemhi Range where the Lemhi kind of terminates at the Snake River plain, which is off of the aquifer and not in a flood plain. So I think there are other locations for that particular facility that need to be included. [CB-TM]

Response: We share the Commentor's concerns about the need to protect the valuable groundwater resource of the SRPA. This is the reason that we have elected to require that the aquifer be restored to drinking water standards within a timeframe that it may be needed for future consumption. The evaluation of on Aquifer and off-Aquifer location for the facility was evaluated as was off-site commercial disposal. A primary reason that the ICDF is the selected alternative is the limitations we are placing on waste acceptable for disposal within this facility. The design and construction of the ICDF will further ensure that the landfill is conservatively designed so that leachate to the underlying sole source aquifer will never exceed drinking water standards. In addition, consolidation improves our ability to retain administrative controls over one large area versus numerous smaller areas. Concerning the Commentor's suggested location, there are several faults that surround the INEEL. In addition there are recharge zones for the SRPA that are not directly over the SRPA. Selection of the location for the ICDF considered a number of site selection criteria, including proximity to existing identified faults. This automatically ruled out locations near existing faults. Additional analysis concerning this issue was conducted for the new Three Mile Island Dry Storage Area.

Comment 204 : A Commentor remarked that the Proposed Plan called for construction of a new radioactive waste disposal facility overlying the SRPA, constructed near unlined radioactive liquid percolation ponds, which have already caused extensive contamination at the proposed location. [HC-W]

Response: Regarding the construction and location of the ICDF, an evaluation was conducted to determine the cost effectiveness of developing a centralized (consolidation) disposal facility for management of the INEEL CERCLA waste. This facility is to manage INEEL only CERCLA waste. There are contaminated soils, both dispersed and uncontained, throughout WAG 3 and other locations on the INEEL that present a risk to the SRPA due to less restrictive pathway in the current configuration. Based on this, contaminated soils at WAG 3 would require some type of remedial action to reduce an impact to the SRPA. As a result, remedial action alternatives, including the ICDF were developed and evaluated. For the ICDF alternative, the soils would be excavated and disposed of in a engineered disposal facility. The engineered facility, ICDF, would consist of RCRA compliant disposal cells, which include lined cells with leachate collection and significant groundwater monitoring systems designed to provide protection of the SRPA.

In the evaluation of the ICDF, the location that was selected is within the contaminated footprint of WAG 3. This has the effect of reducing, rather than expanding the overall contaminated footprint of the INEEL. The current percolation ponds at WAG 3 will be shut down. This will result in more protection to the underlying aquifer and will reduce public and environmental risk. Further, aquifer protection will be provided with required long term disposal cell, soil and groundwater monitoring which will signal any containment system failures and allow for additional remedies and/or corrective actions to be implemented to address the problem, if necessary.

Comment 205 : A Commentor stated that the SRPA is one of Idaho's crown jewels. This hugely productive "sole source" drinking water supply is also essential to the future of Idaho's agricultural economy. Experience has proven that the porous sand and gravel soils and fractured basalt geology overlying this world class water resource are insufficient protection against migrating chemical and radioactive contamination. Relying on man-made materials of potential unproven longevity to make up for unsuitable site conditions, as the Plan recommends, invites future environmental and economic problems. [HC-W]

Response: We share the Commentor's sentiment that the SRPA is one of Idaho's "crown jewels" and understand that this resource is of immense importance to the state's agricultural economy, as well as providing the sole source of drinking water to residents along the plain. We also wholeheartedly agree that activities at the INEEL must be protective of human health and the environment, and comply with all applicable environmental laws and regulations. The Commentor expresses concern regarding the level of protectiveness of current and proposed disposal practices for radioactive material at the INEEL. Stringent waste acceptance criteria will be developed as part of the remedial design process. Only wastes which do not pose a threat of exceeding Idaho drinking water standards in the underlying aquifer will be permitted to be disposed in the engineered landfill. WAG 3 CERCLA wastes that cannot be safely managed on INEEL will be disposed of in an off-site disposal facility in full compliance with state and federal laws and regulations. The materials of construction for the ICDF will in large part be naturally occurring materials (e.g., clays, sands, and gravels).

Comment 206 : A Commentor asked the DOE to work with the Environmental Protection Agency and the State of Idaho to revise the Proposed Plan by steering away from the development of radioactive waste disposal facilities over the SRPA. The Plan and all future INEEL cleanup actions should reflect off-aquifer disposal as the preferred alternative for final disposition of contaminated materials excavated at the site. [HC-W]

Response: Only wastes which do not pose a threat of exceeding drinking water standards in the underlying aquifer will be permitted to be disposed in the engineered landfill. The WAG 3 CERCLA wastes that cannot be safely managed on INEEL will, as the Commentor requests, be disposed of in an off-site disposal facility in full compliance with state and federal laws and regulations.

Comment 207 : A Commentor felt that the "off-aquifer" disposal alternatives both within and outside INEEL's boundaries have not received sufficient study. [L-W]

Response: We share the Commentor's concerns about the need to protect the valuable groundwater resource of the SRPA. The ICDF is actually a significant reduction in the footprint of contaminated soil at INEEL INTEC facility, which already presents an unacceptable risk to the aquifer if no further action is taken. The on-Aquifer and off-Aquifer locations for the proposed facility were evaluated as was off-site commercial disposal. A primary reason that the ICDF is the selected alternative is the limitation we are placing on waste acceptable for disposal within this facility. Unlike typical commercial disposal facilities which take a huge variety of waste types from many different generators, the ICDF is limited to only INEEL CERCLA waste streams which could be managed in place and be protective to the aquifer. A primary reason for consolidation is the efficiency and economy of scale presented through consolidation. Based on our projections substantial monies may be saved to further other necessary remedial actions at INEEL. Further, the design and construction of the ICDF will ensure that the landfill be conservatively managed so that leachate to the underlying sole source aquifer will never exceed drinking water standards. In addition, consolidation improves our ability to retain administrative controls over one large area versus numerous smaller areas.

Comment 208 : A Commentor was concerned with siting the ICDF, and quoted EPA guidance concerning not siting hazardous waste facilities in sensitive locations. [L-W]

Response: The sensitivity of a location is dependent upon many factors. The design, construction and operation of the ICDF will not pose an unacceptable threat to the "sole source aquifer." Stringent waste acceptance criteria will further ensure that this requirement be met.

Comment 209 : A Commentor referenced the Joint EPA-Nuclear Regulatory Commission siting guidelines for mixed waste disposal stating that hydrogeology is considered vulnerable when groundwater travel time along a 100-foot flow path from the edge of engineered containment structure is less than 100 years. [L-W]

Response: Based on the groundwater modeling we performed in the RI/FS, and the types of contaminants (e.g., Cs-137) which will be disposed of at the ICDF, it may take thousands of years for selected contaminants to migrate to the SRPA, assuming no hydraulic barriers are in place. Further, the travel times to the underlying SRPA are significantly increased in an engineered structure like the ICDF, which will be designed to impede transport of contaminants.

Comment 210 : A Commentor stated that, "The underlying eastern SRPA, formally designated a sole source aquifer by EPA in 1991, provides water used at the site and is an important economic resource for southeastern and south central Idaho. More than 3,000 people draw water from wells located within a 3-mile radius of the site. According to the Plan, regional groundwater now velocities 5 ft./day, and generally flows even more rapidly beneath the Chem Plant." [L-W]

Response: INTEC is located in the central portion of the INEEL with the nearest site boundary approximately 8 miles away. Groundwater extracted at the INEEL is carefully monitored to ensure that the workers are not being exposed to unacceptable levels of contamination from the consumption of SRPA groundwater. In addition, there are no nonworker populations (such as towns or other communities) within 3 miles of INTEC. The extent of contamination at INEEL emanating from WAG 3 has been mapped and measured for over 30 years. Sensitive studies of Cl-36 have shown the downdgradient extent of the plume, which is measurable up to 8 miles from the INEEL border. No off-INEEL drinking water users, or potential users will be exposed to contaminant levels above drinking water standards. The action being taken under this ROD is to restore the aquifer underlying INEEL to drinking water standards, within a reasonable timeframe (i.e., 100 years).

Comment 211 : A Commentor stated that unforeseen releases would increase waste constituent concentrations in the area, resulting in drinking water standards being exceeded and further adverse effects from overlying perched water zones. The Commentor further stated that this circumstance could conflict with the NRC site suitability requirement that "disposal facility must not be located where nearby facilities could ... significantly mask environmental monitoring program." 10 CFR 61.50(a)(11) [L-W]

Response: The criteria referenced actually states: "The disposal site must not be located where nearby facilities or activities could adversely impact the ability of the site to meet the performance objectives ... or significantly mask the environmental monitoring program." The ICDF would be designed, constructed, operated, and closed, to not adversely impact the aquifer (SRPA) and surface receptors. For environmental monitoring, the monitoring system would be designed, constructed, operated, and maintained to determine the impacts on the aquifer from the ICDF. The actual design of both the disposal cells and monitoring network will be developed during the remedial design phase of the project.

Comment 212 : One Commentor recommended that we determine whether a technically suitable disposal location exists at the INEEL that is not underlain by the aquifer. If a suitable area exists, conduct health and environmental risk assessments and otherwise develop and evaluate this alternative on-site strategy. [L-W]

Response: Based on the waste that will be accepted; in addition to the design, construction, and operation of the ICDF; the Agencies are confidant that the planned location is protective of human health, the environment. The Agencies are committed to keeping the public informed during the design and construction phase through the issuance of fact sheets and holding workshops, as appropriate.

Comment 213 : A Commentor remarked that pumping and treating the existing contaminated groundwater and perched water zones are challenging and expensive and this difficulty in performing corrective action should serve as a limitation in selecting a site above the SRPA. [L-W]

Response: We agree that cleanup of past releases to groundwater in the perched zones and SRPA are challenging and expensive. We appreciate that high cost of remediation to address the environmental decisions of the past. We must note, however, that the major source of groundwater contamination at the INTEC is from direct injection of hazardous and radioactive substances into the SRPA at the former injection well, not migration of contaminants from the shallow subsurface to the aquifer. However, given the potential difficulty in cleaning up the SRPA, the Agencies will consider the potential impacts of the ICDF on groundwater when selecting the site location and developing the final design. At a minimum, the Agencies plan to develop the ICDF to be protective and minimize potential exposures to either humans or the environment, including groundwater, for at least 1,000 years. The principal contaminants expected to be disposed in the ICDF include Cs-137 and Sr-90, which have relatively short half lives and will substantially decay before 1,000 years.

Comment 214 : A Commentor suggested that the desire to concentrate waste over an already contaminated portion of environmentally vulnerable, economically vital sole source" aquifer is compounded by Department's actions to accelerate waste receipt at the existing, Radioactive Management Complex Subsurface Disposal Area waste management program strategic plan. [L-W]

Response: We cannot emphasize enough that the ICDF is only for INEEL CERCLA cleanup waste disposal. These wastes already exist above the "sole source aquifer" and if not addressed will present a unacceptable risk if the INEEL land is developed for private use in the future. Stringent waste acceptance criteria will be developed as part of the remedial design process. Only wastes that do not pose a threat of exceeding drinking water standards in the underlying aquifer will be permitted to be disposed in the engineered landfill. WAG 3 CERCLA wastes that cannot be safely managed on INEEL will be disposed of in an off-site disposal facility in full compliance with state and federal laws and regulations

Comment 215 : The INEEL CAB recommended that use of clean areas to dispose of wastes be minimized to the extent possible. The Board restated its support in the past for using already contaminated areas as disposal sites for LLW. Use of clean areas is much less desirable. [CAB-W]

Response: Construction of the ICDF will occur in the area to the west of the existing INTEC percolation ponds. A siting study was completed resulting in the selected location for the ICDF area. Site CPP-95 is the contaminated area associated with releases from the main stack at INTEC. The area defined as the AOC will not be suitable for free release or unrestricted use for 100 years. This will require the area to be institutionally controlled with access and use restrictions and radiological surveillance. While the area selected for the ICDF does not encompass the entire existing percolation ponds area, the selected ICDF area is in a previously contaminated area requiring continued access restrictions.

Comment 216 : A Commentor asked that the WAG 3 AOC be shown on a map. [U-W]

Response: A map showing the WAG 3 OU 3-13 AOC is included in this ROD. The boundary extends south of the existing percolation ponds. The entire proposed ICDF area is located within the OU 3-13 AOC.

C.3.3.3. ICDF Design

Comment 217 : A Commentor noted that since the radioactive waste will be extremely hazardous for tens of thousands of years, a conservative risk assessment would consider a 500-year flood rates at 9,680 cubic feet per second (34% greater flow rate than 100 year), as opposed to a 100 year. Further, a 500-Year flood plus failure of Mackay Dam (built in 1917) would result in estimated flows of 9,700 + 54,000 cubic feet per second respectively. [CB-W]

Response: We agree with the Commentor concerning the need to consider a 500-year flood event during remedial design. The majority of the waste we anticipate disposing of in the ICDF will contain Cs-137 and Sr-90 contaminated soil and debris with half lives which through radioactive decay, will result in acceptable risk-based concentrations well within 500 years. The Agencies plan to consider a 500-year flood event when designing the engineered cover. However, the Agencies are not using the 500-year flood event as an ICDF siting criterion. The engineered containment barriers will be designed to control erosion, infiltration, and intrusion. With a flood, erosion of the containment structure is an issue along with infiltration. Both of these issues will be considered and factored into the design of the ICDF. In addition, we will evaluate historic high water elevations and potential future climatic events in our design assumptions.

Comment 218 : A Commentor stated that the ICPP as a whole is about as flat as a tabletop. He referred to a US Geological Survey (USGS) report released in 1998, acknowledging that the northern half of the ICPP would be flooded in a peak 100-year flood. USGS estimated that the ICPP would be under several feet of moving water and the Big Lost flow rate at 7,260 cubic feet per second. The detailed report map shows the northern half of the ICPP would be under as much as four feet of water. [CB-W]

Response: The proposed ICDF location is beyond the southern boundary of INTEC, and is not within the 100-year floodplain, as identified by USGS. Further, The engineered containment barriers (Caps) for the ICDF will be designed to control erosion. Concerning the four feet of water, the USGS report shows a depth of 4 feet of moving water encompasses the bottom of the existing drainage system (ditches) located in the northern part of INTEC, not flowing across the facility unrestricted.

Comment 219 : A Commentor expressed concern that given the value of the SRPA, the lack of natural protection offered by in situ soils and hydrologic conditions and the dangers of relying on manmade systems for waste isolation, the proposed Chem Plant on-site disposal facility is unsuitable. [L-W]

Response: The construction of the ICDF is partially dependent upon the natural protection offered by INEEL soils. During remedial design, it may be determined that the existing soils will need to be supplemented to achieve the design objectives. If this is the case, the supplement actions will be implement to meet the design objectives. This design requirement applies equally to commercial and government facilities. The issue is not whether contaminants exist above the sole source aquifer, it is whether the contaminants exist in an environment in which they may pose an unacceptable risk to human health and the environment.

Comment 220 : A Commentor discussed that the porous, coarse-grained soil deposits and shallow, permeable bedrock beneath the Chem Plant offer limited ability to attenuate contaminant s and impede downward infiltration. Under such unfavorable natural conditions, the man-made liner system for the proposed disposal site would offer the only waste isolation barrier. Failure to successfully join the multiple panels comprising the liners, heavy equipment damage, degradation of liner materials by waste constituents or the simple passage of time could lead to unforeseen releases. Once in the fractured basalt, contaminant dispersion monitoring and corrective action would be difficult and expensive. [L-W]

Response: The operation of the ICDF is not dependent upon the natural protection offered by INEEL soils. Design requirements and construction procedures address the operational concerns mentioned by the Commentor. The WAC provide further assurance that the aquifer will remain protected. Commercial landfills are located above fractured basalt. Siting criteria for the ICDF (which is limited in terms of what wastes may be accepted) is not the same as that of a commercial facility, which accepts many forms of wastes.

Comment 221 : A Commentor asked about the design life for the ICDF liner and for the cover. [SRA-W]

Response: Both the liner (bottom of disposal cells) and cover (engineered barrier; cap) materials for the ICDF will have design life requirements. The design life of the liner materials are grouped into two categories. The first category is the materials used for the leachate collection during the operational phase of the individual disposal cells. These leachate collection materials are the same as those used in the construction of RCRA Subtitle C facilities and have design lives of 30 years or more. The operational phase of the individual disposal cells is expected to be approximately 10 years. Proper cover design should minimize infiltration, thereby preventing the need for long term operation of the leachate collection system. The second liner category is the materials used for the material beneath the leachate collection system and on top of the basalt. For materials beneath the leachate collection system, natural, native, or natural analog materials will be used. These materials would have design lives of geological timescale (>1,000 years). These material will have sufficient design life to control the contaminant migrations until the level of contamination present do not present a risk to the environment. In the case of the engineered barriers (covers), the material of construction would be similar to the materials used beneath the leachate collection system. As design specifications are part of the remedial design process, these issues will be further evaluated during the remedial design.

Comment 222 : A Commentor stated that the concept of the ICDF is flawed and unacceptable. It does not afford sufficient protection to the Snake River Aquifer since it will eventually leak (refer to the recent discovery at Envirocare of 2500 gallons of leachate between the liners). The Commentor asked, how will INEEL manage/dispose of leachate from this facility? Bonneville county was not allowed to construct a municipal landfill over the aquifer, why should DEQ allow construction of a hazardous/PCB waste landfill over the same aquifer? DEQ should be consistent in their application of requirements to protect the aquifer. Will this landfill accept only PCB waste between 50 and 500 ppm PCBs, or will it accept >500 ppm PCBs? [C-W]

Response: We disagree with the Commentor. Currently, there are several municipal landfills sited over the SRPA. The ICDF will be designed, constructed, operated, and closed to remain protective of human health and the environment, including the SRPA, for at least 1,000 years. The Agencies goal is to protect the aquifer. Problems at Envirocare are not relevant to the ICDF design, operation, or closure. Leachate generated during the operation of the ICDF will be managed and treated at the SSST. The treated effluent may be used for dust suppression during operations. The ICDF will be designed to minimize the generation of leachate after closure. This is the reason for the actions identified in the ROD. Concerning PCB wastes, the ICDF will be limited to less than 500 mg/kg (ppm) non-liquid PCBs. Wastes containing free liquids will not be disposed in the ICDF.

Comment 223 : The INEEL CAB recommended that the ICDF be designed to avoid the effect of the probable maximum flood. The contaminants that would be disposed at the ICDF have radionuclides with very long half lives. Design to avoid the impacts of a 100-year flood may not offer sufficient protection. [CAB-W]

Response: When evaluating the "probable maximum flood", it is necessary to know the frequency of the event. Most of the contaminated materials (soil and debris) to be disposed of in the ICDF will remain unacceptable from a human health perspective for less than 500 years. The major effect on a landfill similar to the ICDF would be the effect of errosion of the engineered containment structure (cap). Groundwater generally is not greatly impacted (short-term increase in contaminant migration along with a decrease in contaminant concentrations). The engineered containment structure would be designed to deal with the effects of at least a 500-year flood. This will provide adequate protection for the ICDF from flooding effects along with protection of the SRPA.

Comment 224 : The INEEL CAB recommended that the ICDF final design be fully compliant with the Resource Conservation and Recovery Act (RCRA) substantive requirements. DOE may need to dispose of waste containing RCRA-listed contaminants at the ICDF. The design should accommodate that possibility to avoid expensive retrofitting in the future. [CAB-W]

Response: The ICDF will be designed to meet the design requirements for a RCRA Subtitle C hazardous waste disposal facility. Meeting the RCRA Subtitle C requirements allows for RCRA waste (listed and treated characteristic) to be disposed of in the facility. In addition, hazardous waste materials (hazardous, mixed, and LLW) from other INEEL CERCLA remedial and removal actions would be candidate materials for disposal in the ICDF. This will eliminate retrofitting the ICDF to meet RCRA requirements in the future.

Comment 225 : A Commentor asked, "Regarding the ICDF: How exactly will the design of the proposed ICDF prevent future percolation of contaminants into the groundwater?" [U-W]

Response: The ICDF will be designed to meet the RCRA Subtitle C minimum technical requirements and PCB Chemical Waste Landfill design requirements. Our Waste Acceptance Criteria will assume that contaminants will eventually leach out of the waste in the ICDF and migrate toward the SRPA. Therefore, we will limit our waste acceptance to wastes with contaminant levels that, even if the long-term leachate collection and management system were to fail, would not cause an MCL or unacceptable risk level exceedence in the SRPA, based on modeling.

C.3.3.4. ICDF Waste Acceptance Criteria

Comment 226 : A Commentor remarked that the ICDF Engineering Design and Waste Acceptance Criteria (WAC) must be developed with public involvement through a free and open discussion. Only un-containerized wastes that can be compacted during placement should be allowed so as to minimize subsidence caused by container decomposition. Biodegradable, VOC, collapsible, soluble, TRU, or Greater than Class C Low-level, and Alpha-LLW must also be excluded from the ICDF dump and sent off-site. Prior to completing the ICDF Title II Design, workshops should be convened for stakeholders to comment on the proposal. Waste acceptance criteria maximum contaminate concentration levels must be determined from waste sampling prior to being mixed with any stabilizing materials. In other words, "dilution is not the solution to pollution." [CB-W]

Response: Only INEEL CERCLA waste that is non-containerized, compactable, and non-biodegradable are being considered for disposal in the ICDF without the need for pretreatment. Containerized and biodegradable wastes may require pretreatment and treatment, if necessary, to meet the waste acceptance criteria for disposal in the ICDF. In addition, no TRU waste or waste having concentrations of TRU constituents exceeding 10 nCi/g are being considered as candidate waste for disposal in the ICDF. Also, the waste acceptance criteria, along with the design, will be developed to ensure that the SRPA is protected from potential contamination from the ICDF. Further, the Agencies will keep the Community informed as to the progress and content of the remedial design through a series of Fact Sheets. In addition, presentations and discussions with the INEEL CAB and/or Focus Groups will be held during the development of the design and construction of the ICDF. Concerning the last point, stabilization is a treatment technology used to reduce the leaching potential of a waste. It will not change the how wastes will be managed in the ICDF. Prohibited wastes, like TRU and Alpha LLWs will not be diluted so as to meet the waste acceptance criteria for the ICDF.

