Idaho National Engineering and Environmental Laboratory

IDAHO DEPARTMENT OF HEALTH AND WELFARE
DIVISION OF ENVIRONMENTAL QUALITY

Record of Decision Amendment

Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10

at the Idaho National Engineering and Environmental Laboratory
Idaho Falls, Idaho

DOE/ID-10682 Amend
Revision 0
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Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10

February 2004

Prepared for the
U.S. Department of Energy
Idaho Operations Office

PART I - DECLARATION

SITE NAME AND LOCATION

V-Tanks (TSF-09 and TSF-18) and
PM-2A Tanks (TSF-26) and TSF-06, Area 10,
at Test Area North, Waste Area Group 1, Operable Unit 1-10
Idaho National Engineering and Environmental
Laboratory (CERCLIS ID 4890008952)
Idaho Falls, Idaho

Test Area North (TAN) is one of nine major facilities at the Idaho National Engineering and Environmental Laboratory (INEEL), a U.S. Department of Energy (DOE) facility located in southeastern Idaho, 51.5 km (32 mi) west of Idaho Falls. The INEEL encompasses approximately 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain and extends across portions of five counties: Butte, Jefferson, Bonneville, Clark, and Bingham. The TAN complex, near the northern end of the INEEL, extends over an approximately 30-km^2 (12-mi^2) area. The Technical Support Facility (TSF), which is centrally located within TAN, covers an approximate 460 by 670-m (1,500 by 2,200-ft) area and is surrounded by a security fence. The V-Tanks (TSF-09 and TSF-18), the PM-2A Tanks (TSF-26), and the Reactor Vessel Burial Site (TSF-06, Area 10) are located within the TSF. Waste Area Group (WAG) 1 includes facilities throughout TAN. Operable Unit (OU) 1-10 was developed to comprehensively address those remedial activities at TAN not addressed in other Records of Decision (RODs).

STATEMENT OF BASIS AND PURPOSE

This ROD Amendment and Explanation of Significant Differences (ESD) documents modifications and clarifications to the remedial actions for three sites: the V-Tanks (TSF-09 and TSF-18), the PM-2A Tanks (TSF-26), and the Reactor Vessel Burial Site (TSF-06, Area 10). The original selected remedial actions for these sites were documented in the *Final Record of Decision for Test Area North, Operable Unit 1-10* (DOE-ID 1999a [DOE/ID-10682]) (the 1999 ROD).

For the V-Tanks, a ROD Amendment is necessary because modification of the original selected remedy for the V-Tanks contents was required after the proposed technology became commercially unavailable, and the risk of it remaining unavailable was considered to be too high to proceed under the existing 1999 ROD. The original remedy for the piping used to transfer waste to and from the tanks, the tanks, and the in-line sand filter is not changed significantly by this ROD Amendment.

For the PM-2A Tanks site, an ESD is necessary because a significant change that does not fundamentally alter the overall cleanup approach is being made to the component of the original selected remedy concerning removal and treatment of the tank contents. New information from analysis of the tank during remedial design activities indicates that by making this change, remediation of the PM-2A Tanks site can be completed more quickly; at a lower cost; and with a significant reduction in potential risk to workers, human health, and the environment.

In addition, a clarification is necessary for the V-Tanks and the PM-2A Tanks site because a change that does not fundamentally alter the overall cleanup approach is being made to the component of the original selected remedy concerning remediation of contaminated soil at each of these sites. Since the 1999 ROD was signed, new information has been generated from sampling and analysis of the soil at both of these sites, resulting in the need to clarify the soil remediation portion of the remedies for these sites.

For the Reactor Vessel Burial Site (TSF-06, Area 10), an ESD is necessary because public comments and internal reviews revealed the need to reclassify this site as "No Further Action" (from its previous listing as "No Action") and to apply appropriate institutional controls.

The modifications presented in this ROD Amendment and ESD were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC§ 9601 et seq.), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The documents that form the basis for the decisions made in this ROD Amendment and ESD are contained in the Administrative Record for OU 1-10. The decisions documented in this ROD Amendment and ESD satisfy the requirements of the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (FFA/CO) (DOE-ID 1991) entered into among the DOE, the U.S. Environmental Protection Agency (EPA), and the State of Idaho.

The DOE Idaho Operations Office (NE-ID[a]) is the lead agency for the remedy decisions under Executive Order 12580. The EPA approves the decisions and, along with the Idaho Department of Environmental Quality (IDEQ), has participated in the selection of the remedies described in this document. The IDEQ concurs with the amended remedies. The DOE, EPA, and IDEQ are collectively referred to as "the Agencies" in this document. Within the INEEL's environmental restoration program, this action is being undertaken within the project designated OU 1-10. OU 1-10 is the comprehensive investigation for CERCLA sites within WAG 1.

V-Tanks (TSF-09 and TSF-18)

The V-Tanks are being remediated to prevent any potential future release of the tank contents to the environment. The contents of the V-Tanks are primarily aqueous sludge contaminated with radionuclides, organic compounds (including polychlorinated biphenyls [PCBs]), and inorganic contaminants (including metals). Some of the soil surrounding the tanks is contaminated, principally with Cs-137 and Co-60. The contamination originated from accidental releases during periodic pumping operations to remove excess liquid from the V-Tanks (Section 4.1.6 of the *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory* [RI/FS] [DOE-ID 1997] provides more information about V-Tanks operations). The surrounding contaminated soils and associated piping will be remediated along with the V-Tanks.

The original selected remedial action for the V-Tanks contents documented in the 1999 ROD was identified as "Alternative 2: Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal." However, the non-INEEL facility selected to treat the tank contents became no longer available for carrying out the type of treatment called for in the selected remedy, and no other non-INEEL facility is available that can perform the treatment specified in the selected remedy. Therefore, it was necessary to select a new remedy for the tank contents. As stated before, although significant changes are not being made to the part of the remedy that deals with the removal and disposal of contaminated soil from around the tanks and the tanks themselves, these parts of the remedy are being modified for clarity.

a. The abbreviation NE-ID signifies that the U.S. Department of Energy, Idaho Operations Office (which was abbreviated DOE-ID before October 1, 2003) reports to the DOE Office of Nuclear Energy, Science and Technology.

After reviewing potentially applicable treatment techniques, three technologies (with multiple variations) were selected for the formal evaluation process in 2002 and 2003. The evaluation emphasized currently available, cost-effective, safe, and feasible treatment, storage, and disposal options. The technology identified as the best alternative is chemical oxidation/reduction followed by stabilization. The technology will be implemented on the INEEL, primarily at the V-Tanks site or adjacent areas (e.g., TAN 607) as necessary to facilitate remediation. Therefore, in accordance with Section 117(c) of CERCLA and Section 300.435(c)(2)(ii) of the NCP, and pursuant to the 1999 ROD, this ROD Amendment has been prepared to document the changes.

The amended remedy identified in this ROD Amendment is intended to be the final action for remediation of the V-Tanks. All public participation and documentation procedures specified in NCP Sections 300.435(c)(2)(ii) and 300.825(a)(2) were conducted as required, including issuing a proposed plan (the *New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10* [DOE-ID, EPA, and IDEQ 2003]) that highlighted the proposed changes.

PM-2A Tanks (TSF-26)

Like the V-Tanks, the PM-2A Tanks are being remediated to prevent any potential future release of tank contents to the environment. The PM-2A Tanks contain solidified sludge contaminated with radionuclides, organic compounds (including polychlorinated biphenyls [PCBs]), and inorganic contaminants (including metals). Unlike the V-Tanks, essentially no free liquids are present in these tanks because in 1981 the tanks were partially filled with material to absorb free liquid. However, as with the V-Tanks, some of the soil surrounding the tanks is contaminated, principally with Cs-137. The contamination originated from accidental releases during periodic pumping operations to remove excess liquid from the PM-2A Tanks (Section 4.1.6 of the 1997 RI/FS provides more information about PM-2A Tanks operations). The tanks are part of a system that includes ancillary piping and equipment within the area designated as the PM-2A Tanks site. The surrounding contaminated soils and associated piping will be remediated along with the PM-2A Tanks.

The original selected remedial action for the PM-2A Tanks contents documented in the 1999 ROD was identified as “Alternative 3d: Soil Excavation, Tank Content Vacuum Removal, Treatment, and Disposal.” However, during remedial design activities, including additional sampling, the Agencies determined the tanks were structurally strong enough that they could be removed intact, with the contents still inside. As described in Section 7.2.2.2 of the 1999 ROD, “removal and decontamination [of the tank contents and the tanks themselves] increase the chance of worker exposure and, therefore, lower the short-term effectiveness.” In addition to avoiding potential worker exposure, removal of the tanks with the contents inside will cost less and require less time to complete remediation. As provided in the original selected remedy, the tank contents will be treated as necessary to meet land disposal restrictions (LDRs) and stabilized to meet other waste acceptance criteria (WAC) for disposal at the INEEL CERCLA Disposal Facility (ICDF) or other approved facility. Treatment will take place at or adjacent to the PM-2A Tanks site (e.g., TAN 607) as necessary to facilitate remediation.

As stated above, although significant changes are not being made to the part of the remedy that deals with the removal and disposal of contaminated soil from around the tanks and the tanks themselves, these parts of the remedy are being modified for clarity.

Reactor Vessel Burial Site (TSF-06, Area 10)

TSF-06, Area 10, is the designation for the Reactor Vessel Burial Site. This potential release site was evaluated as part of the WAG 1 Comprehensive RI/FS and, as documented in the 1999 ROD, it was determined to be a “No Action” site. The empty, irradiated reactor vessel is contained in a metal storage tank below the ground surface. No pathway to human or ecological receptors exists; thus, no cleanup is required.

However, during public participation activities conducted in 2003 in connection with the *New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10* [DOE-ID, EPA, and IDEQ 2003]), a commenting group submitted questions about this site. A review was conducted by the Agencies of the relevant documentation, and it was determined that although no pathway exists, potential residual contamination precludes unrestricted land use. The site should be categorized as a "No Further Action" site and protected with institutional controls. The *Institutional Control Plan for Test Area North Waste Area Group 1* (INEEL 2000b) will be modified to include appropriate institutional controls for this site. Detailed language has been added in Section 11.3 of this ROD Amendment and ESD directing this change to the 1999 ROD. The Agencies appreciate the dedication of this public group in bringing the oversight to their attention. The Agencies are pleased to observe that this confirms the value of the design of the CERCLA public involvement process.

ASSESSMENT OF THE SITE

The response actions selected in this ROD Amendment and ESD are necessary to protect public health, welfare, and/or the environment from actual or threatened releases of hazardous substances into the environment. Such a release or threat of release may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE AMENDED REMEDY FOR THE V-TANKS

The complete amended remedy for the V-Tanks is Soil and Tank Removal, Chemical Oxidation/Reduction with Stabilization of Tank Contents, and Disposal. The major treatment activities will take place at the V-Tanks site or in adjacent areas (e.g., TAN 607), as necessary to facilitate remediation. The amended remedy will prevent unacceptable exposure of workers, the public, and the environment to contaminants in the V-Tanks. This remedial action will permanently reduce the toxicity and mobility of the contamination in the V-Tanks. It will meet the final remedial action objectives (RAOs) by removing the source of contamination and, thus, breaking the pathway by which a future receptor may be exposed. This will be the final action for this site. The portion of the amended remedy that addresses removal and treatment of the V-Tanks contents will address the principal threat posed by the V-Tanks contents.

The amended remedy changes the actions that will be taken for the V-Tanks contents. The tank contents will be removed and treated as necessary to meet LDRs. Treatment includes addition of a chemical oxidant/reductant used to destroy the organic compounds followed by stabilization. The waste then will be disposed of at the ICDF or other approved facility. The ICDF was designated by the Agencies in the *Final Record of Decision for the Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13* (DOE-ID 1999b) as an appropriate disposal facility for all INEEL-generated CERCLA waste that meets the ICDF's WAC. This amended remedy meets the applicable or relevant and appropriate requirement (ARAR) (40 CFR 761.61[c]) for a risk-based approach to remediation of the V-Tanks contents. Finally, pursuant to the original remedy selected in the 1999 ROD and refined in the *Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10* (DOE-ID 2003a [DOE/ID-11050]), the surrounding contaminated soil, the tanks, and debris will be removed and disposed of at the ICDF or other approved facility. The final remediation goal (FRG) for soil surrounding the V-Tanks is 23.3 pCi/g for cesium-137 (Cs-137).

The amended remedy for the V-Tanks (TSF-09 and TSF-18) consists of 15 components divided into three subsets—(1) new or modified components of the amended remedy, (2) components of the original remedy that are clarified and remain in effect, and (3) components identified in the 2003 ESD that are in effect, as follows:

New or Modified Components of the V-Tanks Amended Remedy

1. Conducting further sampling and/or analysis of the V-Tanks contents to support refinement of the Resource Conservation and Recovery Act (RCRA) (42 USC§ 6901 et seq.) characteristic evaluation to determine whether treatment is required for underlying hazardous constituents. The results of this step will be subject to review and concurrence by the Agencies.

2. Consolidating and/or blending of the tank contents to the extent practical to facilitate management of the waste as one homogenous waste stream. If laboratory studies on sludge treatment demonstrate a clear benefit, some of the liquid excess from the treatment process may be decanted and treated separately from the remainder of the waste.

3. Continued temporary use of Tank V-9 for storage until the contents of that tank are removed for transfer to another V-Tank. Continued temporary use of Tanks V-1, V-2, and V-3 without secondary containment for storage of waste prior to treatment, blending waste prior to treatment, and/or providing an accumulation location for treated waste prior to stabilization.

4. Chemically oxidizing/reducing the VOCs in the V-Tanks contents as necessary to meet applicable RCRA LDR F001 treatment standards in accordance with ARARs as well as ICDF or other approved disposal facility WAC. Chemical oxidation/reduction of PCBs will be performed as necessary to demonstrate no unreasonable risk to human health and the environment, as part of a PCB risk-based management strategy developed under 40 CFR 761.61(c). Chemical oxidation/reduction will be required for specific underlying hazardous constituents (e.g., BEHP) if the waste is confirmed to exhibit an RCRA characteristic. Laboratory studies will be conducted to optimize the choice of specific oxidant(s)/reductant(s) (e.g., peroxide) and to optimize the treatment process. The treatment process selected may be multi-stage and will be conducted ex situ at the V-Tanks site or in adjacent areas (e.g., TAN 607), as necessary to facilitate remediation.

5. Performing additional treatment (e.g., solidification, stabilization) of the V-Tanks contents as necessary to meet ICDF or other approved disposal facility WAC.

6. Disposing of the treated tank contents at the ICDF or other approved facility.

7. Removing and disposing of the V-Tanks and associated piping at the ICDF or other approved facility.

8. Shipping treatment system off-gas residues and other secondary wastes to the ICDF or an approved treatment facility as necessary based on characterization of the wastes.

Components from the V-Tanks Original Remedy that are Clarified

9. Excavating contaminated soil:

    - Excavating contaminated soil that exceeds the FRG to a maximum of 3 m (10 ft) below ground surface (bgs)

    - Excavating additional soil below 3 m (10 ft) bgs to the extent necessary to remove the V-Tanks and associated piping.

10. Disposing of the contaminated soil at an approved soil repository.

11. Performing post-remediation soil sampling to verify FRGs are met and to analyze for additional contaminants if excavation indicates a release of the V-Tanks contents:

    - For contaminated soil less than 3 m (10 ft) bgs, perform post-remediation sampling to verify FRGs are met

    - For contaminated soil more than 3 m (10 ft) bgs, perform post-remediation sampling to determine the need for institutional controls

    - For contaminated soil beneath the V-Tanks and piping where there is evidence of a release (either a leak from a V-Tank or the associated piping), perform post-remediation soil sampling at the bottom of the excavation to analyze for V-Tanks contaminants to support a risk analysis that supports a potential revision to the FRGs and a determination of the need for further actions. This determination could lead to application of institutional controls, further remediation, or no action

    - For contaminated soil beneath the V-Tanks and piping where there is no evidence of a release from either the V-Tanks or the associated piping, perform post-remediation soil sampling to determine the appropriate institutional controls, if any, for this site.

12. Filling the excavated area with clean soil (soil that meets remedial action objectives [RAOs]) and then contouring and grading to the surrounding elevation.

13. Establishing and maintaining institutional controls consisting of signs, access controls, and land-use restrictions, depending on the results of post-remediation sampling. Institutional controls will be required if residual contamination precludes unrestricted land use after completion of remedial action.

Components from the 2003 Explanation of Significant Differences for the V-Tanks

14. Further characterizing the surrounding contaminated soil and further defining the corresponding area of contamination.

15. Adding ARARs for managing PCB remediation waste (as described in Section 9).

Remedial action objectives for the V-Tanks site will be met through the completion of active remediation (projected for 2007) and implementation of institutional controls. As stated in the 1999 ROD (DOE-ID 1999a), the amended remedy continues to address the risks posed by the V-Tanks by effectively removing the source of contamination and, thus, breaking the pathway by which a future receptor may be exposed.

STATUTORY DETERMINATION

The amended remedy for the V-Tanks is (a) protective of human health and the environment, (b) complies with federal and state requirements that are applicable or relevant and appropriate to the remedial actions, (c) is cost effective, and (d) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

This amended remedy for the V-Tanks also satisfies the statutory preference for treatment as a principal element of the amended remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Under the amended remedy, the waste currently in the V-Tanks will be removed; however, pursuant to the original remedy, contaminants in the surrounding soil may remain at the V-Tanks site after active remediation above levels that allow for unlimited use and unrestricted exposure. If so, institutional controls consisting of signs, access controls, and land-use restrictions will be established and maintained. In addition, a statutory review will be conducted within 5 years after initiation of remedial action, and at least every 5 years thereafter through the standard CERCLA 5-year review process. The reviews will be conducted to ensure that the amended remedy is protective of human health and the environment. This provision does not preclude more frequent reviews by one or more of the Agencies.

RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The following information about the V-Tanks is included in the Decision Summary section (Part II) of this ROD Amendment: (Note: Additional information can be found in the Administrative Record for this OU.)

- Contaminants for treatment and their respective concentrations (Part II, Section 2)
- Estimated costs (in net present value [NPV] using a 7% discount rate) (Part II, Section 8)
- Key factor(s) that led to selecting the amended remedy (i.e., how the amended remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision (Part II, Section 7)
- How source materials constituting principal threats are addressed (Part II, Section 9.5).

The following information about the V-Tanks is not included in this ROD Amendment because it is unchanged from the original 1999 ROD:

- Contaminants of concern (COCs) and their respective concentrations
- Baseline risk represented by the COCs
- Cleanup levels established for the COCs and the basis for these levels
- Current and reasonably anticipated future land-use assumptions used in the baseline risk assessment and 1999 ROD.

SIGNATURE SHEET

Signature sheet for the Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10, of the Idaho National Engineering and Environmental Laboratory, between the U.S. Environmental Protection Agency Region 10 and the U.S. Department of Energy Idaho Operations Office, with concurrence by the Idaho Department of Environmental Quality.

_______________________________ 7/19/04
Michael F. Gearheard, Director
Environmental Cleanup Office, Region 10
U.S. Environmental Protection Agency

Date

SIGNATURE SHEET

Signature sheet for the Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10, of the Idaho National Engineering and Environmental Laboratory, between the U.S. Environmental Protection Agency Region 10 and the U.S. Department of Energy Idaho Operations Office, with concurrence by the Idaho Department of Environmental Quality.

C. Stephen Allred, Director
Idaho Department of Environmental Quality

1/20/04
Date

SIGNATURE SHEET

Signature sheet for the Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10, of the Idaho National Engineering and Environmental Laboratory, between the U.S. Environmental Protection Agency Region 10 and the U.S. Department of Energy Idaho Operations Office, with concurrence by the Idaho Department of Environmental Quality.

Richard B. Provencher, Deputy Manager
Idaho Completion Project
U.S. Department of Energy,
Idaho Operations Office

2/20/04
Date

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FIGURES

TABLES

ACRONYMS

ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
ATG	Allied Technology Group
BEHP	bis-2-ethylhexyl phthalate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DRE	destruction and removal efficiency
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FFA/CO	Federal Facility Agreement and Consent Order
FRG	final remediation goal
FY	fiscal year
GAC	granular-activated carbon
HEPA	high-energy particulate air (filter)
HTRE	Heat Transfer Reactor Experiment
ICDF	INEEL CERCLA Disposal Facility
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDW	investigation-derived waste
INEEL	Idaho National Engineering and Environmental Laboratory
KYNF	Keep Yellowstone Nuclear Free

LDR	land disposal restriction
MACT	maximum achievable control technology
MCL	maximum contaminant level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NE-ID	U.S. Department of Energy, Idaho Operations Office
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NPV	net present value
NTS	Nevada Test Site
O&M	operations and maintenance
OSWER	(EPA) Office of Solid Waste Environmental Remediation
OU	operable unit
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD/RAWP	remedial design/remedial action work plan
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SGAC	sulfur-impregnated granular-activated carbon
SOW	scope of work
SRA	Snake River Alliance
SVOC	semivolatile organic compound
TAN	Test Area North
TCA	1,1,1-trichloroethane
TCE	trichloroethylene

TER	Technology Evaluation Report
TRU	transuranic
TSCA	Toxic Substances Control Act
TSF	Technical Support Facility
UHC	underlying hazardous constituents
UST	underground storage tank
UTS	universal treatment standard
VOC	volatile organic compound
WAC	waste acceptance criteria
WAG	waste area group
WIPP	Waste Isolation Pilot Plant

NOMENCLATURE

bgs	below ground surface
C	centigrade
Co	cobalt
Cs	cesium
F	Fahrenheit
ft	feet
g	gram
gal	gallon
Hg	mercury
in.	inch
kg	kilogram
L	liter
m	meter
mg	milligram
mm	millimeter
mrem	millirem
mi	mile
nCi/g	nanocuries per gram
pCi/g	picocuries per gram
w%	weight percent
yr	year

Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10

PART II – DECISION SUMMARY

1. INTRODUCTION AND STATEMENT OF PURPOSE

This Record of Decision (ROD) Amendment and Explanation of Significant Differences (ESD) documents modifications to the original remedy for three sites in Operable Unit (OU) 1-10 at the Idaho National Engineering and Environmental Laboratory (INEEL): the V-Tanks (TSF-09 and TSF-18), the PM-2A Tanks (TSF-26), and the Reactor Vessel Burial Site (TSF-06, Area 10). The original remedy was documented in the *Final Record of Decision for Test Area North, Operable Unit 1-10* (DOE-ID 1999a [DOE/ID-10682]) (the 1999 ROD).

- **Site Name and Location:**

  V-Tanks (TSF-09 and TSF-18), PM-2A Tanks (TSF-26),
  and the Reactor Vessel Burial Site (TSF-06, Area 10)
  Waste Area Group 1, Operable Unit 1-10,
  Idaho National Engineering and Environmental
  Laboratory (CERCLIS ID 4890008952),
  Idaho Falls, Idaho.

- **Identification of Lead and Support Agencies:** The U.S. Department of Energy (DOE) Idaho Operations Office (NE-ID) is the lead agency for the remedy decisions under Executive Order 12580. The U.S. Environmental Protection Agency (EPA) approves the decisions and, along with the Idaho Department of Environmental Quality (IDEQ), has participated in the selection of the remedies described in this document. The IDEQ concurs with the amended remedies. The DOE, EPA, and IDEQ are collectively referred to as "the Agencies" in this document.

- **Statutory Requirements Met:** In accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.435(c)(2)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and pursuant to the 1999 ROD, this ROD Amendment and Explanation of Significant Differences has been prepared to document changes to the 1999 ROD. All public participation and documentation procedures specified in NCP Sections 300.435(c)(2)(ii) and 300.825(a)(2), including, for the V-Tanks site, issuing a revised proposed plan (the *New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10* [DOE-ID, EPA, and IDEQ 2003 {Administrative Record No. 24783}{the 2003 Proposed Plan}]) that highlighted the proposed changes, were conducted as required.

- **Date of Original ROD Signature:** December 14, 1999.

- **Need for ROD Amendment:** This ROD Amendment documents fundamental changes to certain features of the V-Tanks original remedy selected in the 1999 ROD. (Information about the significant changes at the other two sites discussed in this document are chiefly contained in Section 11.) No facility is available to conduct the treatment of V-Tanks contents as specified in the 1999 ROD. Therefore, the Agencies evaluated several technologies to identify a new alternative for remediation of the V-Tanks contents. From this evaluation, the Agencies have selected chemical oxidation/reduction at the INEEL with stabilization for treatment of the V-Tanks contents.

- **Need for Explanation of Significant Differences:** The ESD portion of this record documents significant changes to certain features of the original remedies selected in the 1999 ROD for the PM-2A Tanks and for the Reactor Vessel Burial Site (TSF-06, Area 10). The ESD portion of this document is contained in Section 11. The remainder of this document chiefly concerns the fundamental changes to the V-Tanks.

- **Location of Administrative Record and Hours of Availability:** The documents that form the basis for the decisions made in this ROD Amendment and ESD are contained in the Administrative Record for OU 1-10. This ROD Amendment and ESD will become part of the Administrative Record pursuant to Section 300.825(a)(2) of the NCP. The Administrative Record is part of the INEEL's Information Repositories, which are available to the public at the following locations:

  INEEL Technical Library
DOE Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83415
(208) 526-1185
Hours: 8 a.m. to 5 p.m. Monday through Friday, except as posted

  Albertsons Library
Boise State University
1910 University Drive
Boise, ID 83725
(208) 385-1621
Hours: 7:30 a.m. to 12 midnight, Monday through Thursday; 7:30 a.m. to 8 p.m. Friday; 10 a.m. to 8 p.m. Saturday; 10 a.m. to midnight Sunday, except as posted

  University of Idaho Library
University of Idaho Campus
434 2nd Street
Moscow, ID 83843
(208) 885-6344
Hours: 8 a.m. to midnight, except as posted

  and on the Internet (at http://ar.inel.gov). In addition, documents that are included in the Administrative Record are listed in Appendix B, Administrative Record Index.

2. OPERABLE UNIT 1-10 HISTORY AND V-TANKS ORIGINAL REMEDY

2.1 V-Tanks History

The two V-Tanks sites (TSF-09 and TSF-18) have similar attributes and are located in the same area (see Figure 2-1). Because of the similarities between the two sites and because they were part of the same waste system (the Intermediate Level Waste System), they were evaluated together. The V-Tanks site TSF-09 includes three 10,000-gal (37,850-L) underground storage tanks (USTs) (Tanks V-1, V-2, and V-3), the contents of the tanks, associated piping, and the surrounding contaminated soil. The tops of the tanks are approximately 3 m (10 ft) below ground surface (bgs). The V-Tanks site TSF-18 includes a 400-gal (1,514-L) UST (Tank V-9), the tank contents, associated piping (including an in-line sand filter), and the surrounding soil. The tank is approximately 2 m (7 ft) bgs. As shown in Table 2-1, the combined volume of waste in the tanks is approximately 12,000 gal, including 2,000 gal of sludge and 10,000 gal of liquid.

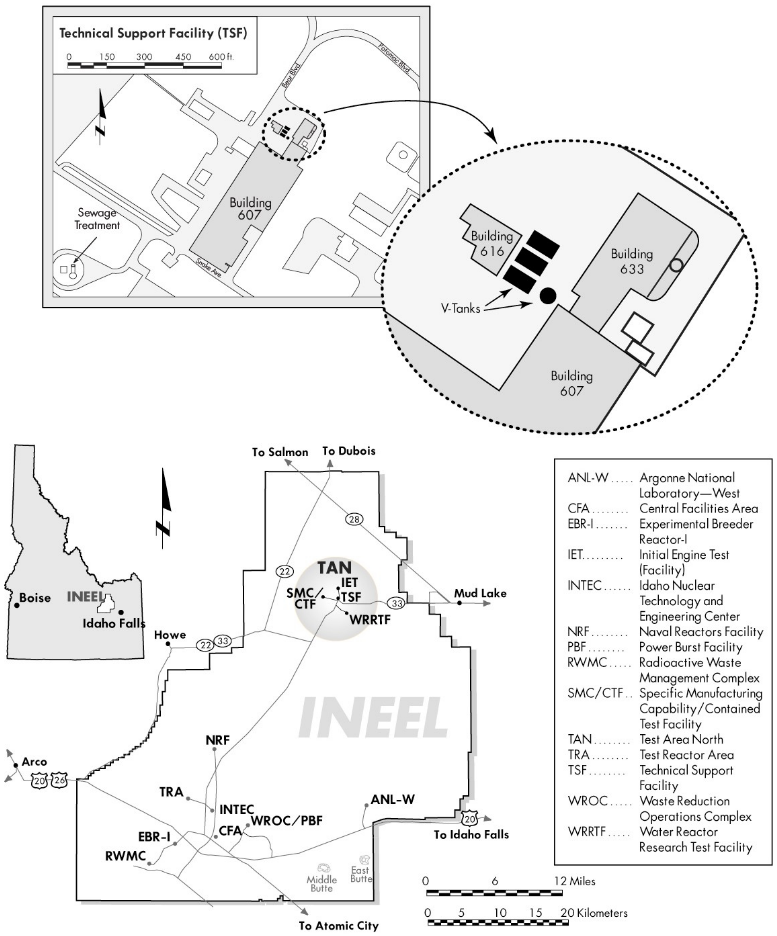

Figure 2-1. Location of Test Area North at the Idaho National Environmental and Engineering Laboratory.

Table 2-1. V-Tanks capacity and volume of contents (in gallons).

		Volume		
Tank	Capacity	Liquid	Sludge	Total
V-1	10,000	1,160	520	1,680
V-2	10,000	1,140	460	1,600
V-3	10,000	7,660	650	8,310
V-9	400	70	250	320
Total	30,400	10,030	1,880	11,910

Source: 2003 Technology Evaluation Report (DOE-ID 2003b) (data rounded).

All four tanks were installed in the early 1950s and were used for about 30 years in a system that collected and treated radioactive liquid waste from Test Area North (TAN) operations, beginning with the Aircraft Nuclear Propulsion Program in the 1950s and early 1960s. Waste was piped from the adjacent research facilities into Tank V-9, where some of the solids were removed. The remaining waste was then routed into one or more of the larger tanks (V-1, V-2, and V-3). The tanks' contents are an aqueous sludge contaminated with radionuclides, inorganic contaminants (including metals), and organic compounds, including polychlorinated biphenyls (PCBs). Nearly all of the contaminants in the V-Tanks are associated with the solid phase of the sludge.

During some pumping operations to remove excess liquid from the V-Tanks, there were releases to the ground. However, because most of the contamination was retained in the solid phase, which was still in the tanks, the spilled liquid contained very low concentrations of contaminants. The 1999 ROD identified Cs-137 as the only contaminant of concern in the soil above future residential risk-based levels.

Table 2-2 lists the primary contaminants in the V-Tanks that affect the selection of an effective remedy. That table presents information on the overall average concentration of the V-Tanks system as well as the minimum and maximum concentration of the contents of any one of the four tanks. These values were used in evaluating the effectiveness and operability of various treatment alternatives. The reader is urged to use caution in comparing these data to other sources of information on the V-Tanks or in comparing these values to regulatory levels. The EPA regulations and guidance require different statistical treatment of analytical data based on whether they are being used for risk assessment, waste characterization, acceptability of treatment options, or compliance with disposal facility acceptance criteria. Risk assessments require 95% upper confidence limit (UCL) values. Waste characterization requires 90% UCL values on the amount of material that will leach from the waste in a given timeframe. To determine whether waste is acceptable, treatment facilities usually look at average concentrations along with maximum and minimum values. Compliance with disposal facility waste acceptance criteria (WAC) is usually based on 90% UCL on total concentrations. It is generally inappropriate to compare data supplied for one purpose with data intended for another use. The data in Table 2-2 were compiled to allow the Agencies to select an effective treatment process. Information supporting the risk assessment and waste characterization activities is in the Administrative Record (on the Internet at http://ar.inel.gov).

Treatment of the V-Tanks contents by the selected remedy will significantly reduce the concentrations of the contaminants identified in Table 2-2. Chemical oxidation/reduction is expected to produce a significant reduction in the concentration of organic compounds. The addition of appropriate stabilization agents to the chemically oxidized/reduced waste is required to bind hazardous metals and radionuclides and reduce the leachability and mobility of those materials. The final waste form after oxidation/reduction and stabilization will require further analysis to ensure compliance with disposal facility acceptance criteria.

Currently, the V-Tanks (TSF-09 and TSF-18) are administratively controlled. The area is fenced and posted with signs that identify it as a CERCLA site. No activities can be performed at the V-Tanks without notification of the appropriate INEEL CERCLA program. Entry into the area requires radiological control precautions. The purpose of these controls is to keep worker exposures as low as reasonably achievable (ALARA) and to prevent the spread of contaminated soil. The controls reduce current and future occupational exposure at the V-Tanks to acceptable levels.

Table 2-2. V-Tanks contents contaminants for treatment.[a]

	Concentration[b]		
	Lowest	Highest	Average
Inorganic Contaminants (mg/kg)			
Antimony	0.363	11.5	0.902
Arsenic	0.146c	3.05 [c]	0.359 [c]
Barium	2.11 [c]	299	12.4 [c]
Beryllium	0.258 [c]	20.2	1.11 [c]
Cadmium	0.864 [c]	21.8 [c]	2.34 [c]
Chlorides	74.2	397	106
Chromium	25.8	1,880	297
Lead	12.1 [c]	454	36.1 [c]
Mercury	19.2 [c]	1,670	79.2 [c]
Nickel	4.24 [c]	319	16.4 [c]
Silver	1.18 [c]	522	18.4 [c]
Volatile Organic Compounds (VOCs) (mg/kg)			
Tetrachloroethylene (PCE)	36.3	438	118
1, 1, 1-Trichloroethane (TCA)	0.049	1,770	52.2
Trichloroethylene (TCE)	0.234	14,500	426
Semivolatile Organic Compounds (SVOCs) (mg/kg)			
Bis-2-ethylhexyl phthalate (BEHP)	338.0	919	454
Aroclor-1260 (a PCB)	9.99	95.9	17.9
Radionuclides (nCi/g)			
Cesium-137	528	4,480	988
Strontium-90	1,510	5,180	1,840
Transuranics[d]	2.03	26.4	4.27

a. The V-Tanks also contain minor concentrations of other elements and compounds that are not included in this list because they do not exceed treatment levels or affect the treatment process. However, the amended remedy is designed to treat all of the tanks contents, including these minor constituents.

b. A weighted average based on the mass of the entire V-Tanks contents (all four tanks combined). The "lowest" concentration is the lowest average concentration measured in any single tank for the given contaminant. The "highest" is the highest average concentration measured in any single tank for the given contaminant.

c. Some of the inorganic concentration values reported in the TER were incorrectly calculated by the private laboratory that analyzed the waste. Those values have been corrected and the corrected values included in this table. These changes would not have significantly affected the technology evaluation and selection process.

d. The transuranics include plutonium, americium, curium, and neptunium.

Source: 2003 Technology Evaluation Report (DOE-ID 2003b), with corrections for inorganic contaminants from EDF-3868, "V-Tank Analytical Data: Calculated Averages and Upper Confidence Limits."

A remedy for the V-Tanks was selected in the 1999 ROD for OU 1-10. The original remedy is described in the next section. The Agencies documented changes in the remedies for several OU 1-10 sites, including the V-Tanks, in the *Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10* (DOE-ID 2003a [DOE/ID-11050]) (the 2003 ESD). For the V-Tanks site, the 2003 ESD addressed further characterization of the surrounding contaminated soil and further definition of the corresponding area of contamination (AOC). The ESD also addressed a change to the applicable or relevant and appropriate requirements (ARARs) for PCB remediation waste.

2.2 V-Tanks Original Remedy and Need to Re-Evaluate Other Technology Alternatives

The V-Tanks original remedy selected in the 1999 ROD was Alternative 2, Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal. Under the original remedy, the tank contents would be removed, placed into containers, and transported to an approved treatment facility off the INEEL. Thermal treatment at the facility would reduce toxicity, mobility, and volume of the contaminants. The treatment residue would either be returned to the INEEL for disposal at the INEEL CERCLA Disposal Facility (ICDF) or disposed of at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, or other approved facility.

The empty tanks and associated piping would be decontaminated, removed, and disposed of at the ICDF or other approved facility. The contaminated soil would be excavated and disposed of at the ICDF or other approved facility. Institutional controls such as signs, access control, and land-use restrictions would be established and maintained as necessary. The estimated capital and maintenance cost for implementing the selected remedy for the V-Tanks in the 1999 ROD was $8,893,348 in net present value (NPV).

To implement the selected remedy, a remedial design/remedial action work plan, the *Comprehensive Remedial Design/Remedial Action Work Plan for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites* (DOE-ID 2002b [DOE/ID 10875]) (the 2002 RD/RAWP), was issued. Pursuant to the 1999 ROD, the 2002 RD/RAWP called for treating each phase, liquid and sludge, separately. The remedy design included removing and shipping the tank contents to the Allied Technology Group (ATG), an out-of-state commercial treatment (vitrification) facility.

However, the ATG facility stopped offering the thermal treatment called for in the 1999 ROD. In addition, other difficulties with carrying out the remedy selected in the 1999 ROD were revealed during the remedial design process. The remedial design for the V-Tanks cleanup indicated that shipping and treating the tank contents involved more complexities and cost than had been anticipated. To reduce the volume of contaminated material shipped out of state and thereby lower the costs of shipping and treatment off the INEEL, the liquid would need to be separated from the sludge (with the liquid treated on the INEEL and only the sludge shipped off the INEEL). This added more steps to the remedial action. The treatment facility's permit limited the amount of radionuclide-containing waste it could have in inventory at any given time. This meant that the INEEL would have to ship the waste in multiple, timed shipments instead of all at once, adding delays to the project schedule. While waiting for shipment, the sludge would have to be stored at the INEEL. This added more steps to the process, and would also require special containers for storage that have to be expensively disposed of after use. Also, the high levels of radionuclides would require special casks for shipping.

Even if an approved treatment facility had been available, these complications would have increased the total cost of the project by over $21 million, making it approximately $32.2 million instead of the original $11.2 million (in Fiscal Year [FY] 1999 dollars; $8.9 million in 1999 net present value

[NPV]). This change in cost not only eliminated the cost advantage that had favored selection of this remedy, but also contributed to the Agencies' decision to look for a different remedy. Consequently, a decision was made to re-evaluate other viable technology alternatives.

2.3 V-Tanks Technology Evaluation Process

The technology evaluation focused on currently viable technologies. Initial screening of technologies is described in the *Technology Evaluation Scope of Work for the V-Tanks* (DOE-ID 2002a). The characterization assumptions that were used for the technology evaluation and comparative analysis are listed in Table 2-3. Table 2-4 lists the treatment assumptions.

In order to be thorough, technologies previously considered in the Comprehensive Remedial Investigation/Feasibility Study (RI/FS) (DOE-ID 1997) were also reviewed and screened. For each potential alternative, preconceptual designs were developed. The designs included process flow diagrams and associated mass balances in sufficient detail to allow development of an approximate schedule and a preconceptual cost estimate (+50%, -30%). The cost estimates consider all pertinent costs (those associated with RD/RAWP issuance, waste disposal, historical costs, transportation, etc.) to ensure a comprehensive life-cycle estimate.

Mass balances for the primary and secondary waste streams were developed to ensure compliance with requirements of the appropriate treatment, storage, and disposal facilities. Sufficient information was developed to evaluate the various technology alternatives relative to the CERCLA criteria.

A decision support model was used to facilitate objective selection of the preferred alternative. That model was modified from one developed at the INEEL in 2000 for modeling, structuring, scoring, and evaluating remedial alternatives for CERCLA sites (INEEL 2000a). The model uses cost data, implementation data, and performance data to compare remedial alternatives. The method can easily incorporate analysis of key site characterization and performance uncertainties. The agencies participated in the application of the model to the V-Tanks contents treatment alternatives, assigning relative weights to each factor used in the analysis.

Table 2-3. Characterization assumptions for the V-Tanks contents.

The characterization assumptions for the V-Tanks contents include the following: • Waste in the V-Tanks has undergone previous RCRA characterization. The V-Tanks contents are characterized as RCRA code F001, due to the spent halogenated solvent (trichloroethylene [TCE]) used in degreasing during TAN operations. • The V-Tanks waste is characteristically hazardous, which invokes the full list of underlying hazardous constituents. Therefore, for example, polychlorinated biphenyls (PCBs) require treatment to the 10-ppm land disposal restriction (LDR) limit, and bis(2-ethylhexyl)phthalate (BEHP) requires treatment to the 28-ppm LDR limit for disposal of the primary waste form at the INEEL CERCLA Disposal Facility (ICDF). • All secondary waste from each treatment alternative will be characterized as F001 listed due to the "derived-from" rule. • Primary and secondary waste (F001 listed) that meets LDRs will be considered for disposal at the ICDF. • Secondary waste (F001 listed) that does not meet LDRs and that cannot be practically treated on the INEEL, in accordance with the treatment alternative mass balances, will be sent off the INEEL for treatment and/or disposal. • (Source: 2003 Technology Evaluation Report [DOE-ID 2003b].)

Table 2-4. Treatment assumptions for the V-Tanks contents.

- The treatment assumptions for the V-Tanks contents include the following:
- For comparative analysis purposes, all proposed remediation technologies will be initiated after 6,000 gal of liquid supernatant have been removed from Tank V-3.
- The ICDF will open in July 2003 and will be available to receive V-Tank waste in 2005, when the remedial action is projected to take place.
- The Agencies will approve the applicable or relevant and appropriate requirements (ARARs) associated with Resource Conservation and Recovery Act (RCRA) alternative treatment standards and Toxic Substances Control Act (TSCA) risk-based petitions.
- Design and treatment operations will be performed to meet “clean closure” requirements.
- The Allied Technology Group (ATG) will remain a nonviable alternative for treatment of the V-Tanks waste. No other treatment off the INEEL will be available before 2005.
- Delisting of the V-Tanks contents as hazardous waste will not be pursued.
- The Nevada Test Site (NTS) or Hanford Reservation will be accepting out-of-state mixed waste for treatment/disposal by 2007.
- The Waste Isolation Pilot Plant (WIPP) will be accepting remote-handled waste by 2007.
- Soil additions for various treatment alternatives (e.g., vitrification and thermal desorption) are acceptable to ensure proper process operations.
- Thermal desorption is approved by the EPA as a type of retort.
- Macro-encapsulation can be performed on those off-gas units that are not granular in form (such as high-efficiency particulate air [HEPA] filters), provided other waste acceptance criteria (WAC) are met (e.g., less than 500 ppm total organic carbon for the ICDF).
- Macro-encapsulation cannot be performed on those off-gas units that are granular in form (such as granular-activated carbon [GAC] and sulfur-impregnated granular-activated carbon [SGAC] filters). As a result, those off-gas units can be disposed of at the ICDF only if they meet land disposal restrictions (LDRs).
- Organic destruction efficiencies demonstrated during treatability studies will be achieved during actual chemical oxidation/reduction of V-Tank waste.
- V-Tank waste is considered a single waste stream for the purposes of establishing necessary treatment requirements.
- Building TAN-616 will be removed down to its foundation by the time remediation is initiated.
- Buildings other than TAN-616 surrounding TSF-09 and TSF-18 will not be affected by the remedial action and removal of TAN-616.
- The contents of all four V-Tanks can be slurried and removed without additional liquid.
- Equipment for transferring the slurried V-Tank sludge and liquid phases will require temporary shielding and secondary containment. Equipment used for decanting V-Tank liquid, before slurrying, only requires secondary containment.
- Maximum achievable control technology (MACT) emission standards only apply to the off-gas treatment system used for the vitrification and thermal desorption alternatives on the INEEL.
- Contamination control during excavation of contaminated soil can be managed by maintaining slightly damp soil conditions, placing wind restrictions on operations, using temporary tarps, etc., as opposed to large temporary containment structures.
- All equipment coming in contact with the waste or its residuals during processing might have to be disposed of at the ICDF as debris. However, an effort will be made to recover or reuse as much of this equipment as possible before disposing of it as debris waste.
- (Source: 2003 Technology Evaluation Report [DOE-ID 2003b].)

2.4 Summary of Retained Technologies for the V-Tanks

The following list summarizes those primary and secondary treatment technologies that were retained through the screening process and incorporated into the 2003 Technology Evaluation Report (TER) (DOE-ID 2003b). Primary technologies represent the primary treatment process that would be applied to the tank contents. The primary technologies considered were vitrification, thermal desorption, and chemical oxidation/reduction followed by stabilization. Secondary technologies are those that would be used in conjunction with the primary technology to treat secondary waste streams, such as carbon adsorption and off-gas filtration.

Specific alternatives associated with each technology, for which formal, detailed evaluations were conducted, are summarized below:

- In situ vitrification with disposal of the primary and the majority of the secondary waste streams at the ICDF

- Ex situ vitrification at the V-Tanks site with disposal of the primary and most of the secondary waste streams at the ICDF

- Thermal desorption at the V-Tanks site with disposal of residue at the ICDF and treatment and disposal of the secondary waste streams off the INEEL

- Thermal desorption at the V-Tanks site with disposal of residue at the ICDF and treatment and disposal of the secondary waste streams on the INEEL

- Thermal desorption at the V-Tanks site with disposal of stabilized residue off the INEEL and treatment and disposal of the secondary waste streams off the INEEL

- In situ chemical oxidation/reduction followed by stabilization with disposal of the primary and the majority of the secondary waste streams at the ICDF

- Ex situ chemical oxidation/reduction at the INEEL followed by stabilization with disposal of the primary and the majority of the secondary waste streams at the ICDF.

2.5 Key Documents for V-Tanks Activities

The goals and results of activities relating to OU 1-10 that have been completed to date are reported in the key documents in Table 2-5. For the reader's convenience, the document number (e.g., DOE/ID-10682) is listed. Either the title or the document number can be used to locate the document in the Administrative Record. The Administrative Record is available online at http://www.inel.gov/publicdocuments/ or at http://ar.inel.gov, or at the Information Repositories listed in Section 1. In addition, documents that are included in the Administrative Record are listed in Appendix B, Administrative Record Index.

Table 2-5. Key documents related to V-Tanks activities.

Referred to as	Date	Title	Document/ AR No.
1997 RI/FS	Nov 97	*Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory*	DOE/ID-10557
November 1998 Proposed Plan	Nov 98	*Proposed Plan for Waste Area Group 1 Test Area North, Idaho National Engineering and Environmental Laboratory*	AR No. 10553
1999 ROD	Oct 99	*Final Record of Decision for Test Area North, Operable Unit 1-10*	DOE/ID-10682
2000 RD/RA SOW	Feb 00	*Test Area North Waste Area Group 1 Operable Unit 1-10 Remedial Design/Remedial Action Scope of Work (SOW)*	DOE/ID-10723
2002 RD/RAWP	March 02	*Comprehensive Remedial Design/Remedial Action Work Plan for the Test Area North, Waste Area Group 1, Operable Unit 1-10, Group 2 Sites*	DOE/ID-10875
2002 Technology Evaluation SOW	Jul 02	*Technology Evaluation Scope of Work for the V-Tanks, TSF-09/18, at Waste Area Group 1, Operable Unit 1-10*	DOE/ID-10999
2002 Fact Sheet	Aug 02	"New Alternatives Considered for V-Tanks at Waste Area Group 1," *Update Fact Sheet*	AR No. 24774
2003 TER	Apr 03	*Technology Evaluation Report for the V-Tanks, TSF-09/18, at Waste Area Group 1, Operable Unit 1-10*	DOE/ID-11038
2003 ESD	Apr 03	*Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10*	DOE/ID-11050
2003 Proposed Plan	Apr 03	*New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10*	AR No. 24783

3. COMMUNITY PARTICIPATION

Public participation was an important element in the decision-making process for the V-Tanks contents remedial action. Public participation also resulted in the significant change to the HTRE Reactor Vessel Burial Site that is chiefly documented in Section 11. In accordance with CERCLA Section 113(k)(2)(B)(i–v) and Section 117, the Agencies provided various opportunities for the public to learn about the activities leading to this V-Tanks ROD Amendment and to provide their opinions and comments for the Agencies' consideration in making the final decision. Between August 2002 and May 2003, a series of publications and face-to-face (or telephone) meetings offered information and comment opportunities to the public, including stakeholder groups. These opportunities included the 2002 Fact Sheet, the 2003 ESD, the 2003 Proposed Plan, briefings and presentations to interested groups, and public meetings, as follows:

Reports in *EM Progress* in 1999, 2000, 2001, 2002, and 2003 provided updates to the approximately 600 individuals on the INEEL Community Relations mailing list during the course of the project.

In August 2002, an Update Fact Sheet, "New Alternatives Considered for V-Tanks at Waste Area Group 1" (INEEL 2002), was distributed to individuals on the mailing list. The fact sheet described the V-Tanks technology evaluation and announced the time frame for future public meetings. It also included information on the availability of technical briefings to those interested in the V-Tanks Remedial Action.

In April 2003, the *New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10* was published (DOE-ID, EPA, and IDEQ 2003). About 600 copies were mailed out to recipients on the INEEL Community Relations mailing list during the week of April 7, 2003. The public comment period for the 2003 Proposed Plan began April 15 and ended May 14.

During the week of April 7, 2003, the INEEL Community Relations representative for TAN telephoned individuals in various Idaho communities who were known to have an interest in INEEL environmental restoration activities. The calls were made to inform them and their organizations in advance about the Proposed Plan, to provide the schedule for the public meeting, and to find out whether they wanted a technical briefing.

Also during the week of April 7, 2003, the DOE Idaho Operations Office (then referred to as DOE-ID [see footnote a]) issued a news release to more than 100 media contacts. The news release announced the 30-day public comment period for the Proposed Plan. This information was published in community calendar sections of newspapers and aired in public service announcements on radio stations. The news release also included information that reference documents for the Proposed Plan were available in the Administrative Record section of the INEEL Information Repositories located in the INEEL Technical Library in Idaho Falls and Albertsons Library on the campus of Boise State University. During the following week, display advertisements announcing the availability of the Proposed Plan and the locations of public meetings were published in the *Post Register* (Idaho Falls), the *Arco Advertiser* (Arco), *The Sho-Ban News* (Fort Hall), *The Idaho State Journal* (Pocatello), *The Times-News* (Twin Falls), the *Idaho Statesman* (Boise), and the *Moscow-Pullman Daily News* (Moscow). A follow-up advertisement ran in newspapers approximately four days before the public meeting in Idaho Falls. Post cards were mailed to approximately 5,400 individuals and organizations on the INEEL mailing list informing them of the availability of the Proposed Plan, the duration of the comment period, and the time and location of upcoming public meeting. An electronic note with this information was sent to all INEEL employees.

Technical briefings were provided to five groups:

- On April 11, 2003, a technical briefing was held for Coalition 21, an Idaho-based advocacy group for "support of nuclear technology" and INEEL's nuclear mission. Coalition 21 had also received a previous briefing in September 2002.

- On April 15, 2003, a technical briefing was held for Snake River Alliance (SRA), an Idaho environmental group whose mission includes seeking "the end of nuclear weapons production activities and solutions to nuclear waste and contamination," particularly INEEL activities that may pose risk to the Snake River Plain Aquifer. The SRA had also received a previous briefing in October 2002.

- On April 16, 2003, a technical briefing was held at Fort Hall, Idaho, for members of the Shoshone-Bannock Tribes. (The Shoshone-Bannock Tribes' representative to the Citizens Advisory Board also attended the following public meeting on April 30.)

- On April 17, 2003, a briefing was held by conference call for Keep Yellowstone Nuclear Free (KYNF), an environmental organization based in Jackson, Wyoming. The KYNF had also received a previous briefing in October 2002. The KYNF's mission is "to stop the creation of hazardous and radioactive air contamination, and any further proposals for nuclear waste incineration, by the INEEL."

- Several briefings, including a conference call on April 30, were provided by the DOE Idaho Operations Office (then DOE-ID [see footnote a]) for the INEEL Citizen's Advisory Board and its Environmental Restoration Subcommittee. The advisory board is a group of 15 individuals, selected to represent Program the citizens of Idaho, who make recommendations to the Agencies regarding environmental restoration activities at the INEEL. The advisory board submitted a recommendation on the V-Tanks remediation activities in January 2003.

A public meeting was held in Idaho Falls on April 30, 2003. The public meeting began at 7 p.m. The newspaper advertisements had invited the public also to attend the "availability session" scheduled from 6 to 7 p.m. Availability sessions are opportunities for informal discussion of the technology evaluation and proposed alternatives with Agency and project representatives before the formal public meeting began. At the meeting, a court reporter recorded discussions and public comments from which written transcripts were later prepared and placed into the Administrative Record for OU 1-10.

Those who attended the meeting were invited to have their comments recorded by the court reporter during the formal comment portion of the meeting, or submit them in writing, or both. A postage-paid, preaddressed form for comments was provided as part of the Proposed Plan. Copies of the form also were provided at the public meeting.

Approximately 10 members of the public or representatives of stakeholder groups (individuals not associated with the OU 1-10 project) attended the Idaho Falls public meeting or the availability session or both.

During the comment period, seven separate sets of formal comments were received—six submitted in writing and one delivered as a formal comment at the public meeting. Part III of this ROD Amendment, the Responsiveness Summary, consists of a summary of the concerns expressed in the comments received, and the Agencies' responses to them. Transcripts of the formal comments delivered at the public meetings and scanned versions of comments received in writing are provided in Appendix A to this ROD Amendment and ESD. The comments are in the Administrative Record for OU 1-10.

All comments received on the 2003 Proposed Plan were considered during the remedy selection process documented in this ROD Amendment and ESD. Community acceptance, as one of the EPA's nine criteria used in final evaluation of remedial alternatives, is documented in Section 7.1 of this ROD Amendment. Public comments also supported the addition of institutional controls for the Reactor Vessel Burial Site (TSF-06, Area 10). These changes are documented in Sections 10 and 11 of this ROD Amendment and ESD.

4. BASIS FOR THE AMENDMENT TO THE V-TANKS

Pursuant to the 1999 ROD, the original remedy for the V-Tanks included removing the V-Tanks contents and shipping them to an out-of-state commercial treatment (vitrification) facility. In early 2002, however, the only available treatment facility, ATG, stopped accepting waste for thermal treatment. No other approved facility is currently available for treating these wastes in accordance with the remedy selected in the 1999 ROD. While other facilities may become available in the future, it is not known whether or when any of these facilities could treat the V-Tanks contents.

Other difficulties with carrying out the remedy selected in the 1999 ROD were revealed during the original remedial design process. The remedial design for the V-Tanks cleanup indicated that shipping and treating the tank contents involved more complexities and cost than had been anticipated. To reduce the volume of contaminated material shipped out of state and thereby lower the costs of shipping and treatment off the INEEL, the liquid would need to be separated from the sludge (with the liquid treated on the INEEL and only the sludge shipped off the INEEL). This added more steps to the remedial action. The treatment facility's permit limited the amount of radionuclide-containing waste it could have in inventory at any given time. This meant that the INEEL would have to ship the waste in multiple, timed shipments instead of all at once, adding delays to the project schedule. While waiting for shipment, the sludge would have to be stored at the INEEL. This added more steps to the process, and would also require special containers for storage that would have to be expensively disposed of after use. Also, the high levels of radionuclides would require special casks for shipping. Even if an approved treatment facility had been available, these complications would have increased the total cost of the project by over $21 million, making it approximately $32.2 million instead of the original $11.2 million (in Fiscal Year [FY] 1999 dollars; $8.9 million in 1999 NPV). This change in cost not only eliminated the cost advantage that had favored the selection of this remedy, but also contributed to the Agencies' decision to look for a different remedy.

Based on these facts, the Agencies decided to reevaluate technologies previously considered and develop additional alternatives so that a new remedy for the V-Tanks contents could be selected. In particular, the new set of alternatives focused on identifying multiple, currently available, cost-effective, safe, and feasible treatment, storage, and disposal options. The reevaluation and decision process is summarized in the 2003 TER (DOE-ID 2003b).

5. REMEDIAL ACTION OBJECTIVES

For the V-Tanks, remedial action objectives (RAOs) were defined in the 1999 ROD for two categories of concern: soil pathways and the tank contents. (Note*:* No changes are being made to the RAOs for the PM-2A Tanks or the HTRE Reactor Vessel Burial Site.)

5.1 V-Tanks Remedial Action Objectives Defined in the 1999 Record of Decision

The RAOs described in the 1999 ROD are based on the results of the human health risk assessment and are specific to the contaminants of concern (COCs) and exposure pathways developed for OU 1-10. The 1999 ROD describes the exposure pathways for all OU 1-10 sites:

- "The current and future occupational scenarios include soil ingestion, inhalation of fugitive dust, and inhalation of volatiles routes of exposure for soils from 0 to 6 in. in depth."
- "The current and future occupational scenarios include the external radiation exposure pathway for soils from 0 to 4 ft in depth."
- "The future residential scenario begins in 100 years. It includes all soil pathway and air pathway exposure routes for soils from 0 to 10 ft in depth."
- "The future residential scenario also includes all groundwater pathway exposure routes, where all sample results are included, regardless of depth."

The following RAO for the soil pathway was identified in the ROD as specific to the V-Tanks site:

- "Reduce risk from external radiation exposure from Cs-137 to a total excess cancer risk of less than 1 in 10,000 for the hypothetical resident 100 years in the future and the current and future worker."

The 1999 ROD assigned the following additional RAO as specific to the V-Tanks site:

- "Prevent release to the environment of the V-Tank contents."

To meet the soil RAOs, Final Remediation Goals (FRGs) were established in Table 6-1 of the 1999 ROD. The objective of the FRGs is to ensure risk-based protection of human health and the environment by providing unrestricted land use in 100 years. Table 6-1 of the 1999 ROD indicates that Cs-137 was the only COC identified for the soils surrounding the V-Tanks that would pose an unacceptable risk after 2099. The table notes that no risk assessment was performed on the tank contents because the tanks were not incorporated into the site until the Feasibility Study phase. Hence, the only identified COC, Cs-137, is based on the soil data that was available at that time. The 1999 ROD established the FRG as 23.3 pCi/g for Cs-137.

5.2 Refinement of V-Tanks Remedial Action Objectives

In accordance with the 2003 ESD, additional soil characterization around and beneath the level of the bottom of the V-Tanks was conducted in the 2003 field season. This soil sampling primarily focused on areas beyond and below previous sampling efforts to identify the extent of contamination. The COCs being tested for in the soil sampling were based on the contaminants identified in the tanks. Results of the sampling will not be final until early 2004.

If new COCs are identified in the soils surrounding the V-Tanks, a new FRG will be determined for each COC, based on the same assumptions and methodology used in the OU 1-10 RI/FS. The FRGs will be calculated such that the cumulative risk from all of the soil COCs will not exceed a carcinogenic risk of 1 in 10,000 and a cumulative hazard index of 1 for the exposure pathways described in the 1999 ROD. The new FRGs, if any, will be presented and justified in the new RD/RAWP for the V-Tanks, to be prepared following this ROD Amendment.

Because it is not known whether additional COCs will be identified in the soil during the upcoming characterization, the RAOs for the V-Tanks have been changed to the following:

- Reduce risk from all pathways and all COCs to a total excess cancer risk of less than 1 in 10,000 and a total hazard index of less than 1 for the hypothetical resident 100 years in the future and for the current and future worker

- Prevent release to the environment of the V-Tank contents.

5.3 Responsiveness to Risk of V-Tanks Remedial Action Objectives

The RAOs will prevent current and future exposure to COCs that could result in a carcinogenic risk in excess of 1 in 10,000, and a cumulative hazard index in excess of 1.