Comment 227 : A Commentor stated, "The volumes and contamination levels for the soil dump aren't clear. It is inappropriate to ask the public to sign-off on the soil dump before its waste acceptance criteria are known. Will the public have an opportunity to help develop and comment on the soil dump design and WAC?" [SRA-W]

Response: Under this ROD, soils and debris from CERCLA cleanup activities could be accepted into the INEEL CERCLA Disposal Facility. For the evaluation of remedial alternatives for Group 3 (Other Surface Soils), a volume of 82,000 yds^3 was considered. The volumes from the various release sites can be found in Appendix A of the FS Report. Information on the maximum contaminant concentrations for the various release sites can be found in Section 5 of the RI/BRA Report. The actual chemical-specific waste acceptance criteria will be developed during the remedial design. However, general criteria have been identified in the ROD. The most important criterion is that the ICDF will only accept material such that the ICDF will not adversely impact the SRPA or surface receptors, over the long term. Others include: only CERCLA wastes; only non-liquid wastes; and no High Level, TRU or Alpha LLW, will be acceptable. During the remedial design activities, we will develop and issue Fact Sheets on the various cleanup activities under this ROD. In addition, we will be available to discuss the various remedial design and remedial action activities with interested public groups as appropriate.

Comment 228 : A Commentor was concerned about being asked to comment on the ICDF when they didn't know what the waste acceptance criteria were. [MMS-W-W]

Response: For the Other Surface Soils group, a conceptual ICDF was evaluated as a remedial alternative. In evaluating the ICDF, candidate material for disposal in the ICDF were identified and evaluated (see Appendix C of the FSS Report, which is contained in the Administrative Record). The actual waste acceptance criteria will be developed during the remedial design. However, the waste acceptance criteria will limit the material acceptable for disposal such that the ICDF will not adversely impact the SRPA or surface receptors.

Comment 229 : A Commentor asked about, Page 28, Alternative 4A, Preferred Alternative. 4th paragraph, of the Proposed Plan and wanted a definition on what wastes are "suitable for disposal" at this disposal facility. [C-W]

Response: Only waste materials from INEEL CERCLA remedial and removal actions which are primarily mixed LLW would be acceptable for disposal in the ICDF, provided that the waste meets the acceptance criteria. The in-AOC waste would be required to meet the acceptance criteria for the ICDF. Waste materials (soils and debris) that do not have the potential to adversely impact the SRPA from contaminants leaching of the waste would be candidate materials for disposal (suitable for disposal). Further, wastes would be required to meet the requirements of Phase IV LDRs, as appropriate. Pre-treatment of wastes, as necessary to meet the acceptance criteria (stabilization for subsidence or leaching control), would be performed prior to disposal.

Comment 230 : One Commentor questioned the quantities, concentrations and size of the proposed ICDF? Also, will the facility serve as a retrievable storage area? Is there any plutonium going into the ICDF? So are you going to follow the 100 nCi standard? If we use 10 nCi/g, how many billions of particles? The thing on the situation was legally, you could take less than100 nCi transuranics from the Tank Farm, putting in this official RCRA endorsed low-level dump; right? [PR-TT]

Response: The proposed ICDF, which would be a permanent disposal site, designed, constructed and monitored in accordance with applicable hazardous waste minimum technology design requirements, is expected to encompass less than 100 acres upon closure including a buffer zone. The maximum allowable radionuclide concentrations will be determined in the RD/RAWP. However, no contaminants will be placed in the ICDF, which would exceed the design capabilities of the facility and threaten the underlying SRPA. For TRU contaminants, which include Pu-239, concentrations above 10 nCi/g (alpha low level) will not be accepted.

Comment 231 : A Commentor questioned whether tank farm soils, if excavated would go to the ICDF? [PR-TT]

Response: Our Group 1 interim action does not envision the excavation and disposal of tank farm soils. The ICDF will not accept TRU wastes above 10 nCi/g nor will it receive HLW. Stabilization of ICPP soils would only be to the extent necessary to prevent future leaching and subsidence. There are LLW soils and debris currently stored at INTEC (Sites CPP-92, -96, -98, and -99) that originated from within the Tank Farm area. This soil and debris is candidate material for the ICDF, provided the material meets the ICDF acceptance criteria. For soils and debris within the WAG 3 AOC that have triggered placement, the material is subject to Hazardous Waste Determinations and LDRs. For the soils remaining in the Tank Farm, OU 3-14 will evaluate the risks and potential remedial actions.

Comment 232 : A Commentor stated, "This, to me, is the whole problem with piece mealing the whole situation. And even in the big picture, if every radionuclide leaked that was there, it would meet federal standards because the aquifer is so large. And the big picture is that's why they view INEEL as the perfect place to have a 200-acre plutonium dump that they talk about is their event goal." [PR-TT]

Response: Protection of the SRPA is one of the primary objectives of the OU 3-13 project. As there is already contamination in the SRPA that will require remediation, the ICDF will not be allowed to adversely impact the aquifer. Additional impacts would only make restoration of the aquifer harder and more costly. Based on this, the maximum concentrations of leachate from the ICDF will be limited to control impacts on the aquifer so that the aquifer is not contaminated above drinking water standards from the ICDF. From the big picture standpoint, the impacts from the ICDF are considered in the overall (cumulative) impacts for WAG 3.

Comment 233 : A Commentor stated, "Literally, our water supply is large, but the medical view of radiation is to -- the less human-added exposure the better, and with zero being the safest limit. And we have a chance to contain all this material, and yet you're going through calculations you know will allow you to rebury it. That's my problem with the whole cleanup. You actually let it leak and it still meets your standards. That's why mixing it with cement is acceptable to you and putting it over the water supply is acceptable to you." [PR-TT]

Response: The ICDF is for the consolidation of existing contaminated soils into a facility designed, constructed, operated, and closed to control and minimize the leakage (leachate) from the material disposed in the cells. The level of radiation that we are designing to be protective of human health is less than 1/20th the dose typically received by the general public in the nearby communities. The disposal cells will prevent the uncontrolled leakage of contamination to the SRPA. Stabilization of INTEC soils will be performed to the extent necessary to prevent future leaching and subsidence.

Comment 234 : A Commentor noted that the Agencies were looking at a 1000 years institutional life and compared this to concerns at Pit 9, with Plutonium concentrations above 100 nCi. [PR-TT]

Response: The 1,000 years for the minimum design life of the engineered containment structure (cap) is not related to the acceptable plutonium concentrations for the ICDF. The 1,000 year value is the time that containment would be necessary to deal with most of the contaminants through radioactive decay. For plutonium and other long-lived radionuclides, concentrations would be limited and other necessary controls and/or actions implemented to limit the concentrations in the leachate to protect the SRPA for adverse impacts. The protection on the SRPA would not end at 1,000 years. In addition, the ICDF would be limited to accepting TRU constituents at levels below 10 nCi/g.

Comment 235 : A Commentor stated, "I just want to make this for the record that this is a permanent solution forever. That there will be a cap or a liner at the bottom and it will be properly capped and contaminated soils will be placed there, initially, in the old percolation ponds. And we believe that will be safe for a thousand-plus years. Other things will go in some of the soil including concrete from breaking up buildings, contaminated equipment, and contaminated structures broken up into bite-size pieces. The volume will be contaminated soil, but, in particular, if the choice is to tear buildings down, then certainly the debris from those buildings, some or all of it is candidate to go in there. Some cannot go there because of too-high levels of radioactivity to some other place. So the ICDF is a generalized disposal facility. It is a centralized facility for other clean up areas, TAN in particular, and anything else that does produce soils or debris will go there. They will not have their own separate repositories. That largely is due to economic arguments." [DK-TT]

Response: The Commentor is correct. The ICDF would be closed with the construction of an engineered containment structure (cap). The actual location of the disposal cells, within the ICDF area, will be determined during remedial design based on technical, regulatory, and financial factors. Wastes that could be accepted at the ICDF include both soil and debris. The acceptance criteria would also limit the concentrations of contaminants to protect the SRPA along with potential surface receptors. The ICDF may be used by other WAGs. Disposal of soil and debris at the ICDF from the other WAGs would only occur if this remedial option is selected through the CERCLA process by the other WAGs.

Comment 236 : The INEEL CAB recommended that the ICDF waste acceptance criteria be sufficiently restrictive to protect the aquifer. The criteria should be constructed using a long-term point of view with an appropriately designed public involvement process. INEEL waste generated by the cleanup program that does not meet the criteria should be disposed of off-site. [CAB-W]

Response: The waste acceptance criteria for the ICDF will be primarily developed to protect the aquifer from unacceptable levels of contamination. Peak contaminant concentrations impacting the aquifer will be evaluated regardless of when the peak occurs in time. This will provide the aquifer with long-term protection from the impacts of the ICDF. During the development of the waste acceptance criteria, fact sheets and other documents will be developed to inform the public. Any INEEL CERCLA waste not meeting the acceptance criteria will be disposed of at other disposal facilities including off-site disposal, if necessary.

C.4. Group 4: Perched Water

Comment 237 : The INEEL CAB recommended that DOE conduct further study of methods for replacing the percolation ponds and that the ROD provide much more detailed information on this issue. [CAB-W]

Response: In the evaluation of alternatives for the INTEC perched water, a replacement facility (new percolation ponds) was evaluated. Additional alternatives for replacement of the existing percolation ponds were evaluated and the information is contained in the Administrative Record. A new set of percolation ponds will be constructed to deal with the existing service waste discharges. If necessary, these ponds will be operated under this ROD until a new wastewater land application program (WLAP) permit to operate is obtained. Upgrading or additional capacity would be conducted under a separate project in support of INTEC facility operations. As recommended the ROD contains more details concerning the timing issue and the implementation of the replacement facility for the existing percolation ponds.

Comment 238 : A Commentor remarked that for Group 4, the perched water, 24 percent of the recharge was from the Big Lost River. Therefore, it seemed that the chances of doing something with the Big Lost River are pretty high because it was a quarter of the recharge. The Proposed Plan only stated that dealing with the Lost River, which is in Phase 2 was just a probability? [DK-TT]

Response: We agree that additional actions may be necessary to reduce the infiltration of water at INTEC to de-water the area of the perched water. Removing the existing Percolation ponds represents over 2/3rds of the recharge. Modeling shows that this may in itself be sufficient. If not, based on monitoring results, Additional infiltration controls will be implemented which will reduce the river recharge in the stretch affecting the perched water and thus eliminate the river as a source of recharge.

C.4.1. Group 4 Description

Comment 239 : A Commentor questioned the consistency of Page 32 Perched Water, Alternative 1 of the Proposed Plan. "It first states that "controls will remain in place until 2095." Then it backpedals and states that perched water monitoring will only take place for 20 years after the ponds are taken out of service." ... "What if perched water is still present 20 years after the ponds are taken out of service?" [C-W]

Response: For this non-selected alternative (Alternative 1: No Action with Monitoring), the percolation ponds were assumed to remain in service until all operations at INTEC had been completed. Treatment of the waste at INTEC would be completed by 2035 and a period of 10 years would be required to complete the facility disposition activities. This would result in the percolation ponds being removed from service in 2045. In the computer modeling, a period of approximately 14 years would be required for the perched water to drainout (change to an unsaturated zone). Perched Water monitoring would continue for 20 years following the removal of the percolation ponds from service. Although the monitoring period would end before 2095, the access (institutional) controls would remain in effect until at least 2095. Should the perched water not drainout as expected, the monitoring would be extended. This extended monitoring would continue for a period after the drainout has occurred.

Comment 240 : A Commentor stated that there was no mention that most of the contamination is the perched water was believed to have come from the tank farm nor was there mention that the perched water was contaminated with RCRA listed waste. [C-W]

Response: The Commentor is correct. Waste containing listed waste constituents were spilled in the Tank Farm soils. Some contaminants have migrated from these soils downward to the perched water bodies and this water may contain RCRA-listed waste constituents.

Comment 241 : A Commentor stated that at Pages 34 and 35, of the Proposed Plan, short-term and long-term effectiveness, no mention was made of the contaminants already present in the basalt and interbeds and their impact on the perched, and deep, aquifers. The Commentor further asked, "What K_d studies have been done to support your answer?" [C-W]

Response: The Commentor is correct in stating that there is known contamination present in both the basalt and interbed materials at INTEC (ICPP). The computer modeling that was conducted for the RI/BRA, FS, and FSS Reports did not consider the source term present in either the basalt or interbed materials. Instead the source terms modeled for most release sites considered the contamination remaining in the surface soils. For release sites where the constituent characteristics and volume of the liquid released to the surface soils were known or estimated, the source terms for these sites considered the released contaminant masses. In addition, these liquid release sites are the largest releases at INTEC. Although this does result in an uncertainty in the source term mass and subsequent modeling calculations, it should not significantly alter the results obtained from the modeling. Additional analysis will be conducted under OU 3-14 on source terms in the Tank Farm area and this analysis may be able to semi-quantitatively evaluate the impact of the source terms contained in the basalt and interbed materials. For the computer modeling, default retardation factors (K_d), which are generally conservative, were used. The K_d values used in the modeling are presented in Appendix F, section F-5, of the RI/BRA Report. Studies to refine the transport mechanisms and rates will be conducted under the OU 3-14 project.

C.4.2. Group 4 Alternatives

Comment 242 : A Commentor stated that the perched water preferred Alternative 2 alone did not meet regulatory requirements unless combined with Alternative 3 (pump and treat). Even so it would partially meet the requirements with the following exception that the existing ICPP percolation ponds will be taken out of service and replaced with new "like for like" percolation ponds not over the existing perched water. The Commentor felt that the contamination of the perched water currently was largely the result of using unlined percolation ponds to dispose of process waste. [CB-W]

Response: If the Perched water was capable of sustainable drinking water at the future residential use hypothetical time frame, the Commentor would be correct that the Ground Water Protection Standards would not be met without implementing Alternative 3. However, the Perched water is not a sustainable source of drinking water. It largely exists because of DOE operations which discharge more water into the soil than can naturally drain, thus resulting in a perched water zone. The perched water does serve to conduct leachate migrating from surface sources to the SRPA. This is why removal of the existing percolation ponds is an important phase of the remedial action.

Also, while it is true that disposal of radiological and hazardous waste occurred in the past at levels which impacted the aquifer, these impacts are what led to the INEEL facility being listed on the National Priority List (NPL) with cleanup being performed under the FFA/CO. Current waste management operations are covered under state and federal programs, which are outside the scope of this action but are designed to protect health and the environment.

Comment 243 : A Commentor remarked that the Plan discounted the Perched Water as "No risk because perched water is not capable of sustaining a pumping rate needed for future domestic water supplies; therefore, it is not a source of potable water." Yet in ICPP Plan Alternative 3 (not the preferred alternative), DOE acknowledges a perched water pump/treat rate of 46 million gallons over 25 years. Applying simple arithmetic that works out to a daily pumping rate of 5,041 gallons per day, which is likely adequate to sustain over ten households? [CB-W]

Response: We are sorry for the confusion on this issue. The Perched Water is primarily sustained by the pumping and disposing of approximately 2 MGD in the existing Percolation Ponds. If the Percolation Ponds are removed from the vicinity of the perched water, the perched water would dissipate within less than twenty years. In the evaluation of Alternative 3 for the Perched Water, the rate of withdrawl from the perched water varied over time (starting high and reducing) to account for the reduction in the available perched water. Also, the amount of contaminant mass removed by Alternative 3 is insignificant compared to the amount of contamination present. Our use of the 100-year future residential scenario and commitment to replace or relocate the Percolation Ponds will result in the availability of the SRPA for future drinking water consumption. The Perched Water is not capable of providing a sustainable drinking water supply, if DOE's use of the Percolation Ponds is ended. Based on the evaluation of alternatives, we concluded that Alternative 2 (Institutional Controls with Aquifer Recharge Control), which includes removing the existing percolation ponds from service, best satisfied the evaluation criteria.

Comment 244 : A Commentor stated that at Page 33, Perched Water (Group 4) - Alternative 3 of the Proposed Plan, "... regarding removal and treatment of 46 million gallons of perched water. I recognize that very few alternatives are available for dealing with contaminated perched water, however, a back of the envelope calculation shows that in order to remove 100% of the Sr-90 estimated to have been released to the environment (19,400 Ci) would require that the average concentration of perched water removed be 100 million pCi/L. Therefore, to remove only 1% of the Sr-90, the average concentration will have to be 1 million pCi/L, which at best could decrease the predicted future risk by 1%. Although several wells have had measured concentrations in the hundreds of thousands of pCi/L, the average concentration is much lower and none have approached 1 million pCi/L. Therefore, this alternative cannot possibly provide any measurable risk reduction, regardless of the cost. The alternative should not be given credibility by including it as an alternative. By quantifying the risk reduction, the ineffectiveness of this alternative could have been quantitatively shown and eliminated." [JM-W]

Response: Alternative 3 was included for Group 4 (Perched Water) to present a range of alternatives and to include at least two viable alternatives. Alternative 3 is a more aggressive approach to the remediation of the Perched Water than Alternative 2. We also feel that Alternative 3 would result in an insignificant risk reduction beyond the results obtained by implementing Alternative 2.

Comment 245 : A Commentor questioned the technical and administrative implementability the Perched Water (Group 4), Alternative 3, given the discontinuous nature of the perched water at INTEC. [JM-W]

Response: Alternative 3 was included for Group 4 (Perched Water) to present a range of alternatives and to include at least two viable alternatives. Alternative 3 is a more aggressive approach to the remediation of the Perched Water than Alternative 2. We believe that Alternative 3 is an implementable alternative, but would only result in a minor risk reduction if implemented.

Comment 246 : A Commentor pointed out that on Page 35, Perched Water (Group 4) - Table 6 and sidebar, of the Proposed Plan, under Alternative 2 the Net Present Value is given as $35.6M but in the sidebar it is given as $20.0 M? [JM-W]

Response: We are aware of the typographical error, but unfortunately were unable to correct it before the release of the Proposed Plan. The correct NPV cost for Table 6 is $20.0M.

Comment 247 : A Commentor pointed out that on Page 33, Alternative 2, the last sentence refers to the OU 3-14 RI/FS studying the effects of the Big Lost River and Sewage Treatment Plant (STP) on the perched water in addition to the tank farm. He stated, "If a strong connection exists between the tank farm and the perched water, then the perched water site should be removed from this Proposed Plan and included in the OU 3-14 Plan and ROD." [C-W]

Response: We are sorry for the confusion. Under the OU 3-13 project, the impacts of the Big Lost River (BLR) and Sewage Treatment Plant (STP) would be investigated and evaluated for impacts on the perched water during the perched water remedial action implementation. The computer modeling conducted for OU 3-13 showed a linkage between the various sources of water (percolation ponds, BLR, STP,etc.) infiltrating the subsurface and the perched water bodies. Operable unit 3-14 will use the existing information from OU 3-13, including removal of infiltrating water source to evaluate localized SRPA contamination within the INTEC fence line.

Comment 248 : A Commentor pointed out that on page 36, 1st partial paragraph. Phase 2 of the Proposed Plan addresses diverting or lining the Big Lost river and/or taking action on the STP perched water, rather than evaluating under OU3-14. [C-W]

Response: The scope of OU 3-14 has changed since the project was initially discussed. Under the OU 3-13 project, the success of removal of the Percolation Ponds will be assessed against the expected dewatering of the Perched Water. If the goals are not achieved, Additional infiltration controls will be implemented which will include lining of the BLR. It is not expected that relocation of the STP is necessary given its small contribution to recharge.

C.5. Group 5: Snake River Plain Aquifer

Comment 249 : A Commentor was concerned that the percolating ponds will still be running and that contaminants in them were flooding or going into the aquifers. [JJ-TM]

Response: We share the Commentor's concern regarding the percolation ponds and their affect on the migration of contaminants based on their present location. This is why this action will require the shutdown of the ponds at their current location and relocation.

Comment 250 : A Commentor stated their belief that the Proposed Plan needed to take a fundamentally different view on how to protect the SRPA. The policy towards protecting the aquifer should be the overriding alternative looked at and other alternatives should flow out of that. [SR-TB]

Response: We agree with the Commentor in that protection of the SRPA is a primary objective in the restoration of the INEEL. Also, with the SRPA, a sole source aquifer, protection of the aquifer is a primary concern for remedial actions. The remedial alternatives that were developed and evaluated considered the impacts on the SRPA. With this in mind, remedial alternatives that do not adversely impact the SRPA are viable alternatives for consideration.

Comment 251 : A Commentor stated that in addition to serving drinking water needs, the SRPA provides vast quantities of water for Idaho agriculture and stated that competing demands for water on Idaho and other western water sources will certainly intensify over the proposed 100-year cleanup timeframe. [L-W]

Response: We agree with the Commentor that water is a very valuable commodity. Most of the water extracted from the SRPA at the INEEL is returned to the aquifer. Under this ROD, the SRPA area associated with INTEC operations outside of the INTEC fence will be restored to drinking water standards. This will make the aquifer useable after 2095 for other activities.

Comment 252 : A Commentor asked, "How widespread is the contamination in the plume? Is there going to be an attempt to retrieve and contain this contamination, or is it just going to be monitored and assumed to be below federal standards?" [PR-TT]

Response: Our evaluation and modeling of the contaminant plume in the SRPA extends approximately 8 miles beyond the INEEL site boundary, however, contaminant concentrations above drinking water standards do not extend beyond the INEEL site boundaries, nor are they expected to in the future. We will implement a contingent action to insure that the aquifer is acceptable for drinking water consumption within 100 years. As necessary we will retrieve contaminants to insure this goal of aquifer restoration is met. Monitoring of the SRPA will be performed until the Agencies determine that there is no longer a risk of MCLs being exceeded after 2095. This will be evaluated in the 5-year reviews.