The RAOs will be accomplished through a combination of remedial action and institutional controls. Institutional controls at the V-Tanks site will be necessary to control access to the site for at least 100 years. As specified in the 1999 ROD, if soils containing concentrations of COCs greater than the FRGs remain in place, institutional controls may be necessary after 100 years to prevent future contact with those soils.

6. DESCRIPTION OF THE V-TANKS ORIGINAL REMEDY AND THE NEW ALTERNATIVES

This section summarizes the original remedy and the new alternatives and describes the common elements and the distinguishing features. The evaluation of new alternatives included reconsideration of the No Action and Limited Action (institutional controls) alternatives. Both were rejected because they would leave contaminants in tanks not designed for indefinite storage. However, institutional controls, which are a part of Limited Action, were retained as a component of the cleanup action. More complete details of the original remedy can be found in the 1999 ROD (DOE-ID 1999a). More complete details about the new alternatives can be found in the 2003 TER (DOE-ID 2003b).

6.1 V-Tanks Original Remedy

The original remedy selected in the 1999 ROD was Alternative 2, Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal. The major components of the selected remedy were as follows:

- Excavating contaminated soil
- Disposing the contaminated soil at an approved soil repository
- Sampling tank contents
- Removing tank contents and placing the contents into U.S. Department of Transportation (DOT) approved containers
- Transporting the tank contents and other investigation-derived waste (IDW) to a treatment facility off the INEEL
- Treating tank contents and IDW at an approved Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) mixed waste treatment facility
- Disposing of treated tank contents and IDW at the ICDF, other approved facility, or WIPP
- Decontaminating the tanks and removing the tanks for disposal
- Post-remediation soil sampling at the bottom of the excavation to verify FRGs are met and to analyze for additional contaminants in the V-Tanks contents waste, in order to perform a risk analysis in support of an institutional control determination at this site
- Filling the excavated area with clean soil (soil that meets remedial action goals), then contouring and grading to surrounding soil
- Establishing and maintaining institutional controls consisting of signs, access control, and land-use restrictions, depending on the results of post-remediation sampling.

The estimated capital and maintenance cost for implementing the selected remedy for the V-Tanks in the 1999 ROD was $8,893,348 NPV.

6.2 Technology 1—Vitrification

Vitrification uses electricity to heat waste to temperatures high enough to melt the waste into a glass-like material as hard as basalt or obsidian. Through vitrification, many contaminants, including radionuclides and most metals, are bound up into the glass and permanently immobilized. Volatile and semivolatile contaminants are either destroyed by the heat or driven off as gas that is then captured and treated. To the extent possible, the contaminated piping and soil associated with the V-Tanks would be incorporated into the melt. Vitrification of the V-Tanks would include construction of an off-gas system to capture and treat volatilized contaminants. After vitrification, the glass would be disposed of at the ICDF. Contaminated soil, tanks, and piping not incorporated in the vitrified waste would be removed and disposed of at the ICDF, as described under the original remedy. Two variations of vitrification were considered, differing in whether the vitrification takes place in situ or ex situ.

6.2.1 Alternative 1(a)—In Situ Vitrification

For *Alternative 1(a)—In Situ Vitrification*, an in situ vitrification system would be deployed, complete with the associated off-gas cleanup system. In this process, graphite electrodes would be inserted into the soil around the tank to melt the waste in place. Sufficient current would then be passed initially through a conductive starter path between electrodes, then through the melting soil and, ultimately, through a molten mass incorporating soil, the tank, and the waste contents to form a relatively homogeneous vitrified mass. The type of melt conducted is referred to as a planar melt, in which the melt takes place at the level of the V-Tanks (10 to 20 ft below grade), eventually incorporating the tank and waste, but allowing vapors to emerge to the surface. Before beginning the melting process, soil (and possibly other absorbent fill material) would be added to the tanks. Existing tank lines and portals would be enlarged, as necessary, to direct and capture most of the off-gases above the ground, thereby precluding subsurface pressure buildup. A large hood would be placed over the area to capture the off-gases, which would be treated through various wet (or dry) scrubber systems, filters, and a thermal oxidizer/reducer before being discharged. Granular-activated carbon (GAC) and sulfur-impregnated granular activated carbon (SGAC) filters would be used to remove organics and mercury, respectively, from the off-gases. The off-gas would be treated to meet maximum achievable control technology (MACT) requirements. Secondary waste scrubber solutions would be generated, treated, and then disposed of at the ICDF.

Following vitrification of the tank system, the vitrified mass would be broken into pieces, removed from the ground, and disposed of at the ICDF. The surrounding soil would be excavated and disposed of at the ICDF, as required. Clean soil would be used to backfill the area of contamination. The selected vendor would establish the exact number of melts, but it could range from one melt, if all of the sludge were first consolidated into one tank, to four melts, if each tank were treated separately. For this preconceptual design, it was assumed that one consolidated melt would be conducted. Other waste material (e.g., piping) potentially could be incorporated into the melt.

For purposes of estimating the mass balance around the in situ vitrification process, characterization data from other in situ vitrification applications were extrapolated as a basis for assuming that water and VOCs would be vented from the waste during the initial heating produced by melting the soil around the tanks. These vapors would be caught in the off-gas system as liquid condensate or adsorbed onto activated carbon. Semivolatile organic compounds (SVOCs) would be pyrolized and destroyed in the melting process. Cadmium, chlorides, and mercury would be vaporized from the melt and captured in the condensate, the high-energy particulate air (HEPA) filters, or in sulfur-impregnated carbon. The majority of the inorganics (including metals and radionuclides) will be incorporated into the glass matrix. Only trace concentrations of these constituents are expected to partition to the off-gas treatment system. Only the carbon beds, due to their relatively high content of volatile organic compounds (VOCs), would be disposed of off the INEEL; all other materials would be disposed of at the ICDF.

6.2.2 Alternative 1(b)—Ex Situ Vitrification

In *Alternative 1(b)—Ex Situ Vitrification*, the tanks' contents would be combined and homogenized and then transferred into a nearby aboveground vitrification unit. The vitrification unit would be pre-insulated to preclude melting the container during ex situ vitrification processing. Then, soil from the area would be added concurrently with the tank contents to provide the proper mix.

Graphite electrodes would be used, as described in Alternative 1(a), to vitrify the waste. However, in this application, all of the melting would occur inside the prefabricated vitrification unit, and the V-Tanks themselves would not be incorporated. The process would include an off-gas cleanup system comparable to the one required for in situ vitrification, and would produce comparable waste streams for disposal. The solidified mass contained in the prefabricated container(s) would be directly disposed of at the ICDF.

To the extent possible, other waste (such as piping and soil) would be incorporated into each melt. Then, the tanks and other contaminated soil would be removed and disposed of at the ICDF. Finally, the area of contamination would be backfilled with clean soil.

6.3 Technology 2—Thermal Desorption

Thermal desorption uses heat at a moderate temperature to separate the volatile and nonvolatile contaminants into two waste streams. Separating the contaminants into two waste streams provides more remediation options than would be available for just one waste stream containing all the contaminants. Additional treatments are required to destroy organic constituents, such as PCBs, and amalgamate the mercury (as required).

Under all variations of this technology, the tanks' contents would be pumped into a thermal desorption unit at the V-Tanks site and heated to a moderate temperature to remove VOCs, SVOCs, and mercury. The bottoms, which would contain the nonvolatile contaminants (including most of the metals and radionuclides), would be treated by stabilization (as required) and disposed of. Stabilization would not be required if soil were added during the desorption process. The off-gas system would destroy volatilized contaminants or capture them for treatment. Under all variations of this technology, the tanks and associated piping would be excavated and disposed of at the ICDF. Three variations of thermal desorption were considered, differing in whether the treatment and disposal steps are carried out on the INEEL, off the INEEL, or with a combination of *on* and *off* the INEEL. (Note to readers: For greater clarity, the titles of the alternatives were changed to reflect this type of wording, using "on the INEEL" or "off the INEEL" rather than "on-Site" and "off-Site.")

The alternatives also differ in whether contaminated soil from the V-Tanks area of contamination (AOC) would be added to the desorber. Thermal desorption has been used successfully elsewhere in the U.S. to treat contaminated soil, but has rarely been used on extremely moist materials such as the sludge in the V-Tanks. Alternatives 2(a) and 2(b) would add the contaminated soil to the sludge to lower the moisture content. This would prevent clumping and uneven heating, resulting in faster drying in the desorber unit. Under Alternative 2(c), the sludge would be treated without the addition of soil.

6.3.1 Alternative 2(a)—Thermal Desorption with Disposal Both On and Off the INEEL (formerly, *Thermal Desorption with Both On-Site and Off-Site Disposal*)

Under *Alternative 2(a)—Thermal Desorption with Disposal Both On and Off the INEEL*, the V-Tank contents would be transferred to the thermal desorption unit and combined with soil from the area of contamination.

Initially, liquid and sludge waste would be removed from each V-Tank in batches and placed directly into the thermal desorption unit, where it would be combined with soil sufficient to adjust moisture levels to within the normal operating range of the thermal desorption unit. Once the soil/waste has been received, the thermal desorption unit would be set in rotation and heated for 1 hour at 95°C (200°F) at 620 mm Hg. During this period, 100% of the water and low-boiling point organic contaminants and about 20% of the mercury would be desorbed. Following low-temperature operations, a vacuum (40 mm Hg) would be established on the rotating vessel, and the unit would be heated for 2 hours at up to 400°C (750°F). It is during this period that 100% of the SVOCs and the remaining mercury would be desorbed.

As in vitrification, a relatively sophisticated off-gas system would be used to collect and treat the off-gas. Since thermal desorption operates at lower temperatures than vitrification, cesium levels in the off-gas system would be reduced. Partitioning of contaminants would be similar to the vitrification process in that VOCs would be captured in the off-gas condensate and on activated carbon, and mercury would be adsorbed on sulfur-impregnated carbon. However, cadmium would not be volatilized, due to the lower operating temperature. The SVOCs would also be captured in the off-gas condensate and on the activated carbon. These slightly radioactive off-gas waste streams (condensate and filters) would be containerized and shipped off the INEEL for treatment and disposal.

After 2 hours at 400°C (750°F), the waste containing most of the heavy metals and radionuclides would be cooled and transferred to the hopper vessel for containerization. Based on the mass balances, this material would not be expected to require stabilization; it would be containerized and disposed of at the ICDF. The tanks and remaining soil would also be disposed of at the ICDF.

6.3.2 Alternative 2(b)—Thermal Desorption with Disposal On the INEEL (formerly, *Thermal Desorption with On-Site Disposal*)

Under *Alternative 2(b)—Thermal Desorption with Disposal On the INEEL*, a thermal desorption system would be used identical to that in Alternative 2(a), but the off-gas system would be modified to include organic destruction, which facilitates treatment of all secondary waste on the INEEL. This process uses a thermal oxidizer/reducer, which would be located at TSF, for destroying the organics.

Rather than collecting the organic constituents on carbon beds, they would be destroyed by the thermal oxidizer/reducer as they are desorbed. All waste products from this alternative could be disposed of at the ICDF.

6.3.3 Alternative 2(c)—Thermal Desorption with Disposal Off the INEEL (formerly, *Thermal Desorption with Off-Site Disposal*)

Alternative 2(c)—Thermal Desorption with Disposal Off the INEEL would eliminate the use of soil in the desorber, allowing a smaller unit to be used, resulting in waste products suitable for treatment and disposal off the INEEL (at the Nevada Test Site [NTS], for example).

As in the previous thermal desorption alternatives, liquid and sludge waste would be removed from each V-Tank and placed directly into the thermal desorption unit, but no carrier soil would be employed. This would minimize the residual waste volume, but also maximize the radiological concentration. The staged desorption process would be identical to that described in Alternative 2(a) in its use of an off-gas system without organic destruction on the INEEL. Partitioning of the desorbed constituents among the secondary waste streams would, therefore, be similar to the first thermal desorption alternative, although the volume of water collected would be reduced since additional soil would not be added.

After 2 hours at 400°C (750°F), the inorganic waste containing most of the heavy metals and radionuclides would be cooled and transferred to the hopper vessel for containerization. After containerization, the waste would be placed in interim storage and later shipped to a disposal facility off the INEEL, such as WIPP, NTS, or the Hanford Reservation. In the event that transuranic levels met WIPP criteria, the residue would be stored without stabilization. If, as expected, the transuranic levels were below WIPP criteria (<100 nCi/g, which is expected based on the material balance), the residue would be stabilized to meet land disposal restrictions (LDRs) and comply with NTS and Hanford waste acceptance criteria and radiological licenses. Currently, these facilities are accepting only mixed waste from within their respective states while pursuing the capability to receive out-of-state waste. Since they are not currently authorized to accept V-Tank waste, it is assumed that the waste (inorganic bottoms/residue) would be placed in interim storage on the INEEL until authorization were granted.

The secondary off-gas waste streams would be treated and disposed of at other facilities off the INEEL, as in Alternative 2(a). The tanks and soil would be sent to the ICDF for disposal.

6.4 Technology 3—Chemical Oxidation/Reduction with Stabilization

For chemical oxidation/reduction with stabilization, a chemical oxidant/reductant would be added to the tanks' contents to destroy the organic contaminants, including PCBs. If necessary, the tank contents could be heated to boiling temperatures to facilitate destruction. An off-gas system would be used to capture and recycle volatilized contaminants back into the reaction, increasing destruction efficiencies. After oxidation/reduction, the tanks' contents would then be chemically neutralized and the metals and radionuclides stabilized with grout or a similar material. The stabilized waste would be disposed of at the ICDF. The contaminants captured in the off-gas and the filters used in the off-gas system would be disposed of at the ICDF or an approved facility off the INEEL. The tanks and piping, along with the remaining contaminated soil, would be excavated and disposed of at the ICDF. Two variations of this technology were considered, differing in whether chemical oxidation/reduction and stabilization takes place in situ or ex situ. For the purposes of the technology evaluation, a chemical oxidation/reduction process was considered. However, during remedial design, it may be determined that chemical oxidation/reduction is a more appropriate technology. Thus, this alternative is described as oxidation/reduction with stabilization.

6.4.1 Alternative 3(a)—In Situ Chemical Oxidation/Reduction with Stabilization

Under *Alternative 3(a)—In Situ Chemical Oxidation/Reduction with Stabilization*, the treatment would run as a batch process in which waste is consolidated as practicable to facilitate oxidation/reduction. For the purposes of the evaluation process, it was assumed that the contents of Tank V-9 would be added to Tank V-2 prior to processing.

To complete the preconceptual designs that provided the basis for the comparative analysis, it was necessary to assume a specific oxidant/reductant—in this case, sodium persulfate. However, other oxidants/reductants, such as Fenton's reagent (hydrogen peroxide) or ozone, may be specified during the design phase.

Under this alternative, the pH of the tank contents would be adjusted and controlled with sodium hydroxide and nitric acid to facilitate the oxidation/reduction process. Persulfate would be added in progressive steps to chemically oxidize/reduce the various organic constituents. Temperatures would be managed to maintain control of the reaction and to achieve the desired destruction level.

Upon completion of the reaction step, the oxidized/reduced liquid waste would be analyzed for key contaminants (e.g., bis-2-ethylhexyl phthalate [BEHP]) to verify whether sufficient destruction and removal efficiencies (DREs) have been achieved. Once adequate destruction efficiency is achieved, the pH would be checked and adjusted, as necessary, to facilitate stabilization to (1) stabilize the remaining inorganic contaminants, metals, and radionuclides, and (2) eliminate free liquid so the resulting solid can be sent to the ICDF for disposal. Sampling and analysis of grouted waste would be completed to verify compliance with regulatory standards (e.g., LDRs) before disposal. The tanks and surrounding soil would then be removed and disposed of at the ICDF.

The condenser would be used to capture any water or contaminants (e.g., VOCs, mercury) evaporated during the oxidation/reduction step. The condensate would be continuously recycled back to the tank to increase destruction of any VOCs. Any VOCs not condensed would be captured on a GAC filter that would be treated and disposed of at a treatment, storage, and disposal facility off the INEEL, since VOC concentrations are expected to exceed the ICDF's waste acceptance criteria. If there were residual mercury vapors, they would be captured on a SGAC filter that could be disposed of at the ICDF, since it is expected to meet the ICDF's waste acceptance criteria.

6.4.2 Alternative 3(b)—Ex Situ Chemical Oxidation/Reduction with Stabilization

Under *Alternative 3(b)—Ex Situ Chemical Oxidation/Reduction with Stabilization*, the chemical oxidation/reduction process used would be identical to that described for Alternative 3(a), maintaining the relative benefits of contamination control in a low-temperature liquid process, while conducting the treatment ex situ in a reaction vessel designed for this application. The vessel would minimize concerns with efficient heating, mixing, and corrosion control, because it could be designed specifically to facilitate the operation of the ex situ chemical oxidation/reduction system. As with in situ chemical oxidation/reduction, a specific oxidant/reductant (persulfate) was identified, but other oxidants/reductants could be selected during the design phase.

For this alternative, in order to facilitate treatment operations, the waste from the V-Tanks would be consolidated and blended to the extent practicable into the minimum number of tanks to produce a single homogenous waste stream. Relatively small batches of this homogenous waste would be withdrawn from the V-Tanks for treatment in appropriately sized reaction vessels. Once in the reaction vessel, the waste would be stirred vigorously. Before and during chemical oxidation/reduction, the stirred tank waste would be adjusted and maintained at a controlled pH, as necessary, to enhance the chemical oxidation/reduction reaction. The chemical oxidant/reductant would be introduced to the stirred tank in stages to allow for oxidation/reduction of tank contents in a batch-processing manner. The initial stage would focus on the VOCs; thus, it would be preferable to minimize the reaction vessel's temperature during this time. Later stages would focus on oxidation/reduction of the SVOCs (such as PCBs and oil components), which could require heating to ensure sufficient destruction.

During chemical oxidation/reduction, there could be significant volatilization of hazardous VOCs into the off-gas system, despite operation at a low temperature (less than 100°C). To attempt a more complete oxidation/reduction, the volatized organics would be condensed, with the condensate recycled back to the reaction vessel. The GAC, SGAC, and HEPA filters between the condenser and the off-gas blower would be used to fully capture noncondensing hazardous off-gases and particulate to prevent release to the environment.

Once a batch chemical oxidation/reduction is complete, the reaction vessel's contents would be transferred and mixed with cementitious grout for stabilization purposes. Stabilization would be performed in the same container used for disposal. Upon removing the chemically oxidized/reduced waste from the reaction vessel, it would be recharged with another batch of well-mixed tank sludge. This would continue until the entire contents of the tanks have been oxidized/reduced and stabilized. The containerized, stabilized waste would be sampled to verify compliance with ICDF waste acceptance criteria and would be disposed of at the ICDF. The empty tanks and surrounding soil would then be removed and disposed of at the ICDF.

6.5 Common Elements of the V-Tanks Alternatives

All of the new alternatives considered include some of the same components. All the alternatives will result in the removal of the tank contents, the tanks, and associated piping. Likewise, all alternatives are compatible with the retained portion of the original selected remedy — removal and disposal of contaminated soil — as clarified in Section 11.2 of this ROD Amendment. The clarification specifies that the current FRGs will be applied in a different manner for soil to a depth of 3 m (10 ft) below ground surface (bgs) and soil more than 3 m (10 ft) bgs. Soil exceeding the Cs-137 FRG of 23.3 pCi/g and above 3 m (10 ft) bgs will be excavated, and any portion of it not incorporated in the treatment process will be disposed of at the ICDF or other approved facility. Soil exceeding the Cs-137 FRG of 23.3 pCi/g that is more than 3 m (10 ft) bgs will have appropriate institutional controls applied. If there is evidence of a release from the V-Tanks or the associated piping, then the underlying soils will be sampled and analyzed for the V-Tank contaminants to support a risk analysis that supports a potential revision to the FRGs and a determination of the need for further actions. This determination could lead to application of institutional controls, further remediation, or no action.

For all alternatives, the portions of the tanks and piping not incorporated in the treatment process will be disposed of at the ICDF or other approved facility. Personal protective equipment and nonrecoverable materials and equipment (items that cannot be easily or cost effectively decontaminated for reuse) will be treated as necessary and also disposed of at the ICDF or other approved facility. Institutional controls for the V-Tanks site will be maintained if contamination remaining at the site precludes unrestricted land use after completion of the remedial action. The excavated area will be backfilled with clean soil after cleanup is complete.

The estimated cost for each alternative is presented as part of the evaluation. Estimated costs are in net present value (NPV), with an estimated accuracy of +50% to -30%. Actual project costs for V-Tanks remediation through September 2002 are $6.0 million. Cost estimates provided for each alternative include the actual costs through September 2002.

All alternatives require institutional controls to protect current and future users from health risks associated with the V-Tank contents prior to remediation and with residual soil contamination remaining after remediation, if any. Consistent with expectations set out in CERCLA (40 Code of Regulations [CFR] 300), none of the remedies rely exclusively on institutional controls to achieve effectiveness. Detailed information and requirements for institutional controls are addressed in the 1999 ROD.

6.6 Distinguishing Features of the V-Tanks Alternatives

The expected outcomes are not substantively changed as a result of this ROD Amendment. The remedy selected in this ROD Amendment will produce an equivalent level of cleanup to the remedy selected in the 1999 ROD. Both remedies remove all the waste from the tanks, treat them to meet LDR treatment requirements and ICDF or other suitable disposal facility WAC limits. The primary distinguishing feature of the remedy selected in this ROD Amendment is that control of the treatment process is maintained at the INEEL, reducing the risk of commercial treatment facilities choosing alternative business strategies that affect the availability of selected treatment alternatives.

Although the remedy for the soils is not altered in intent from the 1999 ROD or from the 2003 Proposed Plan to this ROD Amendment, it is being modified for greater clarity, as noted in Section 6.5, above, and detailed in Section 11.2. As specified in the 1999 ROD, institutional controls will be implemented and maintained by the DOE at the V-Tanks site if residual contamination precludes unrestricted land use after completion of remedial action.

The cost of the new remedy selected in this ROD Amendment is roughly equivalent to the increased level of costs for the 1999 ROD remedy as estimated just before that technology became unavailable and forced the development of this ROD Amendment. However, because the 1999 ROD selected remedy is not available, remediation of the V-Tanks site has been delayed by approximately 4 years.

There were no major changes to the ARARs. The EPA promulgated remediation waste rules that simplify operation of remediation treatment and storage systems, but generally mirror the existing requirements. Other ARARs such as the ARARs specific to PCBs also were clarified. Neither of these changes dramatically alters the basis of the remedy or its overall protectiveness.

7. EVALUATION OF V-TANKS ALTERNATIVES

This section compares the performance of each alternative with respect to the CERCLA evaluation criteria, in order to make clear their relative advantages and disadvantages. The alternatives are evaluated for each of the nine criteria in turn, which are grouped into three sets:

- Threshold criteria (which must be met for an alternative to be considered for selection)
  - Overall Protection of Human Health and the Environment
  - Compliance with Applicable or Relevant and Appropriate Requirements
- Balancing criteria
  - Long-Term Effectiveness and Permanence
  - Reduction of Toxicity, Mobility, or Volume through Treatment
  - Short-Term Effectiveness
  - Implementability
  - Cost
- Modifying criteria
  - State/Support Agency Acceptance
  - Community Acceptance.

For the first four balancing criteria, the decision support model developed in the technology evaluation process yielded scores that were detailed in Section 5 of the 2003 TER and summarized in Section 6 and Table 18 of the 2003 TER. The variance between summary scores for several alternatives was small. A relative evaluation also was made to further assist in selection of the preferred alternative, primarily due to the closeness of the scores of the alternatives from the decision support model (INEEL 2000a). The evaluation of alternatives below presents these scores as high, medium, or low rankings, with additional details as needed to identify comparative advantages and disadvantages within these rankings. The last of the five balancing criteria, Cost, is evaluated in terms of estimated net present value cost of each alternative.

For the reasons described in Sections 2 and 4, the original selected remedy for the V-Tanks contents is infeasible. Therefore, its performance is not included in the comparative evaluation below, but is summarized here as a baseline. As originally evaluated in the 1999 ROD, the original selected remedy (Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal) would have met the threshold criteria for protection of human health and the environment and compliance with ARARs. Its long-term effectiveness was ranked high because the contamination would have been removed from the V-Tanks site. The reduction of toxicity, mobility, or volume through treatment was ranked high because VOCs and SVOCs would be destroyed, volatile metals would be removed, and the remaining metals and radionuclides would be immobilized. The short-term effectiveness was ranked low, due to the complexity of worker protection measures, uncertainties regarding acceptance criteria at disposal facilities off the INEEL, and the risks to communities during shipment off the INEEL. State acceptance was signified by

IDEQ signature of the ROD, and public comments registered general acceptance by the community. However, if this alternative were evaluated today, the ranking for implementability would be low because of the lack of an available facility for treatment, and its cost would be nearly three times that estimated in the 1999 ROD, making it higher than four of the seven alternatives evaluated here, at approximately $32.2 million.

The technology evaluation indicated that of all the alternatives considered, the amended remedy using Ex Situ Chemical Oxidation/Reduction with Stabilization best meets the evaluation criteria. The evaluation of alternatives summarized here is based on data presented in the 2003 TER. The full evaluation of the original selected remedy can be found in the 1999 ROD.

7.1 Evaluation Criteria

The evaluation of alternatives in this section is limited to the alternatives for the V-Tanks contents only. All alternatives are equally effective in removing contaminated soil from the V-Tanks site. No significant change is proposed from the 1999 ROD with respect to the remedy for the contaminated soil, although it is being modified for clarity.

7.1.1 Threshold Criteria

Threshold criteria are requirements that an alternative must meet to be eligible for selection as the final remedy. The threshold criteria are (1) overall protection of human health and the environment, and (2) compliance with ARARs.

7.1.1.1 Overall Protection of Human Health and the Environment. This criterion addresses whether an alternative provides adequate protection of human health and the environment and describes how risks posed through exposure pathways are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls. As a threshold criterion, this must be met for an alternative to be eligible for detailed evaluation and selection.

All of the alternatives are protective of human health and the environment by preventing release to the environment of the V-Tanks contents. Furthermore, the treatment processes can be engineered to ensure that workers and the environment are protected during active remediation.

7.1.1.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). This criterion requires that remedial actions at CERCLA sites at least meet legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations (collectively referred to as ARARs), as required by Section 121(d) of CERCLA and the NCP Section 300.430(f)(1)(ii)(B). As a threshold criterion, this must be met for an alternative to be eligible for selection.

All of the alternatives would meet their respective ARARs. Section 9 lists ARARs for the amended remedy.

7.1.2 Balancing Criteria

The five balancing criteria serve to weigh major tradeoffs between alternatives. They are: (1) long-term effectiveness and performance, (2) reduction of toxicity, mobility, or volume through treatment, (3) short-term effectiveness, (4) implementability, and (5) cost. Since lack of implementability was the reason the remedy selected in the 1999 ROD required amendment, the Agencies gave this criterion considerable weight in the selection process.

7.1.2.1 *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. This criterion includes consideration of residual risk that will remain on the INEEL following remediation, and the adequacy and reliability of controls.

All seven alternatives provide high long-term effectiveness and permanence by removing the contamination from the V-Tanks site.

7.1.2.2 *Reduction of Toxicity, Mobility, or Volume through Treatment.* This criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies which permanently reduce toxicity, mobility, or volume of the COCs.

Alternative 1(a)—In Situ Vitrification has the only high ranking for reduction of toxicity, mobility, and volume through treatment. It would destroy or treat VOCs and SVOCs, capture volatile metals (such as mercury) in the off-gas system, and immobilize the remaining metals and radionuclides. Incorporation of some soil, part of the tank shells, and some of the piping into the melt would increase the volume of the vitrified waste, but vitrification would treat some contaminated soil that otherwise would be excavated and disposed of without treatment.

Alternative 1(b)—Ex Situ Vitrification has a moderate ranking for reduction of toxicity, mobility, and volume through treatment. As with Alternative 1(a), VOCs and SVOCs would be destroyed or treated, volatile metals (such as mercury) would be captured in the off-gas system, and the remaining metals and radionuclides would be immobilized. Vitrification would treat some contaminated soil that otherwise would be excavated and disposed of without treatment. The addition of contaminated soil would reduce the volume of soils disposed of without treatment. However, ex situ processes require substantial amounts of treatment equipment, some of which could not be decontaminated and would need to be disposed of as secondary waste or in conjunction with the primary waste.

Alternative 2(c)—Thermal Desorption with Disposal Off the INEEL has a moderate ranking for reduction of toxicity, mobility, and volume through treatment. It would treat VOCs and SVOCs captured in the off-gas system. Volatile metals (such as mercury) that are captured would be stabilized as necessary. The residual waste from the desorber would be grouted to stabilize toxic metals to meet disposal facility acceptance criteria. This would reduce the mobility of the contaminants with only a slight increase in volume.

Ranking of the remaining four alternatives for reduction of toxicity, mobility, or volume through treatment is low. Under *Alternatives 2(a)—Thermal Desorption with Disposal Both On and Off the INEEL and 2(b)—Thermal Desorption with Disposal On the INEEL*, VOCs and SVOCs captured in the off-gas system would be treated, and volatile metals (such as mercury) that are captured would be stabilized as necessary. However, the mobility of the remaining metals and radionuclides in the bottoms would not be affected. Although water is driven off by the thermal processing, the volume of the bottoms would increase due to the addition of soil in the desorption process. *Alternatives 3 (a—In Situ Chemical Oxidation/Reduction with Stabilization and 3(b)—Ex Situ Chemical Oxidation/Reduction with Stabilization*, would reduce toxicity by destroying the VOCs and SVOCs through oxidation/reduction and would reduce mobility of metals and radionuclides through grouting. However, 3(a) and 3(b) would increase the volume of waste requiring disposal by adding the oxidizing/reducing and neutralizing chemicals and the grout.