Comment 253 : A Commentor questioned where the drinking water standards were to be met in the SRPA. [DK-TT]

Response: Following the year 2095 restoration timeframe, the SRPA will be restored (remediation of the WAG 3 groundwater plume) to drinking water standards in the INTEC operations impacted portion of the SRPA outside the current INTEC fence line.

C.5.1. Group 5 Description

Comment 254 : A Commentor stated that there was insufficient information presented on I-129 distributions to select a remedy for the aquifer. The model predicts possible concentrations, which are greater than the drinking water standard, yet no data exists to support the theory that the HI interbed exceeds the drinking water standard. The Commentor further stated that it was absurd to propose a remedy that costs $39.8M (NPV) or $56.2 (1997 dollars) based on a model prediction. The Agencies should first sample the HI interbed near the injection well and then determine if there really is a problem. Further, the Proposed Plan does not state whether any reasonable or workable treatment alternatives were evaluated besides pumping and treating with ion exchange, which currently will not work cost effectively. The Proposed Plan does not mention whether a Technical Impracticability waiver was considered. The Commentor stated, "I would rather see my tax dollars going to a TI waiver than this absurd and excessively costly pump and treat remedy." [A-W]

Response: The information presented in the Proposed Plan is only a summary of the information contained in the RI/BRA, FS, and FSS Reports, which can be found in the Administrative Record. Contained in these documents are the details concerning contaminant concentrations and distributions (vertical and horizontal). The Commentor is correct in that the model predicts that there are concentrations greater than the drinking water standards, but it should be pointed out that actual samples collected and analyzed by the United States Geological Survey (USGS) exceed the drinking water standards. In the model, the long-term location of the I-129 is predicted to be found in the HI interbed. Part of the remedial action under Alternative 2B is to sample the SRPA at various depths to determine if there is significant I-129 contamination in the HI interbed and other vertical and horizontal locations. The Commentor is not correct in that the active remediation of the aquifer will cost $56.2M (1997 dollars). This cost estimate includes the long-term monitoring of the SRPA that will be required regardless of whether the HI interbed is extensively contaminated or not. The active remediation portion of the cost estimate amounts to $28.2M which includes the installation of extraction wells, treatment facility, treatability studies, and associated costs. Under OU 3-13, remediation of the SRPA within the INTEC fenceline, including the area near the injection well, was not evaluated or analyzed. A final evaluation along with decision on the SRPA, including the area near the injection well, will be conducted under the Tank Farm RI/FS (OU 3-14). In addition, other alternatives including treatments will be evaluated and analyzed for the SRPA in the OU 3-14 RI/FS. It is true that the only treatment options discussed in the Proposed Plan was the pump and treat technology. However, it should be pointed out that other technologies were considered and eliminated from further consideration in the beginning of the FS Report. During the development of the FS and FSS Report, discussions concerning a Technical Impracticability (TI) waiver were held. Ion exchange is not the only physical/chemical treatment option available. Given the small flow rates expected, evaporation of the pumped water and management of the residual sludges on-site is also a viable option. We will perform treatability studies prior to implementing the contingent remedy. If it is determined that the remedy cannot be implemented, a TI waiver for the INTEC SRPA groundwater plume, will be pursued.

Comment 255 : A Commentor stated that of the 39 aquifer well sampling results (from 1995) presented in the RI/FS, only 4 wells had concentrations greater than the detection limit. Also, none of them were statistically above the legal MCL of 1 pCi/L. [JM-W]

Response: The Commentor is not correct. Data obtained in 1995 for I-129 is not useable in that the detection limit was not low enough to determine if I-129 exceeded a concentration of 1 pCi/L. For evaluation and the decision process, the USGS analytical data for I-129 from 1990-1991 were used. In the USGS data, 10 wells exceeded a concentration of 1 pCi/L for I-129. It should be noted that these are open interval monitoring wells. In the computer modeling, the aquifer was modeled as discrete layers. As such, mixing during sampling was not taken into account to determine risk levels.

Comment 256 : A Commentor stated that because the interbed sediment permeabilities are relatively low, a receptor would not pump water from the interbed. Therefore, if the I-129 is in fact trapped in the low permeability sediments, no receptor will drink the water. If the natural water filter exists and is operating as simulated in the computer model, it is good for the Snake River Plain water quality. [JM-W]

Response: It is recognized that removal of water from the interbed area would be problematic. If high levels of contamination occur in the interbed, remediation may be required. However, extraction of contaminated water from the highly contaminated zone would need to be at a sustainable rate of at least 0.5 gpm, for future use.

Comment 257 : A Commentor stated that if the I-129 is not trapped in the sediments, then the model hypotheses are incorrect. If I-129 is not trapped in the interbed, and the a computer model would predict that I-129 concentrations are significantly lower than the current models predicted peak concentrations. Under this scenario, I-129 concentrations would probably not be predicted to be above the MCL of 1 pCi/L in year 2095. [JM-W]

Response: If high levels of I-129 are not found in the interbed, or other low permeability material, the contingency would not need to be implemented as the aquifer would be restored to drinking water standards (MCLs) prior to 2095 by natural attenuation.

Comment 258 : A Commentor stated that the predicted I-129 peak concentrations in year 2095 corresponded to a 2 in 100,000 risk level (see Table 1, page 18 of the Proposed Plan) which is significantly below the risk based action level of 1 in 10,000. The 2 in 100,000 risk level is a very conservative estimate because it assumes the future receptor will pump from the relatively low permeability (high I-129 concentration) interbed rather than the high permeability (low I-129 concentration) basalt. Therefore, this contingent remediation plan is not risk based but rather MCL based on water that, in all probability, would not be pumped from the aquifer. [JM-W]

Response: An acceptable risk level of 1 in 10,000 includes all the contaminants of concern (total carcinogenic risk). In addition to carcinogenic risk, state and federal drinking water standards (MCLs) must be achieved so that the water can be consumed. Both of these standards must be met. The SRPA is required to be restored to the drinking water standards (MCLs) by 2095.

Comment 259 : A Commentor stated that based on the information presented in the supporting reports, I-129 does not appear to be a groundwater COC and the contingent remediation proposed for Group 5 SRPA is not needed. [JM-W]

Response: The SRPA is required to be restored to the drinking water standards (maximum contaminant levels: MCLs) by 2095. The MCL for radionuclides like I-129 is 4 mRem/yr is the standard for total (beta) and (gamma) emitting radionuclides. The major contaminants in the SRPA are considered as COCs and include I-129 and Sr-90.

Comment 260 : A Commentor stated that at Page 15 of the Proposed Plan, under "Snake River Plain Aquifer", mercury is listed as a COC, both prior to and after 2095. Based on the mercury modeling results comparison with the field data (shown in the Chapter 7 of Appendix F in the RI) the RI model significantly over predicts the mercury concentrations. Of the 36 wells presented, sampling results for only three wells showed mercury concentrations above the detection limit (0.1 ug/L). Of the three, only one is clearly above 0.1 ug/L (based on the reporting uncertainty). The RI/FS model shows concentrations as high as 8 ug/L, but there is no data to support this, indicating that the model significantly over predicts current mercury concentrations. [JM-W]

Response: The computer modeling predictions, when compared against the measured values generally are under-predictions not over predictions. The highest levels of mercury predicted occur in the vicinity of the injection well. There are no sampling locations near the closed injection well to measure the concentrations against and compare against the predictions.

Comment 261 : A Commentor stated that at Page 15, under "Snake River Plain Aquifer," of the Proposed Plan, chromium is listed as a COC prior to 2095. As discussed in the RI, chromium is a TRA contaminant which modeling shows could mingle with the INTEC contaminant plumes downgradient from INTEC. Therefore, chromium is not an INTEC contaminant of concern and should not be listed as such. [JM-W]

Response: The Commentor is correct. Chromium is a COC for the TRA groundwater plume. Chromium was included and shown in the OU 3-13 evaluation for completeness (cumulative impacts) of aquifer risk. Post 2095 chromium is not a concern at INTEC. As such, restoration of the aquifer is not needed for chromium.

Comment 262 : A Commentor remarked that RCRA listed waste entered the aquifer through injection well discharges. [C-W]

Response: RCRA hazardous constituents are known to have been injected down the well. The issue that hazardous wastes were injected is not determined in the remedial investigation. If further information results in changed information, the changed information will be evaluated and appropriate changes will be made to the remedies.

Comment 263 : A Commentor asked how far downgradient will production wells be protected and what contaminant(s) are these wells threatened by? [C-W]

Response: Restoration of the SRPA, under this ROD, will deal with the contaminated groundwater outside of the INTEC fenceline as an interim action. The area in the SRPA exceeding either the safe drinking water standards (MCLs) or risk based concentrations from INTEC releases will be remediated to acceptable levels. Currently, the area of concern in the SRPA extends from INTEC to north of CFA. For this contaminated area, the COCs are generally Sr-90 and I-129.

C.5.2. Group 5 Alternatives

Comment 264 : A Commentor stated that the Snake River Plain Aquifer (Group 5) should be remediated with a pump and treat (Alternative 3) for the same reasons the perched water should be removed and treated. [CB-W]

Response: The preferred remedy for the SRPA that was presented in the Proposed Plan is protective and will result in extraction and above-ground treatment, as necessary, to achieve aquifer usability within 100 years. There are some significant differences between the preferred Alternative 2B and Alternative 3. In the case of Alternative 2B, contamination would be removed, if necessary, from the areas within the SRPA which would not be restored to drinking water standards or risk-based levels without active remediation. For Alternative 3, contamination would be removed, if necessary, across the entire contaminated region of the SRPA. The timeframe for both alternatives to restore the SRPA is the same (year 2095). For the SRPA, Alternative 2B is the most cost-effective alternative, while reducing the risk to acceptable levels, evaluated. Based on this we concluded that Alternative 2B (Institutional Controls with Monitoring and Contingent Remediation) best satisfied the evaluation criteria.

Comment 265 : A Commentor questioned the Proposed Plan's conclusion that treatment of contaminated groundwater is not cost-effective if the assumption were tested against future water value projections. [L-W]

Response: The selected alternatives for the perched groundwater and SRPA will meet RAO's and insure that the SRPA is protected for future generations. The question of cost-effectiveness relates to the time versus cost for additional measures to remove contaminants from the SRPA and perched groundwater.

Comment 266 : A Commentor stated that Alternative 2B for the SRPA includes provisions for pumping groundwater from a low permeability layer. However, pumping water from low permeability layers when those layers are surrounded by higher permeability layers is not feasible. The Commentor recommended that the Agencies select Alternative 2A. [CC-W]

Response: Alternative 2B does have a contingent active remediation component for the portion of the SRPA sufficiently contaminated that active remediation may be necessary to restore the aquifer to drinking water standard at the end of the restoration timeframe (i.e., 2095). Based on the groundwater modeling that was conducted in support of both the RI/BRA and FS Reports, the long-term contamination in the aquifer is in the low permeability zone surrounded by higher permeability zones. This does present a challenge in the extraction of the contaminated porewater. Removal of the contaminated porewater will not be easy. However, the trigger level (monitoring criteria) has a concentration value 11 pCi/L in 2000) with a specified rate of extraction of at least 0.5 gpm continuous. Extraction of 0.5 gpm from the low permeability zone within a well is not highly probable. As a result, water for the high permeability zones will be bled into the extraction area of the monitoring well to allow for an extraction rate of 0.5 gpm. The mixed water would then be used to demonstrate whether active remediation would be required. The purpose of the aquifer restoration is not to restore it to *pristine conditions*, but to restore the aquifer to acceptable levels (drinking water standards; MCLs). With the bleeding of the high permeability zones water into the low permeability zone water, it is feasible to extract 0.5 gpm to determined compliance with the monitoring levels.

Comment 267 : A Commentor asked how long monitoring will be maintained? [SRA-W]

Response: Monitoring of the SRPA will be performed until the Agencies determine that there is no longer a risk that the MCLs will be exceeded after 2095. This will be evaluated during the 5-year reviews.

Comment 268 : A Commentor stated that it didn't look as if there was an implementable treatment technology if the groundwater has to be cleaned and asked what efforts were going forward throughout the DOE complex to address this lack? [SRA-W]

Response: No treatability studies have been conducted to determine the cost and performance data for treating low level I-129 contaminated groundwater. If extraction and treatment is necessary, via ion exchange, we will perform these necessary studies to determine a cost-effective solution to treating the groundwater. If we choose to go forward with evaporation and residuals management, this approach should not present a technical impracticability concern, especially given the small flow rates anticipated.

Comment 269 : A Commentor asked several questions concerning the preferred alternative and I-129 cleanup. A concern was that the peak I-129 concentrations in the aquifer are predicted (in the computer model) to still be relatively high in year 2095, trapped in interbed sediments (a natural water filter) with permeabilities far lower than the surrounding basalt aquifer. The Proposed Plan does not say whether or not the interbed will be the sole focus of this monitoring plan. [JM-W]

Response: Modeling predicted that the long-term levels of I-129 above the MCL would be found in the sedimentary interbed in the aquifer, because this material impedes the flow of contaminated groundwater relative to flow in the bedrock fractures. Monitoring wells will be sampled during construction to determine the zone or zones of highest contaminant concentrations. The zone or zones with the highest concentrations will be monitored long-term to determine remedy effectiveness. It should be noted that a sustainable extraction rate of at least 0.5 gpm will be used for determining if the contamination exceeds the action levels.

Comment 270 : A Commentor asked the Agencies to not put this I-129 based aquifer contingent remediation plan into a record of decision (ROD) that could force: (1) current decision makers to spend money drilling wells and placing well screens in the aquifer in low permeability zones that will be useless for monitoring contaminant migration from the INTEC facility. Monitoring wells should be screened at depths that will likely be used by future residents so that useful data can be collected to support computer model calibration and reliable predictions of future contaminant concentrations; and (2) future decision makers to spend money on very likely ineffective and unnecessary treatability studies and possibly an I-129 remediation project. [JM-W]

Response: Monitoring under this ROD is to determine remedy effectiveness, not investigative information for future uses. Future users may screen their well within any water bearing zone in the SRPA. The monitoring will be conducted in the highest contamination zone(s) whether the contamination occurs in the basalt or interbed layers at a sustainable extraction rate of at least 0.5 gpm, which could be used by a future resident. The treatability studies and subsequent aquifer remediation only will be implemented if the concentrations in the highest zone exceed the action levels at a sustainable extraction rate of at least 0.5 gpm and the extent of the hot spot is sufficient in areal extent to warrant removal.

Comment 271 : A Commentor requested that the Agencies put into the ROD that monitoring of I-129 is needed to confirm that it is not a COC. The Commentor believed that the detection of relatively high I-129 concentrations in the aquifer will negate the hypotheses upon which the current computer model is based and require that the I-129 source and its transport in the subsurface be reevaluated in light of the new information. The Commentor stated that new predictions will have to be made at that time to estimated the I-129 concentrations expected after year 2095 and that Aquifer remediation decisions should be based on the results of this future analysis. [JM-W]

Response: The Commentor is discussing I-129 as a COC in source areas at OU 3-13. The source of the I-129 in the aquifer is that it was disposed of directly into the aquifer using the injection well. Impacts of the I-129 from surface and subsurface releases are not significantly adding to the I-129 plume and long-term aquifer impacts. Refinement of the aquifer COCs within the INTEC fence line from source areas like the Tank Farm soils and associated risks will be conducted under OU 3-14.

Comment 272 : The INEEL CAB recommended that the DOE continue its efforts to find viable and effective remediation alternatives before implementing "pump and treat" strategies for the aquifer contamination. [CAB-W]

Response: Pump and treat is an effective technology for ground water cleanup in this case, where the COC's are highly soluble and attenuate only slightly on the aquifer sediments, which is the case for I-129. Pump and treat technologies are less effective when working with non-aqueous wastes or highly attenuated constituents like Cs-137.

Comment 273 : The INEEL CAB Board stated that it understood that extraction of groundwater (from the zone of influence in the SRPA) will take place only if contaminant levels are found to exceed trigger levels. But they doubted that the "pump and treat" approach would be effective under the circumstances that exist at WAG 3, and encouraged the Agencies to continue their efforts to identify other viable alternatives. The costs associated with pump and treat strategies jeopardize other valuable programs. [CAB-W]

Response: Modeling predicts that the long-term levels of I-129 above the MCL will be found in the sedimentary interbed in the aquifer, because this material impedes the flow of contaminated groundwater relative to flow in the bedrock fractures. The zone or zones with the highest concentrations will be monitored long-term to determine if remedial action is warranted. If so, then a pump and treat approach will be taken to remove sufficient contaminated groundwater to achieve aquifer restoration by the year 2095. It should be noted that only zones capable of sustaining an extraction rate of at least 0.5 gpm will be pumped as these are the zones that could be used in the future for providing drinking water. As I-129 is highly soluble in groundwater and attenuates only slightly on the aquifer sediments, extraction of ground water will also result in the removal of the I-129 hot spots. We appreciate the concerns that the CAB has regarding other uses of pump and treat technologies. It is correct that they are less effective when working with non-aqueous wastes or with highly attenuating constituents (e.g., Cs-137).

C.6. Group 6: Buried Gas Cylinders

Comment 274 : A Commentor asked that the mechanisms which will cause "over-pressurization" in the buried cylinders be explained as the cylinders are buried and experience very small changes in temperature. Further the Commentor asked that if "over-pressurization" cannot occur, the Agencies needed to identify the imminent safety hazard associated with this site. [C-W]

Response: We apologize for our poor choice of words. Over-pressurization is not the best term we could have used to describe the problems at these sites. Corrosion of the cylinders will result in the cylinders not being able to maintain or handle the internal pressure. As a result, the cylinders will then leak their contents into the environment. In the case of Site CPP-84, the cylinders are currently buried, but have been uncovered by past flooding conditions. Site CPP-94 cylinders are not completely buried. The major safety hazard associated with these sites is the **unintentional** disturbance and possible acute impacts.

Comment 275 : A Commentor stated that regarding the Buried Gas Cylinder Sites, the description in no way confirmed any potential for release of contaminants that pose a risk to human or ecological species health and questioned why is this site in this Proposed Plan? [U-W]

Response: The typical CERCLA risk from these sites is following the release of the cylinders contents. As these sites represent a "threat of release" to the environment, these sites were added to the FFA/CO. Currently, there are no existing INEEL programs, other than CERCLA, for dealing with these cylinders. The major safety pathway for the cylinders is from disturbing the cylinders without adequate safety controls. The disturbance, intentional or accidental, will be an acute hazard. These cylinders are not likely to explode or over-pressurize, but these are possible scenarios. Neither scenario is considered an imminent event.

C.6.1. Group 6 Description

Comment 276 : A Commentor asked the Agencies to note that the acetylene cylinders may contain liquid acetone used to dissolve the acetylene gas and stated that based on the site description, the site is not well characterized and risk to human health and the environment had not been determined. The Commentor suggested that this be done prior to conducting a remedial action. [C-W]

Response: We, unfortunately must disagree with the Commentor. The analysis and evaluation conducted on the Buried Gas Cylinder sites (Group 6) was based on the information available to us. The general characteristics of the material (waste) contained in the cylinders is known. The risks from these sites is not a traditional CERCLA risk (chronic exposure), but more like that risk posed by unexploded ordnance (acute risk). This acute risk will occur from disturbing the buried gas cylinders. Further characterization involves the removal of the cylinders and proper disposal, which requires characterization, which is what the remedial action calls for.

Comment 277 : A Commentor asked the Agencies to note that if HF is in the cylinders then it is a RCRA listed waste. [C-W]

Response: The Commentor is correct that HF can be a listed hazardous waste. Treatment will be utilized to render the HF nonhazardous in compliance with ARARs.

C.6.2. Group 6 Alternatives

Comment 278 : A Commentor stated that at Page 40, Alternative 2, of the Proposed Plan it states that the alternative will also include initial site characterization and questioned why characterization was being performed after the ROD rather than during the RI/FS. [C-W]

Response: The analysis and evaluation conducted on the Buried Gas Cylinder sites (Group 6) was based on the information available to us. The general characteristics of the material (waste) contained in the cylinders is known. The risks from these sites is not a traditional CERCLA risk (chronic exposure), but more like that risk posed by unexploded ordnance (acute risk). This acute risk will occur from disturbing the buried gas cylinders. Further characterization involves the removal of the cylinders and proper disposal, which requires characterization, which is what the remedial action calls for. The sites have been sufficiently characterized to develop remedial action alternatives. The characterization activities described under the alternative are necessary to implement the remedy, not characterize the site for risk assessment purposes.

Comment 279 : A Commentor remarked that there was no doubt in his my mind that Alternative 2, dig it up and do the right thing, is still the only thing that should be done. [DK-TT]

Response: We thank the Commentor. The best and most cost effective alternative for Group 6 is the preferred alternative (Alternative 2: removal, treatment and disposal).

C.7. Group 7: SFE-20 Hot Waste Tank System

Comment 280 : A Commentor stated that the Proposed Plan had a conflicting statement concerning when SFE-20 Hot Waste Tank System was taken out of service. [C-W]

Response: We are sorry for the confusion. The tank system was removed from service in 1976. The 1977 date shown in the Proposed Plan was a typographical error.

C.7.1. Group 7 Description

Comment 281 : A Commentor questioned the risk basis for taking action on the SFE-20 Hot Waste Tank System since there was no exposure pathway as the tank is contained within a vault, and the "'risk of release" is certainly small. [C-W]

Response: The SFE-20 Hot Waste Tank System is listed as a release site on the FFA/CO. The tank contents represent a threat of release to the environment, which is within the purview of CERCLA. The tank contents will eventually leak out of the tank and into the tank vault. During the 1984 investigation, there was evidence that water had infiltrated into the vault, which shows that water which leaked into the vault could also leak out of the vault. Soils beneath the SFE-20 Hot Waste Tank System are considered part of the release site and will be dealt with as part of the remedial action. Further, detailed, characterization of the tank contents is the first activity in the selected remedy (Alternative 4:Removal, Treatment, and Disposal). Based on the available information and analysis conducted, there is sufficient information to select a remedy under CERCLA for this site.