7.1.2.3 *Short-Term Effectiveness.* Short-term effectiveness evaluates the amount of time until the remedy effectively protects human health and the environment at the V-Tanks site. It also evaluates any adverse effects that may be posed to workers, the community, or the environment during construction and operation while the remedial activity is being carried out. All of the alternatives with the exception of *Alternative 2(c)—Thermal Desorption with Disposal Off the INEEL* accomplish the remedial action during the same timeframe. Alternative 2(c) would require interim storage on the INEEL before disposal of the final waste form.

The highest degree of short-term effectiveness is offered by *Alternatives 3(a)—In Situ Chemical Oxidation/Reduction with Stabilization, 3(b)—Ex Situ Chemical Oxidation/Reduction with Stabilization, and 2(b)—Thermal Desorption with Disposal On the INEEL*. Under Alternative 3(a), in situ processing minimizes potential risks to workers and the environment. Most treatment processes would take place on the INEEL, minimizing risks to communities off the INEEL. The technology's relative simplicity reduces complexity in worker protection measures. The relative simplicity and low temperatures of Alternative 3(b) make worker-protection measures less complicated. In addition, most or all treatment processes would take place on the INEEL, minimizing risks to communities off the INEEL. As an ex situ process, this alternative would pose slightly more risks to workers than an in situ process. Alternative 2(b), like 3(a) and 3(b), has high short-term effectiveness because all treatment and disposal processes would take place on the INEEL, avoiding risks to communities off the INEEL. However, under 2(b) there are potential worker exposure hazards from materials handling and dust created during the process.

Alternatives 1 (a)—in Situ Vitrification, 1(b)—Ex Situ Vitrification, and 2(a)—Thermal Desorption with Disposal Both On and Off the INEEL offer moderate short-term effectiveness. The vitrification processes of Alternatives 1(a) and 1(b) involve high energy and high temperature, which could pose risks to workers that are complex to manage. Most processes would take place on the INEEL, however, minimizing risks to communities off the INEEL. Since Alternative 1(b) treatment takes place above ground, worker exposure hazards are increased. The moderate ranking for short-term effectiveness of Alternative 2(a) is due to its potential worker exposure hazards from materials handling and dust, as well as shipping, which could pose risks to communities off the INEEL.

Alternative 2(c)—Thermal Desorption with Disposal Off the INEEL has the lowest ranking for short-term effectiveness, because it would pose potential worker exposure hazards from materials handling, from dust created during the process, and from high radiation levels. Additionally, 2(c) calls for shipping off the INEEL, which could pose risks to communities.

7.1.2.4 Implementability. The criterion of implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, and coordination with other governmental entities, are also considered.

Implementability is high for *Alternatives 2(a)—Thermal Desorption with Disposal Both On and Off the INEEL, 2(b)—Thermal Desorption with Disposal On the INEEL, 3(a)—In Situ Chemical Oxidation/Reduction with Stabilization, and 3(b)—Ex Situ Chemical Oxidation/Reduction with Stabilization.* For 2(a) and 2(b), the prevalent use of thermal desorption would enhance implementation; however, application of this technology to radioactive materials has been limited, and this lack of experience adds design and operating complexities. The technology is moderately complex but has good recovery; that is, the treatment technology may be easily adjusted if the initial treatment does not fully satisfy objectives. Under 2(b), treatment on the INEEL of contaminants in the off-gas would add to the process complexity. However, since all wastes would be disposed of on the INEEL, availability of disposal facilities would be more assured. For 2(a), shipment of organic contaminants off the INEEL for treatment would reduce regulatory and operational complexity. Alternatives 3(a) and 3(b), are given a high implementability ranking because the systems and equipment involved have a high technical reliability with relatively few major components, and with the flexibility of the technology there is excellent recovery. Design of in situ treatment under 3(a), however, would involve some complexities associated with integrity of the tank once the chemical solution is added, in-tank heating and mixing issues, and removal and transport of the grout-filled tanks. Alternative 3(b) minimizes the issues of tank integrity, heating and mixing, and dealing with grout-filled tanks. As an ex situ process, it would resolve the technical uncertainties associated with in situ treatment. The maturity of the chemical oxidation/reduction technology for this type of application is limited; thus, additional testing will be required to confirm previous treatability studies (INEEL 1998).

Alternatives 1(a)—In Situ Vitrification and 1(b)—Ex Situ Vitrification have only moderate implementability. In situ vitrification has been successfully implemented on similar sites, and disposal facilities are available, but it is a relatively complicated process with complex recovery and monitoring considerations. Alternative 1(b) would require portable temporary vitrification units, which are not widely used, and the process is relatively complicated with complex recovery and monitoring considerations.

The lowest implementability ranking is for *Alternative 2(c)—Thermal Desorption with Disposal Off the INEEL*. Although the desorption technology called for under this alternative is widely used, it has not been previously carried out on high-radiation sludges. Recovery would be relatively complex. If an approved disposal facility off the INEEL is not available when needed, final completion of the cleanup could be delayed or even precluded, with costs commensurately increased.

7.1.2.5 Cost. The estimated life-cycle costs (in NPV using a 7% discount rate) for the alternatives are, in order of lowest to highest: $29.4 million for 3(b), $29.5 million for 3(a), $30.3 million for both 2(a) and 2(b), $32.7 million for 1(b), $33.0 million for 1(a), and $33.8 million for 2(c). These costs were calculated as planning estimates during preparation of the 2003 TER. Since that time, a remedy has been selected by the Agencies and the cost estimate for that selected remedy was updated for use in this ROD Amendment (see Section 8.2). Because of the expenditure required to update a cost estimate, no updates were made for the alternatives not selected. The costs presented in this ROD Amendment are considered accurate to +50% and –30%. Details of the cost estimates are presented in Appendix A of the 2003 TER. Due to the closeness of these estimates, cost was not a major discriminator in the final selection.

7.1.3 Modifying Criteria

Modifying criteria are fully considered after public comment on the proposed plan is received. The two modifying criteria are (1) state acceptance and (2) community acceptance. The modifying criteria are used in final evaluation of remedial alternatives and are equal in importance to the balancing criteria.

7.1.3.1 State Acceptance. State acceptance is demonstrated by IDEQ concurrence with the selected remedial alternative and signature of this ROD Amendment. The IDEQ was involved in the development and review of the 2003 TER and the 2003 Proposed Plan (as described in Section 2 of this ROD Amendment), as well as this ROD Amendment and other project activities such as public briefings and meetings.

7.1.3.2 Community Acceptance. For community acceptance, the factors that are considered include those elements of the remedial alternatives that interested persons in the community support, have reservations about, or oppose.

In general, commenters expressed support for both the alternatives and the evaluation process. Overall concerns most often mentioned include: (a) assurance of long-term effectiveness and protectiveness, (b) use of reliable and fully tested technology, and (c) continued public involvement and information.

Community response to the vitrification alternatives included strong support and strong opposition. Two commenters or groups questioned the technology's reliability and safety, and another group opposes vitrification as "nothing more than a proxy for incineration," which they strongly oppose. However, two other commenters support vitrification, citing its high ranking for reduction of toxicity, mobility, or volume, and its long-term effectiveness.

No specific comments for or against the thermal desorption alternatives were received. However, one commenting group made clear their general disfavor of thermal technologies, because of the likelihood of off-gassing and airborne emissions.

Community support for the preferred alternative, Ex Situ Chemical Oxidation/Reduction with Stabilization, was generally favorable, with its low-temperature and ability to treat the complex mixture of wastes cited as advantages, as well as its use of ex situ processing to avoid problems with tank safety. One commenting group opposes it because of its low ranking for reduction of toxicity, mobility, and volume. Several commenters and groups expressed concerns about the legality of adding grout for land disposal, the adequacy of the proposed off-gas system to prevent accidental releases into the atmosphere, and whether enough treatability studies would be carried out to prove the technology prior to full implementation. The Responsiveness Summary (Part III) portion of this ROD Amendment documents the full range and content of the public comments received regarding the recommended action.

7.2 Comparison of V-Tanks Alternatives

Alternative 3 (b)—Ex Situ Chemical Oxidation/Reduction with Stabilization is preferred over the other alternatives because it is a low-temperature operation, uses a simplified off-gas treatment system, and generates a stabilized waste form that can be disposed of at the ICDF. A comparison to other alternatives follows:

- Compared to *Alternative 1(a)—In Situ Vitrification*, the preferred alternative has fewer potential hazards to workers, fewer monitoring concerns, lower costs, higher system reliability, and less off-gas waste production. These advantages more than offset Alternative 1(a)'s relative strengths of technology maturity, less primary waste volume, and increased treatment capability for investigation-derived waste.

- Compared to *Alternative 1(b)—Ex Situ Vitrification*, the preferred alternative has fewer potential hazards to workers, lower costs, and higher system reliability.

- Compared to *Alternative 2(a)—Thermal Desorption with Disposal Both On and Off the INEEL*, the preferred alternative produces a lower volume of off-gas wastes, requires fewer shipments off the INEEL, and presents fewer potential hazards to workers. These advantages more than offset Alternative 2(a)'s greater administrative feasibility.

- Compared to *Alternative 2(b)—Thermal Desorption with Disposal On the INEEL*, the preferred alternative poses fewer potential hazards to workers, offers higher system reliability, and produces a lower volume of off-gas wastes.

- Compared to *Alternative 2(c)—Thermal Desorption with Disposal Off the INEEL*, the preferred alternative poses fewer potential hazards to workers, uses readily available disposal facilities, has a lower cost, requires fewer shipments off the INEEL, and offers better system reliability.

- Compared to *Alternative 3(a)—In Situ Chemical Oxidation/Reduction with Stabilization*, the preferred alternative has equal system reliability and fewer design complexities.

Table 7-1 shows how the alternatives compare under each criterion.

Table 7-1. Cost decision support model.

Table 7-1. The table represents the quantified results of a decision support model that was developed collaboratively by the Agencies during the technology evaluation. The model used more than 20 subcriteria to numerically evaluate the performance of various technologies against the five CERCLA balancing criteria. Because the technologies had been carefully selected for optimum viability, they performed well in the decision support model evaluation and generated very close numerical rankings. The evaluation of alternatives in Section 7.1 and the comparison of alternatives in Section 7.2 are based on the results of the decision support model. The final numerical rankings, which discriminate more precisely than the visual representation below, are described in detail in Sections 4 and 5 of the 2003 Technology Evaluation Report.

	Vitrification		Thermal Desorption			Chemical Oxidation/Reduction with Stabilization	
	In Situ *1(a)*	*Ex Situ* *1(b)*	*Disposal Both On and Off the INEEL* *2(a)*	*Disposal On the INEEL* *2(b)*	*Disposal Off the INEEL* *2(c)*	*In Situ* *3(a)*	☑ *Ex Situ* *3(b)*
Threshold Criteria [a]							
Overall protection	Y	Y	Y	Y	Y	Y	Y
Compliance with laws	Y	Y	Y	Y	Y	Y	Y
Balancing Criteria							
Long-term effectiveness	●	●	●	●	●	●	●
Reduction of toxicity, mobility, or volume through treatment	●	◒	○	○	◒	○	○
Short-term effectiveness	◒	◒	◒	●	○	●	●
Implementability	◒	◒	●	●	○	●	●
Cost (in millions) [b]							
Capital costs	$32.7	$32.4	$30.0	$30.0	$33.5	$29.2	$29.1
Operating and maintenance costs [c]	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Cost	$33.0	$32.7	$30.3	$30.3	$33.8	$29.5	$29.4

Note: The Original Selected Remedy was Soil and Tank Removal, Ex Situ Treatment of Tank Contents, and Disposal. However, the alternative is no longer viable, prompting development of a new remedy.

☑ Indicates the preferred alternative
Y Yes, meets criterion
● High, most satisfies criterion
◒ Moderate, satisfies criterion
○ Low, least satisfies criterion

a. An alternative must meet the threshold criteria to be considered for selection. An alternative either fully satisfies the criteria or does not. The No Action and Limited Action (Institutional Controls) alternatives did not meet the threshold criteria and were eliminated from detailed analysis.

b. Costs are estimated and rounded. Costs are in net present value, with an estimated accuracy of +50% to -30%. Detailed cost estimates are in Appendix A of the 2003 Technology Evaluation Report. Cost estimates provided for each alternative include the costs to date.

c. The only operating and maintenance costs required would be for institutional controls and would be identical for all alternatives, since all alternatives would remove contamination in order to meet remediation goals.

8. V-TANKS AMENDED REMEDY

The amended remedy for the V-Tanks contents is Chemical Oxidation/Reduction with Stabilization. This remedy applies chemical oxidation/reduction processes that provide the relative benefits of contamination control in a low-temperature liquid process. The final design of the ex-situ V-Tanks contents treatment process is expected to include aqueous-phase destruction of the organic COCs enhanced by gaseous-phase destruction of the VOCs. A simplified process flow diagram for treatment of the V-Tanks contents under the amended remedy is shown in Figure 8-1. Final details of the treatment process will be provided in the remedial design.

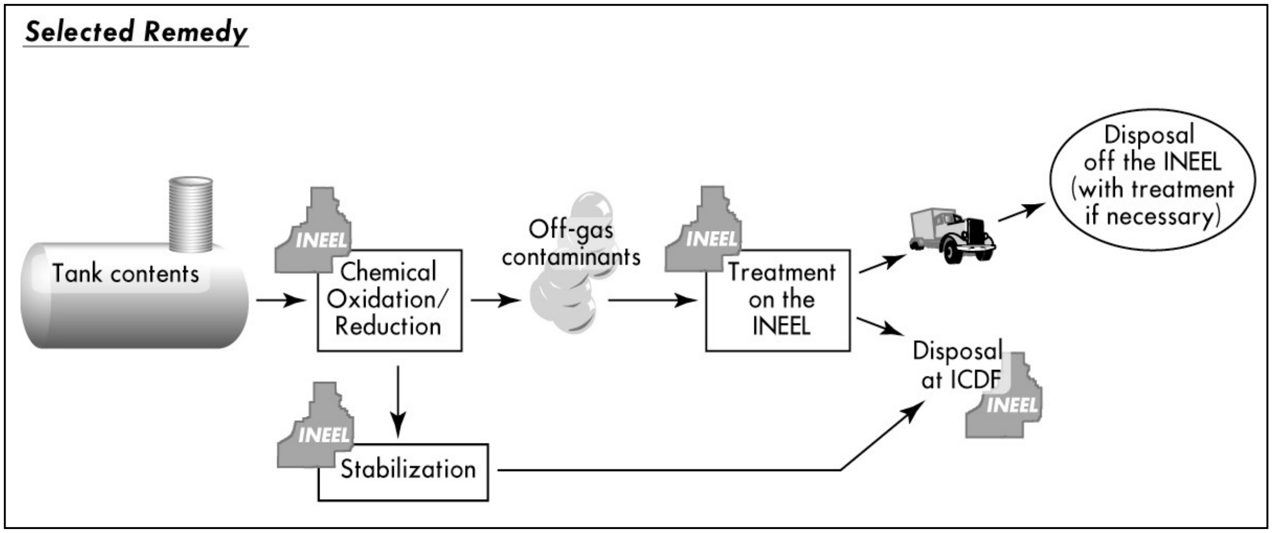

Figure 8-1. Simplified process flow diagram for the V-Tanks contents under the amended remedy.

The complete amended remedy for the V-Tanks (TSF-09 and TSF-18) is Soil and Tank Removal, Chemical Oxidation/Reduction with Stabilization of Tank Contents, and Disposal. The major treatment activities will take place at the V-Tanks site or areas adjacent (e.g., TAN 607), as necessary to facilitate remediation. The amended remedy will prevent unacceptable current and future exposure of workers, the public, and the environment to contaminants in the V-Tanks. This remedial action will permanently reduce the toxicity and mobility of the contamination in the V-Tanks. It will meet the final RAOs by removing the source of contamination and, thus, break the pathway by which a future receptor may be exposed. This will be the final action for this site. The portion of the amended remedy that addresses removal and treatment of the V-Tanks contents will address the principal threat posed by the V-Tanks contents.

Under this amended remedy, the V-Tanks contents will be chemically oxidized/reduced to the extent necessary to meet treatment standards in accordance with ARARs and then solidified in order to meet ICDF or other approved disposal facility WAC. The ICDF was designated by the Agencies in the *Final Record of Decision for the Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13* (DOE-ID 1999b) as an appropriate disposal facility for all INEEL-generated CERCLA waste that meets the ICDF's WAC. This amended remedy meets the ARAR (40 CFR 761.61[c]) for a risk-based approach to remediation of the V-Tanks contents. Finally, pursuant to the original remedy selected in the 1999 ROD and refined in the 2003 ESD, the surrounding contaminated soil, the tanks, and debris will be removed and disposed of at the ICDF. The FRG for soil surrounding the V-Tanks is 23.3 pCi/g for Cs-137.

The amended remedy for the V-Tanks (TSF-09 and TSF-18) consists of 15 components divided into three subsets—(1) new or modified components of the amended remedy, (2) components of the original remedy that are clarified and remain in effect, and (3) components identified in the 2003 ESD that remain in effect, as follows:

New or Modified Components of the V-Tanks Amended Remedy

1. Further sampling and/or analysis of the V-Tanks contents to support refinement of the RCRA characteristic evaluation to determine whether treatment is required for underlying hazardous constituents. The results of this step will be subject to review and concurrence by the Agencies.

2. Consolidating and/or blending of the tank contents to facilitate management of the waste as one homogenous waste stream to the extent practical. If laboratory studies on sludge treatment demonstrate a clear benefit, some of the liquid excess to the treatment process may be decanted and treated separately from the remainder of the waste.

3. Continued temporary use of Tank V-9 for storage until the contents of that tank are removed for transfer to another V-Tank. Continued temporary use of Tanks V-1, V-2, and V-3 without secondary containment for storage of waste prior to treatment, blending waste prior to treatment, and/or for providing an accumulation location for treated waste prior to stabilization.

4. Chemically oxidizing/reducing the VOCs in the V-Tanks contents as necessary to meet applicable RCRA LDR F001 treatment standards in accordance with ARARs as well as ICDF or other approved disposal facility WAC. Chemical oxidation/reduction of PCBs will be performed as necessary to demonstrate no unreasonable risk to human health and the environment, as part of a PCB risk-based management strategy developed under 40 CFR 761.61(c). Chemical oxidation/reduction will be required for specific underlying hazardous constituents (e.g., BEHP) if the waste is confirmed to exhibit a RCRA characteristic. Laboratory studies will be conducted to optimize the choice of specific oxidant(s)/reductant(s) (e.g., peroxide) and to optimize the treatment process. The treatment process selected may be multi-stage and will be conducted ex situ at the V-Tanks site or areas adjacent (e.g., TAN 607) as necessary to facilitate remediation.

5. Additional treatment (e.g., solidification, stabilization) of the V-Tanks contents as necessary to meet ICDF or other approved disposal facility WAC.

6. Disposing of the treated tank contents at the ICDF or other approved facility.

7. Removing and disposing of the V-Tanks and associated piping at the ICDF or other approved facility.

8. Shipping treatment system off-gas residues and other secondary wastes to the ICDF or an approved treatment facility as necessary based on the off-gas residue characterization.

Components from the V-Tanks Original Remedy that are Clarified

9. Excavating contaminated soil:

   - Excavating contaminated soil surrounding the V-Tanks that exceeds the FRG to a maximum of 3 m (10 ft) below ground surface (bgs)

- Excavating additional soil below 3 m (10 ft) bgs to the extent necessary to remove the V-Tanks and associated piping.

10. Disposing of the contaminated soil at an approved soil repository.

11. Post-remediation soil sampling to verify that FRGs are met and to analyze for additional contaminants if excavation indicates a release of the V-Tanks contents:

    - For contaminated soil less than 3 m (10 ft) bgs, post-remediation sampling to verify that FRGs are met.

    - For contaminated soil more than 3 m (10 ft) bgs, post-remediation sampling to determine the need for institutional controls.

    - For contaminated soil beneath the V-Tanks and piping where there is evidence of a release (either a leak from a V-Tank or the associated piping), post-remediation soil sampling at the bottom of the excavation to analyze for V-Tanks contaminants to support a risk analysis that supports a potential revision to the FRGs and a determination of the need for further actions. This determination could lead to application of institutional controls, further remediation, or no action.

    - For contaminated soil beneath the V-Tanks and piping where there is no evidence of a release from either the V-Tanks or the associated piping, post-remediation soil sampling to determine the appropriate institutional controls, if any, for this site.

12. Filling the excavated area with clean soil (soil that meets RAOs) and then contouring and grading to the surrounding elevation.

13. Establishing and maintaining institutional controls consisting of signs, access controls, and land-use restrictions, depending on the results of post-remediation sampling. Institutional controls will be required if residual contamination precludes unrestricted land use after completion of remedial action.

Components from the 2003 ESD for the V-Tanks

14. Further characterizing the surrounding contaminated soil and further defining the corresponding area of contamination.

15. Adding ARARs for managing PCB remediation waste (as described in Section 9).

The RAOs for the V-Tanks site will be met through the completion of active remediation (projected for 2007) and implementation of institutional controls. As stated in the 1999 ROD, the amended remedy continues to address the risks posed by the V-Tanks by effectively removing the source of contamination and, thus, breaking the pathway by which a future receptor may be exposed.

8.1 Institutional Controls for the V-Tanks

The institutional controls identified in the 1999 ROD for the TSF-09 and TSF-18 V-Tanks are not changed. The 1999 ROD specifies institutional control requirements and requires that institutional controls be implemented and maintained by the DOE at any CERCLA site at the INEEL where residual contamination precludes unrestricted land use.

The 1999 ROD also states that a comprehensive approach for establishing, implementing, enforcing, and monitoring institutional controls at the INEEL, including WAG 1, will be developed in accordance with EPA's *Region 10 Final Policy on the Use of Institutional Controls at Federal Facilities* (EPA 1999a). More detailed information and requirements for WAG 1 institutional controls are included in the 1999 ROD.

8.2 Cost Estimate for the V-Tanks Amended Remedy

The estimated life-cycle cost in NPV for the amended remedy is $32.6 million. Table 8-1 summarizes the *V-Tanks ROD Amendment Cost Estimate* (INEEL 2004). The estimated cost presented incorporates further scope and estimate development for the selected remedy since the comparative estimates were prepared for each of the evaluated technologies (see Section 7.1.2). The planning estimate summarized in Table 8-1 has been updated from the earlier comparative estimate based on the *Conceptual Design Report for Ex Situ Chemical Oxidation/Reduction and Stabilization of the V-Tanks at Waste Area Group 1, Operable Unit 1-10* (INEEL 2003) and detailed planning for fiscal year 2004. The NPV was calculated using a discount rate of 7%. The accuracy range of this estimate is +50% to –30%.

8.3 Expected Outcomes for the V-Tanks Amended Remedy

The Agencies' goal in this action is to remove the tanks and their contents from the V-Tanks site, thereby preventing potential release of contaminants to the environment. The amended remedy will result in attainment of the remediation goals and protection of current and future workers and future residents.

Table 8-1. Cost estimate summary for the V-Tanks amended remedy.

	Actual Cost Through FY 03	Estimated Cost	Contingency [a, b] (percent)		Total Cost FY 03 Dollars	Summary Cost	
						FY 03 Dollars	NPV Dollars
CAPITAL COSTS							
FFA/CO MANAGEMENT AND OVERSIGHT						**$ 3,911,438**	**$ 3,882,712**
Project Management and Support							
OU 1-10 RD/RA Scope of Work (50% of actual cost)	163,301				163,301		
V-Tanks Project Mgmt. and Support	1,382,949	2,365,188			3,748,137		
	$ 1,546,250	**$ 2,365,188**			**$ 3,911,438**		
REMEDIAL DESIGN						**$ 11,217,697**	**$ 11,189,783**
Original Remedy Design							
V-Tanks V-9 Sampling	921,108				921,108		
V-Tanks RD/RAWP and Supporting Documents	1,917,310				1,917,310		
V-Tanks Closure Plan	56,597				56,597		
V-Tanks Safety Analysis	166,290				166,290		
	$ 3,061,305				**$ 3,061,305**		
Early Remedial Action (ERA) Design							
V-Tanks ERA RD/RAWP Addendum (soil sampling and line isolation)	617,352				617,352		
V-Tanks ERA RD/RAWP Addendum Revision (contents consolidation and sampling)	45,533	1,073,280			1,118,813		
	$ 946,233	**$ 1,073,280**			**$ 1,736,165**		
Technology Evaluation and ROD Amendment							
V-Tanks Technology Evaluation	630,698	68,922			699,620		
V-Tanks Technology Evaluation Report	177,307				177,307		
V-Tanks Proposed Plan and ROD Amendment	158,477	40,058			198,535		
V-Tanks Closure Plan	58,289	21,166			79,455		
V-Tanks Conceptual Design	497,728				497,728		
V-Tanks Laboratory Studies	223,840	697,198	218,404	(31%)	1,139,442		
V-Tanks RD/RA Scope of Work	15,247	61,920			77,167		
	$ 2,077,121	**$ 820,342**	**218,404**	**(27%)**	**$ 3,115,867**		
New Remedy Design							
New V-Tanks RD/RAWP and Supporting Documents		2,892,045	188,421	(7%)	3,080,466		
V-Tanks Safety Analysis	44,191	119,799	59,904	(50%)	223,894		
	44,191	**$ 3,011,844**	**248,325**	**(8%)**	**$ 3,304,360**		

Table 8-1. (continued).

	Actual Cost Through FY 03	Estimated Cost	Contingency [a, b]	(percent)	Total Cost FY 03 Dollars	Summary Cost FY 03 Dollars	Summary Cost NPV Dollars
CAPITAL COSTS (continued)							
REMEDIAL ACTION						**$ 16,898,238**	**$16,690,842**
Legacy Waste Management and Disposition	424,474	331,121			755,595		
	$ 424,474	**$ 331,121**			**$ 755,595**		
Early Remedial Action							
V-Tanks Volume Monitoring	69,479	53,028			122,507		
Early Site Preparation	555,662				555,662		
Soil Sampling and V-9 Piping Isolation	504,230	70,032			574,262		
Contents Consolidation and Sampling		2,202,738	98,788	(4%)	2,301,526		
	$ 1,129,371	**$ 2,325,798**	**98,788**	**(4%)**	**$ 3,553,957**		
Tank Contents Remedial Action							
RA Management and Oversight		2,916,830	0	(0%)	2,916,830		
Treatment System Procurement and Delivery		1,171,851	559,894	(48%)	1,731,745		
Mockup Testing Off the INEEL		661,656	338,577	(51%)	1,000,233		
Site Mobilization, Preparation, and Setup		981,601	292,204	(30%)	1,273,805		
Readiness Assessment and Prefinal Inspection		200,000	74,000	(37%)	274,000		
Tank Contents Removal and Treatment		1,107,777	718,893	(65%)	1,826,670		
Waste Sampling, Packaging, and Disposal		818,791	521,877	(64%)	1,340,668		
Tank Contents Prefinal Inspection and Reporting		55,000	15,000	(27%)	70,000		
Treatment System Dismantlement and Demobilization		31,869	15,934	(50%)	47,803		
		$ 7,945,375	**$ 2,536,379**	**(32%)**	**$ 10,481,754**		
Soil, Tanks, and Piping Remedial Action							
Soil Removal and Disposal		1,130,309	282,578	(25%)	1,412,887		
Tanks and Ancillary Piping/Equipment Removal and Disposal		126,306	67,260	(53%)	193,566		
Site Backfill and Restoration		106,591	28,388	(27%)	134,979		
Soil, Tanks, and Piping Prefinal Inspection and Reporting		55,000	15,000	(27%)	70,000		
		$ 1,418,206	**$ 393,226**	**(28%)**	**$ 1,811,432**		
V-Tanks Remedial Action Final Inspection and Reporting							
Final Inspection and RA Report		165,000	48,000	(29%)	213,000		
Closure Certification and Closure Report		65,000	18,000	(28%)	83,000		
		$ 230,000	**66,000**	**(29%)**	**$ 296,000**		
Capital Cost Subtotal	$ 5,638,323	$ 19,521,154			25,159,477		
Contingency			3,451,122				
CAPITAL COST TOTAL	**$ 5,638,323**	**$ 19,521,154**	**$ 3,561,122**	**(18%)**	**$ 28,720,599**	**$ 32,027,873**	**$31,763,337**

Table 8-1. (continued).

	Actual Cost Through FY 03	Estimated Cost	Contingency [a, b] (percent)		Total Cost FY 03 Dollars	Summary Cost FY 03 Dollars	Summary Cost NPV Dollars
OPERATIONS AND MAINTENANCE (O&M) COST							
OU 1-10 Institutional Controls and Five-Year Reviews							
Institutional Controls	100,617	288,000			388,617		
Five-Year Reviews		162,500	48,750	(30%)	211,250		
	$ 100,617	**$ 450,500**	**48,750**	**(11%)**	**$ 599,867**		
O&M Cost Subtotal	100,617	450,500			551,117		
Contingency			48,750	(11%)			
O&M COST TOTAL	**$ 100,617**	**$ 450,500**	**48,750**	**(11%)**	**$ 599,867**	**$ 599,867**	**$ 326,971**
TOTAL ESTIMATED COST	**$ 9,046,214**	**$ 19,971,654**	**$ 3,609,872**	**(18%)**	**$ 32,627,740**	**$ 32,627,741**	**$ 32,090,308**

Notes: a. Contingency is not applied to actual cost.
b. Overall contingency on estimated cost is 18%. The contingency rate applied to each line item varies.

9. STATUTORY DETERMINATIONS FOR THE V-TANKS

Under CERCLA Section 121 and the NCP, the Agencies must select remedies that are protective of human health and the environment, that comply with ARARs (unless a statutory waiver is justified), that are cost effective, and that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ, as a principal element, treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous wastes, and has a bias against “off-Site disposal” (that is, disposal off the INEEL) of untreated wastes. The following sections discuss how the amended remedy meets these statutory requirements.

9.1 Protection of Human Health and the Environment

The amended remedy will protect human health and the environment from contaminants in the V-Tanks contents by removing the contents from the V-Tanks site. Institutional controls also will ensure that pathways to human or ecological receptors will not be completed during the institutional control period before 2099. Land-use restrictions may be implemented after 2099 to protect human health and the environment if contaminated soils above the final remediation goals are left in place.

9.2 Compliance with ARARS

Implementation of the amended remedy will comply with all ARARs. However, some ARARs identified in the 1999 ROD have been deleted, some corrected, and others added in this amended remedy. Table 9-1 lists all ARARs from the 1999 ROD, changed ARARs, and newly identified ARARs for the amended remedy.

9.2.1 Clarification of ARARs

The Agencies have agreed to clarify and apply ARARs to the remedy as described in the following subsections:

9.2.1.1 One Waste Stream. All the waste in Tanks V-1, V-2, V-3, and V-9 is considered one waste stream. Waste typically was routed through Tank V-9 for solids removal before distribution to V-1, V-2, or V-3, depending on available capacity. While the concentrations of specific hazardous constituents may vary from tank to tank, the overall average concentration of the hazardous waste constituents for all tanks will be used to determine the applicability of LDR treatment standards to the entire waste stream.

9.2.1.2 Waste Characterization. The V-Tanks waste has been characterized as a F001 listed waste under RCRA based on the documented use of trichloroethylene for its solvent properties meeting the F001 listing criteria in 40 CFR 261 Subpart D. The F001 “spent solvent” designation in 40 CFR 261.31 can include other chlorinated solvents (i.e. tetrachloroethylene, methylene chloride, 1,1,1 trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons) that may be present in the V-Tanks waste above the F001 treatment standard. Currently, no determination has been made by NE-ID regarding whether these other solvents meet the criteria for receiving the F001 designation as listed RCRA wastes. However, the V-Tanks waste will be treated to meet the F001 treatment standard in 40 CFR 268.40 for all of the F001 chlorinated solvents. No other listed waste codes are applicable to this waste. Other characteristic codes may be applicable to the waste.

Table 9-1. Summary of ARARs for the V-Tanks amended remedy.

Requirement (Citation)	ARAR Type			Status			Comments
	ction-pecific	hemical - pecific	ocation-pecific	nchanged	eleted	ew or odified	
Clean Air Act and Idaho Air Regulations							
IDAPA 58.01.01.161 (formerly IDAPA 16.01.01.161), Toxic Substances		A		X			Applies to air emissions during excavation of soils and during removal and treatment of waste.
IDAPA 58.01.01.500.02 (formerly IDAPA 16.01.01.500.02), Requirements for Portable Equipment	A				X		Administrative requirement only, no substantive requirements. Applies to portable equipment used to remove and treat waste.
IDAPA 58.01.01.585 (formerly IDAPA 16.01.01.585), Toxic Air Pollutants, Noncarcinogenic Increments		A		X			Applies to air emissions during excavation of soils and during removal and treatment of waste.
IDAPA 58.01.01.586 (formerly IDAPA 16.01.01.586), Toxic Air Pollutants, Carcinogenic Increments		A		X			Applies to air emissions during excavation of soils and during removal and treatment of waste.
IDAPA 58.01.01.591 (formerly IDAPA 16.01.01.591), National Emission Standards for Hazardous Air Pollutants, and the following as cited in it:	A					X	Added correct reference. Applies to air emissions during excavation of soils and during removal and treatment of waste.
40 CFR 61.92, National Emission Standards for Hazardous Air Pollutants Standard (NESHAPS)		A		X			Applies to air emissions during excavation of soils and during removal and treatment of waste.
40 CFR 61.93, NESHAPS Emission Monitoring and Test Procedures	A			X			Applies to air emissions during excavation of soils and during removal and treatment of waste.
40 CFR 61.94(a), NESHAPs Emissions Compliance	A			X			Applies to air emissions during excavation of soils and during removal and treatment of waste.
IDAPA 58.01.01.650 and .651 (formerly IDAPA 16.01.01.650 and .651), Rules for Control of Fugitive Dust	A			X			Applies to air emissions during excavation of soils and during removal and treatment of waste.
RCRA and Hazardous Waste Management Act							
Generator Standards							
IDAPA 58.01.05.006 (formerly IDAPA 16.01.05.006), Standards Applicable to Generators of Hazardous Waste, and the following, as cited in it:	A			X			
40 CFR 262.11, Hazardous Waste Determination	A			X			Applies to contaminated soils and tank waste, as well as newly generated secondary waste.
40 CFR 262.20–.23, The Manifest	A			X			Applies to contaminated soils and tank waste, as well as newly generated secondary waste that will be transported.
40 CFR 262.30–.33, Pre-Transport Requirements	A			X			Applies to contaminated soils and tank waste, as well as newly generated secondary waste that will be transported.

Table 9-1. (continued).

Requirement (Citation)	ARAR Type			Status			Comments
	ction- pecific	hemical - pecific	ocation- pecific	nchanged	eleted	ew or odified	
General Facility Standards							
IDAPA 58.01.05.008 (formerly IDAPA 16.01.05.008), Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, and the following, as cited in it:	A			X			
40 CFR 264.13 (a)(1-3), General Waste Analysis	A			X			Applies to V-Tanks waste before treatment and after treatment but before disposal
40 CFR 264.14, Security	A			X			Applies to the treatment facility for the V-Tanks waste at TSF.
40 CFR 264.15¸ General Inspections Requirements	A			X			Applies to the treatment facility for the V-Tanks waste at TSF.
40 CFR 264.16, Personnel Training	A			X			Applies to the treatment facility for the V-Tanks waste at TSF.
40 CFR 264.Subpart C, Preparedness and Prevention	A			X			Applies to the treatment facility for the V-Tanks waste at TSF.
40 CFR 264.Subpart D, Contingency Plan and Emergency Procedures	A			X			Applies to the treatment facility for the V-Tanks waste at TSF.
40 CFR 264.111(a) and (b) Closure Performance Standards	A					X	Applies to the V-Tanks site after waste removal.
40 CFR 264.114¸ Disposal or Decontamination of Equipment, Structures, Soils	A			X			Applies to equipment used to remove waste and soils, to treat tank waste, and to transport treated waste and contaminated soil. Also applies to the V-Tanks and ancillary lines and equipment.
40 CFR 264.171–.178, Use and Management of Containers	A			X			Applies to containers used during the removal and treatment of V-Tanks waste at TSF.
40 CFR 264.192–.196, Tanks Systems	A					X	Added as applicable to new tank systems used to treat or store V-Tanks waste.
40 CFR 264.197(a)¸ Tank Closure and Post-Closure Care	A			X			Applies to the V-Tanks and to new tanks used in the treatment system at TSF.
40 CFR 264.553(c) and (e)¸ Temporary Units	A					X	Added as applicable to the use of the V-Tanks for the accumulation and subsequent storage of treated waste.
40 CFR 264.554 (a) to (k), Staging Piles	A					X	Added as applicable to staging piles of contaminated soils.

Table 9-1. (continued).

Requirement (Citation)	ARAR Type			Status			Comments
	ction-pecific	hemical -pecific	ocation-pecific	nchanged	eleted	ew or odified	
Land Disposal Restrictions							
IDAPA 58.01.05.011 (formerly IDAPA 16.01.05.011) Land Disposal Restrictions, and the following, as cited in it:	A			X			
40 CFR 268.40(a)(b)(e)¸ Applicability of Treatment Standards	A			X			Applies to V-Tanks waste and secondary wastes generated during treatment of the V-Tanks waste.
40 CFR 268.45, Treatment Standards for Hazardous Debris	A			X			Applies to V-Tanks debris and debris associated with the treatment system at TSF.
40 CFR 268.48(a)¸ Universal Treatment Standards	A			X			Applies to V-Tanks waste and secondary wastes generated during treatment of the V-Tanks waste.
40 CFR 268.49, Alternative LDR Treatment Standards for Contaminated Soil	A			X			Applies to contaminated soil from around the V-Tanks.
Toxic Substance Control Act (TSCA)							
40 CFR 761.61(c), Remediation Waste: Risk-based Disposal Approval	A	A				X	Applicable to management and disposal of PCB Remediation Waste at the INEEL.
40 CFR 761.79(b)(1)¸ PCB Decontamination Standards and Procedures: Decontamination Standards	A	A				X	Applicable to decontamination of equipment used to manage PCB contaminated waste.
40 CFR 761.79(c)(1) and (2)¸ Decontamination Standards and Procedures: Self-Implementing Decontamination Procedures	A	A		X			Applicable to decontamination of equipment used to manage PCB contaminated waste.
40 CFR 761.79(d)¸ Decontamination Solvents	A	A		X			Applicable to decontamination of equipment used to manage PCB contaminated waste.
40 CFR 761.79(e)¸ Limitation of Exposure and Control of Releases	A	A		X			Applicable to decontamination of equipment used to manage PCB contaminated waste.
Toxic Substance Control Act (TSCA) (continued)							
40 CFR 761.79(g)¸ Decontamination Waste and Residues	A	A		X			Applicable to decontamination of equipment used to manage PCB contaminated waste.
To-Be-Considered							
DOE Order 5400.5, Chapter II(1)(a, b)¸ Radiation Protection of the Public and the Environment	TBC			X			Applies to the V-Tanks site before, during, and after remediation.
DOE Order 435.1, Radioactive Waste Management	TBC			X			Applies to the V-Tanks site before, during, and after remediation.
Region 10 Final Policy on Institutional Controls at Federal Facilities (EPA 1999a)	TBC			X			Applies to contamination left in place.

Key: A=applicable requirement; TBC = to be considered.

The sampling data at this time is not adequate to exclude some of the potentially applicable characteristic "D" codes. Interference between compounds during the laboratory analysis of waste samples resulted in detection limits that exceeded characteristic levels for some of the "D"-coded waste constituents. That means it is not possible to determine if the actual concentrations in the waste exceed the applicable limits for some constituents. Until the additional planned sampling is completed, the Agencies will assume that the "D" characteristic codes are applicable for those codes where the interference prevents a determination on the applicability of the "D" code. This means that the treatment system will be designed to meet the "D" code treatment standards and associated Universal Treatment Standards (UTS) for any Underlying Hazardous Constituents (UHCs). This is in addition to the applicable F001 treatment standards. If the additional sampling effort demonstrates that the V-Tanks waste does not exhibit any hazardous characteristic so that there are no applicable "D" codes, then treatment goals will be modified in the RD/RA Workplan to achieve compliance with only the applicable F001 treatment standards. In that case, treatment of UHCs to UTS levels will not be required.

9.2.1.3 Management of PCB Remediation Waste. The Agencies have determined that the management of PCB remediation waste will be modified in accordance with the ARAR, 40 CFR 761.61(c). Under TSCA, separate analysis of the liquid phase (< 0.1 mg/kg) and the sludge phase (294 mg/kg) is required. If the waste is not separated into its separate phases, the combined waste must be managed as if the combined waste were at the concentration of the higher phase (40 CFR 761.1[b][4][iv]). The waste in the V-Tanks will, therefore, be managed at the as-found concentration of the highest individual phase (294 mg/kg), rather than the 18 mg/kg average concentration. The PCBs in the V-Tanks waste are the result of historical spills or unauthorized releases of PCB-containing materials from nuclear testing and development activities at TAN. Drains from within the TAN facilities collected spilled materials and routed the waste to the V-Tanks. The V-Tanks were installed for the express purpose of collecting waste products from TAN activities for appropriate management (i.e., as pollution control devices). The waste in the V-Tanks (an aqueous industrial sludge) meets the definition of PCB remediation waste under 40 CFR 761.3. Bulk PCB remediation waste with a concentration greater than 50 ppm may be disposed of without treatment in a hazardous waste landfill (40 CFR 761.61[a][5][iii]). For CERCLA waste, the ICDF is equivalent to a hazardous waste landfill and, therefore, may receive the V-Tanks waste for disposal. The V-Tanks waste is also less than the ICDF WAC upper limit for PCBs established at 500 ppm.

The TSCA prohibits the land disposal of waste(s) greater than 50 mg/kg that fail the paint filter test. The TSCA also prohibits the solidification of this waste to pass the paint filter test unless a risk-based petition is approved under 40 CFR 761.61(c). The ARAR 40 CFR 761.61(c) allows a risk-based petition showing the planned treatment for the V-Tanks waste, the final disposition at the ICDF, and a demonstration of the acceptable risk resulting from management of the waste according to this plan. The information required for this petition has been compiled in "Risk-Based Approach for Management of PCB Remediation Waste from the V-Tanks" (Engineering Design File [EDF]-3077), and that document has been placed in the Administrative Record for OU 1-10. Signature by EPA of this ROD Amendment constitutes the CERCLA equivalent of the approval required under TSCA, confirming that EPA finds the proposed management approach does not pose an unreasonable risk of injury to human health or the environment.

9.2.1.4 Characterization of Secondary Waste as F001 Listed Waste. VOCs, mercury, or other hazardous constituents released during the chemical oxidation/reduction or stabilization processes and collected on activated carbon, sulfur-impregnated carbon, or HEPA filters is a new waste stream, with its own treatment requirements. After treatment of the V-Tanks contents, these secondary wastes will be characterized as F001, and further characterized to determine if the stream exhibits any of the characteristics of a hazardous waste. Applicable treatment standards will be assigned based on these characteristics. The secondary waste will be tested to determine if it meets applicable LDR treatment standards, and it will be treated, as appropriate.

9.2.1.5 Temporary Use for Accumulation. Tank systems that are used to manage hazardous waste are typically required to have secondary containment. New tank systems that are installed as part of the remedy will meet that requirement. However, the remedy design may call for the existing V-Tanks to be temporarily used (for an anticipated period of less than one year) to provide an accumulation location for treated waste prior to stabilization without secondary containment. An evaluation of the tanks as documented in "Use of V-1, V-2, and V-3 for Storing, Blending, and Accumulating Waste During Remediation of the V-Tanks" (EDF-3948) demonstrates that the tanks meet the requirements of 40 CFR 264.553(c), allowing the temporary use of these tanks during remediation. Signature of this ROD Amendment constitutes the CERCLA equivalent of the approval required under RCRA for use of the V-Tanks for accumulation and subsequent storage of treated waste during the treatment operation without secondary containment.

9.2.1.6 Staging Piles. Based on the presence of F001-listed hazardous constituents in the contents of the V-Tanks, and documented spills of the tank waste to soils at the ground surface during waste transfers, it is assumed that the contaminated soil (which resulted from spills during some pumping operations to remove excess liquid from the V-Tanks) also carries the F001 code. Soil sampling results to date have not revealed detectable concentrations of the hazardous constituents for which the F001 code applies. Regardless, the application of the F001 code to the contaminated soils means the contaminated soils must be managed in accordance with RCRA regulations. In accordance with the 1999 OU 1-10 ROD, contaminated soils will be excavated and disposed of at the ICDF. During excavation and prior to transport, the contaminated soils may be placed directly in roll-off boxes or may be placed in staging piles. 40 CFR 264.554(a) to (k), "Staging Piles," is cited as an ARAR for contaminated soils, in case the remedial design determines that staging piles are a necessary feature of the remedial action.

9.3 Cost Effectiveness

In the Agencies' judgment, the amended remedy is cost effective and represents a reasonable value for the money to be spent. In making this determination, the Agencies used the following definition from NCP Section 300.430(f)(1)(ii)(D): "A remedy shall be cost effective if its costs are proportional to its overall effectiveness." The Agencies' determination was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and compliant with ARARs). Overall effectiveness is evaluated by assessing three of the five balancing criteria in combination: long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness, and then comparing the overall effectiveness to costs to determine cost effectiveness. The relationship of the overall effectiveness of the amended remedy was determined to be proportional to its costs and, hence, it represents a reasonable value for the money to be spent.

The estimated life-cycle cost in NPV for the amended remedy is $32.1 million, as presented in Table 8-1. (The NPV includes actual costs expended through September 2003 but does not include a contingency on the actual costs.)

9.4 Utilization of Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

The Agencies have determined that the amended remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for the final remedial action at this V-Tanks site. The Agencies determined that the amended remedy provides the best balance of tradeoffs in terms of the five balancing criteria (described in Section 7), while also considering the statutory preference for treatment as a principal element and bias against treatment and disposal off the INEEL, and considering state and community acceptance.

9.5 Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied because treatment is used to destroy organic compounds including PCBs and to stabilize inorganic contaminants including metals and radionuclides.

9.6 Five-Year Review Requirements

Under the amended remedy, the contamination in the V-Tanks contents will be removed from the V-Tanks site. However, pursuant to the original remedy, contaminants in the surrounding soil may remain on the INEEL during the remedial action above levels that allow for unlimited use and unrestricted exposure. Therefore, a statutory review will be conducted within 5 years after initiation of remedial action, and at least every 5 years thereafter through the standard CERCLA 5-year review process. The reviews will be conducted to ensure that the amended remedy is, or will be, protective of human health and the environment. This provision does not preclude more frequent reviews by one or more of the Agencies.

10. DOCUMENTATION OF SIGNIFICANT CHANGES

This section documents both significant and minor changes to the V-Tanks remedy. Section 10.1 summarizes three significant and two minor changes from the 2003 Proposed Plan.

10.1 Changes to the V-Tanks Remedy from the Proposed Plan

The following are three significant changes made to the V-Tanks remedy from the 2003 Proposed Plan:

1. Further sampling and/or analysis of the V-Tanks contents will be completed to support refinement of the RCRA characteristic evaluation to determine whether treatment is required for underlying hazardous constituents. The results of this effort will be subject to review and concurrence by the Agencies.

2. An option to decant and separately treat some of the liquid from the tanks was added to the amended remedy. To optimize the treatment of the V-Tanks contents, the 2003 TER considered removal and treatment of a portion of the liquid phase in the evaluation of the remedial alternatives. The Proposed Plan did not specify this option. This option may be implemented if laboratory studies establish a clear benefit.

3. The selected remedy is ex situ chemical oxidation/reduction to treat VOCs to both F001 LDR treatment standards and disposal facility waste acceptance criteria. PCBs also will be chemically oxidized/reduced as necessary to demonstrate no unreasonable risk to human health and the environment, as part of the PCB risk-based management approach under 40 CFR 761.61(c) (see Section 9.2.1.3, “Management of PCB Remediation Waste”). Chemical oxidation/reduction also will be required for specific underlying hazardous constituents (e.g., BEHP) if the waste is confirmed to be RCRA characteristic. Resulting treatment residues will be solidified or stabilized as necessary to meet the ICDF or other approved disposal facility WAC.

The following are two minor changes made to the V-Tanks remedy from the 2003 Proposed Plan:

1. During the data validation process, a laboratory error was discovered in the calculation of inorganic concentrations. This error has been corrected in Table 2-2 of this document. The changes in the data would not have significantly affected the technology evaluation or the selection process.

2. The titles of the Thermal Desorption alternatives were modified for clarity. No other changes were made to these alternatives.

11. EXPLANATION OF SIGNIFICANT DIFFERENCES

This section documents significant changes and clarifications to existing remedies and documents public participation activities. Section 11.1 summarizes a significant change to the original remedy for the PM-2A Tanks. Section 11.2 clarifies portions of the original remedy selected in the 1999 ROD for remediation of contaminated soil at both the V-Tanks and PM-2A Tanks sites. Section 11.3 documents a significant change to the Reactor Vessel Burial Site. Section 11.4 documents the public participation efforts associated with these changes.

11.1 Changes to the PM-2A Tanks Remedy from the 1999 Record of Decision

One significant change was made to the PM-2A Tanks remedy from the 1999 ROD. The change was made in part to support the INEEL accelerated cleanup initiative.

Like the V-Tanks, the PM-2A Tanks are being remediated to prevent any potential future release of the tank contents to the environment. The PM-2A Tanks contain solidified sludge contaminated with radionuclides, organic compounds (including chlorinated solvents), and inorganic contaminants (including metals). Unlike the V-Tanks, essentially no free liquids are present in the PM-2A Tanks because in 1981 the tanks were partially filled with material to absorb free liquid. As with the V-Tanks, the contents of the PM-2A Tanks are considered F001 listed based upon the documented use of trichloroethylene for its solvent properties. The F001 “spent solvent” designation includes other chlorinated solvents (i.e. tetrachloroethylene, methylene chloride, 1,1,1 trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons) that may be present in the PM-2A Tanks waste above the F001 treatment standard. Currently, no determination has been made by NE-ID regarding whether these other solvents meet the criteria for receiving the F001 designation as F001 listed RCRA waste. However, the PM-2A Tanks waste will be treated to meet the F001 treatment standard in 40 CFR 268.40 for all of the F001 chlorinated solvents.

As with the V-Tanks, some of the soil surrounding the tanks is contaminated, principally with Cs-137. The contamination originated from accidental releases during periodic pumping operations to remove excess liquid from the PM-2A Tanks (Section 4.1.6 of the 1997 RI/FS provides more information about PM-2A Tanks operations). The tanks are part of a system that includes ancillary piping and equipment within the area designated as the PM-2A Tanks site. The surrounding contaminated soils and associated piping will be remediated along with the PM-2A Tanks.

The original selected remedial action for the PM-2A Tanks contents documented in the 1999 ROD was identified as “Alternative 3d: Soil Excavation, Tank Content Vacuum Removal, Treatment, and Disposal.” However, during remedial design activities, including additional sampling, the Agencies determined the tanks are structurally strong enough that they could be removed intact, with the contents still inside. As described in Section 7.2.2.2 of the 1999 ROD, “removal and decontamination [of the tank contents and the tanks themselves] increase the chance of worker exposure and, therefore, lower the short-term effectiveness.” In addition to avoiding potential worker exposure, removal of the tanks with the contents inside will cost less and require less time to complete remediation. As provided in the original selected remedy, the tank contents will be treated as necessary to destroy or remove the F001 listed constituents to meet LDRs and stabilized to meet other WAC for the disposal at the ICDF or other approved facility.

As stated above, although significant changes are not being made to the part of the remedy that deals with the removal and disposal of contaminated soil from around the tanks and the tanks themselves, these parts of the remedy are being modified for clarity. Details about these changes are provided in Section 11.2.

The original remedy called for removal of the tank contents, decontamination of the tanks, filling the tanks with an inert material, and leaving the tanks in place. Under the new remedy, after the tanks are excavated with the contents still inside and the contents treated as necessary, the tanks and treated contents will be transported to the ICDF or other approved facility for disposal. Void space in the tanks will be filled pursuant to that facility's WAC.

Table 11-1 lists components of the original remedy that are being changed.

Removing the tanks with the waste still inside improves short-term effectiveness. Potential risks to workers are avoided because the contents will not be removed from the tanks. Keeping the waste inside the tanks also reduces the potential for release of the contaminated materials to the environment during remediation. In addition, removing the tanks allows the sand bedding, cradle, and soil under the tanks to be directly accessible for inspection and sampling to confirm that no releases have occurred from the tanks.

As specified under the original remedy, the contents will be treated as necessary to meet disposal facility WAC. The results of sampling activities conducted in 2003 indicated that, except for tetrachloroethylene (PCE), the contents meet LDRs. The tank contents are expected to be treated through thermal desorption or chemical oxidation/reduction to reduce the PCE to meet LDRs and disposal facility WAC. Treatment will take place at or adjacent to the PM-2A Tanks site (e.g., TAN 607) as necessary to facilitate remediation. Treatment studies will be conducted as necessary to select and refine the most appropriate treatment option. After treatment, the tank contents will be re-sampled to confirm compliance with LDRs and the applicable disposal facility WAC, and the tanks and the treated contents will be transported to the ICDF or other approved facility for disposal.

Based on a "rough order of magnitude" cost estimate, the modified remedy is projected to cost approximately 20 percent less than the original selected remedy (the original selected remedy was estimated in 1999 to cost $6.6 million). The cost savings are primarily the result of eliminating the vacuum system equipment and controls necessary to remove and manage the tank contents separately from the tanks.

Table 11-1. Changes to the selected remedy for the PM-2A Tanks (TSF-26).

Remedial Action Element	Original Remedy	Remedy Change
Waste Removal	Removing tank contents using commercial vacuum excavation technology	Tanks will be removed with the waste still inside.
Decontamination	Decontaminating the tanks and filling with inert material	There is no need to decontaminate the tanks since they will no longer be left in place but disposed of at the ICDF or other approved facility. Before disposal, the contents of the tanks will be treated as necessary to meet LDRs and disposal facility WAC. Void space in the tanks will be filled, as necessary or desirable, as part of disposal facility operations.
Waste Treatment	Verification of the waste form not requiring treatment before disposal (and treating tank contents to meet waste acceptance criteria, if necessary).	The waste in the tanks will be treated as necessary to meet LDRs and disposal facility WAC. Confirmation sampling will be conducted to verify that no further treatment is necessary prior to disposal.
Estimated Cost	$6.6 million	$5.3 million[a]

a. Cost estimate for remedy change was prepared as a "rough order of magnitude" estimate.

11.2 Clarifications to the V-Tanks and PM-2A Tanks Remedies from the 1999 Record of Decision

Clarifications are made to the 1999 ROD for remediation of contaminated soil at Sites TSF-09 and TSF-18 (the V-Tanks) and Site TSF-26 (the PM-2A Tanks). For these sites, the 1999 ROD identified the source of soil contamination as being from spills during transfer of waste to and/or from the tanks. Based on site characterization, the baseline risk assessment for these sites only addressed soils surrounding the tanks. From the site characterization and the risk assessment, Cs-137 was identified as a contaminant of concern and the final remediation goal of 23.3 pCi/g was established as the cleanup level.

The 1999 ROD did not address, in detail, the potential for soil contamination under the tanks and piping due to leaks. To cover this potential, the 1999 ROD called for (a) post-remediation soil sampling at the bottom of each excavation to verify FRGs are met, and (b) analysis of the soil samples for additional contaminants present in the tanks' contents to perform a risk analysis in support of an institutional control determination for each site.

As the V-Tanks and associated piping are removed, the underlying soils will be evaluated to determine if there is any evidence of a leak or release of the V-Tanks contents. This evaluation will include visual examinations of the tanks and piping, visual evaluations for staining of underlying soils, and radioactive field screening. If there is evidence of a leak or release, then post-remediation sampling for tank contaminants and further risk analysis are necessary that support a potential revision to the FRGs, if there is a need for further actions. This determination could lead to application of institutional controls, further remediation, or no action. The following clarifications, therefore, are made to the soil remedy description for the V-Tanks and the PM-2A Tanks sites to more clearly distinguish between the remedy requirements for soils surrounding the tanks and piping (above or adjacent to the tanks and piping and typically between ground surface and 3 m [10 ft] bgs) and soil beneath the tanks and piping (typically more than 3 m [10 ft] bgs):

- The soil remedy description for Sites TSF-09 and TSF-18 (the V-Tanks) is clarified in Table 11-2
- The soil remedy description for Site TSF-26 (the PM-2A Tanks) is clarified in Table 11-3
- The overall soil management strategy for Sites TSF-09 and TSF-18 (the V-Tanks) and Site TSF-26 (the PM-2A Tanks) is illustrated in Figure 11-1.

11.3 Changes to the Remedy for the Reactor Vessel Burial Site (TSF-06, Area 10) from the 1999 Record of Decision

A significant change from the determinations documented in the 1999 ROD is made for the Reactor Vessel Burial Site (TSF-06, Area 10). This potential release site was evaluated as part of the WAG 1 Comprehensive Remedial Investigation/Feasibility Study (DOE-ID 1997). As no pathway existed to human or ecological receptors, no cleanup was required and therefore the site was documented as a "No Action" site in the 1999 ROD.

Table 11-2. Clarifications to the soil remedy description for Sites TSF-09 and TSF-18 (the V-Tanks).

Remedial Action Element	Original Remedy	Remedy Clarification
Final Remediation Goal	The FRG is 23.3 pCi/g for Cs-137.	FRGs apply in a different manner for soil to a depth of 3 m (10 ft) bgs and to soil more than 3 m (10 ft) bgs: Excavation of soil exceeding the Cs-137 FRG of 23.3 pCi/g to a maximum depth of 3 m (10 ft) bgs Application of institutional controls for soil exceeding the Cs-137 FRG of 23.3 pCi/g that is more than 3 m (10 ft) bgs.
Extent of Excavation	Excavating contaminated soil. Contaminated soil that is above the 23.3 pCi/g FRG for Cs-137 will be removed to the bottom of the excavation of the V-Tanks and will be disposed of.	Excavating contaminated soil that exceeds the FRG to a maximum of 3 m (10 ft) bgs. Excavating additional soil below 3 m (10 ft) bgs to the extent necessary to remove the V-Tanks and associated piping.
Post-Remediation Sampling	Post-remediation soil sampling at the bottom of the excavation to verify FRGs are met and to analyze for additional V-Tanks contaminants in order to perform a risk analysis in support of an institutional control determination at this site.	Post-remediation soil sampling to verify FRGs are met and to analyze for additional contaminants if excavation indicates a release of the V-Tanks contents. Clarified as follows: For the contaminated soil less than 3 m (10 ft) bgs, post-remediation sampling to verify the Cs-137 FRG is met. For the contaminated soil that is more than 3 m (10 ft) bgs, post-remediation sampling to determine the need for institutional controls. For the contaminated soil beneath the V-Tanks and piping where there *is* evidence of a release (a leak from a tank or the piping), post-remediation soil sampling at the bottom of the excavation, to analyze for V-Tanks contaminants to support a risk analysis that supports a potential revision to the FRGs and a determination of the need for further actions. This determination could lead to application of institutional controls, further remediation, or no action. For the contaminated soil beneath the V-Tanks and piping where there is *no* evidence of a release either from the V-Tanks or the associated piping, post-remediation soil sampling to determine the appropriate institutional controls.
Institutional Controls	Additional institutional controls may be required based on the contamination remaining at the V-Tanks sites after completion of the remedial action.	Institutional controls will be required if contamination remaining at the site precludes unrestricted land use after completion of the remedial action.