Comment 282 : A Commentor stated that the SFE-20 tank had not been shown to be a release site, or that of an imminent release. The Commentor thought that the tank held hazardous waste and should have been placed on the RCRA Part A application or addressed under the D&D program. [C-W]

Response: The SFE-20 tank and associated structure are a source term that threatens the environment, the SRPA in particular. Since the tank was abandoned prior to the effective date of RCRA application to mixed wastes, the SFE-20 Hot Waste Tank System is listed as a release site on the FFA/CO. The tank contents will eventually leak out of the tank and into the tank vault. Based on the available information and analysis conducted, there is sufficient information to select a remedy under CERCLA for this site. The tank contents are not known to have listed waste constituents, but there may be characteristic concentrations of other hazardous constituents.

C.7.2. Group 7 Alternatives

Comment 283 : A Commentor stated, "Once again, DOE fails to correctly classify the waste in SFE-20 tank in a blatant attempt to circumvent regulatory requirements. The RI/FS sample data of the tank, (see table below) shows clearly that the tank contents (liquid and sludge) as well as the tank concrete vault contents meet the definition of mixed transuranic (TRU) waste, and by regulatory definition, it must go to a deep geologic repository. Grouting (mixing with cement) as proposed by DOE, is a thoroughly discredited disposal method B tried and failed at Hanford." [CB-W]

Response: Preliminary information supports that concentrations of TRU may be high enough to require disposal of the Tank's contents at WIPP. However, due to the radiological hazards and access restrictions, we have not completed characterization of this tank, which will be required even if we elected to leave the tank in place. Under evaluation of alternatives, we concluded that Alternative 4

(Removal, Treatment, and Disposal), which includes characterization activities, best satisfies the evaluation criteria. The Tank and tank contents will be disposed of in compliance with ARARs.

Comment 284 : One Commentor strongly disagreed with our recommendation to remove VES-SFE-20 in its entirety. Several reasons were given which are answered separately herein. [TW-W]

Response: The Commentor expresses concern over the accuracy of our cost estimates and the consistency of our decisions. We appreciate the time and effort taken by the Commentor in supporting his position and have responded directly to each of the specific concerns stated.

Comment 285 : A Commentor stated that the concept of clean closure VES-SFE-20 did not make sense for the simple reason that it is only a few yards from CPP-603, which may very well be left in place. "Why spend $4.6M to totally remove VES-SFE-20 when a much larger facility is being left in place? The contamination levels in VES-SFE-20 are minor compared to CPP-603, and any groundwater effects from the VES-SFE-20 facility will be negligible, especially is the liquids are removed. Grouting and leaving the VES-SFE-20 building will provide more than adequate protection and permanence." [TW-W]

Response: Preliminary information supports that concentrations of TRU may be high enough to require disposal of the Tank's contents at WIPP. Due to the radiological hazards and access controls, we have not completed characterization of this tank, which will be required even if we elected to leave the tank in place. Successful grouting will also require perpetual long term monitoring and maintenance. For the SFE-20 Hot Waste Tank System, complete removal, treatment, and disposal is the most cost effective and risk reducing option evaluated. In addition, it is significantly less costly to completely remove the facility and waste than to close the facility in place with continued institutional controls and monitoring. Based on this we concluded that Alternative 4 (Removal, Treatment, and Disposal), best satisfied the evaluation criteria.

Comment 286 : A Commentor stated that the capital costs did not make sense for Group 7, questioning how could the Agencies show capital costs of $5M for Alternative 2, which is essentially filling with grout and covering with dirt, and $4.8M for Alternative 3, which consists of removing the tank liquid contents and then filling with grout? It seemed to the Commentor that Alternative 2 should be less than Alternative 3 since it did not include the costs for removal of the liquids. [TW-W]

Response: In the case of Alternative 2, the facility will be filled with grout and an engineered containment structure (cap), consisting of multiple layers constructed over the area. This engineered containment structure will be designed and constructed for long-term (+1,000 year) protection. Although a small earthen barrier would be relatively cheap, it would not be an ARAR-compliant engineered barrier designed to protect against future releases to the underlying aquifer. The difference in cost between the alternatives is due to cap design and construction. For Alternative 3, the liquid will be removed prior to grouting and no engineered containment structure will be required. However, both of these alternatives will still require long-term institutional controls and surveillance and maintenance activities.

Comment 287 : A Commentor asked why the cost for Alternative 4, which includes removal of the liquid and then total removal of the entire building, ($4.6M) is less than Alternative 3, which does not involve removal of the building? The Commentor further asked if Alternative 4 included any costs for handling/burial of the contaminated materials? [TW-W]

Response: A cost estimate breakdown is provided in Appendix A of the FSS Report. This document is referenced in the Proposed Plan and available for inspection as part of the Administrative Record. The costs for removal and disposal of the facility and associated structures for the SFE-20 Hot Waste Tank System were include in the cost estimate for Alternative 4. Alternative 4 involves the complete removal and treatment of the SFE-20 Hot Waste Tank System, so no long-term surveillance and monitoring will be required. For Alternative 3, with waste being left in place, long-term surveillance and monitoring is required.

Comment 288 : Concerning Page 43, Alternative 4, of the Proposed Plan, a Commentor asked what types of treatment will the debris (steel and concrete) be subject to and if the treatment would be conducted on site? [C-W]

Response: Treatment may be necessary to meet the ICDF acceptance criteria for the emptied tank and structure. The treatment (stabilization, solidification, or sizing), if necessary, will be conducted within the WAG 3 AOC, which is on-site.

Comment 289 : A Commentor asked, "What are the levels of alpha contamination in this waste; the debris? Will these alpha levels be acceptable at the ICDF; at Envirocare? The Commentor went on to say that if the tank was left in the Proposed Plan, then the Agencies needed to be much more specific about what will be done with the waste. [C-W]

Response: Sampling of the sludge in the tank has shown TRU constituent concentrations exceeding 90 nCi/g. The concentrations of the contaminants in the debris are considerably lower. Some debris materials from this site may be acceptable for disposal at ICDF. The concentration of contaminants for this material are probably higher that the acceptance criteria for Envirocare without treatment (very high (gamma) radiation field). The ICDF will accept <10nCi/g TRU wastes. Depending upon the contaminant levels, in the removed wastes, pre-treatment may be required prior to disposal either on or off-site.

Comment 290 : A Commentor was supportive of the proposal to dig up, dispose of the tank, dispose of the contents of the tank and the sludge and asked what the time schedule was on that [DK-TT]

Response: Concerning the time schedule for implementation of the alternative, we have not developed our scope of work for implementing the preferred alternatives identified in the Proposed Plan, instead concentrating on preparing the ROD and this Responsiveness Summary. However, a rough guess would suggest completion of the alternative by the year 2008.

Comment 291 : One Commentor liked the removal option because it's was kind of a prototype or a pilot of what can be done with the Tank Farm. [DK-TT]

Response: The decision of the waste within the tanks at the Tank Farm will be evaluated by the Idaho HLW & FD EIS. The actual closure activities will be conducted in compliance with an approved HWMA/RCRA closure plan for the tank and associated system. The information gained from the Group 7 remediation will be used during the closure of the Tank Farm tanks where possible. The disposition of the soils within the Tank Farm area will be determined under the Tank Farm RI/FS (OU 3-14).

D. OTHER ISSUES

D.1. Tank Farm

Comment 292 : A Commentor was concerned that an environmental impact statement be prepared on the Tank Farm, as it is the major contamination source on all of INEEL. [DK-TT]

Response: It is recognized that the largest amount of contamination at INTEC occurs in the Tank Farm area. The ultimate disposition of the waste in the INTEC Tank Farm tanks is being evaluated in the Idaho HLW & FD EIS. In addition, this EIS is evaluating the disposition of the tanks within the INTEC Tank Farm. Evaluation of the soils surrounding the INTEC Tank Farm is being further investigated and evaluated under the OU 3-14 RI/FS project. With CERCLA being functionally equivalent to NEPA, the RI/FS will meet the needs of an EIS under NEPA and no EIS process will be conducted for the Tank Farm soils. Several remedial action alternatives for dealing with the soil will be evaluated under the OU 3-14 RI/FS. Concerning the schedule, the INTEC Tank Farm is an active facility and implementation of the final action will need to be conducted following the closure activities. Prior to the final disposition of the INTEC Tank Farm area, actions may be taken to reduce the impacts on human health and the environment. These actions will be continued until the final actions are completed on the INTEC Tank Farm area.

D.2. Decontamination, Decommissioning, and Dismantlement

Comment 293 : A Commentor inquired if implosion-in-place was a likely alternative for some of the more contaminated buildings at the Chem Plant and though that although, residual risk "belongs" to D&D rather then ER, it was appropriate to discuss it in the Proposed Plan. [SRA-W]

Response: Evaluation of alternatives for the disposition of facilities at INTEC is not part of the OU 3-13 project. The disposition of certain INTEC facilities is, however, being evaluated under the Idaho HLW & FD EIS. Implosion or grouting in place is an alternative being evaluated. The intent of the OU 3-13 project is to reduce the risk to the environment at INTEC to acceptable levels. The residual risk from the INTEC facilities closed in place will need to be factored into the cumulative risk and the cumulative risk will need to be maintained at an acceptable level.

Comment 294 : A Commentor asked what the schedule was for transfer to EM-60 of facilities whose missions have ended (e.g., ICPP 601)? [SRA-W]

Response: When the mission for a facility at INEEL has ended and no future mission is identified, the facility ownership is transferred to the EM-60 organization for facility deactivation, as the Commentor stated. Following the deactivation activities, ownership of the facility is transferred to the EM-40 organization for final disposition (dismantlement). Occasionally, the EM-60 conducts activities on a facility to include the final disposition. For example, the CPP-601 facility is currently under EM-60 ownership.

Comment 295 : A Commentor was concerned that the Agencies stated that the selected alternative [for Group 2 soils] is consistent with expected D&D activities. Since when is this a requirement of CERCLA? Do the Agencies expect these D&D activities to be conducted as part of CERCLA? If so, what are the decision documents the public should expect to review, prior to these activities? [C-W]

Response: Closure of the facilities at INTEC will be designed and implemented to remain protective of human health and environment, in particular the SRPA. As the remediation of the SRPA is being conducted under CERCLA, impact to the aquifer need to be coordinated with the CERCLA Program. Aspect or parts of INTEC facility closures may end up being within future CERCLA projects. If activities for INTEC facility closures are conducted under CERCLA, the appropriate documents will be developed and public participation activities will be conducted.

D.3. Pit 9

Comment 296 : A Commentor was concerned that risk calculations were not performed to compare the risks between below ground disposal and above ground storage. As an example, the Pit 9 ROD, was cited where the Agencies admitted in writing that they had never done them. [PR-TT]

Response: Issues dealing with Pit 9 are not within the scope of this project. However, concerning storage of waste above ground, the waste being considered for the ICDF is a large volume with relatively low concentrations. The wastes would need to be containerized resulting in a very large facility to store them. For example, the Group 3 soils alone would represent over 300,000 55-gal drums or over 17,000 - 8ft x 4ft x 4ft boxes. In addition, the waste will have to monitored periodically. Both of these operation will increase the amount of exposure that workers will receive. In addition, there will be an increase in the amount of exposure that the public could be exposed to. With containment above ground the containers will be required not to leak any material and this will require periodic repackaging. Based on these issues, containment in an above ground facility does not make since from either a risk or economical standpoint.

Comment 297 : A Commentor questioned the Agencies' assertion that storage above ground is more dangerous than disposal below and compared the issue to work at Pit 9. [PR-TT]

Response: Issues dealing with Pit 9 are not within the scope of this project. Wastes stored above ground has to be packaged and monitored periodically. Both of these operation will increase the amount of exposure that workers will receive and potentially the public. For disposal below ground, in an engineered facility, there is only one probable exposure route (contaminated groundwater ingestion). The disposal cells at ICDF will be designed, constructed, operated, and closed with protection of the SRPA as a primary objective.

D.4. Other Disposal Facilities

Comment 298 : A Commentor was concerned that previous "cleanup" actions were just consolidation of mixed LLW into old waste percolation ponds and covering it over. The unlined Warm Waste Percolation Pond at the INEEL Test Reactor Area, Test Area North, and Argonne-West are examples of this practice. The Commentor further stated that the RCRA Subtitle C landfills have double liners, leachate detection/collection systems, and impermeable caps. Further, the Commentor stated that the Nuclear Regulatory Commission restrictions prohibit citing radioactive waste disposal dumps on 100 year flood plains. [NRC 10 CFR ss 61.50] [CB-W]

Response: Much of what the Commentor says we support. However, the Commentor is incorrect concerning the classification of wastes disposed of in the Warm Waste Pond that was used to consolidate non-RCRA radioactive waste. The Commentor may be confusing the Warm Waste Pond with the Chemical Waste Pond, which did receive RCRA wastes and will be closed in accordance with the applicable RCRA closure requirements. On another point, no remedial action has been taken at the ANL-W pond, and the pond is subject to RCRA closure, outside the scope of this action, so we are uncertain as to what the Commentor was referring to. Concerning the Test Area North (TAN), RCRA hazardous waste disposal did occur into an old injection well, directly into the aquifer. Remediation, under the OU 1-07B ROD, is underway to restore the aquifer to drinking water quality. Lastly, the Nuclear Regulatory Commission (NRC) regulations are not ARARs for DOE projects, but construction of new disposal sites are subject to the 100 year floodplain criteria, and this is an ICDF design requirement.

D.4.1. Radioactive Waste Management Complex (RWMC)

Comment 299 : A Commentor asked that the Agencies consider the issue of using the existing radioactive waste management complex, which does currently dispose of low-level radioactive waste in a facility on site. The Commentor supported closing the RWMC facility as soon as possible. [SR-TB]

Response: The operation and management of the RWMC is outside the scope of this project. Further, the RWMC does not have sufficient capacity to dispose of the soil and debris considered for the ICDF. In addition, the RWMC is over SRPA and not an engineered facility designed to accept and dispose of waste with both radionuclide and non-radionuclide constituents, as the ICDF will be. Since a considerable amount to the waste proposed for the ICDF contains both radionuclide and non-radionuclide constituents, the RWMC facility would be unsuitable for the disposal of MLLW.

D.5. Idaho High Level Waste and Facilities Disposition Environmental Impact Statement (Idaho HLW & FD EIS)

Comment 300 : A Commentor stated that it was their understanding that the HLW stabilization EIS will "cover" decontamination and decommissioning of the ICPP buildings and asked if it will include a timeline? And if yes, how will it relate to 2045, when, according to the plan, operations will end at the Chem Plant? [SRA-W]

Response: The Idaho HLW & FD EIS will evaluate various scenarios for the disposition of INTEC facilities dealing with the generation, treatment, storage, and disposal of HLW. In the evaluation of the disposition alternatives, the expected implementation time frames are also evaluated in the Idaho HLW & FD EIS. As the HLW at INTEC is required to be "road ready" by 2035, it was assumed that all treatment of the HLW was completed by 2035. A period of 10 years was assumed to be needed for the disposition of the necessary INTEC facilities, which results in the year 2045. Depending on the decisions made for the Idaho HLW & FD EIS, the timeframes for the disposition of INTEC facilities could change.

Comment 301 : A Commentor stated that it was appropriate that at least a brief discussion of the alternatives for HLW stabilization appear in the Proposed Plan. [SRA-W]

Response: Discussion of alternatives being considered under the Idaho HLW & FD EIS are outside the scope and not evaluated in the OU 3-13 - RI/FS. As such, no discussion of the Idaho HLW & FD EIS alternatives is included in the Proposed Plan or ROD.

Comment 302 : A Commentor asked, "Will the EIS deal with the New Waste Calciner? Where does the Calciner fit in?" [DK-TT]

Response: Treatment of the liquid waste at INTEC contained in the Tank Farm is not within the scope of this project, but is covered under the state HWMA/RCRA program and the Governor's Agreement. High level wastes have previously been treated with the New Waste Calcining Facility (NWCF). The Idaho HLW & FD EIS is currently evaluating alternatives to deal with the liquid waste in the High Level Waste Tank Farm.

Comment 303 : The INEEL CAB inquired whether under the preferred alternative for contaminated perched water under WAG 3, the existing percolation ponds will be removed from service and replaced with "like for like" replacement ponds or service water discharge to the Big Lost River. The INEEL CAB recommended that additional feasibility studies be conducted before determining how to proceed with replacement. [CAB-W]

Response: The current discharges to the existing percolation ponds are contributing to the migration of contamination through the vadose zone. In evaluating alternatives to deal with this impact, the OU 3-13 FS and FSS Reports considered eliminating the existing percolation ponds and replacing them with a similar facility. The major emphasis of the ROD is to eliminate the current discharge contributing to the perched ground water and mobilizing contaminants into the SRPA. A new set of percolation ponds is the simplest and fastest way to cease the discharge and minimize the impacts on the SRPA. We also support the concept of looking at alternatives to like-for-like replacement. We hope that ways can be found to reduce water usage at INTEC, prior to the construction of the replacement ponds. However, we cannot stop the use of the existing ponds without establishing a known and reliable alternative to managing the 2 MGD wastewater.

Comment 304 : The INEEL CAB stated that in order to fairly assess the feasibility of replacements to the percolation ponds, the Agencies should more fully characterize the wastewater that currently goes into the percolation ponds and develop estimates of volumes and chemical composition for wastewater that will need to be managed once the existing ponds are taken out of service. The INEEL CAB recommend that recycling of water be maximized and encourage the treatment of residual wastewater to reduce risks. [CAB-W]

Response: We agree that there are gaps in the data characterizing the discharges of service waste at INTEC to the percolation ponds. To resolve this issue, a sampling program has been initiated to collect the necessary samples and adequately characterize the waste. This information will be used determine treatment requirements on the discharge. Resulting from these sampling and analysis activities will be the chemical (radionuclide and nonradionuclide) composition and estimated volumes of service waste discharged. An evaluation of potential disposal methods was conducted and is in the Administrative Record. The result of this evaluation was the decision to select replacement percolation ponds for dealing with the service wastewater. The criteria for discharge into the new replacement percolation ponds will limit the impacts of contamination on the environment.

D.6. Unconfirmed Information at INTEC

Comment 305 : A former ICPP workers recalled stacking sandbags six feet high around the plant during a spring flood about ten years ago. [CB-W]

Response: The Commentor is evidently referring to a flood threat near the INTEC "about 10 years ago." While no flooding threat has occurred at the facility in the last 10 years, it will seem that the events referred to by the Commentor are the flood threats during 1983-1984, or 1957-1958. As a result of these flood threats, DOE took action to mitigate the flooding potential. Following the 1957-1958 flood threat, the diversion dam near the RWMC was constructed. After the 1983-1984 flood threat, the diversion dam was raised. However, we are unaware of any actual flooding at INTEC approximately 10 years ago.

D.7. Mobility of Plutonium

Comment 306 : A Commentor inquired about the Nevada study on Plutonium migration and it's binding with clay. In the Nevada study, the Pu was bound to the clay and submicron particles floating in sediment in the water and was mobile, which is proof that it should not be buried. [PR-TT]

Response: We recognize that plutonium can migrate in the environment through soils and basalt. There are several mechanisms (ionic and colloidal) that control the migration of plutonium. Evaluation of the plutonium migration at INEEL uses conservative parameters. Also, the ICDF will be designed to minimize the generation of leachate, and restricted in the concentrations of hazardous substances like plutonium that it can receive, thus prevent the migration of contaminants like plutonium to the SRPA at concentrations that present an unacceptable risk.

D.8. Nuclear Energy

Comment 307 : A Commentor wanted the Agencies to get on with this reduction of risk to our unborn generations to follow. Stop promoting this risky energy source and military deterrent around the world. [RK-W]

Response: Cleanup activities at INEEL, including both the environmental restoration and waste management programs, are intended to reduce the risk to human health and the environment. There are current ongoing projects to reduce the risk from waste in storage and previous contamination. Implementation of this ROD will quantify and reduce the risk from various areas at INTEC to acceptable levels. The CERCLA actions are aimed at cleanup from past operations and do not promote energy or power generation from any source. Since part of the DOE's mission is the research and development of nuclear energy sources the cleanup activities must consider these kind of missions as part of cleanup responsibilities.

Comment 308 : A Commentor stated, "While I don't oppose foreign countries sending us the spent nuclear waste from peaceful use of the atom. It is only because it is the lesser of two evils. Let this waste be used by a mad man to build a nuclear bomb or try safe containment, that the INEEL has not been able to do." [RK-W]

Response: Some spent nuclear fuel from foreign nations is being received at INEEL for temporary storage. This foreign spent nuclear fuel will eventually be packaged for final disposition in an approved disposal facility. While there has been contamination as a result of operations (accidental and past waste management practices) at INTEC, the storage of spent nuclear fuel at the INEEL has been and will continue to be safe.

Comment 309 : A Commentor wanted help in getting the permanent repository for high-grade nuclear waste open. [RK-W]

Response: We believe that the Commentor is referring to the High Level Waste Repository. There are currently two permanent repositories being considered by the Department of Energy. The first repository will deal with TRU waste (waste containing transuranic constituents concentrations of 100 nCi/g or greater). This facility is referred to as the WIPP and is located near Carlsbad, New Mexico. The second repository will deal with commercial and DOE produced spent nuclear fuel and DOE produced HLW. The proposed facility is referred to as Yucca Mountain and is located in western Nevada. Progress is being made to open both of these facilities to accept the appropriate waste materials. The DOE is responsible for both repositories and is attempting to open both repositories as soon as possible.

D.9. Research and Development

Comment 310 : A Commentor wanted support for more research to support alternative renewable energy sources (i.e., solar voltaics, superconductivity at lower temps). [RK-W]

Response: It is recognized that research and development of technologies is needed for the future. There are efforts to bring new missions to the INEEL. The technologies that the Commentor is referred to may end up among the technologies undergoing further and future research and development at the INEEL.