Table 11-3. Clarifications to the soil remedy description for Site TSF-26 (the PM-2A Tanks).

Remedial Action Element	Original Remedy	Remedy Clarification
Final Remediation Goal	The FRG is 23.3 pCi/g for Cs-137.	FRGs apply in a different manner for soil to a depth of 3 m (10 ft) bgs and to soil more than 3 m (10 ft) bgs: Excavation of soil exceeding the Cs-137 FRG of 23.3 pCi/g to a maximum depth of 3 m (10 ft) bgs Application of institutional controls for soils exceeding the Cs-137 FRG of 23.3 pCi/g more than 3 m (10 ft) bgs).
Extent of Excavation	Excavating contaminated soil.	Excavating contaminated soil exceeding the FRG to a maximum of 3 m (10 ft) bgs.
	Contaminated soil that is above the 23.3 pCi/g FRG for Cs-137 will be removed to the bottom of the excavation of the PM-2A Tanks and will be disposed of.	Excavating additional soil exceeding the FRG below 3 m (10 ft) bgs to the extent necessary to remove the PM-2A Tanks and associated piping.
Post-Remediation Sampling	Post-remediation soil sampling at the bottom of the excavation to verify FRGs are met and to analyze for additional PM-2A Tank contaminants in order to perform a risk analysis in support of an institutional control determination at this site.	Post-remediation soil sampling to verify final remediation goals (FRGs) are met and to analyze for additional contaminants if excavation indicates a release of the PM-2A Tanks contents waste. Clarified as follows: For contaminated soil less than 3 m (10 ft) bgs, post-remediation sampling to verify the Cs-137 FRG is met. For contaminated soil more than 3 m (10 ft) bgs, post-remediation sampling to determine need for institutional controls. For contaminated soil beneath the PM-2A Tanks and piping, where there is evidence of a release (leak from tank or piping), post-remediation soil sampling at the bottom of the excavation to analyze for PM-2A tanks contaminants to support a risk analysis that supports a potential revision to the FRGs and a determination of the need for further actions. This determination could lead to application of institutional controls, further remediation, or no action. For contaminated soil beneath the PM-2A Tanks and piping, where there is no evidence of a release from tank or associated piping, post-remediation soil sampling to determine the appropriate institutional controls, if any, for this site.
Institutional Controls	Based on the results of post remedial action sampling, institutional controls may be required.	Institutional controls will be required if contamination precludes unrestricted land use after completion of remedial action.

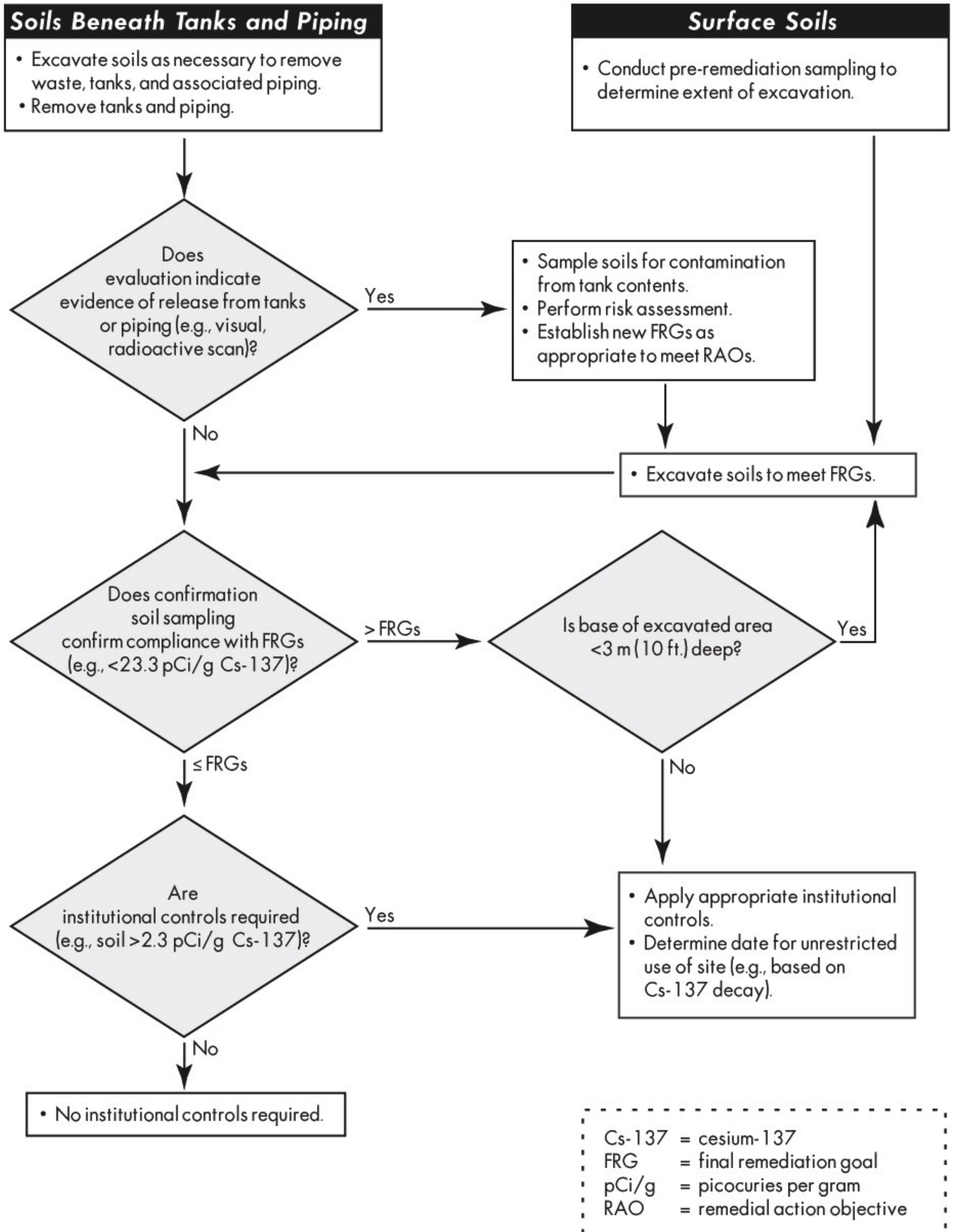

Figure 11-1. Confirmation soil sampling strategy for Operable Unit 1-10.

However, during public participation activities conducted in 2003 in connection with the 2003 Proposed Plan, a commenting group submitted a question regarding the status of this site. The comment prompted a review of the relevant documentation for the site. Even though no pathway exists to human or ecological receptors, residual contamination at the site precludes unrestricted land use. Thus, the site should more appropriately be designated as “No Further Action” (as that term is defined in the FFA/CO) and protected with institutional controls.

The institutional control requirements for this site are provided in Table 11-4. The Institutional Controls Plan governing OU 1-10 will be modified to include appropriate institutional controls for this site. The Agencies are pleased to note that the value of the CERCLA public involvement process has been confirmed.

11.4 Explanation of Significant Differences Public Participation

The INEEL will publish a notice of availability and a brief description of these ESD changes in the local newspaper (the Idaho Falls *Post Register*) and six other Idaho newspapers to meet the requirements of 40 CFR 300.435(c)(2)(i). The INEEL Community Relations Office may be contacted at (208) 526-3183 or (800) 708-2680. There will be no formal comment period.

Table 11-4. Institutional control requirements for the Reactor Vessel Burial Site (TSF-06, Area 10).

Site TSF-06, Area 10. Risk at this site precludes unrestricted land use and, therefore, requires institutional controls. Institutional controls will be maintained until the site is released for unrestricted use in a 5-year review.

Timeframe	Land Restriction	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
DOE control	Industrial	Radionuclides	Ensure limited exposure to contaminated soil.	1. Visible access restrictions	FFA/CO (DOE-ID 1991) National Oil and Hazardous Substances Pollution Control Plan (40 CFR Part 300)
				2. Control of activities	CERCLA (42 USC 9620 & 120[h])
			Ensure land use is appropriate.	1. Property lease requirements including control of land use, if necessary	CERCLA (42 USC 9620 & 120[h][5]) Hall Amendment of the National Defense Authorization Act (Public Law 103-160) Property release restrictions (DOE Order 5400.5)
Post DOE control	Industrial	Radionuclides	Ensure land use is appropriate.	1. Property transfer requirements including issuance of a finding of suitability to transfer and control of land use, if necessary	FFA/CO (DOE-ID 1991) CERCLA (42 USC 9620 & 120[h][3][d]) CERCLA (42 USC 9620 & 120[h][3][C][ii]) CERCLA (42 USC 9620 & 120[h][3][A][iii]) CERCLA (42 USC 9620 & 120[h][l]-[3]) CERCLA (42 USC 9620 & 12O[h][4]) Property relinquishment notification (43 CFR 2372.1) Criterion for BLM acceptance of property (43 CFR 2374.2) Excess property reporting requirements (41 CFR 101-47.202-1,-2,-7) Property release restrictions (DOE Order 5400.5)

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40 CFR 261, 2004, “Identification and Listing of Hazardous Waste,” *Code of Federal Regulations*, Office of the Federal Register, February 2004.

40 CFR 262, 2002, “Standards Applicable to Generators of Hazardous Waste,” *Code of Federal Regulations*, Office of the Federal Register, February 2002.

40 CFR 264, 2002, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities,” *Code of Federal Regulations*, Office of the Federal Register, April 2002.

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PART III – RESPONSIVENESS SUMMARY

13. BACKGROUND ON COMMUNITY INVOLVEMENT

Comments and questions received during the public comment period are summarized in the first section of this responsiveness summary. The comments were grouped according to the topics they focused on, and were then summarized into succinct statements in order to capture the significant issue discussed, or information requested. The purpose is to provide the following, as required by U.S. Environmental Protection Agency (EPA) guidelines for responsiveness summaries, as documented in *Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA 1999b [EPA 540-R-98-031, OSWER Directive 9200.1-23P]):

- A clear and concise measure of which aspects or elements of the alternative the community supports, opposes, or has reservations about

- General concerns about the sites being remediated under this action, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process at those sites.

The responsiveness summary also indicates how the public's comments were integrated into the decision process and puts the Agencies' response to comments "on record."

The following responsiveness summary provides the community and Agency decision makers with a synopsis of community preferences and concerns, and Agency responses. Although the summarized statements rephrase for brevity the comments submitted, they in no way replace them and are not intended to alter their focus. Bracketed numbers at the end of each summarized topic statement identify the original comment or comments. The complete original comments can be referred to in Appendix A for the discussions or questions from which the summaries of significant concerns were condensed.

All comments that were received are presented in Appendix A, either as scanned written submissions or as transcripts of the formal comments made at each public meeting. Each document is annotated to indicate the comments used to prepare the Responsiveness Summary. The documents are numbered separately in two series: comments in response to the Proposed Plan (W1 through W6) and comments transcribed during the formal comment session of the public meeting (T1). Indexes at the beginning of Appendix A list the comments by commenter, by response number, and by topic.

The responsiveness summary begins with questions and comments on the community relations process for the remediation of the V-Tanks (see Section 3 [Part II of this document] for the history of community participation in this action). Next are questions and comments concerning the treatability studies and the activities carried out during this process. Finally, questions and comments are presented that focus on the remedial actions proposed under this Record of Decision (ROD) Amendment and Explanation of Significant Differences (ESD). In this manner, topics follow an order paralleling their presentation in the Proposed Plan. A total of 58 topics are identified in this summary.

Section 7.1.3 (Part II) summarizes how the community's issues and concerns were incorporated into the evaluation of alternatives for the V-Tanks, while Section 11.3 (Part II) summarizes how the community's comments resulted in a significant change to the institutional controls for the HTRE Reactor Vessel Burial Site. Section 12, References, includes the documents referenced in the Responsiveness Summary.

14. STAKEHOLDER CONCERNS AND AGENCY RESPONSES

The following sections detail the topics of concern to the community, as raised during the public comment period, and the Agencies' responses.

14.1 Overall Goals of the INEEL Environmental Restoration Program

1. **Topic:** A commenting group asserts that there is public skepticism about the Department of Energy's (DOE's) veracity and the other Agencies' willingness to adequately enforce their regulatory and oversight responsibilities. [W2-5]

   Response: The U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (IDEQ) are jointly responsible for cleanup actions at the INEEL. The Federal Facility Agreement and Consent Order (FFA/CO) designated the State and the EPA (the "support agencies") as partners to and regulators of DOE (the "lead agency"). Cleanup activities at the INEEL are directed by project managers who represent each of the three Agencies. The project managers or their support staff meet or confer weekly on cleanup status during all phases of each remediation. Through this coordinated effort, the Agencies jointly develop the necessary work plans, technical investigations, and other documents, including proposed plans and records of decision (RODs).

   The State and EPA review and comment on all key documents for cleanup. In addition, State and EPA representatives are active participants in meetings, briefings, and workshops, either in person or by teleconference. Both the State and EPA may also hold meetings and briefings on the cleanup program. This ROD Amendment, like all INEEL RODs, is the result of a substantial and sustained process of regulatory enforcement and oversight by the support agencies.

   Questions and comments about INEEL activities, and the State's and EPA's oversight, can be addressed to the Agencies:

   Nick Ceto
   INEEL Program Manager
   U.S. Environmental Protection Agency Region 10
   712 Swift Boulevard, Suite 5
   Richland, WA 99352
   Phone: 509-376-9529

   Daryl Koch
   Manager of Federal Facilities Section, Idaho Department of Environmental Quality
   1410 N. Hilton
   Boise, ID 83706
   Phone: (208) 373-0492

   Kathleen E. Hain, Director
   DOE Environmental Restoration Program
   U.S. Department of Energy Idaho Operations Office
   P.O. Box 1625
   Idaho Falls, ID 83415-3911
   Phone: (208) 526-4392

In addition to mailings and public meetings, the INEEL provides additional avenues for public involvement, including tours and briefings. These are described in each proposed plan and on-line at http://cleanup.inel.gov/getinvolved/. The INEEL Community Relations Plan (available on-line at http://cleanup.inel.gov/publicdocuments/remediation/ explains more about these opportunities for comment and involvement. Community Relations Plan Coordinator Joseph Campbell can be reached at (208) 526-3183.

The investigation and cleanup process and schedule for Test Area North (TAN) have complied with the FFA/CO. Every reasonable effort is made to ensure that TAN remediation activities contribute to the ultimate goal of protecting human health and the environment by use of recognized engineering and institutional responses that meet standards for protectiveness identified by the Agencies. These standards (the applicable and relevant or appropriate requirements, or ARARs) were originally identified in the 1999 ROD and in this ROD Amendment and will be enforced by the Agencies. The remedies proposed for Waste Area Group (WAG) 1 sites are in no way illegal.

The cleanup process carried out for TAN has included all required community relations activities to ensure that the public has been provided appropriate opportunities for involvement in a wide variety of site-related decisions, including site analysis and characterization, alternatives analysis, and remedy selection. The public meetings, the proposed plans and associated comment periods, and the Administrative Record all provided opportunities for the community to learn about the WAG 1 remediation and to inform the Agencies about their concerns. The Agencies hope that the WAG 1 CERCLA process with its public comment opportunities, in conjunction with other regulatory hearing processes required by the Resource Conservation and Recovery Act (RCRA), will help build trust in the INEEL's path forward to cleanup completion.

2. **Topic:** To what extent does the INEEL examine the interaction of different components of INEEL-wide cleanup, such as the ramifications of long-term disposal of V-Tanks waste at the INEEL CERCLA Disposal Facility (ICDF)? [T1-9]

   Response: The ICDF was authorized under the comprehensive remediation of WAG 3 (the Idaho Nuclear Technology and Engineering Center (INTEC]). Although the ICDF is located at INTEC, it was designed to be the repository for waste generated from CERCLA actions across the INEEL. The ICDF was designed to accommodate the waste types and volumes expected to be generated under CERCLA cleanup activities at the INEEL, including CERCLA waste generated from Operable Unit (OU) 1-10. The waste from the V-Tanks that is disposed of at the ICDF will comply with the ICDF waste acceptance criteria (WAC). The ICDF waste acceptance criteria are, in turn, based on a thorough performance assessment, which evaluated the potential for impacts to the environment (e.g., the aquifer) assuming the entire ICDF were filled with CERCLA waste and then designed the ICDF facility and WAC to prevent such impacts from occurring. As long as each waste stream disposed of at the ICDF meets these criteria, which the V-Tanks waste will, the ICDF will remain protective of human health and the environment.

   Although each cleanup activity is carried out separately, project managers coordinate technical knowledge and lessons learned from previous cleanup actions at the INEEL and elsewhere. All CERCLA cleanup activities at the INEEL are integrated under a structure established by the 1991 Federal Facility Agreement and Consent Order (FFA/CO). The FFA/CO placed the INEEL facilities into 10 waste area groups (WAGs). WAG 1 is Test Area North (TAN).

   Each WAG is further broken down into operable units (OUs) for more efficient management. Each OU takes in a group of sites with similar contamination problems. Most OU numbers identify site investigations or early actions. The FFA/CO established 10 OUs within TAN. The V-Tanks cleanup is part of OU 1-10, the comprehensive remediation for WAG 1, which assessed the results of preceding site investigations, carried out investigations of sites not previously evaluated, and determined the overall risk posed by this WAG.

Similarly, the comprehensive investigations of WAGs 2 through 9 each examined the cumulative risk for that WAG. Under WAG 10, these documents and the results of analysis of areas between the INEEL facilities are comprehensively assessed to provide a picture of INEEL-wide risk.

In May 2002, the Agencies formalized an agreement to pursue an accelerated cleanup plan at the INEEL that will further improve the INEEL's cleanup approach, both for better risk reduction and for more efficient and timely cleanup.

3. **Topic:** The V-Tanks contaminants, particularly the transuranics, will not be removed from the INEEL, but only moved from Test Area North (TAN) to the INEEL CERCLA Disposal Facility (ICDF). How can the Proposed Plan claim that this strategy offers long-term effectiveness for protection of human health and the environment? [W4-8]

   Response: At the V-Tanks location, the selected remedy does satisfy the CERCLA criterion of long-term effectiveness and permanence because it will ensure protection of human health and the environment over time through high reliability of the technology involved, and high certainty that the protection achieved by this remedy will be maintained. Chemical oxidation/reduction will destroy the volatile and semivolatile compounds in the tank contents, eliminating them as a risk. The technology will not destroy the metals and radionuclide contaminants; there are no commercially available technologies that can do this. Instead, grouting will reduce the mobility of metals and radionuclides, thereby lowering their risk to human health and the environment. Subsequent disposal of the stabilized residuals at the ICDF will isolate this remaining contamination from potential exposure to human and ecological receptors, completing the goals of the cleanup action.

   A lined, covered, and monitored landfill such as the ICDF helps meet CERCLA's overall goal of long-term protection by reducing uncontrolled access to the waste and inhibiting mobility of contaminants. The ICDF has been designed to meet the substantive requirements of a landfill permitted under the Resource Conservation and Recovery Act (RCRA) and was approved by the Agencies under the WAG 3 Record of Decision (ROD). The ICDF is also designed to meet the substantive requirements of DOE Orders governing radioactive waste disposal. Regardless of whether the immobilized waste residuals are disposed of at the ICDF or sent to a facility off the INEEL, the material will meet waste acceptance criteria (WAC) designed to ensure protection of human health and the environment. An alternative that includes disposal off the INEEL would not be more protective than one that uses disposal at the ICDF with regard to the risk factors that would have to be considered if the material were transported through communities off the INEEL.

   DOE will provide institutional controls for sites subject to land-use restrictions (including the V-Tanks site and ICDF) over at least the next 100 years unless a 5-year review concludes that unrestricted land use is allowable. After 100 years, DOE may no longer manage INEEL activities and controls will take the form of land-use restrictions. Though land use after 100 years is highly uncertain, it is likely that industrial applications will continue at WAG 1 and at the ICDF. The Hall Amendment of the National Defense Authorization Act of 1994 (Public Law 103-160) requires concurrence from EPA on the lease of any National Priorities List sites during the period of DOE control and CERCLA (42 USC 9620 Section 120[h]) requires that the state be notified of a lease involving contamination. When DOE no longer manages INEEL activities and controls are needed, CERCLA (42 USC 9620 Section 120[h]) requires that DOE indicate the presence of contamination and any restrictions in property transfer documentation.

4. **Topic:** The proposed plan states on page 6 that the long-range land use plan for Test Area North (TAN) is nonnuclear industrial facilities. However, in 2002, the DOE announced a mission change for the entire INEEL to nuclear research and development, including commercial nuclear power stations at the INEEL. Why has this mission change not been factored into the V-Tanks contents proposed plan? [W4-11]

   Response: The announced mission change does not alter or detract from CERCLA cleanup activities now in progress at the INEEL and is, in that sense, an unrelated matter. The INEEL's current mission is available on the Internet (at http://www.inel.gov/about/mission-vision.shtml). Further information on the INEEL mission change also can be found on the Internet (at http://www.inel.gov/elizabeth_sellers_message.pdf). It is not yet known what the details of the proposed new INEEL nuclear research mission will be, relative to activities at TAN. However, the mission change will not hinder or delay cleanup of the V-Tanks or other sites scheduled for remediation. In fact, under the 2002 Agency agreement to pursue accelerated risk reduction and cleanup at the INEEL, many ongoing and projected remediation activities have been consolidated for more efficient management and to ensure that cleanup is completed.

   The DOE is not changing its commitment to clean up all inactive waste sites at the INEEL that pose a risk to human health or the environment, including the V-Tanks. This cleanup is required to eliminate health and environmental threats posed by hazardous waste sites to current and future workers and future residents. The program also includes a review process that reevaluates the effectiveness of remedial actions at least once every five years where residual contamination remains at levels that do not allow for unrestricted access. At TAN, this review process will provide continuing opportunities, no matter what TAN's mission is or becomes, to ensure the long-term effectiveness of cleanup levels achieved by the V-Tanks remedy, should some contaminants remain in place.

5. **Topic:** There has been no environmental impact statement addressing the INEEL's mission change to future nuclear industrial activities, even though substantial federal resources are already being committed to this new mission. [W4-12, W2-23]

   Response: Development of new missions at the INEEL is a separate issue from the remediation of contamination resulting from past activities. Cleanup activities at Test Area North (TAN), including the V-Tanks remediation, are required by the long-standing obligation of DOE to complete CERCLA cleanup at all its facilities. These remedial actions are not related to the mission change, and must continue regardless of any future missions that may or may not be given by Congress to the INEEL. The question of applicability of the National Environmental Protection Act (NEPA) to such future missions is therefore not relevant for the V-Tanks cleanup, or for other INEEL locations scheduled for cleanup under CERCLA.

   The V-Tanks remediation activities are structured so they do not limit future industrial missions at TAN or the INEEL, but instead allow for the creation of new opportunities by removing contamination that would preclude other uses.

14.2 Public Participation and Community Relations

6. **Topic:** The commenter appreciates being on the mailing list to continue being updated on the progress of the INEEL's cleanup activities. [W5-1]

Response: The Agencies encourage citizen involvement in decision-making at the INEEL. In addition to the mailings and public meetings, the INEEL provides other avenues for public involvement including tours and briefings. Mailing addresses, telephone numbers, e-mail addresses, and internet addresses are provided in each proposed plan for citizens to get additional information, briefings, or tours from Agency and project representatives. The INEEL Community Relations office can be contacted by telephone toll-free at 1-800-708-2680, or by mail at P.O. Box 1625, Idaho Falls, Idaho 83415-3940. Joseph Campbell, the INEEL Community Relations representative for Test Area North, can be contacted by e-mail at campjl@inel.gov or by telephone at (208) 526-3183.

7. **Topic:** The commenting group notes that in order to fully support any technology for use in remediation, they must be involved early in the process and receive verifiable demonstration that the technology is both effective and low risk. [W6-6]

Response: A variety of opportunities for early public information and involvement exist, and have been expanded continuously over the years of INEEL's cleanup program. The INEEL's Community Relations Office began contacting individuals and community groups during the early stages of planning for the V-Tanks by making phone calls, providing technical briefings as desired, and actively soliciting early feedback. This process is described in Section 3 of this ROD Amendment. Opportunities for information and comment on an ongoing basis are also available, as noted in the response to Topic 6, above. The web page of the INEEL Community Relations Office (at http://www.inel.gov/environment/) provides information about the current status of cleanup projects.

The feasibility study (in this case, the 2003 Technology Evaluation Review [2003 TER]) and proposed plan present all applicable and relevant or appropriate requirements (ARARs) that must be met, and they identify and evaluate technologies that are capable of meeting those ARARs. Thus, the 2003 TER and the proposed plan that is based on it present a general strategy, a preconceptual design rather than a detailed process. CERCLA Guidance does not require final development and demonstration of a proposed treatment technology prior to the proposed plan and record of decision (ROD), because the cost and time involved in testing multiple potential remedial designs would substantially delay the beginning of the cleanup and add substantially to the final costs.

A number of conceptual verification, treatability studies, and other required tests may be required to confirm the effectiveness and safety of the chosen treatment technologies before operations start at a cleanup site. The level of technical, safety, and cost information required to reach this point makes the development of the final selected remedy a lengthy process.

The feasibility study phase of a cleanup is the beginning of the remedy development process. Its purpose is to identify multiple technologies known to be able to address comparable waste, and to provide the information necessary for the Agencies to determine which of them could be used successfully. The feasibility study, on which the proposed plan is based, is always placed in the Administrative Record and is available for public review. During the proposed plan comment period, readers may address their comments to the data developed in the feasibility plan and other supporting documents, as well as to the proposed plan; some of the groups who commented on the V-Tanks action have taken the opportunity to do this.

Building on the proposed plan, the ROD establishes the cleanup technology to be used and the cleanup levels to be achieved. However, it is only after the signing of the ROD, in the Remedial

Design phase, that the Agencies collectively determine the engineering design (including schedule, cost estimates, and disposal options for wastes generated) and verify that all remediation activities will comply with applicable standards in state and federal laws. The technology selected to remediate the V-Tanks — ex situ chemical oxidation/reduction with stabilization — has seen limited past deployments, so additional laboratory and pilot testing on both surrogate and actual V-Tanks waste are planned during the design phase. This testing and the detailed engineering design will help demonstrate that the technology is effective and low-risk.

8. **Topic:** The public must be kept informed and involved in the determination of what waste is accepted at the INEEL CERCLA Disposal Facility (ICDF), particularly when there is substantial public concern over what contaminants will be accepted, and how they will be treated and packaged for disposal. This responsibility is spelled out in the National Environmental Protection Act (NEPA), which requires environmental impact statements and public hearings. [W2-23]

   Response: The INEEL carefully meets or exceeds all public information opportunity requirements, and did so for the ICDF development process. The Operable Unit (OU) 3-13 Record of Decision (ROD), which was signed in 1999, selected remedies for Waste Area Group (WAG) 3 sites, including the creation of the ICDF complex. The OU 3-13 RI/FS and ROD, with the associated public involvement process, address NEPA values, such that no separate NEPA document or NEPA process is required. The waste acceptance criteria (WAC) for the ICDF were developed during the ICDF remedial design process. This included public meetings and opportunity for public comment. As part of the public process for the OU 1-10 ROD Amendment, the Proposed Plan specifically informed the public about the potential use of the ICDF for the disposal of the V-Tanks waste, debris, and contaminated soils.

   For more information about the ICDF, contact Joseph Campbell, the INEEL Community Relations representative for the ICDF, at 208-526-3183 or at campjl@inel.gov. For general information, call 1-800-708-2680, or send mail to P.O. Box 1625, Idaho Falls, ID 83415-3940.

14.3 Content and Organization of the Proposed Plan

9. **Topic:** Several commenters expressed their appreciation for the thoroughness and easy-to-read format of the proposed plan and for being given the opportunity to comment. [W5-3, W6-7]

   Response: The Agencies appreciate all suggestions from the public on the types of information and format that help the INEEL's proposed plans better serve their purpose. Proposed plans are a key community relations activity undertaken as part of the CERCLA process. The Agencies want the proposed plans to be clear and understandable to all readers, whether or not they are previously familiar with the CERCLA activities at the INEEL, so as to allow the fullest possible public participation in the decision-making process. Proposed plan language and organization are continuously evaluated and improved in response to public feedback, such as this.

10. **Topic:** Given that the waste characterization data is incomplete, that the use of the INEEL CERCLA Disposal Facility (ICDF) violates transuranic (TRU) waste acceptance criteria, and that other applicable and relevant or appropriate requirements (ARARs) have not been addressed, the commenting group recommends that the Agencies develop a new, more complete proposed plan for cleanup of the V-Tanks before proceeding with the action. [W2-9]

    Response: The Agencies believe that the waste characterization data for the V-Tanks have been fully summarized, as required, in the 2003 Technology Evaluation Report and other documents on which the Proposed Plan was based. The primary source documents for the V-Tanks risk and feasibility evaluation described in the Proposed Plan are listed in Section 2.5 of this ROD Amendment. All relevant documents are in the Administrative Record, available online at http://www.inel.gov/publicdocuments/ or at the Information Repositories listed in Section 1 of this ROD Amendment.

The Proposed Plan summarizes all required information leading to this ROD Amendment. It should be noted that when a remedy requires amendment, CERCLA guidance expresses a preference that the new proposed plan highlight the proposed changes but not repeat in detail any information about the cleanup that has not changed. At each stage of the remediation process, data are reviewed for continued validity. As described in Section 10.1 of this ROD Amendment, a laboratory error in calculating the concentration of inorganic contaminants was found and corrected in Table 2-2 of this document. These data changes, while different from the 2003 Proposed Plan and previous documents, would not have significantly affected the technology evaluation and do not affect the remedy selected in this ROD Amendment. The three Agencies believe that the Proposed Plan for this ROD Amendment represents a complete document and see no need to develop a more extensive Proposed Plan.