D.10. Idaho Space Port

Comment 311 : A Commentor wanted DOE to aggressively pursue the Idaho Space Port location at INEEL. [RK-W]

Response: The INEEL is supporting the State of Idaho in pursuing a Space Port located at the INEEL. There are several other states also trying to secure the Space Port. Selection of the location of the Space Port will be determined in the future. The Space Port is a privatized venture and not specifically under the authority of the DOE.

D.11. INTEC Operations

Comment 312 : A Commentor believed that a systematic review of operations, including SNF and HEU throughout history and a mass balance review, is required to understand the status of the INTEC facility with adequate rigor to undertake the cleanup safely. If necessary, the DOE should prepare a classified appendix to cover these issues. "If possible, any classified information should be reviewed to determine whether the restrictions on public access (including UNCI) continue to be required. DOE headquarters committed to releasing a public document on HEU inventories, comparable to "Plutonium: The First 50 Years: in 1997." [SRA2-W]

Response: There is adequate historical information available concerning historical operations and activities at INTEC. We agree with the Commentor that there is a lack understanding by the public concerning the operations at INTEC. Generally, the uranium extracted during the reprocessing operations was sent to the Savannah River Site (SRS). At SRS, the uranium was generally used in SRS nuclear reactors to produce both tritium (H-3) and plutonium. As part of the INEEL cleanup activities, there is an ongoing program to identify and remove/reduce unstable nuclear material from INEEL facility. For example, a recent project at INTEC removed uranium from the ROVER facility located in CPP-640. Mass balances have been historically maintained during operations at INTEC, including waste management activities. In both the Spent Nuclear Fuel (SNF) EIS and Idaho HLW & FD EIS, mass balances are taken into account when evaluating the waste volumes, treatment, disposal, and other criteria. Also, the CERCLA project considers mass balances. No appendix is planned to be developed (classified or unclassified) containing information on SNF and Highly Enriched Uranium (HEU). Currently, there is no report developed on HEU inventories. However, DOE is in the process of developing a report.

INDEX OF COMMENTS

Shown below is an index of the comments received on the Proposed Plan during the public comment period. Presented in this index are the 312 numbered comments received. This index shows both the various Commentors and their associated numbered comments.

Appendix B

Idaho National Engineering and Environmental Laboratory Administrative Record File Index for the Comprehensive RI/FS of Operable Unit 3-13 08/10/99

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY
ADMINISTRATIVE RECORD FILE INDEX FOR THE COMPREHENSIVE RI/FS OF OPERABLE UNIT 3-13
09/22/99

FILE NUMBER

AR1.1 BACKGROUND

A Document #: *3533
Title: Contaminants of Concern in the Test Area North Groundwater
Author: Zimmerle, J.R.
Recipient: N/A
Date: 01/08/92

A Document #: *3534
Title: Summary of RCRA Facility Investigation Activities at TAN
Author: Zimmerle, J.R.
Recipient: N/A
Date: 01/08/92

A Document #: *5169
Title: Assessment of the groundwater pathway from the leaching of surficial and buried contamination
Author: N/A
Recipient: N/A
Date: 07/29/92

*** This document can be found in Administrative Record binder Operable Unit 1-07A, Vol. I**

A Document #: 10986
Title: Response to Notice of Deficiency (NOD) for Closure Plan Submittal Received from the EPA/State
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 11/15/89

A Document #: 14143
Title: Background Concentrations of Selected Metals and Radionuclides in the Big Lost River Alluvium at the Idaho Chemical Processing Plant
Author: WINCO
Recipient: Not specified
Date: 02/28/94

FILE NUMBER

AR1.1 BACKGROUND (continued)

A Document #: 18017
Title: Disposal of Drill Cuttings from Monitoring Well (MW)-18
Author: Jenkins, T.W.
Recipient: Orlean, H.; Reno, S.L.
Date: 10/23/95

A. Document #: 2549
Title: USGS Comments on Closure plan for CPP-63 Hexone spill by CPP-710
Author: Mann, L.J.
Recipient: Feigner, K.D.
Date: 08/27/87

A Document #: 2558
Title: USGS Comments on Ground-water monitoring plan, ICPP Injection Well
Author: Mann, L.J.
Recipient: Pierre, W.
Date: 05/27/87

A Document #: 2559
Title: USGS Comments on Closure plan, ICPP Injection Well
Author: Mann, L.J.
Recipient: Pierre, W.
Date: 05/27/87

A. Document #: 2560
Title: USGS Comments on Closure plan for the Hexone spill west of CPP-660
Author: Mann, L.J.
Recipient: Pierre, W.
Date: 06/01/87

A Document #: 2801
Title: USGS Comments on Closure plan for CPP-55, Mercury contaminated area (South of ICPP T-15)
Author: Mann, L.J.
Recipient: Pierre, W.
Date: 04/29/87

A Document #: 3077
Title: Closure Plan for CPP-64 (Hexone Spill West of CPP-660)
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 07/19/90

FILE NUMBER

AR1.1 BACKGROUND (continued)

A Document #: 3090
Title: Closure Plan for Land Disposal Unit CPP-48 –Excess Chemical French Drain
Author: Not specified
Recipient: Not specified
Date: 06/10/91

A Document #: 4962
Title: Flooding Potential at the Idaho Chemical Processing Plant
Author: Niccum, M.R.
Recipient: Not specified
Date: 04/01/73

A Document #: 610
Title: Final Closure Report for CPP-55, Mercury Contaminated Area
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 12/03/90

A Document #: 611
Title: Final Closure Plan for CPP-39, Hydrofluoric Acid Storage Tank
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 12/05/90

A Document #: 6111
Title: Revision of Closure Plan for Land Disposal Unit (LDU) CPP-63, Hexone Leak Near Building CPP-710
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 08/22/89

A Document #: 6533
Title: WINCO Comments on EPA Region X Review of Summary Assessments CPP-41, CPP-43, CPP-70, CPP-71, CPP-76, and CPP-77
Author: Matule, A.J.
Recipient: Weiler, F.H.
Date: 11/07/89

FILE NUMBER

AR1.1 BACKGROUND (continued)

A Document #: 6589
Title: HLWTFR Project Using Devises to Locate Underground Utilities
Author: Earle, O.K.
Recipient: Williamson, D.J.
Date: 10/13/91

A Document #: 6594
Title: Disposition of Radioactively Contaminated Soil
Author: Earle, O.K.
Recipient: Williamson, D.J.
Date: 12/18/91

A Document #: 6596
Title: Sites Within OU 3-07
Author: Mascarenas, C.S.
Recipient: Williams, J.L.
Date: 10/29/91

A Document #: 6614
Title: Evaluation of a Unidirectional Gamma Detector for Operable Unit 3-07
Author: Doornbos, M.H.
Recipient: Mascarenas, C.S.
Date: 10/22/92

A Document #: 6622
Title: Report on Preliminary Review of Impact on Tank Farm due to Characterization Activities
Author: Malik, L.E.
Recipient: McGee, W.D.
Date: 06/08/92

A Document #: 10707
Title: Inclusion of Documents into the Administrative Record
Author: Jenkins, T. W.
Recipient: Ellis, D. L.
Date: 09/20/99

FILE NUMBER

AR1.1 BACKGROUND (continued)

A Document #: 6623
Title: Portable Pipe Mapper (PPM) Field Test at the Idaho Chemical Process Plant (ICPP)
Author: Motazed, B.
Recipient: Not specified
Date: 01/01/92

A Document #: 6625
Title: Idaho Chemical Processing Plant (ICPP) Waste Area Group Assessment
Author: Not specified
Recipient: Not specified
Date: 01/04/91

A Document #: 6626
Title: Meeting -Injection Well
Author: Valentine, J.
Recipient: Not specified
Date: 05/08/86

A Document #: 6628
Title: Final Report for CPP-42I
Author: Hanson, N.W.
Recipient: Poland, D.J.
Date: 09/14/88

A Document #: RC-10-98
Title: Multi-Agency Radiation Survey and Site Investigation Manual (MARISSIM) Investigation for CPP-709 Radionuclides
Author: Chambers, R.
Recipient: Rodman, G.R.
Date: 09/21/98

A Document #: RDG-03-97
Title: Waste Area Group (WAG) 3 Core Samples
Author: Greenwell, R.D.
Recipient: Connolly, J.M.
Date: 03/20/97

FILE NUMBER

AR1.1 BACKGROUND (continued)

Document #: RDG-03-99
Title: Soil Restoration Department Management Assessment of Waste Area Group (WAG) 3, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Radiological Management Area (RMA) and Storage Yard
Author: Greenwell, R.D.
Recipient: Distribution
Date: 04/14/99

Document #: RFM-41-89
Title: ICPP Injection Well Abandonment Report
Author: Mozes, R.F.
Recipient: Shadley, D.E.
Date: 12/11/89

Document #: RHM-33-84
Title: CPP-601 Process Cells A, B, C, D, & L D&D Final Report
Author: Meservey, R.H.
Recipient: Brehm, J.
Date: 10/26/84

Document #: SGS-127-91
Title: Information Request
Author: Bergeman, N.L.
Recipient: Hinman, M.B.
Date: 04/25/91

Document #: SGS-289-91
Title: Tank Closure Notification
Author: Evans, T.A.
Recipient: Lyle, J.L.
Date: 07/31/91

Document #: SGS-334-91
Title: Tank Closure Notification
Author: Evans, T.A.
Recipient: Lyle, J.L.
Date: 08/22/91

FILE NUMBER

AR1.1 BACKGROUND (continued)

Document #: SGS-353-91
Title: Tank Closure Notification
Author: Evans, T.A.
Recipient: Lyle, J.L.
Date: 09/10/91

Document #: SMB-05-94
Title: Idaho Department of Health and Welfare (IDHW) Request for Idaho Chemical Processing Plant (ICPP) Stack Emissions Data
Author: Burns, S.M.
Recipient: Koch, D.
Date: 07/15/94

Document #: TAI-05-84
Title: Radiological Controls for the Decontamination of Low Level Waste Project Equipment
Author: Ikenberry, T.A.
Recipient: Bingham, G.E.; Cukurs, M.; Beesley, L.M.
Date: 07/19/84

Document #: 6634
Title: Waste Transfer Line Gasket Leak –Operating Occurrence Report
Author: Lohse, G.E.
Recipient: Kennedy, K.K.
Date: 01/16/76

Document #: 6660
Title: Maps for CPP-14
Author: WINCO
Recipient: Not specified
Date: 05/01/90

Document #: 903-1188
Title: ICPP Geophysical Survey
Author: Retzlaff, R.
Recipient: Williams, J.L.
Date: 08/17/92

Document #: 965
Title: Transmittal of Closure Plan for CPP-59, Kerosene Spill
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 11/06/90

FILE NUMBER

AR1.1 BACKGROUND (continued)

A Document #: ACI-110
Title: Buried Waste Line Register for National Reactor Testing Station (NRTS) Part IV CPP
Author: Paige, B.E.
Recipient: Not specified
Date: 06/01/72

A Document #: 6648
Title: Project Initiation Request –Demolition of Abandoned Sewage Plant –CPP-703 & CPP-715
Author: Soderberg, J.D.
Recipient: Not specified
Date: 02/04/83

A Document #: 6650
Title: Characteristics of the ICPP Sanitary Waste Collection Systems
Author: WINCO
Recipient: Not specified
Date: 09/01/80

A Document #: 6722
Title: Transmittal of the Closure Plan for LDU CPP-34 (Soil Storage Area in the NE Corner of the ICPP)
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 06/19/90

A Document #: 7756
Title: Hazardous Waste Streams at CPP
Author: Wallace, M.T.
Recipient: Winder, T.
Date: 01/15/86

A Document #: 8472
Title: Revised Closure Plan Approach for Land Disposal Units (LDU' s)
Author: Solecki, J.E.
Recipient: Gearheard, M.F.
Date: 01/15/86

FILE NUMBER

AR1.1 BACKGROUND (continued)

Document #: 6632
Title: ICPP Tank Farm Contaminated Soil Investigation
Author: Not specified
Recipient: Not specified
Date: 01/04/91

Document #: 6638
Title: Report on Perforation and Cementing for Abandonment of the ICPP Injection Well MAH-FE-PL-304
Author: Fenix and Scisson and MK-Environmental Services
Recipient: Not specified
Date: 10/01/89

Document #: NEJ-28-91
Title: Final Report on Robotic Geophysical Survey
Author: Josten, N.E.
Recipient: Urbanski, C.J.
Date: 12/02/91

Document #: KLF-150-97
Title: Listing Codes Applicable to Disposition of Investigation Derived Waste Originating From ICPP
Author: Falconer, K.L.
Recipient: Hovinga, J.E.
Date: 07/08/97

Document #: KLF-159-95
Title: WAG 3 Investigation-Derived Waste Aquifer Well Purge Water
Author: Raunig, D.E.
Recipient: Green, L.A.
Date: 05/15/95

Document #: NEB-3-86
Title: Sources of Information for CERCLA Study
Author: Nebeker, R.L.
Recipient: Pointer, T.F.
Date: 02/02/86

FILE NUMBER

AR1.1 BACKGROUND (continued)

A Document #: MK-83-E-1792
Title: Disposition of Stockpiled Low Level Contaminated Soil Excavated During the Low Level Waste Project Phase I at ICPP –M-K Project S-2258, ICWA 83-49
Author: Hicks, F.E.
Recipient: Bingham, G.E.
Date: 11/28/83

A Document #: KXJ-9-92
Title: State of Idaho, Request for Information
Author: Jones, K.L.
Recipient: Distribution
Date: 01/14/92

A Document #: JFE-13-84
Title: Location of Contaminated Dirt Burial
Author: Erben, J.F.
Recipient: Distribution
Date: 04/16/84

A Document #: DLS-31-85
Title: Summary of RALA D&D Status
Author: Smith, D.L.
Recipient: Meservey, R.H.
Date: 08/09/85

A Document #: DWR-01-93
Title: Evaluation of Records for Waste Generated at the Idaho Chemical Processing Plant (ICPP) and Disposed at the Radioactive Waste Management Complex (RWMC) During the Period of 1960-1983
Author: Rhodes, D.W.
Recipient: Nitschke, R.L.
Date: 01/08/93

A Document #: CJU-05-92
Title: Subsurface Imaging Results for the High Level Waste Tank Farm Replacement (HLWTFR) Project
Author: Urbanski, C.J.
Recipient: Distribution
Date: 02/19/92

FILE NUMBER

AR1.1 BACKGROUND (continued)

Document #: BING-106-83
Title: Disposition of Stockpiled Soil
Author: Bingham, G.E.
Recipient: Hicks, F.E.
Date: 12/08/83

Document #: AMU-161-90
Title: CPP-59 Closure Plan Submittal
Author: Umek, A.M.
Recipient: Lyle, J.L.
Date: 11/08/90

Document #: DDN-01-85
Title: Identification of Radioactive Mixed Waste Streams at the Idaho Chemical Processing Plant
Author: Nishimoto, D.D.
Recipient: Falconer, K.L.
Date: 04/11/85

Document #: SGS-464-91
Title: Tank Closure Notification
Author: Evans, T.A.
Recipient: Sato, W.N.
Date: 11/06/91

Document #: WINCO-1021
Title: Radiological Characterization and Decision Analysis for the SFE-20 Waste Tank and Vault
Author: Moser, C.L.; Schmidt, D.A.
Recipient: Not specified
Date: 09/01/84

Document #: WINCO-1032
Title: RALA Off-Gas Cell and Storage Tank (CPP-631 and VES-702) Decontamination and Decommissioning Plan
Author: Moser, C.L.
Recipient: Not specified
Date: 07/01/85

FILE NUMBER

AR1.1 BACKGROUND (continued)

A Document #: WIN-86-0034-CPP
Title: Unusual Occurrence Report -Inadvertent Transfer Resulting in Loss of Waste Solution
Author: Lee, J.L.
Recipient: Green, M.J.
Date: 10/24/86

A Document #: WIN-86-0032-CPP
Title: Unusual Occurrence Report -WL-212 Contaminated Liquid Spill
Author: Lee, J.L.
Recipient: Moffitt, W.C.
Date: 10/24/86

A Document #: WINCO-1123, Revision 1
Title: The Radiological Safety Analysis Computer Program (RSAC-5) User' s Manual
Author: Wenzel, D.R.
Recipient: Not specified
Date: 02/01/94

A Document #: DJK-09-96-A
Title: Transition of Radiologically Contaminated Surplus Facilities from EM-60 to EM-40
Author: Kenoyer, D.J.
Recipient: Moriarty, T.P.
Date: 11/13/96

A Document #: DOE/ID-10392, Rev. 0
Title: Well Fitness Evaluation for the Idaho National Engineering Laboratory, Vol. I
Author: Sehlke, G.; Davis, D.E.; Tullock, W.W.; Williams, J.A.
Recipient: Not specified
Date: 06/01/93

A Document #: DOE/ID-10392, Rev. 0
Title: Well Fitness Evaluation for the Idaho National Engineering Laboratory, Vol. II
Author: Sehlke, G.; Davis, D.E.; Tullock, W.W.; Williams, J.A.
Recipient: Not specified
Date: 06/01/93

FILE NUMBER

AR1.1 BACKGROUND (continued)

Document #: DOE/ID-10392, Rev. 0
Title: Well Fitness Evaluation for the Idaho National Engineering Laboratory, Vol. III
Author: Sehlke, G.; Davis, D.E.; Tullock, W.W.; Williams, J.A.
Recipient: Not specified
Date: 06/01/93

Document #: ERD-210-91
Title: Closure Plan for CPP-33, Contaminated Soil in Tank Farm Area Near WL-102, NE of CPP-604
Author: Burns, T.F.
Recipient: Not specified
Date: 06/04/91

Document #: DOE/ID-10402, Rev. 3
Title: Comprehensive Well Survey for the Idaho National Engineering Laboratory, Vol. II
Author: Not specified
Recipient: Not specified
Date: 05/01/94

Document #: 893-1195.950
Title: Report on Surface Geophysical Surveys at the Idaho Chemical Processing Plant
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 09/04/91

Document #: ERD-229-91
Title: Closure Plan for CPP-48, Excess Chemical Dump Tank (French Drain South of CPP-633)
Author: Burns, T.F.
Recipient: Gearheard, M.
Date: 06/13/91

Document #: ERD-075-91
Title: Notification of Modification of Part A Permit for the INEL
Author: Burns, T.F.
Recipient: Donavan, R.P.
Date: 03/14/91

FILE NUMBER

AR1.1 BACKGROUND (continued)

Document #: ERD-105-91
Title: Characterization Data and Other Information Regarding COCA Units CPP-39, -51, -54, -59, and -64
Author: Burns, T.F.
Recipient: Ledger, J.D.
Date: 03/28/91

Document #: ERD-102-91
Title: Document Review –Closure Plan for Land Disposal Unit CPP-40 at the Idaho Chemical Processing Plant, Idaho National Engineering Laboratory
Author: Ford, J.S.
Recipient: Mann, S.A.
Date: 07/16/91

AR1.3 PRELIMINARY ASSESSMENT (PA) REPORT

Document #: 6637
Title: Site Assessment Documentation Packages for CPP-13, CPP-15, CPP-27, CPP-29, CPP-35, CPP-36, CPP-58 E, and CPP-58 W
Author: Culp, B.
Recipient: Not specified
Date: 03/31/92

AR1.4 SITE INVESTIGATION (SI) REPORT

Document #: 6630
Title: COCA Unit Discovery at the ICPP
Author: Nygard, D.
Recipient: Weiler, H.
Date: 11/06/89

AR1.7 INITIAL ASSESSMENTS

Document #: 5403
Title: CPP-39, CPP HF Storage Tank (YDB-105) and Dry Well, OU 3-13
Author: N/A
Recipient: N/A
Date: 07/08/87

FILE NUMBER

AR1.7 **INITIAL ASSESSMENTS (continued)**

A Document #: 5412
Title: CPP-48, French Drain South of CPP-633, OU 3-13
Author: N/A
Recipient: N/A
Date: 10/15/86

A Document #: 6645
Title: CPP-13, Pressurization of the Solid Storage Cyclone NE of CPP-633
Author: N/A
Recipient: N/A
Date: 07/07/87

A Document #: 6674
Title: CPP-8, CPP-603 Basin Filter System Line Failure
Author: N/A
Recipient: N/A
Date: 10/07/86

A Document #: 6675
Title: CPP-9, Soil Contamination Near the NE Corner of CPP-603 South Basin
Author: N/A
Recipient: N/A
Date: 10/07/86

A Document #: 6676
Title: CPP-10, CPP-603 Plastic Pipeline Break
Author: N/A
Recipient: N/A
Date: 10/07/86

A Document #: 6677
Title: CPP-11, CPP-603 Sludge and Water Release
Author: N/A
Recipient: N/A
Date: 10/07/86

A Document #: 6678
Title: CPP-12, Contaminated Paint Chips and Pad South of CPP-603
Author: Poland, D.J.
Recipient: N/A
Date: 10/07/86

FILE NUMBER

AR1.7 INITIAL ASSESSMENTS (continued)

Document #: 6679
Title: CPP-13, Pressurization of the Solid Storage Cyclone NE of CPP-633
Author: Poland, D.J.
Recipient: N/A
Date: 07/08/87

Document #: 6680
Title: CPP-15, Solvent Burner East of CPP-605
Author: Poland, D.J.
Recipient: N/A
Date: 10/07/86

Document #: 6681
Title: CPP-16, Contaminated Soil from Leak in Line from WM-181 to PEW
Author: Poland, D.J.
Recipient: N/A
Date: 10/07/86

Document #: 6682
Title: CPP-17, Soil Storage Area Near Peach Bottom Fuel Storage Area
Author: Poland, D.J.
Recipient: N/A
Date: 10/07/86

Document #: 6683
Title: CPP-18, Gas Storage Building
Author: Poland, D.J.
Recipient: N/A
Date: 10/07/86

Document #: 6684
Title: CPP-19, CPP-603 to CPP-604 Line Leak
Author: Poland, D.J.
Recipient: N/A
Date: 10/07/86

Document #: 6685
Title: CPP-20, CPP-604 Radioactive Waste Unloading Area
Author: Poland, D.J.
Recipient: N/A
Date: 07/08/87

FILE NUMBER

AR1.7 INITIAL ASSESSMENTS (continued)

A Document #: 6673
Title: CPP-7, Soil Contamination Northwest of CPP-642 (East of CPP-603)
Author: Poland, D.J.
Recipient: N/A
Date: 10/07/86

AR1.9 NEW SITE IDENTIFICATION/INCLUSION

A Document #: 16760
Title: New Site Identification - Tank Farm Soil Stockpiles - CPP-97
Author: DOE; EPA; IDHW
Recipient: Not specified
Date: 10/16/98

A Document #: 16807
Title: New Site Identification - Tank Farm Shoring Boxes - CPP-98
Author: DOE; EPA; IDHW
Recipient: Not specified
Date: 11/03/98

A Document #: 16808
Title: New Site Identification - Boxed Soil - CPP-99
Author: DOE; EPA; IDHW
Recipient: Not specified
Date: 12/15/98

A Document #: 12899
Title: New Site Identification –Buried Cylinders East –CPP-94
Author: DOE
Recipient: Not specified
Date: 02/20/97

A Document #: 14345
Title: New Site Identification –Simulated Calcine Trench NU-1.95 –CPP-93
Author: DOE
Recipient: Not specified
Date: 01/25/95

FILE NUMBER

AR1.9 NEW SITE IDENTIFICATION/INCLUSION (continued)

✓.	Document #:	DOE/ID-10705
	Title:	Evaluation and Site Selection For A New Service Waste Disposal Facility For The Idaho Nuclear Technology and Engineering Center
	Author:	Not specified
	Recipient:	Not specified
	Date:	09/01/99

AR2.3 EE/CA APPROVAL MEMORANDUM

✓.	Document #:	10315
	Title:	Approval Memorandum for the Idaho Chemical Processing Plant Radionuclide-Contaminated Soils Removal Action
	Author:	N/A
	Recipient:	DOE, EPA, IDHW
	Date:	02/01/97

AR2.4 EE/CA

✓.	Document #:	DOE/ID-10568, Rev. 0
	Title:	Engineering Evaluation/Cost Analysis for Radionuclide-Contaminated Soils Removal Action at the Idaho Chemical Processing Plant
	Author:	Francis, C.S.; Hall, M.; Heidkamp, H.A.; Heilman, D.; Henderson, L.; Nicklaus, D.M.; Sorman, K.L.; Wells, R.P.
	Recipient:	Not specified
	Date:	02/01/97
✓	Document #:	OPE-ER-29-97
	Title:	Transmittal of the Engineering Evaluation/Cost Analysis for Radionuclide-Contaminated Soils Removal Action at the Idaho Chemical Processing Plant
	Author:	Jensen, N.R.
	Recipient:	Pierre, W.; Nygard, D.
	Date:	02/28/97
✓	Document #:	DOE/ID-10568, Rev. 1
	Title:	Engineering Evaluation/Cost Analysis for Radionuclide-Contaminated Soils Removal Action at the Idaho Chemical Processing Plant
	Author:	Francis, C.S.; Hall, M.; Heidkamp, H.A.; Heilman, D.; Henderson, L.; Nicklaus, D.M.; Sorman, K.L.; Wells, R.P.
	Recipient:	Not specified
	Date:	06/01/97

FILE NUMBER

AR2.4 EE/CA (continued)

A Document #: OPE-ER-102-97
Title: Transmittal of the Engineering Evaluation/Cost Analysis for Radionuclide-Contaminated Soils Removal Action at the Idaho Chemical Processing Plant
Author: Jensen, N.R.
Recipient: Pierre, W.; Nygard, D.
Date: 06/24/97

A Document #: 10543*
Title: Idaho Chemical Processing Plant Windblown Area, Section 9, of the Engineering Evaluation/Cost Analysis for Operable Unit 10-06 Radionuclide-Contaminated Soils Removal Action at the Idaho National Engineering Laboratory, Volume I, INEL-95/0259, Rev. 0
Author: Jessmore, P.J.; Rood, S.M.; Haney, T.J.; Paarmann, M.L.; VanHorn, R.L.; Harris, G.A.; Stepan, I.E.; Burns, S.M.
Recipient: Not specified
Date: 06/01/95

***The entire document may be found in Administrative Record OU 10-06, Volume I.**

AR2.5 ACTION MEMORANDUM

A Document #: DOE/ID-10588
Title: Action Memorandum for the Idaho Chemical Processing Plant Radionuclide-Contaminated Soils Removal Action
Author: Not specified
Recipient: Not specified
Date: 05/01/97

A Document #: 5280
Title: Action Memorandum –Removal Action –Idaho Chemical Processing Plant
Author: Earle, O.K.
Recipient: Williams, A.C.
Date: 05/28/93

A Document #: 5281
Title: Action Memorandum –Removal Action –Idaho Chemical Processing Plant
Author: Earle, O.K.
Recipient: Williams, A.C.
Date: 05/28/93

FILE NUMBER

AR2.5 ACTION MEMORANDUM (continued)

A Document #: OKE-64-93
Title: Action Memorandum For Time-Critical Removal Actions Planned for FY-93 at the Idaho Chemical Processing Plant for Inclusion Into the Administrative Record File
Author: Earle, O.K.
Recipient: Williams, A.C.
Date: 05/28/93

AR2.7 HEALTH AND SAFETY PLAN

A Document #: INEL/EXT-97-00132, Rev. 1
Title: Health and Safety Plan for ICPP Radionuclide-Contaminated Soils Removal Action
Author: Arrowood, J.; Gurney, L.; Steed, K.; Haight, R.
Recipient: Not specified
Date: 05/01/97

AR2.8 WORK PLAN

A Document #: DOE/EXT-97-00116, Rev. 0
Title: Removal Action Plan for the Idaho Chemical Processing Plant Radionuclide-Contaminated Soils Removal Action
Author: Cram, A.
Recipient: Not specified
Date: 06/01/97

AR3.1 SAMPLING AND ANALYSIS PLAN

A Document #: 18021
Title: Sampling and Analysis Plan for the ICPP Percolation Ponds 1 and 2
Author: Wastren Remediation, Inc.
Recipient: Not specified
Date: 03/24/93

A Document #: 14084
Title: Sampling and Analysis Plan for Boxed Soils from Solid Waste Management Unit CPP-58 and Basement Exit Excavations at CPP-604/605 at the Idaho Chemical Processing Plant
Author: Golder Associates Inc.
Recipient: Not specified
Date: 07/01/93

FILE NUMBER

AR3.1 SAMPLING AND ANALYSIS PLAN (continued)

A Document #: 93MSE/ID-225
Title: Transmittal of WAG 3/WAG 10 Sampling and Analysis Plan
Author: Barry, G.A.
Recipient: Burns, S.M.
Date: 08/02/93

A Document #: 6744
Title: Sampling and Analysis Plan for WAG 3/WAG 10 Radionuclide-Contaminated Soils Treatability Study
Author: Barry, G.A.; Doornbos, M.H.
Recipient: Not specified
Date: 08/01/93

A Document #: AM/ERWM-RPO-173-92
Title: Transmittal of the Closure Addendum for the Draft Sampling and Analysis Plans (SAP) for Operable Units (OU) 3-07 and -08 (Tank Farm I & II, respectively), and WAG 3 Quality Assurance Project Plan (QAPjP)
Author: Lyle, J.L.
Recipient: Pierre, W.; Nygard, D.
Date: 07/31/92

A Document #: AM/ERWM-RPO-154-92
Title: Transmittal of the Modifications to Operable Unit (OU) 3-07, the Tank Farm Sampling and Analysis Plan (SAP) at the Idaho Chemical Process Plant (ICPP) Waste Area Group 3 (WAG 3)
Author: Lyle, J.L.
Recipient: Pierre, W.; Nygard, D.
Date: 07/10/92

A Document #: 893-1195.320
Title: Report for the Idaho Chemical Processing Plant (ICPP) Drilling and Sampling Program at Land Disposal Unit CPP-59
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 01/01/91

A Document #: 893-1195.330
Title: Report for the Idaho Chemical Processing Plant (ICPP) Drilling and Sampling Program at Land Disposal Unit CPP-64
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 01/01/91

FILE NUMBER

AR3.1 **SAMPLING AND ANALYSIS PLAN (continued)**

Document #: 893-1195.360
Title: Report for the Idaho Chemical Processing Plant (ICPP) Drilling and Sampling Program at Land Disposal Unit CPP-54
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 01/01/91

Document #: INEL-95/0064
Title: Report of 1993/94 Tank Farm Drilling and Sampling Investigation at the Idaho Chemical Processing Plant
Author: Not specified
Recipient: Not specified
Date: 02/01/95

Document #: 893-1195.530
Title: Report of the Idaho Chemical Processing Plant Drilling and Sampling Program at the HLLW Tank Farm and LDU CPP-33
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 12/19/91

Document #: 903-1171
Title: Report for the Idaho Chemical Processing Plant Sampling and Analysis Program at Service Waste Percolation Pond No. 2
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 04/15/92

Document #: ERD1-098-92
Title: Transmittal of the Sampling and Analysis Plan (SAP) for Operable Unit (OU) 3-08 at the Idaho Chemical Processing Plant (ICPP) Waste Area Group 3 (WAG 3)
Author: Lyle, J.L.
Recipient: Pierre, W.; Nygard, D.
Date: 04/07/92

Document #: INEEL/EXT-97-00677, Rev. 0
Title: Limited Scope and Hazard Characterization Plan for Soil Disturbance CERCLA Radiological Characterization at ICPP – CPP-701 Petroleum Contaminated Soil
Author: Jones, R.K.; Willis, B.J.
Recipient: Not specified
Date: 06/01/97

FILE NUMBER

AR3.1 SAMPLING AND ANALYSIS PLAN (continued)

A Document #: INEL-95/0137, Rev. 0
Title: Sampling and Analysis Plan for the Waste Area Group 3 Remedial Investigation/Feasibility Study Work Plan (FINAL)
Author: Meyer, T.J.
Recipient: Not specified
Date: 08/01/95

AR3.2 SAMPLING AND ANALYSIS DATA/CHAIN OF CUSTODY FORMS (COC)

A Document #: RM-06-93-A
Title: Validation of Organochlorine Herbicide Data from the Fourth Quarter 1992 Groundwater Sampling Effort at the Westinghouse Idaho Chemical Processing Plant: Sample Delivery Groups
Author: Marty, R.C.
Recipient: Williams, J.L.
Date: 02/24/93

A Document #: RPW-44-94
Title: Transmittal of Limitations and Validation Report (L&V) Idaho Chemical Processing Plant (ICPP), Operable Unit 3-07, Radiochemical Analysis, Sample Delivery Group #3PG10301BG
Author: Wells, R.P.
Recipient: Holder, K.D.
Date: 04/12/94

A Document #: 6629
Title: Final Report for 2nd PECR
Author: Hunter, B.R.
Recipient: Stalke, A.K.
Date: 07/27/87

A Document #: OPE-ER-052-95
Title: Transmittal of the Validated Data for Perched Water Sampling December 1994 and January 1995
Author: Green, L.A.
Recipient: Pierre, W.; Nygard, D.
Date: 03/23/95

FILE NUMBER

AR3.2 **SAMPLING AND ANALYSIS DATA/CHAIN OF CUSTODY FORMS (COC) (continued)**

A Document #: INEL/EXT-97-00341, Rev. 0
Title: Limited Scope and Hazard Characterization Plan for Soil Disturbance CERCLA Radiological Characterization at ICPP
Author: Jones, R.K.
Recipient: Not specified
Date: 03/01/97

A Document #: DLF-01-89
Title: Review of Documents (QA/QC Samples)
Author: Forsberg, D.L.
Recipient: Minkin, S.C.
Date: 09/27/89

A Document #: OPE-ER-254-97
Title: Transmittal of the Validated Analytical Sampling Data for Idaho Chemical Processing Plant (ICPP) Radionuclide-Contaminated Soils Non-Time Critical Removal Action at the Idaho Chemical Processing Plant
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 11/25/97

A Document #: ERD-011-91
Title: Submittal of Summary Analytical Data for Investigations at the ICPP (CPP-51, CPP-54, CPP-59, and CPP-64)
Author: Solecki, J.E.
Recipient: Humphrey, D.L.
Date: 01/11/91

A Document #: ERD-036-91
Title: Submittal of Summary Analytical Data for Investigations at the ICPP (CPP-39, CPP-34, and CPP-55)
Author: Solecki, J.E.
Recipient: Humphrey, D.L.
Date: 02/27/91

FILE NUMBER

AR3.3 WORK PLAN

A Document #: INEL-95/0056, Rev. 0
Title: Waste Area Group 3 Comprehensive Remedial Investigation/Feasibility Study Work Plan (FINAL), Vol. I, through 8. References
Author: N/A
Recipient: N/A
Date: 08/01/95

A Document #: INEL-95/0056, Rev. 0
Title: Waste Area Group 3 Comprehensive Remedial Investigation/Feasibility Study Work Plan (FINAL), Vol. I, Appendices
Author: N/A
Recipient: N/A
Date: 08/01/95

A Document #: INEL-95/0056, Rev. 0
Title: Waste Area Group 3 Comprehensive Remedial Investigation/Feasibility Study Work Plan (FINAL), Vol. II, through Attachment 5
Author: N/A
Recipient: N/A
Date: 08/01/95

A Document #: INEL-95/0056, Rev. 0
Title: Waste Area Group 3 Comprehensive Remedial Investigation/Feasibility Study Work Plan (FINAL), Vol. II, Attachment 6
Author: N/A
Recipient: N/A
Date: 08/01/95

A Document #: 6658
Title: Technical Work Plan for the Idaho Chemical Processing Plant, Sampling and Analysis Program at Solid Waste Management Unit CPP-14, Vol. I, Rev. 1
Author: Golder Associates, Inc.
Recipient: N/A
Date: 01/11/91

A Document #: 6659
Title: Technical Work Plan for the Idaho Chemical Processing Plant, Quality Assurance Project Plan for Drilling and Sampling Activities at Solid Waste Management Unit CPP-14, Vol. II, Rev. 1
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 01/11/91

FILE NUMBER

AR3.3 WORK PLAN (continued)

A Document #: 6636
Title: Technical Work Plan for the Idaho Chemical Processing Plant, Sampling and Analysis Program at Solid Waste Management Unit CPP-14, Vol. I, Rev. 2
Author: Golder Associates, Inc.
Recipient: N/A
Date: 12/16/91

A Document #: 893-1195.310
Title: Report for the Idaho Chemical Processing Plant, Drilling and Sampling Program at Land Disposal Unit CPP-39
Author: Golder Associates, Inc.
Recipient: Ledger, J.D.
Date: 01/01/91

A Document #: OPE-ER-099-94
Title: Transmittal of the Draft Final Technical Work Plan for the WAG 3 and WAG 10 Radionuclide-Contaminated Soils Treatability Study
Author: Lyle, J.L.
Recipient: Pierre, W.; Nygard, D.
Date: 04/26/94

A Document #: OPE-ER-127-95
Title: Transmittal of the Draft Final Waste Area Group 3 Remedial Investigation/Feasibility Study Work Plan
Author: Green, L.A.
Recipient: Pierre, W.; Nygard, D.
Date: 07/05/95

A Document #: 893-1195.450, Vol. I
Title: Technical Work Plan for the Idaho Chemical Processing Plant Drilling and Sampling Program at the ICPP Tank Farm (CPP-33)
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 07/25/90

A Document #: 893-1195.450, Vol. II
Title: Quality Assurance Project Plan for Drilling and Sampling Activities at the ICPP Tank Farm (CPP-33)
Author: Golder Associates, Inc.
Recipient: Not specified
Date: 07/25/90

FILE NUMBER

AR3.3 WORK PLAN (continued)

A Document #: INEEL/EXT-98-01097, Rev. 0
Title: Treatability Study Work Plan for the Segmented Gate System Technology Deployment
Author: Wells, R.P.
Recipient: Not specified
Date: 04/01/99

AR3.4 RI REPORTS

A Document #: OPE-ER-122-96
Title: Transmittal of the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEL--Part A, RI/BRA Report (Draft)
Author: Jensen, N.R.
Recipient: Pierre, W.; Nygard, D.
Date: 08/05/96

AR3.8 RISK ASSESSMENT

A Document #: OPE-ER-117-95
Title: Transmittal of the Draft WAG 3 Screening Level Ecological Risk Assessment
Author: Green, L.A.
Recipient: Pierre, W.; Nygard, D.
Date: 06/19/95

AR3.9 QUALITY ASSURANCE PROJECT PLAN

A Document #: QAPjP-E-035, Revision 0
Title: Quality Assurance Project Plan for Characterization Activities at WAG 3
Author: WINCO
Recipient: Not specified
Date: 07/21/92

A Document #: INEL-95/0086, Rev. 4 (formerly EGG-WM-10076)
Title: Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, and 10
Author: Baumer, A.R.; Flynn, S.C.; Watkins, C.S.
Recipient: Not specified
Date: 03/01/95

FILE NUMBER

AR3.9 QUALITY ASSURANCE PROJECT PLAN (continued)

A Document #: DOE/ID-10587, Rev. 5 (formerly INEL-95/0086)
Title: Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10 and Inactive Sites
Author: Baumer, A.R.; Flynn, S.C.; Thompson, R.G.; Watkins, C.S.
Recipient: Not specified
Date: 12/01/97

AR3.10 SCOPE OF WORK

A Document #: 5791
Title: Final Scope of Work for the Waste Area Group 3 Comprehensive Remedial Investigation Feasibility Study
Author: WINCO
Recipient: N/A
Date: 10/14/94

A Document #: OPE-ER-283-94
Title: Transmittal of the Final Scope of Work for the Waste Area Group 3 Comprehensive Remedial Investigation Feasibility Study
Author: Green, L.
Recipient: Pierre, W.; Nygard, D.
Date: 10/21/94

A Document #: RPO-001-92
Title: Transmittal of Scope of Work (SOW) for Track 2 Preliminary Scoping Study at Operable Unit (OU) 3-08
Author: Lyle, J.L.
Recipient: Pierre, W.; Nygard, D.
Date: 01/10/92

A Document #: OPE-ER-035-93
Title: Transmittal of the Draft Scope of Work (SOW) for Operable Unit 3-08A (ICPP North Area RI/FS)
Author: Lyle, J.L.
Recipient: Pierre, W.; Nygard, D.
Date: 11/15/93

A Document #: 6590
Title: Review of Draft Scope of Work for Operable Unit-7, Tank Farm
Author: Mejia, C.
Recipient: Williamson, D.; Fourr, B.; Williams, J.; Gombert, D.
Date: 10/18/91

FILE NUMBER

AR3.10 SCOPE OF WORK (continued)

Document #: 6591
Title: Review of Draft Scope of Work for Operable Unit-7, Tank Farm
Author: Mejia, C.
Recipient: Williamson, D.; Fourr, B.; Williams, J.; Gombert, D.
Date: 10/18/91

Document #: 6592
Title: Review of Draft Scope of Work for Operable Unit-7, Tank Farm
Author: Mejia, C.
Recipient: Williamson, D.; Fourr, B.; Williams, J.; Gombert, D.
Date: 10/18/91

Document #: OPE-ER-047-94
Title: Transmittal of the Draft Final Scope of Work for Operable Unit 3-08A (ICPP North Area RI/FS)
Author: Lyle, J.L.
Recipient: Pierre, W.; Nygard, D.
Date: 02/18/94

AR3.11 FIELD SAMPLING

Document #: DOE/ID-10579, Rev. 0
Title: Field Sampling Plan for the Idaho Chemical Processing Plant Radionuclide-Contaminated Soils Removal Action
Author: Wells, R.P.
Recipient: Not specified
Date: 05/01/97

Document #: OPE-ER-91-97
Title: Transmittal of the Field Sampling Plan for the Idaho Chemical Processing Plant Radionuclide-Contaminated Soils Removal Action and the Removal Action Plan for the ICPP Radionuclide-Contaminated Soils Removal Action
Author: Jensen, N.R.
Recipient: Pierre, W.; Nygard, D.
Date: 06/12/97

FILE NUMBER

AR3.11 FIELD SAMPLING (continued)

A Document #: INEEL/EXT-97-00805
Title: Field Sampling Plan for the D&D of the CPP-631 RaLa Building, and CPP-709 and CPP-734 Monitoring Stations at the Idaho Chemical Processing Plant
Author: Jones, R.W.
Recipient: Not specified
Date: 08/01/97

AR3.12 RI/FS REPORTS

A Document #: OPE-ER-106-97
Title: Transmittal of the Draft Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL
Author: Jines, A.T.
Recipient: Pierre, W.; Nygard, D.
Date: 06/27/97

A Document #: OPE-ER-127-97
Title: Transmittal of the Draft Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL
Author: Hain, K.E.
Recipient: Pierre, W.; Nygard, D.
Date: 08/14/97

A Document #: DOE/ID-10534
Title: Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL--Part A, RI/BRA Report (Final), Binder 1
Author: Rodriguez, R.R.; Schafer, A.L.; McCarthy, J.; Martian, P.; Burns, D.E.; Raunig, D.E.; Burch, N.A.; VanHorn, R.L.
Recipient: Not specified
Date: 11/01/97

A Document #: DOE/ID-10534
Title: Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL--Part A, RI/BRA Report (Final), Binder 2
Author: Rodriguez, R.R.; Schafer, A.L.; McCarthy, J.; Martian, P.; Burns, D.E.; Raunig, D.E.; Burch, N.A.; VanHorn, R.L.
Recipient: Not specified
Date: 11/01/97

FILE NUMBER

AR3.12 RI/FS REPORTS (continued)

A Document #: DOE/ID-10534
Title: Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL--Part A, RI/BRA Report (Final), Binder 3
Author: Rodriguez, R.R.; Schafer, A.L.; McCarthy, J.; Martian, P.; Burns, D.E.; Raunig, D.E.; Burch, N.A.; VanHorn, R.L.
Recipient: Not specified
Date: 11/01/97