The ICDF waste acceptance criteria (WAC) will be completely satisfied by the treated V-Tanks waste submitted for disposal. The concentration of the transuranics in the tanks is currently 4.27 nCi/g and will be reduced even further through treatment. These concentrations are well below the ICDF waste acceptance levels. See Sections 14.5 and 14.6, below, for more discussion of the ICDF WAC and other ARARs that will be met by this cleanup.

14.4 Operable Unit 1-10 Remediation Planning and Costs

11. **Topic:** A commenting group asks for confirmation that the proposed amended remedy will cleanup both the V-Tanks contents *and* the surrounding contaminated soil. [W2-2]

    Response: Yes. Both the V-Tanks and the surrounding soils will be remediated in an integrated action. The 2003 Proposed Plan focused on the changes to the remedy previously selected for the V-Tanks in the 1999 Record of Decision (ROD). Although the remedy for the surrounding contaminated soil has not changed in any substantive way from the 1999 ROD, the details of how remediation of the surrounding soil will be carried out have been clarified (see Section 11.2). The V-Tanks contents remedy described in this ROD Amendment is part of an overall cleanup strategy that will eliminate risk to human health and the environment from both the V-Tanks contents and the surrounding contaminated soil.

12. **Topic:** Several commenters noted that the Proposed Plan addresses only four V-Tanks, whereas there are at least six and perhaps more underground tanks at TAN. Why doesn't the Proposed Plan address Tanks V-13 and V-14? [W2-3, W2-14, T1-1]

    Response: There are indeed additional underground tanks at TAN that are not addressed by this ROD Amendment. To understand their handling, it is important to note the difference between the term "V-Tanks," which identifies a kind of underground storage vessel, and the site name "the V-Tanks," which identifies a particular location to be remediated. The V-Tanks site addressed in this ROD Amendment received that designation in the Federal Facility Agreement and Consent Order (FFA/CO), and was defined as containing only four v-type tanks: Tanks V-1, V-2, V-3, and V-9. These are the four described in the 2003 Proposed Plan and this ROD Amendment. The amended remedy for the V-Tanks site properly addresses only the four tanks contained in this site, as established by the FFA/CO.

Besides the four v-type tanks in the V-Tanks site, two other v-type tanks that were in use at TAN require remediation. These are Tanks V-13 and V-14, which were designated in the FFA/CO as TSF-26 and are also referred to as the PM-2A tanks. The PM-2A tanks are currently being cleaned up under the remedy selected in the 1999 ROD (see Section 7 of that ROD). Since the remedy for the PM-2A tanks is unchanged from the 1999 ROD, it was not addressed in the 2003 Proposed Plan.

Other v-type tanks (e.g., Tank V-4) were located in TAN Building 616. The building and its contents, including these other v-type tanks, are being, or have already been, removed under the INEEL's Deactivation, Decommissioning, and Dismantlement (D&D&D) Program. Those components of Building 616 that managed hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) are also being addressed under a RCRA closure plan. (Topic 13, below, provides more information on the closure plan).

13. **Topic:** The commenter contends that there are additional V-Tanks in Building 616 at Test Area North (TAN) that must be described and remedied as part of the V-Tanks cleanup. The action, as proposed, is incomplete. [W4-4]

    Response: TAN Building 616 does contain multiple vessels with the "v" designation (e.g., Tank V-4). However, these tanks are not part of the V-Tanks remediation project and are not identified in the Federal Facility Agreement and Consent Order (FFA/CO). TAN Building 616 and its contents, including the tanks, are being addressed under the INEEL's Deactivation, Decommissioning, and Dismantlement (D&D&D) Program, because there have been no identified releases of contaminants to the environment; therefore, the building is not a CERCLA site. The components within this building are also being addressed by a Closure Plan under the Resource Conservation and Recovery Act (RCRA). The cleanup of Building 616 is currently being completed and is expected to be finalized by the end of 2003. Sampling will be conducted during D&D&D inside the building and underneath it, and if releases to the environment are discovered, these releases would be cleaned up under CERCLA pursuant to the procedures established in the 1999 ROD.

14. **Topic:** Several commenters stated that there are additional buried wastes not previously included in remedial actions at Test Area North (TAN) that would appropriately be addressed with the V-Tanks. [T1-2, W2-4]

    Response: The Agencies agreed to remediate the four V-Tanks, the associated piping, and the surrounding contaminated soil as one unit because they are part of an interconnected waste handling system that contains a single consistent waste stream. At this time, sampling has shown no additional, adjacent, related past releases. As stated in the 1999 Record of Decision (ROD), the possibility exists that contaminated environmental media not identified by the Federal Facility Agreement and Consent Order (FFA/CO) or in the 1999 ROD will be discovered in the future as a result of routine operations, maintenance activities, or dismantlement, decommissioning, and decontamination (D&D&D) activities at TAN. Newly discovered sites will be addressed using the process for new site inclusion as defined in the FFA/CO and refined in the 1999 ROD and will be assessed and remediated under CERCLA pursuant to the process agreed upon by the Agencies at the time of the new site identification. Where appropriate, the remedial action objectives (RAOs) and final remediation goals (FRGs) identified in the 1999 ROD and this ROD Amendment will be used to complete any necessary cleanup.

15. **Topic:** Several commenters listed release sites at Test Area North (TAN) that require cleanup but have not yet been fully addressed, even though the 1999 Record of Decision (ROD) was designated as comprehensive. The sites in question are the ANP Cask Storage Pad, the Area 10 HTRE Reactor Vessel Burial Site, and the TAN pool. [W2-17, T1-5]

    Response: The three sites listed were identified in the 1991 FFA/CO as potential contamination sites to be investigated within WAG 1. The analyses carried out on them were summarized in the 1997 RI/FS and the 1999 ROD.

    TSF-06, Area 8, is the designation for the ANP Cask Storage Pad. Part of this site is currently included within the active Radioactive Parts Service and Storage Area (RPSSA) facility, which will be evaluated during future dismantlement, decommissioning, and decontamination (D&D&D) activities at TAN. Sampling during the risk assessment indicated that the soil contamination at this site is below the levels at which remediation is required. More information on this site is available in the Administrative Record for Waste Area Group (WAG) 1 in the 1997 Remedial Investigation and Feasibility Study (RI/FS) and the 1999 ROD. (More information about the Administrative Record is presented in Section 1 of this document. Section 2.5 of this document lists key documents used to prepare this ROD Amendment.)

    TSF-06, Area 10, is the designation for the HTRE Reactor Vessel Burial Site. This potential release site was evaluated as part of the WAG 1 comprehensive RI/FS and, as documented in the 1999 ROD, it was determined to be a No Action site. The irradiated empty reactor vessel is contained in a metal storage tank and is believed to be more than 10 feet below ground surface. No pathway to human or ecological receptors exists; thus, no cleanup is required. However, based on the commenter's questions about this site, a review was conducted of the relevant documentation. It was determined that although no pathway exists, potential residual contamination precludes unrestricted land use. Thus, the site should be protected with institutional controls. The WAG 1 Institutional Control Plan (INEEL 2000b) will be modified to include appropriate institutional controls for this site. Detailed language has been added in Section 11.3 of this ROD Amendment directing this change to the 1999 ROD. The Agencies appreciate the dedication of the commenter in bringing this oversight to their attention. The Agencies are pleased that this matter confirms the effectiveness of the design of the CERCLA public involvement process.

    The TAN Pool (which is part of the TAN 607 Hot Shop) is currently being emptied under a deactivation process but remains within an active facility. Potential threats to human health and the environment from this site will be addressed during the facility D&D&D. More information on this site is available in the Administrative Record for WAG 1. As part of an active facility, the TAN Pool is not being addressed under WAG 1 CERCLA actions.

16. **Topic:** Cost is an important factor. In the comparison of seven alternatives presented in the Proposed Plan, the estimated costs are so close they cannot be used for ranking. However, the commenting group notes that these estimates are preliminary. [W1-2]

    Response: Even though the cost differences between the alternatives turned out to be small, cost was used in the CERCLA evaluation process as required. The narrowness of the differences resulted in the cost criterion having a relatively minor impact in the overall evaluation of alternatives.

    The cost estimates used to evaluate and present alternatives in a proposed plan are based on the best available information. Changes in various elements of the cost are expected to occur as new information and data are collected during the engineering design of the selected remedy. Because of this expectation that costs will be refined, CERCLA allows presentation of the cost estimates in the proposed plan to range from +50 to –30% of the actual final cost. Changes in cost beyond these limits prompt an explanation of significant differences or a ROD amendment. As was explained in the 2003 Proposed Plan, such a cost change was one factor that prompted the requirement for this ROD Amendment, and the preceding preparation of the 2003 Explanation of Significant Differences (ESD), accompanied by notice to the public of its availability.

14.5 Risk Assessment and Characterization of Contaminants

17. **Topic:** Data on the contaminant characterization has changed substantially across the relevant documents resulting in what one commenting group notes as major discrepancies. [W2-1]

    Response: Some of the discrepancies noted by the commenting group stem from a data labeling error in a 1996 INEEL report, which was corrected in the 1997 Remedial Investigation/Feasibility Study (RI/FS). The values presented by the commenting group in their Table A (see page A-10 of Appendix A) for the liquid concentration for the metals barium, cadmium, chromium, and lead have inappropriate unit labels. These values appear to have been taken from the *Work Plan for Waste Area Group 1, Operable Unit 1-10, Comprehensive Remedial Investigation/Feasibility* Study (S. M. Lewis, et al., 1996 [DOE-ID/10527]), which mistakenly labeled the Toxicity Characteristic Leaching Procedure (TCLP) values for those metals as mg/kg instead of µg/L. This error by the INEEL makes the reported values appear 1,000 times higher than they actually were. The error was found and the data reported correctly in all follow-up documents. As these data are TCLP values, which represent the quantity of each metal that can leached from a waste with an acidic solution, they should not be taken as representing the liquid waste in the V-Tanks. It is inappropriate to contrast these leachate concentrations to the total concentrations reported in the rest of the commenting group's Table A.

    The sludge values cited by the commenting group in the same table appear to show a consistent drop from data referenced in the 1998 Proposed Plan to the values listed in the 2003 Proposed Plan. The INEEL does not make this claim. The apparent decrease in concentrations is the result of an inappropriate comparison of the solids in one tank to the combination of solids and liquids in a different tank. Because most of the contamination is in the sludge phase, the overall waste stream, which combines both the sludge and water, has a lower overall concentration. This lower overall waste concentration is more representative of the waste that is actually in the tanks and that must be treated to meet disposal criteria.

    Information on contaminants is refined and updated whenever new data becomes available from sampling, or when regulatory requirements change. The Agencies evaluate the potential impact of any substantial change in data regarding a cleanup site. As of the 2003 Proposed Plan, the most recent comprehensive presentation of data on the contaminants in the V-Tanks contents can be found in the Engineering Design File EDF-3868, which is available in the Administrative Record.

    Data are also reviewed for continuing validity at each stage of the remediation process. As described in Section 10.1 of this ROD Amendment, a laboratory error in calculating the concentration of inorganic contaminants was found and corrected in Table 2-2 of this document. These data changes, while different from the 2003 Proposed Plan and previous documents, would not have significantly affected the technology evaluation and do not affect the remedy selected in this ROD Amendment.

18. **Topic:** According to a commenting group, DOE is implying in the 2003 Proposed Plan that in the four years since the November 1998 Proposed Plan, there has been a reduction in the waste due to

"decay," which is being relied upon as part of the remedy. Is "decay" offered as the reason for the change in contaminant concentration numbers? [W2-10]

Response: "Decay," or the expectation that the actual concentration of the contaminants in the V-Tanks contents will decrease, or attenuate, is not part of the remedial strategy, either as selected in the 1999 Record of Decision (ROD) or as amended in this ROD Amendment. Decay of radioactive constituents in the V-Tanks contents will reduce their concentration over time. However, for the purposes of developing this ROD Amendment, the INEEL has chosen not to consider the relatively small reduction in the concentration of radioactive elements that would have occurred since the original data were collected. The discrepancies noted by the commenting group stem from a data labeling error in a 1996 INEEL report combined with an inapplicable data comparison by the commenting group. Given that the 1996 data cited are incorrectly labeled, the commenting group's conclusion that this represents "decay" is also inapplicable here. The correct data for the V-Tanks radioactive constituent concentrations are in the 1997 Remedial Investigation/Feasibility Study (RI/FS) and all following documents for this action. See Topic 17, above, for more information on contaminant characterization.

19. **Topic:** The 2003 Proposed Plan, in Table 2, Contaminants for Treatment, does not present contaminant concentrations in the same units as the federal and state regulations use. In particular, the contaminant concentrations are listed in mg/kg (milligrams per kilogram) or nCi/g (nanocuries per gram), but not in maximum contaminant levels (MCLs), which is what the regulations use. The commenting group urges that MCLs should be presented side-by-side with the INEEL's contaminant sampling results in all public documents to allow the general public to make a determination of whether the proposed alternatives are appropriate. This use of data units that are not easily comparable confuses the public and exacerbates their distrust. [W2-11, W2-16]

Response: CERCLA investigations present contaminant data in unit types appropriate to the affected media (e.g., soils, water, or air) or related to the contaminant and the governing regulation (e.g., radionuclides are measured in Curies per gram). MCLs are standards that set the maximum permissible amount of a contaminant in water delivered to any user of a public system. MCLs are not relevant for the V-Tanks site because water is not an affected medium. For the contaminated media that are present in the V-Tanks contents and contaminated soil, risk reduction goals use other measurement standards as appropriate, which are presented in the 1999 Record of Decision (ROD), the 2003 Proposed Plan, and this ROD Amendment in sections on remediation objectives and goals.

Because regulatory compliance for CERCLA remediation is generally so complex, details cannot be fully specified in the Proposed Plan. They are presented in the supporting documents, which are available in the Administrative Record. The commenting group's suggestion for development of clearer explanations of contaminant concentration data, and how the treated waste will comply with regulatory requirements, will be forwarded to the INEEL Community Relations office for improved presentation in future public documents. Reduction of toxicity, mobility, and volume through treatment is a CERCLA evaluation criterion, and data for the comparison are also available in the Administrative Record for those who are interested. For the V-Tanks amended remedy, Section 5 of the 2003 Technology Evaluation Report (TER) compares estimated concentrations of the treated waste for key contaminants to the regulatory levels, in equivalent units.

20. **Topic:** Why are the transuranics in the V-Tanks contents not classified as transuranic (TRU) waste for purposes of disposal? The liquids and sludge in the V-Tanks must be combined for remediation. When they are combined, the concentration will be > 100 nCi/g, which requires that the contents be treated and disposed of as TRU waste. The commenter questions why the transuranics in the

V-Tanks are not being removed from Idaho as required by the 1995 Settlement Agreement. [W2-13, W4-9]

Response: INEEL waste types are classified based not just on their chemical content but also on disposal requirements. The V-Tanks contents are classified as a mixed waste, which includes hazardous wastes (heavy metals, volatile organic contaminants [VOCs], and semivolatile organic contaminants [SVOCs]) and low-level radioactive waste. There are transuranic elements in the V-Tanks, but not TRU waste.

Transuranic *elements* are a group of radioactive chemical elements “beyond uranium” in the periodic table, having atomic numbers greater than 92 (such as plutonium, atomic number 94). Transuranic *waste* is a legally defined category of waste, established for regulatory and management purposes. As a waste category, TRU waste contains more than 100 nanocuries (3,700 becquerels) of alpha-emitting transuranic isotopes per gram of waste and half-lives greater than 20 years (as cited in the 1995 Settlement Agreement). Although low concentrations of several transuranic elements are present in the V-Tanks contents, the concentrations of the combined sludge and liquid (with a combined weighted average of 4.27 nCi/g) are not high enough to meet the TRU waste definition. It is estimated that prior to disposal at the INEEL CERCLA Disposal Facility (ICDF), the treated V-Tanks waste will have a transuranic concentration of approximately 2 nCi/g, well below the 10 nCi/g limit for the ICDF and the 100 nCi/g TRU waste designation.

21. **Topic:** The commenter does not believe land disposal of transuranic (TRU) waste is approved, given that the concentration of transuranics is at a high level of 26.4 nCi/g within the V-Tanks system. [W4-5]

Response: The commenter is correct in noting that Table 2 of the 2003 Proposed Plan lists the highest single reading for transuranics as 26.4 nCi/g. This sample came from Tank V-9 (as reported in Table 3 of the 2003 Technology Evaluation Report [TER]). All readings from Tanks V-1, V-2, and V-3 were lower (11.0, 4.02, and 2.03 nCi/g, respectively). This variability results because waste typically was routed first through Tank V-9 for solids removal before distribution to Tank V-1, V-2, or V-3 (depending on which had the most available capacity).

The Agencies have agreed that because the waste in the four tanks resulted from the same processes, but varies in concentrations of individual contaminants due to the use history described, all the waste in the four V-Tanks will be managed as one waste stream, and will be combined for treatment. Thus, although the concentrations of specific hazardous constituents vary from tank to tank, the average concentration of the hazardous waste constituents for all tanks is the one that will be used. The average concentration of 4.27 nCi/g is well below the INEEL CERCLA Disposal Facility’s (ICDF’s) waste acceptance criterion (WAC) of 10 nCi/g. Furthermore; the estimated transuranic concentration of the treated waste to be disposed of at ICDF is 2 nCi/g. It is the concentration of transuranics (and other contaminants) following treatment that will be used to show compliance with disposal requirements (WAC) at ICDF.

Beginning several years ago, the INEEL’s proposed plans have included the “lowest” and “highest” readings in response to public comments. Some commenters said they would be better able to assess whether the expense of remediation was necessary if they could see the range of extremes from the sampling suite. CERCLA guidance does not require that maximum readings be presented.

Table 2 of the 2003 Proposed Plan (included in this ROD Amendment as Table 2-2) presents information on the primary contaminants in the V-Tanks that affect the selection of an effective remedy. The overall average concentration values are used in evaluating the effectiveness and operability of various treatment alternatives. The reader is urged to use caution in comparing this data to other sources of information on the V-Tanks or in comparing these values to regulatory levels. U.S. Environmental Protection Agency (EPA) regulations and guidance require different statistical treatment of analytical data when it is used for risk assessment, waste characterization, acceptability of treatment options, or compliance with disposal facility acceptance criteria. For example, risk assessments require 95% upper confidence limit (ucl) values, while waste characterization requires 90% ucl values on the amount of material that will leach from the waste in a given timeframe, and acceptability at treatment facilities usually looks at average concentrations along with maximum and minimum values. Compliance with disposal facility WAC is usually based on 90% ucl on total concentrations. It is generally inappropriate to compare data supplied for one purpose with data intended for another use. The data presented in the 2003 Proposed Plan were supplied to show what contaminants are present, and to help the reader evaluate the cleanup alternatives described. Other information to support risk assessment and waste characterization can be found in the documents in the Administrative Record.

14.6 Remedial Action Objectives and Compliance with ARARs

22. **Topic:** Environmental regulations and laws prohibit disposal of the V-Tanks contaminants on the INEEL. [W2-6, W2-8]

    Response: The comment is incorrect. All of the applicable or relevant and appropriate requirements (ARARs) (which is the term used in CERCLA cleanup actions to identify the set of all environmental regulations and laws that apply to the action) relevant to this action were identified during preparation of the 2003 Technology Evaluation Report [TER], on which the 2003 Proposed Plan was based. None of the ARARs prohibit disposal of the V-Tanks contents, or the surrounding contaminated soil, at an approved disposal facility on the INEEL. The 2003 Proposed Plan presented and evaluated those technologies found capable of meeting the ARARs. After this ROD Amendment is signed, the selected treatment technologies will move from conceptual design into full remedial design. As part of this remedial design phase, safety plans and other work documents will specify in detail how each individual ARAR will be met. These documents will be placed in the INEEL Information Repository as each is completed and approved.

23. **Topic:** Commenters believe that the V-Tanks contents include alpha-emitting low-level waste (α-LLW), which the 1995 Settlement Agreement specifically requires to be shipped to a repository outside Idaho. Therefore, the commenters conclude that the V-Tanks contents must be shipped out of Idaho. In addition, it is noted that a March 31, 2003, federal court ruling requires the Department of Energy (DOE) to "remove all buried transuranic waste from Idaho," which commenters interpret as including the V-Tanks contents. [W2-7, W2-13, W4-9, T1-3]

    Response: It is correct that the V-Tanks contents are classified as low-level waste (LLW) and that the waste contains alpha-emitting radionuclides. However, it is not correct that this makes the V-Tanks remediation subject to the 1995 Settlement Agreement. By definition, LLW is waste that does not meet the definitions for high-level waste (HLW), transuranic (TRU) waste, spent nuclear fuel, or by-product materials. The 1995 Settlement Agreement requires the removal of all stored TRU waste from Idaho (i.e., waste with greater than 100 nCi/g transuranic content). It does not include LLW in this requirement. See Topic 20, above, for additional information on waste-type categories.

24. **Topic:** Treatment that adds soil to the tank contents constitutes dilution, which is expressly prohibited under the Resource Conservation and Recovery Act (RCRA) (40 CFR 268.3[a]). The commenter believes such a dilution is planned because the concentration of transuranics, noted as 26.4 nCi/g on page 6 of the 2003 Proposed Plan, exceeds the waste acceptance criteria (WAC) of 10 nCi/g for disposal at the INEEL CERCLA Disposal Facility (ICDF). [W2-12]

Response: The RCRA regulation cited does prohibit dilution — for instance through the addition of soil — as a substitute for treatment if that addition is not a contributing part of the treatment process. The alternatives developed for the V-Tanks contents were designed for treatment of the contaminants; no alternatives were considered that would not result in reduction of toxicity and the mobility of the contaminants. Several of the alternatives, as described in the 2003 Proposed Plan, would add some of the contaminated soil surrounding the V-Tanks to enhance the treatment process. For example, vitrification would add soil as a source of silicon to allow the melting process to produce a more stable glass waste form. While this would dilute the concentration of contaminants, it would not be done to avoid treatment but rather to improve treatment effectiveness and control during the treatment process. This is allowed by the U.S. Environmental Protection Agency's (EPA's) RCRA program (as documented in the June 1, 1990, *Federal Register* at 55 FR 22666). The selected remedy, using chemical oxidation/reduction, does not add any soil to the treatment process. As noted in the response to Topic 21, above, the average concentration of 4.27 nCi/g in the V-Tanks contents is well below the ICDF's waste acceptance criterion of 10 nCi/g, even prior to treatment.

25. **Topic:** Under the preferred alternative, adding grout leads to dilution for the purposes of land disposal, which does not seem legal. "Dilution is not the solution," a commenting group notes. [W2-24, T1-4]

Response: Grouting is the process of adding appropriate stabilization agents such as portland cement that will chemically bind with the hazardous metals. This stabilization step reduces the leachability of these metals, making it harder for these contaminants to be released into the environment. This reduction in leachability is required to meet both RCRA LDRs and the WAC for any disposal facility. The U.S. Environmental Protection Agency (EPA) has reviewed the inherent dilution that takes place during stabilization treatment processes. This dilution is considered acceptable when there is a significant reduction in leachability of hazardous contaminants and when appropriate volumes of stabilization materials are used. The selected remedy will deploy a stabilization process that meets those goals.

The Agencies recognize that when hazardous metals are stabilized, there is not only a dilution of the hazardous metals as discussed above in Topic 24 but also a dilution of the other constituents, including the radioactive contaminants. The Agencies concur that this inherent dilution is acceptable when this dilution occurs as a result of treatment necessary to meet either Resource Conservation and Recovery Act (RCRA) land disposal restrictions (LDRs) or disposal facility waste acceptance criteria (WAC).

26. **Topic:** The commenter contends that requirements of the National Environmental Policy Act (NEPA), which include the evaluation of alternative disposal locations through the environmental impact statement (EIS) process, have not been met for the disposal component of this action. In addition, the proposed disposal facility, the INEEL CERCLA Disposal Facility (ICDF), was not permitted under the Resource Conservation and Recovery Act (RCRA), which it should have been in order to be used in this cleanup. [W2-20, W2-23, T1-8]

Response: The Agencies disagree. Under DOE's CERCLA/NEPA Policy, DOE relies on the CERCLA process for the review of actions to be taken under CERCLA; that is, no separate NEPA document or NEPA process is ordinarily required. NEPA values were addressed, to the extent practicable, in the Operable Unit (OU) 3-13 Remedial Investigation and Feasibility Study (RI/FS) and Record of Decision (ROD), with the associated CERCLA public involvement process. The OU 3-13 ROD, which was signed in 1999, selected remedies for Waste Area Group (WAG) 3 sites, including the creation of the ICDF complex. The ICDF was not permitted under RCRA because, under Section 121(e) of CERCLA, it is exempted from permitting requirements as long as the applicable substantive requirements of RCRA are met. The ICDF is designed to meet the substantive requirements for a RCRA hazardous waste landfill.

27. **Topic:** Is it legal to dispose of radioactive waste on flood plains, under U.S. Nuclear Regulatory Commission (NRC) restrictions, such as 10 CFR 61.50? [W2-22]

Response: NRC regulations prohibit the disposal of radioactive waste in 100-year flood plains. Although these NRC regulations are not applicable to the ICDF, the ICDF complies with this requirement. The INEEL CERCLA Disposal Facility (ICDF) is outside the 100-year flood plain. In addition, the ICDF will be surrounded by an engineered berm 15 feet higher than the predicted 100-year flood plain elevation. As part of the ICDF planning and design process, research data from the U.S. Geological Survey and other sources were evaluated to confirm the safety of the proposed facility relative to potential flooding.

28. **Topic:** For disposal, shouldn't waste acceptance criteria (WAC) maximum contaminant concentration levels be determined from waste sampling prior to mixture with any stabilizing materials? [W2-24]

Response: No. The selected remedy includes stabilization as a treatment step. WAC maximum contaminant concentration levels apply to the waste as received at the disposal facility. See responses to Topics 24 and 25, above, for further details that may relate to this concern.

29. **Topic:** The commenter believes that this action fails to meet Resource Conservation and Recovery Act (RCRA) requirements, which prohibit dilution through addition of soils (whether contaminated or not) and grout. In addition, hazardous waste constituent concentrations must be considered prior to dilution in order to meet RCRA land disposal requirements (LDRs). [W4-1]

Response: This CERCLA action fully complies with all applicable or relevant and appropriate requirements (ARARs) for CERCLA actions. Both RCRA and CERCLA prohibit dilution — for instance through the addition of soil — as a substitute for treatment. While several alternatives discussed in the 2003 Proposed Plan would add contaminated soil prior to the treatment process, this would not be done to avoid treatment but rather to improve treatment effectiveness and control of the operation. Several other alternatives would add grout as the last step in treatment, in order to stabilize constituents in the waste that could otherwise be mobile in the environment. Such additions are allowed by RCRA (as documented in the June 1, 1990, *Federal Register* at 55 FR 22666). The selected remedy using chemical oxidation/reduction does not add any soil to the treatment process; however, it does add grout or other stabilizing agent to reduce leachability, in order to meet RCRA LDRs and the waste acceptance criteria (WAC) for disposal. The hazardous waste constituent concentrations that are measured for the RCRA LDRs are required to be measured at the end of treatment. Addition of stabilizing material under the selected remedy is part of the treatment for reduction of mobility of metals.

30. **Topic:** The commenter feels that because Tank V-9 has such high concentrations of transuranics and other contaminants, it should be dealt with separately, especially because of its mixed waste classification under the Resource Conservation and Recovery Act (RCRA). [W4-2]

Response: The four V-Tanks form a complete system. It is the system that is being remediated. Thus, it is the concentration of the contaminants in the entire system that forms the basis for developing a final remediation design for the selected remedy so that it will meet RCRA land disposal restrictions (LDRs) and the disposal facility waste acceptance criteria (WAC). This strategy produces a single homogenous waste stream that will allow the optimization of the treatment process; this should reduce any potential difficulties that might arise in treating this complex waste stream.

The higher concentrations of hazardous and radioactive contamination found in Tank V-9 are primarily due to the higher percentage of sludge (solids) in that tank. (Most of the contaminants are found in the solid phase.) However, the same contaminant constituents are found in the sludge in all four tanks. Tank V-9 was designed to function as a sludge removal unit prior to the waste being stored in the other tanks. Comparison of the sludge between the various tanks (without taking into consideration the liquid) reveals similar wastes in all four V-Tanks.

31. **Topic:** The commenter does not believe the INEEL CERCLA Disposal Facility (ICDF) waste acceptance criteria (WAC) allow for disposal of transuranics which reach a concentration high of 26.4 nCi/g. [W4-5]

Response: This is correct. The ICDF's WAC restrict disposal of waste to less than 10 nCi/g of transuranic contaminants. As discussed in the response to Topic 29, compliance with WAC limits is evaluated after treatment requirements are met. Whether treatment is done as one consolidated waste stream or for individual tanks, the remedy selected in this ROD Amendment will meet the required treatment levels and produce a waste stream for disposal with a transuranic concentration less than 10 nCi/g, which meets the ICDF WAC.

32. **Topic:** The commenter believes that the proposal for disposal at the INEEL CERCLA Disposal Facility (ICDF) of V-Tank wastes that include transuranics requires notice in the *Federal Register,* under 10 CFR 1022 et seq. The commenter refers also to the applicability of 10 CFR 1022.2(a), 1022.3(3), and 1022.4(q). [W4-7]

Response: Federal regulation 10 CFR 1022 establishes the notification requirements for projects in wetlands and floodplains. Since the ICDF is not located within identified wetlands or floodplains, such notice is not required for this remedial action.

33. **Topic:** An environmental impact statement (EIS) is required before transuranic wastes can be stored at the INEEL CERCLA Disposal Facility (ICDF), given the likelihood that they will eventually contaminate the aquifer. [W4-9]

Response: An environmental impact statement is not required before wastes can be stored at the ICDF. The ICDF was selected and designed under the Waste Area Group (WAG) 3 comprehensive cleanup, which addressed NEPA values. Under DOE's policy on application of NEPA to CERCLA cleanup actions (July 11, 2002), DOE relies on the CERCLA process for the review of actions to be taken under CERCLA. That is, no separate NEPA document or NEPA process is ordinarily required, because DOE addresses NEPA values, to the extent practicable, in the Operable Unit (OU) 3-13 RI/FS and ROD, along with the associated CERCLA public involvement process.