A Document #: DOE/ID-10572
Title: Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL--Part B, FS Report (Final), Binder 1
Author: Rodriguez, R.R.; Schafer, A.L.; McCarthy, J.; Martian, P.; Burns, D.E.; Raunig, D.E.; Burch, N.A.; VanHorn, R.L.
Recipient: Not specified
Date: 11/01/97

A Document #: DOE/ID-10572
Title: Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL--Part B, FS Report (Final), Binder 2
Author: Rodriguez, R.R.; Schafer, A.L.; McCarthy, J.; Martian, P.; Burns, D.E.; Raunig, D.E.; Burch, N.A.; VanHorn, R.L.
Recipient: Not specified
Date: 11/01/97

A Document #: DOE/ID-10619, Rev. 2
Title: Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL - Part B, FS Supplement Report, Vol. 1 and 2
Author: Greenwell, R.D.; Evans, C.S.
Recipient: Not specified
Date: 10/01/98

A Document #: OPE-ER-160-98
Title: Transmittal of the Final Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL--Part B, FS Supplement Report (Revision 2)
Author: Hain, K.E.
Recipient: Pierre, W.; Nygard, D.
Date: 10/14/98

FILE NUMBER

AR3.12 RI/FS REPORTS (continued)

Document #: OPE-EP&SA-98-002
Title: Transmittal of Final Comprehensive Remedial Investigation/Feasibility Study for the Idaho Chemical Processing Plan Operable Unit 3-13 at the Idaho National Engineering and Environmental Laboratory and Draft Proposed Plan for Waste Area Group 3
Author: Depperschmidt, J.
Recipient: Distribution
Date: 01/05/98

Document #: OPE-ER-95-222
Title: Transmittal of Validated Analytical Sampling Data for Idaho Chemical Processing Plant (ICPP) Perched Water Wells, Snake River Plain Aquifer (SRPA) Wells, Well USGS-47 Vertical Contaminant Profiling, and ICPP Soil Samples Conducted for the Waste Area Group (WAG) 3 Comprehensive Remedial Investigation/Feasibility Study (RI/FS)
Author: Green, L.A.
Recipient: Pierre, W.; Nygard, D.
Date: 12/05/95

Document #: DEB-20-97
Title: Summary of Assumptions Used During Development of Waste Area Group (WAG) 3 Remedial Investigation and Feasibility Study (RI/FS) Microshield Modeling Results
Author: Burns, D.E.
Recipient: Henry, R.L.
Date: 10/13/97

Document #: OPE-ER-253-97
Title: Transmittal of the Final Comprehensive RI//FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 11/25/97

Document #: OPE-ER-174-97
Title: Transmittal of the Draft Final Comprehensive RI//FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 10/30/97

FILE NUMBER

AR3.14 TRACK 2 SUMMARY REPORT

A Document #: OPE-ER-308-94
Title: Transmittal of the Revised Track 2 Summary Report for Operable Unit 3-09
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 11/22/94

AR3.15 HEALTH AND SAFETY PLAN

A Document #: 6621
Title: Site Specific Health and Safety Plan –FY-1992 Drilling and Sampling Program –Track 2 Investigation of OU 3-07 Tank Farm and OU 3-08 Tank Farm II
Author: Mascarenas, C.S.
Recipient: Not specified
Date: 08/10/92

A Document #: 6651
Title: Site Specific Health and Safety Plan –Solid Waste Management Unit (SWMU) CPP-14
Author: Alcalde, A.
Recipient: Not specified
Date: 10/16/90

A Document #: 6652
Title: Site Specific Health and Safety Plan –Solid Waste Management Unit (SWMU) CPP-36 INEL
Author: Alcalde, A.
Recipient: Not specified
Date: 10/16/90

A Document #: 6656
Title: Site Specific Health and Safety Plan –Land Disposal Unit (LDU) CPP-63
Author: Alcalde, A.
Recipient: Not specified
Date: 10/16/90

A Document #: 6655
Title: Site Specific Health and Safety Plan –ICPP Land Disposal Unit (LDU) CPP-48
Author: Alcalde, A.
Recipient: Not specified
Date: 10/16/90

FILE NUMBER

AR3.15 HEALTH AND SAFETY PLAN (continued)

A Document #: 6653
Title: Site Specific Health and Safety Plan –ICPP Land Disposal Unit (LDU) CPP-37
Author: Alcalde, A.
Recipient: Not specified
Date: 10/16/90

A Document #: 6654
Title: Site Specific Health and Safety Plan –Land Disposal Unit (LDU) CPP-40; LDU CPP-47
Author: Alcalde, A.
Recipient: Not specified
Date: 10/16/90

A Document #: EGG-ER-10922, Rev. 0
Title: Health and Safety Plan for the WAG 3/WAG 10 Radionuclide-Contaminated Soils Treatability Study
Author: Barry, G.A.; Nuthak, S.A.; Pickett, S.L.
Recipient: Not specified
Date: 08/01/93

A Document #: INEL-95/0136, Rev. 0
Title: Health and Safety Plan for the Waste Area Group 3 Comprehensive Remedial Investigation/Feasibility Study (Final)
Author: Meyer, T.J.
Recipient: Not specified
Date: 08/01/95

A Document #: INEL-95/0136, Rev. 2
Title: Health and Safety Plan for the Waste Area Group 3 Comprehensive Remedial Investigation/Feasibility Study
Author: Meyer, T.J.
Recipient: Not specified
Date: 07/01/95

A Document #: INEL-95/0292, Rev. 0
Title: Health and Safety Plan for D&D of CPP-631, -709, -734
Author: LaBuy, S.A.; Peterson, D.A.
Recipient: Not specified
Date: 06/01/95

FILE NUMBER

AR3.15 HEALTH AND SAFETY PLAN (continued)

A Document #: INEL-95/0292, Rev. 1
Title: Health and Safety Plan for D&D of CPP-631, -709, -734
Author: LaBuy, S.A.; Peterson, D.A.
Recipient: Not specified
Date: 06/01/97

AR3.17 REMEDIAL INVESTIGATION AND BASELINE RISK ASSESSMENT REPORT

A Document #: KLF-210-95
Title: Modification to the WAG 3 Baseline Risk Assessment Approach
Author: Rodriguez, R.R.
Recipient: Green, L.A.
Date: 06/21/95

AR3.20 TREATABILITY STUDY

A Document #: PTL-02-94
Title: Comments on the Draft Technical Work Plan for the WAG 3 and WAG 10 Radionuclide Contaminated Soils Treatability Study
Author: Laney, P.T.
Recipient: Honeycutt, T.K.
Date: 03/22/94

A Document #: GMH-01-93
Title: Comments concerning the treatability study of INEL soils, including ICPP soils
Author: Huestis, G.M.
Recipient: Daum, K.A.
Date: 08/04/93

AR3.21 SCHEDULE

A Document #: OPE-ER-131-96
Title: Transmittal of the Revised WAG 3 Operable Unit 3-13 Comprehensive RI/FS Schedule
Author: Jensen, N.R.
Recipient: Pierre, W.; Nygard, D.
Date: 08/27/96

FILE NUMBER

AR3.21 SCHEDULE (continued)

A Document #: OPE-ER-33-97
Title: Transmittal of the Revised WAG 3 Operable Unit 3-13 Comprehensive RI/FS Schedule
Author: Jines, A.T.
Recipient: Pierre, W.; Nygard, D.
Date: 03/05/97

A Document #: 10110
Title: Revised Closure Plan Schedule
Author: Solecki, J.E.
Recipient: Monson, S.
Date: 09/29/89

A Document #: 8206
Title: Detailed Schedules for Preparation of Closure Plans
Author: Solecki, J.E.
Recipient: Gearheard, M.F.
Date: 01/11/90

A Document #: KHK-147-89
Title: Detailed Schedules for Preparation of Closure Plans
Author: Blumberg, D.J.
Recipient: Sato, W.N.
Date: 12/22/89

AR4.2 FS REPORTS

A Document #: OPE-ER-18-98
Title: Transmittal of the Draft OU 3-13 Feasibility Study Supplement to the Final OU 3-13 Comprehensive RI//FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 01/29/98

A Document #: OPE-ER-128-98
Title: Transmittal of the Revised Draft Comprehensive RI//FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL –Part B, FS Supplement Report (Revision 1)
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 08/06/98

FILE NUMBER

AR4.2 FS REPORTS (continued)

A Document #: OPE-ER-40-98
Title: Transmittal of Documents for Review of WAG 3 Cost Estimates
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 03/12/98

A Document #: FL-92-0234
Title: Feasibility of Performing Gamma Isotopic Profiles in the Idaho Chemical Processing Plant Waste Tank Farm Observations Wells
Author: Battaglia, P.J.
Recipient: Alexander, D.
Date: 09/29/92

AR4.3 PROPOSED PLAN

A Document #: 10542
Title: Proposed Plan for Waste Area Group 3 at the Idaho Chemical Processing Plant Idaho National Engineering and Environmental Laboratory
Author: INEEL Community Relations
Recipient: Not specified
Date: 10/01/98

A Document #: OPE-ER-159-98
Title: Transmittal of the Final Proposed Plan (Rev 6) for Waste Area Group 3--Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Hain, K.E.
Recipient: Pierre, W.; Nygard, D.
Date: 10/14/98

A Document #: 15054
Title: DOE-HQ Approval and Comments on the Draft Proposed Plan for Remediation of the Idaho National Engineering and Environmental Laboratory, Waste Area Group 3, Operable Unit 3-13, Idaho Chemical Processing Plant, Comprehensive Remedial Investigation/Feasibility Study
Author: Robison, S.A.
Recipient: Hain, K.E.
Date: 11/14/97

FILE NUMBER

AR4.3 **PROPOSED PLAN (continued)**

Document #: OPE-ER-68-98
Title: Transmittal of the Revised Draft Proposed Plan, (Rev. 1) for Waste Area Group 3, Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 04/17/98

Document #: OPE-ER-78-98
Title: Transmittal of the Revised Draft Proposed Plan, (Rev. 2) for Waste Area Group 3, Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 05/14/98

Document #: OPE-ER-104-98
Title: Transmittal of the Revised Draft Proposed Plan, (Rev. 3) for Waste Area Group 3, Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 06/22/98

Document #: OPE-ER-261-97
Title: Transmittal of the Draft Proposed Plan for Waste Area Group 3, Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 12/04/97

Document #: OPE-ER-133-98
Title: Transmittal of the Revised Draft Proposed Plan (Rev 4) for Waste Area Group 3, Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 08/17/98

FILE NUMBER

AR4.3 PROPOSED PLAN (continued)

A. Document #: OPE-ER-148-98
Title: Transmittal of the Revised Draft Proposed Plan (Rev 5) for Waste Area Group 3, Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 09/15/98

A. Document #: OPE-ER-28-98
Title: Transmittal of the Revised Draft Proposed Plan for Waste Area Group 3, Idaho Chemical Processing Plant, Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 02/13/98

AR5.1 RECORD OF DECISION

A. Document #: OPE-ER-44-99
Title: Transmittal of the Draft Record of Decision –Idaho Nuclear Technology and Engineering Center, Idaho National Engineering and Environmental Laboratory
Author: Hain, K.E.
Recipient: Pierre, W.; Nygard, D.
Date: 03/29/99

A. Document #: OPE-ER-119-99
Title: Transmittal of the Final Record of Decision –Idaho Nuclear Technology and Engineering Center, Idaho National Engineering and Environmental Laboratory
Author: Hain, K.E.
Recipient: Pierre, W.; Nygard, D.
Date: 08/30/99

A. Document #: OPE-ER-99-99
Title: Transmittal of the Draft Final Record of Decision – Idaho Nuclear Technology and Engineering Center, Idaho National Engineering and Environmental Laboratory
Author: Hain, K.E.
Recipient: Pierre, W.; Nygard, D.
Date: 07/20/99

FILE NUMBER

AR5.1 RECORD OF DECISION (continued)

Document #: OPE-ER-28-99
Title: Transmittal of the Draft Record of Decision –Idaho Nuclear Technology and Engineering Center, Idaho National Engineering and Environmental Laboratory
Author: Hain, K.E.
Recipient: Kluk, A.
Date: 02/17/99

AR5.4 RECORD OF DECISION REVIEW COMMENTS

Document #: 10679
Title: IDHW/DEQ Comments on Draft Record of Decision – Idaho Nuclear Technology and Engineering Center
Author: Not specified
Recipient: Jenkins, T.W.
Date: 03/01/99

Document #: 10681
Title: IDHW/DEQ Comments on Draft Record of Decision – Idaho Nuclear Technology and Engineering Center (DOE/ID-10660)
Author: Reno, S.L.
Recipient: Hain, K.E.
Date: 05/14/99

Document #: 10682
Title: IDHW/DEQ Comments on Draft Final Record of Decision, Idaho Nuclear Technology and Engineering Center (DOE/ID-10660)
Author: Reno, S.L.
Recipient: Hain, K.E.
Date: 08/04/99

Document #: 10683
Title: EPA Review of Draft Final Record of Decision (ROD) for O.U. 3-13, Idaho Chemical Processing Plant
Author: Pierre, W.
Recipient: Hain, K.E.
Date: 08/04/99

FILE NUMBER

AR10.1 COMMENTS AND RESPONSES

A Document #: 18079
Title: Concern over Department' s Proposed Plan for Waste Area Group 3 at the Idaho Chemical Processing Plant at INEEL and Request Personal Attention in Redirecting Critical Aspects of Effort - Request Public Comment be Extended for Thirty Days
Author: Chenoweth, H.
Recipient: Richardson, B., DOE-HQ
Date: 12/18/98

A Document #: 18080
Title: Response to Congresswoman Helen Chenoweth
Author: Owendoff, J.M.
Recipient: Richardson, B., DOE-HQ
Date: 02/01/99

A Document #: 18081
Title: Response to Congresswoman Helen Chenoweth –Public Comment Period on Proposed Plan for INTEC Extended
Author: Richardson, B., DOE-HQ
Recipient: Chenoweth, H.
Date: 02/22/99

A Document #: OPE-ER-73-98
Title: Response to Recommendation on Proposed Soils Repository at the Idaho National Engineering and Environmental Laboratory
Author: Jenkins, T.W.
Recipient: Rice, C.M.
Date: 04/29/98

A Document #: OPE-ER-48-99
Title: Response to Recommendation on the Proposed Plan for Remedial Action at the Idaho Chemical Processing Plant (Waste Area Group 3)
Author: Jenkins, T.W.
Recipient: Rice, C.M.
Date: 03/31/99

A Document #: 10684
Title: Comments on the WAG 3 Proposed Plan
Author: Christinna
Recipient: Lyle, J. L
Date: 12/17/98

FILE NUMBER

AR10.1 COMMENTS AND RESPONSES (continued)

A Document #: 10685
Title: Comments on WAG 3
Author: Priestley, F.
Recipient: Chenoweth, H.
Date: 01/01/99

A Document #: 10686
Title: Comment on the Proposed Plan for WAG 3
Author: Vanhorn, R. L.
Recipient: Simpson, E. A.
Date: 12/15/98

A Document #: 10687
Title: WAG 3 Comments
Author: Ansley, Shannon L.
Recipient: Simpson, E. A.
Date: 12/02/98

A Document #: 10688
Title: Comments on WAG 3
Author: Taylor, A. E.
Recipient: Simpson, E. A.
Date: 10/31/98

A Document #: 10689
Title: Comments on WAG 3
Author: Randolph, P.
Recipient: Simpson, E. A.
Date: 10/27/9

A Document #: 10690
Title: Idaho Chemical Processing Plant (INTEC) Proposed Plan Comments
Author: Commander, J.
Recipient: Lyle, J. L.
Date: 12/01/98

A Document #: 10691
Title: Comments on Proposed Clean-up Plan for INEEL Chemical Processing Plant
Author: Lemley, J. K.
Recipient: Lyle, J. L.
Date: 12/18/98

FILE NUMBER

AR10.1 COMMENTS AND RESPONSES (continued)

A Document #: 10692
Title: Comments on WAG 3
Author: Hobson, S.
Recipient: Chenoweth, H.
Date: 02/08/99

A Document #: 10693
Title: Comments on WAG 3
Author: Crapo, M; Craig, L.; Simpson, M.
Recipient: Bergholz, W.
Date: 02/09/99

A Document #: 10694
Title: Comments on WAG 3
Author: Robertson, B. B.
Recipient: DOE-ID
Date: 02/11/99

A Document #: 10695
Title: Comments on WAG 3
Author: Kuehn, R. M.
Recipient: Simpson, E. A.
Date: 02/08/99

A Document #: 10696
Title: Comments on Environmental Remediation at Idaho National Engineering Laboratory, Idaho Chemical Processing Plant Radioactive Waste Management Complex
Author: Broscious, C.
Recipient: Community Relations Coordinator
Date: 04/06/99

A Document #: 10697
Title: Draft Comments (7/14/98) ICPP Draft Cleanup Plan
Author: Broscious, C.
Recipient: Community Relations Coordinator
Date: 07/14/98

FILE NUMBER

AR10.1 COMMENTS AND RESPONSES (continued)

A Document #: 10698
Title: Comments ICPP Draft Cleanup Plan
Author: Broscious, C.
Recipient: Pierre W.; Trever, K.; Wichmann, T.
Date: 08/14/98

A Document #: 10699
Title: Comments on Department of Energy Idaho National Engineering and Environmental Laboratory Idaho Chemical Processing Plan Proposed Cleanup Plan
Author: Broscious, C.
Recipient: Community Relations Coordinator
Date: 11/19/98

A Document #: 10700
Title: Comments on Proposed Plan for Idaho Chemical Processing Plant
Author: Coperfield, C.
Recipient: Lyle, J. L.
Date: 12/21/98

A Document #: 10701
Title: Public Comment Clean Up Plan for Waste Area Group 3 (Idaho Chemical Processing Plant) INEEL
Author: Stewart, M. M.
Recipient: Community Relations Coordinator
Date: 12/22/98

A Document #: 10702
Title: Idaho Chemical Processing Plant (INTEC) Proposed Plan –Comment
Author: Hensel, D.
Recipient: Community Relations Coordinator
Date: 12/22/98

A Document #: 10703
Title: Comments to WAG 3 Proposed Plan
Author: Robo, R.
Recipient: Lyle, J. L.
Date: 12/21/98

FILE NUMBER

AR10.1 COMMENTS AND RESPONSES (continued)

Document #: 10704
Title: Comments on the Proposed Plan for Waste Area Group 3—Idaho Chemical Processing Plant Idaho National Engineering and Environmental Laboratory—Snake River Alliance
Author: Brailsford, B.
Recipient: Community Relations Coordinator
Date: 12/22/98

Document #: 10705
Title: Comments on ICPP Proposed Plan
Author: McCarthy, J. M.
Recipient: Community Relations Coordinator
Date: 12/22/98

Document #: 10706
Title: WAG 3 Comments
Author: Citizens Advisory Board
Recipient: Community Relations Coordinator
Date: 11/18/98

AR10.3 PUBLIC NOTICE(S)

Document #: 10545
Title: Notice of Availability - Meetings Scheduled on Cleanup of Idaho Nuclear Technology and Engineering Center
Author: INEEL Community Relations
Recipient: Not specified
Date: 10/22/98

Document #: 16878
Title: Notice of Availability - Comment Period Extended on Proposed Cleanup Plan for Idaho Nuclear Technology and Engineering Center
Author: INEEL Community Relations
Recipient: Not specified
Date: 01/11/99

FILE NUMBER

AR10.4 PUBLIC MEETING TRANSCRIPTS

A Document #: 10675
Title: INEEL Public Meeting on Proposed Cleanup Plan for Idaho Chemical Processing Plant (INTEC) –Idaho Falls, Idaho
Author: INEEL Community Relations
Recipient: Not specified
Date: 11/16/98

A Document #: 10676
Title: INEEL Public Meeting on Proposed Cleanup Plan for Idaho Chemical Processing Plant (INTEC) –Twin Falls, Idaho
Author: INEEL Community Relations
Recipient: Not specified
Date: 11/17/98

A Document #: 10677
Title: INEEL Public Meeting on Proposed Cleanup Plan for Idaho Chemical Processing Plant (INTEC) –Boise, Idaho
Author: INEEL Community Relations
Recipient: Not specified
Date: 11/18/98

A Document #: 10678
Title: INEEL Public Meeting on Proposed Cleanup Plan for Idaho Chemical Processing Plant (INTEC) –Moscow, Idaho
Author: INEEL Community Relations
Recipient: Not specified
Date: 11/19/98

AR10.6 FACT SHEETS AND PRESS RELEASES

A Document #: 14841
Title: Update Fact Sheet - Comprehensive investigation identifies extent of contamination within Waste Area Group 3
Author: INEEL Community Relations
Recipient: Not specified
Date: 11/01/97

FILE NUMBER

AR10.6 FACT SHEETS AND PRESS RELEASES (continued)

Document #: 14840
Title: Update Fact Sheet - Waste Area Group 3 environmental investigation nearly complete
Author: INEEL Community Relations
Recipient: Not specified
Date: 09/01/98

Document #: 6520
Title: DOE NEWS - for Immediate Release - WINCO Coordinates Effort to Recycle Contaminated Metal
Author: Bugger, B.
Recipient: Not specified
Date: 06/01/93

Document #: 6548
Title: DOE NEWS - for Immediate Release - DOE Completes Environmental Assessment on Upgrading Chem Plant Tank Farm
Author: Coe, M.
Recipient: Not specified
Date: 06/24/93

Document #: 6710
Title: DOE NEWS - for Immediate Release - Idaho Chemical Processing Plant Transition Plan Made Available to the Public
Author: Coe, M.
Recipient: Not specified
Date: 08/05/93

Document #: 6805
Title: DOE NEWS - for Immediate Release - Removal Actions to Take Place at the Idaho Chemical Processing Plant
Author: Bugger, B.
Recipient: Not specified
Date: 09/24/93

Document #: 6836
Title: DOE NEWS - for Immediate Release - WINCO, Private Vendor Demonstrates Technology for Cleaner Decontamination
Author: Bugger, B.
Recipient: Not specified
Date: 10/15/93

FILE NUMBER

AR10.6 FACT SHEETS AND PRESS RELEASES (continued)

Document #: 7559
Title: DOE NEWS -for Immediate Release -Retech Sign Agreement for Test Melt of Contaminated Metal
Author: Bugger, B.
Recipient: Not specified
Date: 03/30/94

Document #: 7595
Title: DOE NEWS -for Immediate Release -Engineers New Sensor System with Arms Control, Cleanup Applications
Author: Bugger, B.
Recipient: Not specified
Date: 04/01/94

AR11.1 EPA HEADQUARTERS GUIDANCE

Document #: 14842
Title: Response to Recommendations from the National Remedy Review Board (NRRB) on the Proposed Remedy for INTEC
Author: Rose, K.A.
Recipient: Jenkins, T.
Date: 08/05/98

AR11.4 TECHNICAL SOURCES

Document #: WM-F1-83-006
Title: Internal Technical Report -Radiological Characterization and Decision Analysis for the CPP-603 BIF Filter Room
Author: Schmidt, D.A.; Smith, D.L.; Smith, S.S.; Wilding, M.W.
Recipient: Not specified
Date: 05/01/83

Document #: WM-F1-83-024
Title: Internal Technical Report -Radiological Characterization and Decision Analysis for the CPP-603 Fuel-Element Cutting Facility
Author: Schmidt, D.A.; Smith, D.L.
Recipient: Not specified
Date: 09/01/83

FILE NUMBER

AR11.4 TECHNICAL SOURCES (continued)

A Document #: WM-F1-81-004
Title: Internal Technical Report –CPP-633 NaK Furnace Characterization
Author: Smith, D.L.; Bradford, D.J.
Recipient: Not specified
Date: 03/01/81

A Document #: WM-F1-81-010
Title: Internal Technical Report –Characterization of the RALA Off-Gas Cell, CPP-631
Author: Smith, D.L.; Bradford, D.J.
Recipient: Not specified
Date: 05/01/81

A Document #: WM-F1-81-023, Rev. 1
Title: Internal Technical Report –Radioactive Waste Characterization of CPP-603 Cleanup Basin System –CPP-740
Author: Low, J.O.
Recipient: Not specified
Date: 05/01/82

AR11.6 TECHNICAL MEMORANDUM

A Document #: 17286
Title: Transmittal of the Draft Technical Memorandum on the Hydrogeology at the Idaho Chemical Process Plant
Author: Jenkins, T.W.
Recipient: Jones, E.; Reno, S.L.
Date: 10/28/94

A Document #: OPE-ER-199-96
Title: Transmittal of the Three Technical Memoranda on Technology Screening, Remedial Action Objectives, and Applicable or Relevant and Appropriate Requirements
Author: Jensen, N.R.
Recipient: Pierre, W.; Nygard, D.
Date: 12/23/96

FILE NUMBER

AR11.6 TECHNICAL MEMORANDUM (continued)

A Document #: WINCO-1060
Title: Modeling Hypothetical Groundwater Transport of Nitrates, Chromium, and Cadmium at the Idaho Chemical Processing Plant
Author: Thomas, T.R.
Recipient: Not specified
Date: 11/01/88

A Document #: EGG-ER-11101
Title: Technical Memorandum for the WAG 3 and WAG 10 Soils Treatability Study: Physical Separation of Radionuclides in Soils
Author: Gombert, D.; Honeycutt, T.K.; Goettsche, J.H.; Huestis, G.M.; Tranter, T.J.
Recipient: Not specified
Date: 12/01/93

AR12.1 EPA COMMENTS

A Document #: 5776
Title: Comments on the Technical Memorandum Conceptual Flow and Transport Models of the Unsaturated and Saturated Zones for the WAG 3 Comprehensive RI/FS
Author: Meyer, L.
Recipient: Green, L.
Date: 06/17/94

A Document #: 5778
Title: EPA Comments on the Draft Aquifer Characteristics Technical Memorandum
Author: Meyer, L.
Recipient: Green, L.
Date: 08/10/94

A Document #: 5777
Title: Review Comments of the Draft Technical Work Plan for the WAG 3 and WAG 10 Radionuclide-Contaminated Soils Treatability Study
Author: Liverman, E.
Recipient: Green, L.
Date: 03/18/94

FILE NUMBER

AR12.1 EPA COMMENTS (continued)

Document #: 5783
Title: EPA Comments, Draft Scope of Work for the Waste Area Group 3 Comprehensive RI/FS
Author: Meyer, L.
Recipient: Green, L.
Date: 08/08/94

Document #: 10429
Title: EPA Comments, Draft Comprehensive RI/FS for the Idaho Chemical Processing Plant (OU 3-13)
Author: Orlean, H.
Recipient: Hain, K.E.
Date: 08/13/97

Document #: 15038
Title: EPA Comments on Idaho Chemical Processing Plant (ICPP), INEL Waste Area Group (WAG) 3 Technical Workplan for Perched Water Pumping and Tracer Tests
Author: Jones, E.
Recipient: Green, L.A.
Date: 10/19/94

Document #: 15053
Title: Additional EPA Comments on Draft Comprehensive RI/FS for the Idaho Chemical Processing Plant (OU 3-13)
Author: Orlean, H.
Recipient: Hain, K.E.
Date: 09/12/97

Document #: 18066
Title: Idaho Chemical Processing Plant (ICPP), INEL Waste Area Group (WAG) 3 Technical Memorandum for Radiologically Contaminated Soils (New Unit NU-21.93)
Author: Jones, E.
Recipient: Green, L.A.
Date: 11/18/94

FILE NUMBER

AR12.1 EPA COMMENTS (continued)

A. Document #: 18071
Title: EPA Review of "Draft ICPP Radionuclide-Contaminated Soils Removal Action EE/CA"
Author: Pierre, W.
Recipient: Jensen, N.R.
Date: 01/30/97

A. Document #: 18077
Title: EPA Comments on the Supplemental Feasibility Study for the Idaho Chemical Processing Plan by the Environmental Protection Agency
Author: EPA
Recipient: Not specified
Date: 09/09/99

A. Document #: 18078
Title: EPA Comments on the Draft Final Proposed Plan for the ICPP
Author: Rose, K.R.
Recipient: Not specified
Date: 09/09/99

A. Document #: 12995
Title: EPA Comments on Draft Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 –Part A, RI/BRA Report
Author: Orlean, H.
Recipient: Jensen, N.R.
Date: 10/04/96

A. Document #: 2317
Title: EPA Comments on INEL Initial Assessment Ranking Update on CPP-55 Closure Plan Review, and CPP-77 Summary Assessment Review
Author: Feigner, K.D.
Recipient: Gesell, T.F.
Date: 12/24/87

A. Document #: 2494
Title: EPA Review of Selected Summary Assessments
Author: Feigner, K.D.
Recipient: Gesell, T.F.
Date: 01/05/88

FILE NUMBER

AR12.1 EPA COMMENTS (continued)

Document #: 2668
Title: EPA Review of INEL Closure Plan Reviews for TAN-726, Ion Exchange Treatment Unit, TAN-674 Tank, IET Container Storage Unit, and Hg Contaminated Area -CPP-55
Author: Feigner, K.D.
Recipient: Gesell, T.F.; Clark, C.E.
Date: 10/27/87

Document #: 3537
Title: EPA Review Summary Assessments
Author: Gearheard, M.; Koshuta, C.
Recipient: Weiler, H.
Date: 10/16/89

Document #: 6318
Title: EPA Closure Plan Review Mercury Contaminated Area CPP-55
Author: Tetra Tech, Inc.
Recipient: Not specified
Date: 10/01/87

Document #: 6497
Title: EPA Summary Assessment Reviews
Author: Feigner, K.D.
Recipient: Clark, C.E.
Date: 05/21/87

Document #: 6709
Title: EPA Notice of Deficiency for Closure Plan Submittal
Author: Gearheard, M.F.; Koshuta, C.R.
Recipient: Solecki, J.E.
Date: 10/26/89

Document #: 8682
Title: EPA/IDHW Notice of Deficiencies for Sixteen INEL Closure Plans; CPP-55, CPP-37, CPP-33, CPP-34, CPP-48, CPP-39, CPP-63, CPP-47, CPP-40, CPP-59, CPP-64, TSF Disposal Pond, CFA-03, CFA-02, TAN-629 and CFA Motor Pool Pond
Author: Gearheard, M.F.; Koshuta, C.R.
Recipient: Weiler, F.H.
Date: 11/08/86

FILE NUMBER

AR12.2 IDHW COMMENTS

Document #: 5779
Title: IDHW/DEQ Informal Comments on Sediment Layering Effect on Contaminant Transport for Nonperched Unsaturated Areas at the ICPP
Author: Reno, S.L.
Recipient: Jenkins, T.
Date: 08/30/94

Document #: 5782
Title: IDHW/DEQ Comments, Draft Scope of Work for the Waste Area Group 3 Comprehensive RI/FS
Author: Reno, S.L.
Recipient: Green, L.
Date: 08/10/94

Document #: 15034
Title: IDHW/DEQ Comments on Draft Technical Memorandum Waste Area Group 3, Comprehensive Remedial Investigation Baseline Risk Assessment Methodology, OU 3-13, September 28, 1994
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 11/01/94

Document #: 15035
Title: IDHW/DEQ Concurrence with Draft Final Scope of Work, Waste Group 3 Comprehensive Remedial Investigation/Feasibility Study
Author: Reno, S.L.
Recipient: Green, L.A.
Date: 10/06/94

Document #: 15040
Title: IDHW/DEQ Comments on Technical Memorandum on the Hydrogeology at the Idaho Chemical Processing Plant, OU 3-13
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 11/22/94

FILE NUMBER

AR12.2 IDHW COMMENTS (continued)

Document #: 15045
Title: IDHW/DEQ Review and Comment Period for Draft Sampling and Analysis Plan for the Waste Area Group 3 Remedial Investigation/Feasibility Study
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 02/17/95

Document #: 15051
Title: IDHW/DEQ Comments on the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL (Draft), June 1997
Author: Reno, S.L.
Recipient: Hain, K.E.
Date: 09/03/97

Document #: 5784
Title: IDHW/DEQ Informal Comments on Technical Memorandum Assessment of Porflow Boundary Conditions for Use in the ICPP Unsaturated Zone Model and Attachment A Assessment of the Cylindrical Coordinate Option in Porflow
Author: Reno, S.L.
Recipient: Jenkins, T.
Date: 08/30/94

Document #: 5785
Title: IDHW/DEQ Concurrence with Draft Final Scope of Work, Waste Area Group (WAG) 3 Comprehensive RI/FS
Author: Reno, S.L.
Recipient: Green, L.
Date: 10/06/94

Document #: 15039
Title: IDHW/DEQ Comments on Draft Technical Memorandum for the Water Quality Trend Analysis in the Snake River Plain Aquifer, Idaho Chemical Processing Plant, October 6, 1994, OU 3-13
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 11/07/94

FILE NUMBER

AR12.2 IDHW COMMENTS (continued)

Document #: 15044
Title: IDHW/DEQ Informal Comments on Draft WAG 3 Saturated Zone Conceptual Model
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 01/09/95

Document #: 15036
Title: IDHW/DEQ Comments on Closure Plan for CPP-34/INEL
Author: Lane, R.
Recipient: Monson, B.R.
Date: 08/14/90

Document #: 15037
Title: IDHW/DEQ Comments on Draft Technical Work Plan for the Idaho Chemical Processing Plant Perched Ground Water Pumping and Tracer Tests, September 16, 1994
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 10/18/94

Document #: 18069
Title: IDHW/DEQ Review Comments on the Draft Track Two Summary Report for Operable Unit (OU) 3-08 at the Idaho Chemical Processing Plant (ICPP), Waste Area Group 3 (WAG 3)
Author: Stoops, T.M.
Recipient: Green, L.A.
Date: 06/09/93

Document #: 18040
Title: IDHW/DEQ Review of Draft Final Scope of Work for the WAG 3 North Area Remedial Investigation/Feasibility Study (OU 3-08a)
Author: Rosenberger, M.S.
Recipient: Green, L.A.
Date: 03/09/94

FILE NUMBER

AR12.2 IDHW COMMENTS (continued)

Document #: 18041
Title: IDHW/DEQ Review of Draft SOW for Waste Area Group 03, Operable Unit 08a; Idaho Chemical Processing Plant
Author: Stoops, T.M.
Recipient: Green, L.A.
Date: 01/19/94

Document #: 15055
Title: IDHW/DEQ Comments on the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL (Draft Final)
Author: Reno, S.L.
Recipient: Hain, K.E.
Date: 11/14/97

Document #: 15059
Title: IDHW/DEQ Informal Comments on the Working Draft of Proposed Plan for Waste Area Group 3, Idaho Chemical Processing Plant
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 01/09/98

Document #: 18023
Title: IDHW/DEQ Comments on Waste Area Group 3 Comprehensive Remedial Investigation/Feasibility Study Work Plan (Draft)
Author: Reno, S.L.
Recipient: Green, L.A.
Date: 05/01/95

Document #: 18068
Title: IDHW/DEQ Comments on Technical Memorandum for the ICPP Radiologically Contaminated Soils (New Unit NU-21.93), OU 3-13
Author: Reno, S.L.
Recipient: Jenkins, T.W.
Date: 11/18/94

Document #: 12996
Title: IDHW/DEQ Comments on Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEL –Part A, RI/BRA (Draft) (DOE/ID-10534, August 1996, Revision 0)
Author: Reno, S.L.
Recipient: Jensen, N.R.
Date: 10/08/96

FILE NUMBER

AR12.2 IDHW COMMENTS (continued)

A. Document #: 14351
Title: IDHW/DEQ Comments on Engineering Evaluation/Cost Analysis for Radionuclide-Contaminated Soils Removal Action at the Idaho Chemical Processing Plant (DOE/ID-10568, February 1997)
Author: Reno, S.L.
Recipient: Jensen, N.R.
Date: 03/27/97

A. Document #: 16292
Title: IDHW/DEQ Comments on the Revised Draft Proposed Plan for Waste Group 3 at the Idaho Chemical Processing Plant
Author: Reno, S.L.
Recipient: Hain, K.E.
Date: 03/06/98

A. Document #: 16293
Title: IDHW/DEQ Comments on the Draft Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL –Part B, FS Supplement Report
Author: Reno, S.L.
Recipient: Hain, K.E.
Date: 03/26/98

A. Document #: 6112
Title: IDHW/DEQ Comments Concerning the Public Comment Period for the Closure Plan for CPP-55
Author: Donovan, R.P.; Findley, C.E.
Recipient: Barry, J.H.
Date: 09/19/89

A. Document #: 6725
Title: IDHW/DEQ Review of the Revised Closure Plan for CPP-23
Author: Koshuta, C.R.
Recipient: Solecki, J.E.
Date: 04/17/90

<u>**FILE NUMBER**</u>

AR12.3 DOE RESPONSE TO COMMENTS

A Document #: 2820
Title: Caliper Logs for CPP-23 Injection Well
Author: Solecki, J.E.
Recipient: Monson, B.R.
Date: 08/22/90

A Document #: 6036
Title: Summary Assessments
Author: Solecki, J.E.
Recipient: Gearheard, M.
Date: 03/13/90

A Document #: 906
Title: State of Idaho Request for Information Concerning the Status of "A Shallow Seepage Pit on the West Side of CPP-603" (SWMU CPP-2)
Author: Solecki, J.E.
Recipient: Nygard, D.
Date: 12/07/89

A Document #: 6635
Title: Response to State Questions
Author: Green, L.A.
Recipient: Hendrickson, B.
Date: 04/26/90

A Document #: OPE-EP-131-97
Title: Regulatory Position on the Status of CPP 709 and CPP 734
Author: Wessman, D.L.
Recipient: Steger, R.
Date: 04/10/97

A Document #: OKE-21-90
Title: Strontium 90 in Borehole CPP-55-06
Author: Earle, O.K.
Recipient: Lyle, J.L.
Date: 12/06/90

FILE NUMBER

AR12.3 DOE RESPONSE TO COMMENTS (continued)

Document #: OKE-13-91
Title: Revised LDU Questionnaires
Author: Earle, O.K.
Recipient: Lyle, J.L.
Date: 02/04/91

Document #: OKE-18-90
Title: Strontium 90 in Borehole CPP-55-06
Author: Earle, O.K.
Recipient: Sato, W.N.
Date: 11/19/90

Document #: OPE-ER-101-97
Title: Response to Recommendation on the Technology Screening and Alternative Development for WAG 3 Comprehensive Feasibility Study Report
Author: Jenkins, T.W.
Recipient: Rice, C.M.
Date: 06/18/97

Document #: DJB-41-89
Title: Summary Assessment Review Letter from the EPA/STATE
Author: Blumberg, D.J.
Recipient: Weiler, F.H.
Date: 11/09/89

Document #: DJB-49-90
Title: October 16, 1989 EPA Request for Additional Information for Deletion of Selected SWMU' s from the COCA through the Summary Assessment Process
Author: Blumberg, D.J.
Recipient: Panasiti, J.D.
Date: 05/23/90

Document #: DJB-09-90
Title: Summary Assessment Review Letter from the EPA/STATE
Author: Blumberg, D.J.
Recipient: Weiler, F.H.
Date: 01/12/90

FILE NUMBER

AR12.3 DOE RESPONSE TO COMMENTS (continued)

A Document #: AJM-23-89
Title: EPA Region X and Idaho Department of Health and Welfare Conditions for Closure of LDU CPP-55
Author: Matule, A.J.
Recipient: Weiler, F.H.
Date: 05/26/89

A Document #: OPE-ER-196-96
Title: Response to Comments for the Waste Area Group 3, Draft Comprehensive Remedial Investigation and Baseline Risk Assessment Report (RI/BRA), Part A of the Comprehensive Remedial Investigation, Feasibility Study Report
Author: Jines, A.T.
Recipient: Pierre, W.; Nygard, D.
Date: 12/17/96

A Document #: DJB-40-89
Title: Response to Notice of Deficiency for Closure Plan Submittal Received from the EPA/STATE
Author: Blumberg, D.J.
Recipient: Weiler, F.H.
Date: 11/09/89

A Document #: GS-04-90
Title: Revision of WINCO' s Response to EPA Region X' s Review of Summary Assessments CPP-41, CPP-43, CPP-70, CPP-71, CPP-76, and CPP-77
Author: Sehlke, G.
Recipient: Blumberg, D.J.
Date: 03/07/90

A Document #: GS-15-89
Title: Response to EPA' s Notice of Deficiency for WINCO' s Accelerated Closure Plan Schedule
Author: Sehlke, G.
Recipient: Blumberg, D.J.
Date: 11/08/89

FILE NUMBER

AR12.3 DOE RESPONSE TO COMMENTS (continued)

A. Document #: ERD-161-91
Title: Response to Information Request by Mr. Walker Howell Regarding Sampling Data at CPP-55-06
Author: Lyle, J.L.
Recipient: Ledger, J.D.
Date: 05/09/91

A. Document #: ERD-209-91
Title: Response to Regulatory Comments on Closure Plan for CPP-59, Kerosene Tank Overflow
Author: Burns, T.F.
Recipient: Gearheard, M.
Date: 05/30/91

AR12.4 EXTENSION REQUESTS AND APPROVALS

A. Document #: 10298
Title: Extension of Review Period on the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEL--Part A, RI/BRA Report (Draft) - (OPE-ER-122-96)
Author: Reno, S.L.
Recipient: Jensen, N.R.; Pierre, W.
Date: 08/29/96

A. Document #: 10430
Title: Extension of Review Period on the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL (Draft) - (DOE/ID-10572, June 1997)
Author: Reno, S.L.
Recipient: Hain, K.E.; Pierre, W.
Date: 08/11/97

A. Document #: OPE-ER-67-98
Title: Request for Extension of the OU 3-13 Draft ROD and Related Documents
Author: Hain, K.E.
Recipient: Pierre, W.; Nygard, D.
Date: 05/15/98

FILE NUMBER

AR12.4 EXTENSION REQUESTS AND APPROVALS (continued)

A. Document #: 10446
Title: Concurrence with enforceable schedule extension for OU 3-13 Draft Record of Decision
Author: Nygard, D.
Recipient: Hain, K.E.
Date: 05/27/98

A. Document #: 10447
Title: Concurrence on Request for Extension of Enforceable Milestone for OU 3-13 Draft Record of Decision (ROD)
Author: Pierre, W.
Recipient: Hain, K.E.
Date: 05/27/98

A Document #: 15057
Title: Request for 20-Day Extension of Comment Period on the Draft Proposed Plan for the Idaho Chemical Processing Plant at INEEL
Author: Rose, K.A.
Recipient: Hain, K.E.
Date: 12/30/97

A Document #: 6115
Title: Receipt of your Notice of Delay dated 9/28/92 for submission of Track Two Summary Reports for Operable Units 3-07 and 3-08
Author: Stoops, T.M.
Recipient: Lyle, J.L.
Date: 10/26/92

A Document #: 905
Title: INEL Request for Extension for Closure Plans for COCA Units CPP-64, CPP-59 and CPP-39
Author: Gearheard, M.F.; Koshuta, C.R.
Recipient: Solecki, J.E.
Date: 08/03/90

FILE NUMBER

AR12.4 EXTENSION REQUESTS AND APPROVALS (continued)

A Document #: OPE-ER-102-95
Title: Extension of Comment Resolution Period on the Waste Area Group 3 Remedial Investigation/Feasibility Study Work Plan
Author: Green, L.A.
Recipient: Pierre, W.; Nygard, D.
Date: 06/05/95

A Document #: OPE-ER-173-96
Title: Twenty Day Extension Notification for Submittal of the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEL -Part A, RI/BRA Report (Draft Final)
Author: Jenkins, T.W.
Recipient: Pierre, W.; Nygard, D.
Date: 11/13/96

A Document #: ERD-197-91
Title: Request for Extension of the CPP-59 Closure Plan Revision Schedule
Author: Burns, T.F.
Recipient: Ledger, J.D.; Gearheard, M.
Date: 05/21/91

NOTE: **Sampling data can be examined at the Technical Support Building, 1580 Sawtelle.**