In accordance with the waste acceptance criteria (WAC) for the ICDF, no transuranic waste can be disposed of at the facility. No transuranic waste will be generated during the V-Tanks cleanup. Low-level radioactive waste (LLW) will be generated during the V-Tanks cleanup and will be sent to the ICDF for disposal. This LLW will contain concentrations of transuranic radionuclides that are well below the ICDF's WAC.

The ICDF's design incorporates a complex liner system beneath the waste to inhibit downward migration of wastes from the landfill, a leachate collection system, a leak-detection monitoring system, and groundwater monitoring wells to insure long-term effectiveness of this CERCLA disposal facility, especially protection of the aquifer.

34. **Topic:** Requirements of the National Environmental Protection Act (NEPA) have not been considered, and must be, in order to use the INEEL CERCLA Disposal Facility (ICDF). The U.S. Department of Energy (DOE) is required, to the extent possible, to accommodate the requirements of Executive Orders 11988 and 11990 through applicable DOE NEPA procedures, as under 10 CFR 1022.2(2)(b). An environmental impact assessment should have been performed for the ICDF even to be constructed. [W4-10]

    Response: See response to Topic 33 for an explanation of why separate NEPA requirements, including an environmental impact assessment, do not apply to the use of the ICDF. The same policy applied to the development of the ICDF complex, which was authorized under the Operable Unit (OU) 3-13 ROD, which was signed in 1999.

35. **Topic:** An environmental impact statement (EIS) is also required because of the INEEL's mission change to new nuclear activities. [W4-12]

    Response: The National Environmental Protection Act (NEPA) does require all federal agencies to assess potential environmental impacts from major proposed new actions. However, as described in the response to Topic 5, above, the cleanup of the V-Tanks is a CERCLA action in response to past activities that resulted in contamination, and is unrelated to any NEPA requirements that may arise from the INEEL's mission change.

14.7 Development, Implementation, and Evaluation of Alternatives

14.7.1 Development of Alternatives

36. **Topic:** The technologies described in the 2003 Proposed Plan combine the contents of all four V-Tanks, add contaminated soil, and/or add grout. Is the purpose of this to reduce the concentration of transuranics to permissible levels? If so, the proposed plan should have made this more clear to the public. The commenter finds this an inadequate justification for dilution. In particular, dilution through grouting is of concern for the preferred alternative. [W4-6]

    Response: The addition of contaminated soil and/or grout under some of the technology alternatives presented in the 2003 Proposed Plan is not for the purpose of dilution, but as an integral and necessary part of treatment. See responses to Topics 24 and 25, above, for more details on the use of soil to enhance treatment effectiveness and the use of grout as a required stabilizing agent. The use of these materials, as part of treatment effectiveness and/or reduction of mobility, does incidentally dilute the constituent concentrations, but this is in no way the justification.

37. **Topic:** How can the disposal of V-Tanks waste at the INEEL CERCLA Disposal Facility (ICDF) be an effective long-term solution if the U.S. Department of Energy (DOE) ends institutional control of the INEEL in 100 years? [W2-21]

Response: The ICDF meets the CERCLA criteria for "Overall Protectiveness" and "Long-Term Effectiveness" with an engineered design that prevents both potential downward mobility of waste and exposure via surface pathways to current and future workers, future residents, and the environment. DOE will manage institutional controls at the ICDF for a minimum of 100 years to continue its protectiveness. After 100 years, institutional controls will still be required to maintain protectiveness as long as hazardous substances constitute a threat or potential threat to the underlying aquifer, the public, workers, or the environment. The owner of the property after 100 years, whether DOE, another Federal agency, or any other entity, will be required to maintain institutional controls until such time as the land can be released for unrestricted and unlimited use.

14.7.2 Disposal of Waste at the ICDF

38. **Topic:** When the liquids and sludge in the V-Tanks are combined for remediation, their concentration of transuranics will be > 100 nCi/g. This requires that they be treated and disposed of as transuranic (TRU) waste, not at the INEEL CERCLA Disposal Facility (ICDF). The commenter believes that the transuranics in the V-Tanks must be removed from Idaho under the 1995 Settlement Agreement. [W2-13]

Response: The V-Tanks contents do not meet the definition of TRU waste (>100 nCi/g; see response to Topic 20, above). The response to Topic 21, above, explains in more detail how the concentrations are measured. The highest concentration of contaminants in the V-Tanks is that shown in Table 2 of the 2003 Proposed Plan, which is in the sludge. When the contents of all four tanks are combined for remediation, the overall concentration of transuranics in the V-Tanks is below 10 nCi/g before treatment. After treatment, the V-Tanks waste will have a TRU concentration of approximately 2 nCi/g, well below the 10 nCi/g limit for the ICDF and the 100 nCi/g threshold for TRU waste designation. Since the 1995 Settlement Agreement applies to TRU waste and the V-Tanks contents are not TRU waste (even though they contain transuranic elements), the V-Tanks waste is not required to be removed from Idaho.

39. **Topic:** Waste acceptance criteria (WAC) for the INEEL CERCLA Disposal Facility (ICDF) and U.S. Nuclear Regulatory Commission (NRC) restrictions on radioactive waste dumps do not allow disposal at the ICDF of the contaminants in the V-Tanks. Rather, these must go to a geologic repository off the INEEL. Will the ICDF accept waste from any INEEL cleanup activity, or will some types of waste, or waste from some Operable Units, be refused? [W2-15]

Response: The ICDF was designed and approved by the Agencies (EPA, IDEQ, and DOE) for the disposal of contaminants such as those found within the V-Tanks. The ICDF WAC were developed to limit the concentration and quantity of contaminants to levels that would be protective of human health and the environment, including the aquifer. Concentrations and quantities in excess of these levels are not accepted for disposal. Although NRC regulations do not apply to the ICDF, the contents of the V-Tanks would be acceptable for disposal under those regulations.

Only INEEL CERCLA wastes are acceptable for disposal at the ICDF. These wastes can include low-level radioactive waste (LLW), mixed low-level radioactive waste (MLLW), hazardous waste, and non-liquid waste subject to the Toxic Substances Control Act (TSCA). Prohibited wastes include not only non-CERCLA wastes and non-INEEL wastes but also waste with transuranic constituents greater than 10 nCi/g, liquid waste, explosives and reactives, spent nuclear fuel, and high-level waste (HLW). The contents of the V-Tanks currently meet all of these criteria except the prohibition against liquid waste. The contents will be solidified to meet that criterion prior to disposal at the ICDF. Any INEEL CERCLA waste that fails to meet the ICDF WAC will be refused for disposal at the ICDF.

40. **Topic:** Commenters continue to be concerned about the long-term safety of the INEEL CERCLA Disposal Facility (ICDF) relative to the aquifer. In particular, one commenter asks whether the ICDF's location on a flood plain makes it possible that flooding could leach contaminants buried at the ICDF downward into the aquifer. Contamination of the aquifer is of concern not only for human health and safety reasons but because the aquifer is immensely important to Idaho's agricultural economy. [W2-19, T1-7]

    Response: As part of the ICDF planning and design process, U.S. Geological Survey and other research data were evaluated to assess the safety of the proposed facility relative to potential flooding. The ICDF location was determined to be outside the 100-year flood plain. In addition, the ICDF will be surrounded by an engineered berm 15 ft higher than the predicted 100-year flood plain. The ICDF's compliance with key federal and state disposal facility design laws includes a cap compliant with the Resource Conservation and Recovery Act (RCRA), monitoring, and an engineered multiple liner system that includes a leachate collection and removal system, and a leak detection and removal system to inhibit fluid movement below the complex liner system. The landfill will meet additional standards for protectiveness with maintenance, monitoring, and post-closure activities that will verify protection of human health and the environment. More information about the ICDF is available on-line at http://www.inel.gov/publicdocuments/pdfs/cercla01-50671-04.pdf.

41. **Topic:** The commenter feels that the contents of Tank V-9 should not be disposed of in the INEEL CERCLA Disposal Facility, which is over the Snake River Plain Aquifer, because its high concentration of transuranics will enter the aquifer and the Snake River. [W4-3]

    Response: The higher concentrations of hazardous and radioactive contamination found in Tank V-9 are primarily due to the higher concentration of sludge (solids) in that tank, which was designed to function as a sludge removal unit prior to storage of the waste in the other tanks. The waste in the four tanks is similar, however, and resulted from the same generation processes; therefore, the Agencies have agreed that all the waste in the four V-Tanks will be treated as one waste stream, and combined to the extent practical for treatment. This will allow a more optimized and effective treatment process. The final design for the selected remedy will treat the combined waste stream, including Tank V-9 waste, so that all residual waste from the V-Tanks site meets the ICDF waste acceptance criteria (WAC). The ICDF WAC is designed to prevent the disposal of waste such that a future release from the ICDF could result in concentrations of contaminants, including transuranics, that exceed the Idaho groundwater quality standards (drinking water standards) in the underlying Snake River Plain Aquifer. If a waste exceeds the ICDF WAC, it cannot be disposed of at the ICDF.

42. **Topic:** An environmental impact statement (EIS) is required before transuranic (TRU) wastes can be stored at the INEEL CERCLA Disposal Facility (ICDF), where they will eventually contaminate the aquifer. ICDF disposal of transuranics also fails to comply with the requirements of the 1995 Settlement Agreement, which requires removal of all transuranics from the INEEL. [W4-9]

Response: An EIS is not required for V-Tanks waste to be disposed of at the ICDF, as detailed in the response to Topic 26, above. The responses to Topics 20 and 23, above, explain why the 1995 Settlement Agreement is not applicable to the cleanup of the V-Tanks.

14.7.3 Overall Evaluation of Alternatives

43. **Topic:** All three alternatives and their variations are approved as both protective of the environment, and able to be carried out safely. [W1-1]

    Response: Under the CERCLA evaluation process, an alternative must fully satisfy the criterion of providing overall protection of human health and the environment in order to be selected. All of the technology alternatives considered for the V-Tanks met this threshold criterion. The criterion of short-term effectiveness, which evaluates an alternative's safety to workers, the community, and the environment during implementation, was also satisfied by all of the alternatives, but the preferred alternative, ex situ chemical oxidation/reduction with stabilization, was one of only three that received a high ranking for this criterion. In addition, the preferred alternative had the highest combined ranking of all the alternatives considered, which led to its selection.

44. **Topic:** The transuranic contaminants in the V-Tanks will not be removed from the INEEL, and thus long-term effectiveness is not as high as claimed in the 2003 Proposed Plan. The long-term protection of health and the environment is not achieved because the transuranics are not being removed from the INEEL. [W4-8]

    Response: The CERCLA criteria for "Overall Protectiveness" and for "Long-Term Effectiveness" require the removal of V-Tanks waste from the V-Tanks site to an approved disposal facility. The INEEL CERCLA Disposal Facility (ICDF) meets these CERCLA criteria by providing an engineered design that inhibits both potential downward migration of waste and exposure via surface pathways to current and future workers, future residents, and the environment. Institutional controls at the ICDF will be in place for a minimum of 100 years to continue its protectiveness. The ICDF cap is a 1,000-year design. The INEEL is currently implementing a Long-Term Stewardship Program, which will remain after programs and projects are completed, as long as institutional controls, monitoring, maintenance, or other post-closure care is required.

45. **Topic:** The commenting group prefers nonthermal technologies. [W6-1]

    Response: The preference is noted. The INEEL agrees that operating temperatures are an important area of consideration when selecting a technology. With all else being equal, lower temperature systems will generally be ranked higher on the criterion of short-term effectiveness because of the lower potential risk to workers; however, they may receive lower rankings on the criteria of long-term effectiveness and reduction of toxicity, mobility, and volume because of lower destructive capabilities. That caveat of "all else being equal" is always the difficult part of an evaluation such as this. The tradeoffs between the higher efficiencies obtained at higher temperatures versus the off-gas control issues associated with those higher temperatures will continue to be an important factor in future technology selections.

46. **Topic:** The commenting group prefers those technologies that have the least amount of off-gassing and airborne emissions. [W6-2]

    Response: The preference is noted.

47. **Topic:** The commenting group cannot support an untested technology. [W6-3]

Response: All of the technologies retained for evaluation in the technical evaluation leading to this ROD Amendment were required to have a reliable use record and to be viable technologies, even if they have not been used on the particular mix of constituents present in the site to be remediated, such as the V-Tanks. More detailed testing, as necessary, to optimize the performance of the selected remedy may be performed during the remedial design phase following the signing of this ROD Amendment. The Agencies have the option of using models, treatability studies, readiness reviews, and other procedures as necessary, to confirm a remedy's feasibility and fully define its engineering design prior to use. The preferred alternative has been previously demonstrated to be viable through a treatability study conducted in 1998 (INEEL/EXT-98-00739). This technology test, conducted on actual V-Tanks waste, demonstrated sufficient organic destruction efficiencies to meet regulatory requirements. Furthermore, similar chemical oxidation/reduction and stabilization processes have been conducted, or are planned, that increase the confidence level that the process will be successful. Based on the previous tests and operations on similar waste streams, plus additional testing planned during the design phase, the preferred alternative appears to be a viable alternative for treating V-Tanks waste.

Citizens have raised questions about the quality of data used in investigations, and how the State of Idaho and U.S. Environmental Protection Agency (EPA) ensure quality. For a remedial investigation, the Agencies identify data quality objectives, which specify the quality of data required to support decisions in the feasibility study and cleanup program. The development of data quality objectives follows guidance in CERCLA, the National Contingency Plan, and EPA documents. Existing data are used whenever data quality objectives are met or can be validated.

A fundamental goal of cooperative efforts by the agencies in implementing the action plan is to emphasize remedial action. This goal recognizes that no reasonable amount of investigation can resolve all uncertainty and that remedial actions must accommodate changes from what was originally expected. Such an approach encourages timely selection of a remedy, flexibility for remedial action, and the ability to respond to information discovered during investigations.

48. **Topic:** The commenting group cautions that in order to fully support any technology for use in remediation, they must be involved early in the process and receive verifiable demonstration that the technology is both effective and low-risk. [W6-6]

Response: As part of advance public information and involvement opportunities for this amendment to the V-Tanks remedy, the INEEL's Community Relations Office began contacting individuals and community groups by phone, providing technical briefings as desired, and actively soliciting early feedback. This process is described in Section 3 of this ROD Amendment.

Conceptual validation, treatability studies, and other tests that may be required to verify the effectiveness and safety of the selected remedy are part of a lengthy development and selection process. This begins well before a proposed plan is written with the feasibility study phase (in this case, the technology evaluation documented in the 2003 Technology Evaluation Report), and continues after the Agencies sign a record of decision (ROD) with the remedial design phase. Because of the cost and time involved in testing multiple potential remedial designs, which would substantially delay the start of the cleanup and add considerably to the overall cost, CERCLA guidance only requires a ROD to present a general strategy for satisfying cleanup requirements, rather than a detailed process. Thus, while a ROD establishes the cleanup technology to be used and the cleanup levels to be achieved, it is only in the following remedial design phase that the Agencies determine the engineering design (including schedule, cost estimates, and disposal options for wastes generated) and verify that all remediation activities will comply with applicable standards in state and federal laws identified in this ROD Amendment. The technology selected to remediate the V-Tanks – ex situ chemical oxidation/reduction with stabilization – has seen limited past deployments, so additional laboratory and pilot testing on both surrogate and actual V-Tanks waste are planned during the design phase. This testing and the detailed engineering design will help demonstrate, before full-scale implementation, that the technology is both effective and low-risk.

As described in the response to Topic 7, above, opportunities for additional information and comment about the V-Tanks remediation process are available on an ongoing basis. The web page of the INEEL Community Relations Office (at http://www.inel.gov/environment/) provides information on the current status of cleanup projects.

14.8 Vitrification Alternatives 1(a) and 1(b)

49. **Topic:** Commenters report that vitrification has a record of accidents and other unplanned failures. Specifically, the commenters state that in 1996, Oak Ridge National Laboratory (ORNL) was using in situ vitrification (ISV) and it exploded, putting workers and the public at extreme risk; that the INEEL tried an ISV project several years ago and also experienced an explosion, which burned up the containment tent, and that other failed vitrification projects have taken place at the Hanford Reservation. The commenters state that the Idaho Department of Environmental Quality (IDEQ) and the U.S. Environmental Protection Agency (EPA) have failed to inform the public about these failures, thereby misleading members of the public into mistakenly concluding that ISV is a viable remedial technology for the INEEL. What is the use and safety record of ISV across the U.S. Department of Energy's (DOE's) Complex? [W2-18, T1-6]

Response: The "ISV failures" referred to by the commenters resulted during testing of a previous version of this technology. That version was refined and improved based on analysis of these "failures." The result of these improvements is the planar ISV method. Planar ISV is the technology evaluated in the 2003 Technology Evaluation Review (TER) and presented in the 2003 Proposed Plan.

Planar ISV systems were developed to prevent the "failures" experienced during the developmental stages of ISV. These early failures were not true explosions, but rather rapid releases of air and steam bubbles through the ISV melt. As the air and steam bubbles moved through the ISV melt, to ground surface, they caused the "air-lifting" of the molten glass product within the ISV melt to lift above the subsidence crater and flow across ground level.

Details about the ORNL Melt Expulsion are documented in a 1996 report.[b] This event was only a glass flow, not an expulsion into the air (as it has commonly been misidentified by some members of the public). Movement of steam and air bubbles through the melt did result in some splatter into the air as the bubbles broke — on the order of a few pounds of glass fragments. The radioactive material was not released into the air, but was contained within the matrix of the glass. The expelled glass fragments containing the radioactivity were easily collected and sent for appropriate disposal.

Subsequent analysis of the ambient air collected by the ORNL project's three air samplers did not

b. Spalding, B. P., 1996, *Technical Evaluation Summary of the In Situ Vitrification Melt Expulsion at the Oak Ridge National Laboratory on April 21, 1996,* ORNL/ER-377, Oak Ridge National Laboratory, July, 1996.

reveal any airborne contamination resulting from the melt expulsion. There was no risk to human health or the environment, certainly not the “extreme risk” suggested in the comment. The reasons for the ORNL melt expulsion are detailed in a formal DOE report.[c]

Other melt expulsions that the commenters refer to are as follows:

a. A private, full-scale test, conducted by Geosafe in support of their eventual ISV processing of 55-gal drums of moist soil contaminated with up to 1.4 wt% PCBs, at the GE Spokane site. In this test, wet soils in the sealed drums that were being processed caused a sudden release of pressurized steam into the melt, that resulted in an “air lifting” and melt splattering similar to what happened at ORNL. The melt expulsion was exacerbated, however, by the fact Geosafe was using a fabric hood containing a flammable sealant. Contact with the molten glass splatter caused the sealant to ignite, and burned up the hood as well as adjacent combustible equipment and materials (such as the electrical cable insulation). Details of this incident are reported in Geosafe’s 1994 test report.[d]

b. A pilot-scale test, conducted by Pacific Northwest Laboratory at the INEEL on simulated waste in 1989. During this demonstration test, sealed 5-gal containers containing canola oil placed within the melt location resulted in numerous pressure build-ups and releases of vapors through the pilot-scale ISV melt that also caused molten glass splatter sufficient to ignite the fabric hood material. Details of this expulsion are recorded in Callow et al. [e]

A summary of ISV melt expulsions to date was prepared by R. K. Farnsworth as part of the *Operable Unit 7-13/14 In Situ Vitrification Treatability Study Work Plan*.[f]

Based on the lessons learned from the initial demonstrations of ISV technology, planar ISV was developed and successfully tested in 1998. Planar ISV precludes the types of failures mentioned above by melting the waste material from the sides in rather than the top down. This modification to the process prevents the buildup of a layer of untreated waste trapped beneath a layer of molten glass. Safe operation of the planar ISV process on subsurface tanks containing substantial quantities of vaporizable material, was demonstrated as part of a simulated treatability study performed in support of the 1998 V-Tanks Proposed Plan and 1999 ROD. The results of this treatability study indicated that planar-ISV could safely process subsurface tanks containing substantial quantities of vaporizable material without the potential for subsurface pressure build-up or melt expulsion. The results of this successful treatability study are available in the Administrative Record. The Agencies have reviewed this information and consider planar ISV a viable and safe option for remediation of the V-Tanks.

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c. DOE, 1996, *In Situ Vitrification Workshop*, October 15–17, 1996, Oak Ridge, Tennessee.

d. Geosafe, 1994, *Investigation into the Causes and Application of the Melt Displacement Event During Geosafe Operational Acceptance Test #2 (OAT-2)*, GSC-2301, Geosafe Corporation, Richland, Washington.

e. Callow, R. A., L. E. Thompson, J. R. Weidner, C. A. Loehr, B. P. McGrail, and S. O. Bates, 1991, *In Situ Vitrification Application to Buried Waste: Final Report of Intermediate Field Tests at Idaho National Engineering Laboratory*, EGG-WTD-9807, EG&G, Inc., Idaho National Engineering Laboratory, August 1991.

f. Farnsworth, R. K., et al., 1999, “Appendix E, A Preliminary Assessment of Concerns Over Melt Expulsion Potential During ISV Processing,” DOE/ID-10667, Rev. 1, Idaho National Engineering and Environmental Laboratory, January 1999.

The Agencies believe that an adequate review has been made of the information on the failures associated with the early stages of the development of ISV. The early failures mentioned by the commenters are no longer considered relevant or representative of the current state of development of planar ISV technology and would not aid the Agencies in the selection of a preferred treatment alternative. The Agencies selected planar ISV as a technology alternative for the V-Tanks in the TER because the test data indicate that planar ISV is no longer subject to the failures experienced during the early development of ISV[g]. This same issue was addressed in the Responsiveness Summary section of the 1999 Record of Decision (see pages 3-24 through 3-26).

50. **Topic:** A commenter supports vitrification, either in situ or ex situ, because it provides the highest reduction in toxicity, mobility, and volume; is the most durable and mature treatment technology available; can treat a greater amount of contaminated soil that would otherwise be disposed of without treatment; and provides the least risk to humans and the environment in storage and transportation of radioactive waste. [W3-1]

Response: Compared to the other alternatives, vitrification does provide the highest reduction in toxicity, mobility, and volume, is the most durable, and is the most mature technology, or one of the most mature technologies, of those evaluated for the V-Tanks cleanup. The commenting group is also correct that a greater amount of contaminated soil would be treated with this technology, than under the other technologies. These are some of vitrification's strengths, and have been documented in the 2003 Technology Evaluation Report (DOE/ID-11038). However, these strengths were contrasted against several weaknesses of the vitrification process relative to the other technologies considered, such as System Complexity, Ease of Additional Remedial Actions, Monitoring Concerns, Administrative Feasibility, Increased (potential) Worker Hazards, Secondary Waste Volumes and Cost. Based on this, it appeared that ex situ chemical oxidation/reduction and stabilization had the highest overall ranking of the seven technologies considered. Furthermore, there has been less public support for thermal treatment technologies than for technologies performed at temperatures below 100° C (such as ex situ chemical oxidation/reduction and stabilization).

As to the greater durability of the vitrified waste form after disposal, however, while data does indicate that the durability of a vitrified waste form is over 100 times that of a grouted waste form, the effect of this difference provides only a small difference in rankings, since the ICDF is a lined facility designed to last over 1,000 years. There is limited potential for contaminant migration from the ICDF following its 1,000-year lifetime, as well. Finally, given that nearly all waste from the V-Tanks would be disposed of at the ICDF under most alternatives, the transportation risks associated with vitrification would be similar to those associated with the preferred alternative.

51. **Topic:** A commenter supports vitrification, but endorses the selection of the preferred alternative, ex situ chemical oxidation/reduction, to eliminate concerns about the tanks' strength, and because grouting will stabilize both cesium-137 (Cs-137) and strontium-90 (Sr-90). The commenter noted the complex mixture of contaminants to be treated. [W5-2]

Response: The Agencies agree with these points. While vitrification provides more durability in the stabilization of these wastes relative to grouting, the fact that all V-Tanks wastes will be disposed of at the ICDF guarantees that the waste will be isolated from the environment for at least 1,000 years, which is sufficient time for Cs-137 and Sr-90 to decay to background levels. Although a vitrified product will stabilize radionuclides with longer half-lives (such as the transuranic

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g. Michael, D. L, 1998, *Treatability Study for Planar-In Situ Vitrification of INEEL Test Area North V-Tanks,* INEEL/EXT-98-00854, Idaho National Engineering Laboratory, October 1998.

contaminants) better than grout, the limited migration potential of the transuranics from the engineered ICDF facility is only a minimal increase to the overall ranking of vitrification, relative to ex situ chemical oxidation/reduction with its stabilization through grouting. The Agencies also agree regarding the complexity of the contaminants that are being treated. It is for this reason that lab-scale treatability studies are currently underway to verify that a chemical oxidation/reduction approach, followed by stabilization, will meet the requirements associated with remediation of the V-Tanks wastes.

52. **Topic:** The commenting group opposes vitrification because it is nothing more than a proxy for incineration. [W6-4]

Response: Not only is vitrification not a proxy for incineration, it is quite different in its means of operation. As a consequence, incineration and vitrification differ considerably in their potential risk to human health and the environment. The Agencies evaluated vitrification as a potential technology for cleanup of the V-Tanks because of its advantages. The U.S. Code of Federal Regulations (40 CFR 260.10) defines incineration as enclosed devices that thermally treat hazardous wastes using controlled flame combustion. Vitrification is not incineration because it does not involve primary treatment via controlled flame combustion in an enclosed device. As a result, the U.S. Environmental Protection Agency considers vitrification technologies (both in situ and ex situ) as non-incineration thermal treatment processes, not subject to the same regulations as incinerators.

One important difference for protection of human health and the environment is that unlike incinerators, vitrification is carried out under a reducing environment. In situ vitrification is carried out in the subsurface; ex situ vitrification is carried out in a specially designed vessel located aboveground. The reducing conditions do not favor the formation of dioxins or furans, as are common in incineration. Furthermore, because of the presence of overburden in both in situ and ex situ vitrification, the off-gas hood remains cool enough that there is minimal potential for a reaction to form dioxins and furans in the hood, as it encounters oxygen.

In prior operations involving the treatment of chlorinated organics, vitrification has been demonstrated to meet stringent regulatory limits relative to products of incomplete combustion and species such as dioxins and furans. Vitrification has also been shown in tests to result in greater than 99.9999% destruction or removal of PCBs.

Another distinction between vitrification and incineration is that vitrification’s different thermal conditions, and its much more controllable off-gas filtration system, results in far less off-gas particulates and more radionuclide retention in the melt (greater than 99.9%). This means orders of magnitude less contamination in the off-gas from vitrification than would be encountered in incineration devices. In Australia, where high temperature incineration of hazardous waste is effectively banned (due to a lack of public and political support), vitrification has been publicly accepted and identified as an alternative to incineration.

14.9 Thermal Desorption Alternatives 2(a), 2(b), and 2(c)

No specific comments on this topic were identified.

14.10 Chemical Oxidation/Reduction Alternatives 3(a) and 3(b)

14.10.1 Description of Technology

53. **Topic:** Under the preferred alternative, adding grout leads to dilution for the purposes of land disposal, which does not seem legal. [T1-4]

    Response: Grouting is an integral part of the stabilization step in the waste treatment. Any dilution of constituent concentrations as a result of this occurs as a part of a necessary step in treatment, not solely for the purpose of land disposal. See responses to Topics 25 and 26, above, for a detailed discussion of this issue.

54. **Topic:** A commenting group wrote that it is concerned by how little data exists on using these technologies on waste similar to the INEEL's. They believe no laboratory or small-scale work has been carried out locally. This leads them to ask whether down the road, after a lot of time and money have been invested on full-scale equipment, the U.S. Department of Energy (DOE) will encounter some technical "showstopper" that could have been detected by a little small-scale work earlier. [W1-3]

    Response: A treatability study was completed in 1998 (INEEL/EXT-98-00739) on actual V-Tank waste that demonstrated the effectiveness of the chemical oxidation/reduction and stabilization process. Furthermore, before operations start at a cleanup site, all necessary conceptual verification, treatability studies, and any other tests required are completed to validate the effectiveness and safety of the chosen treatment technologies. Because of the level of technical, safety, and cost information required to reach this point, the development of the final selected remedy is a lengthy process.

    Thus, while a record of decision (ROD) establishes the cleanup technology to be used and the cleanup levels to be achieved, it is only after the signing of the ROD, in the remedial design phase, that the Agencies collectively determine the engineering design (the technical analysis and procedures that result in a detailed set of plans and specifications) and verify that all activities will comply with applicable or relevant and appropriate requirements in state and federal laws. It is for this reason, that laboratory-scale treatability studies are currently underway to verify that a chemical oxidation/reduction approach, followed by stabilization, will meet the V-Tanks remedial action objectives.

14.10.2 Evaluation of Alternatives

55. **Topic:** The commenting group does not support the preferred alternative, chemical oxidation/reduction with stabilization, because it provides the lowest amount of reduction of toxicity, mobility, and volume through treatment. [W3-2]

    Response: Although the preferred alternative received a lower ranking than several others on this CERCLA criterion, it does address it acceptably. It will reduce toxicity by destroying the volatile organic contaminants (VOCs) and semivolatile organic contaminants (SVOCs) through oxidation/reduction, and will reduce mobility of metals and radionuclides by grouting. As noted in the 2003 Technology Evaluation Report (TER) and the 2003 Proposed Plan, the primary reason ex situ chemical/oxidation reduction with stabilization was rated low in this category relative to vitrification was the increase in volume of the primary waste stream through the treatment process. This increase in volume results from the addition of the oxidant/reductant and the grout. Reduction of toxicity and mobility are achieved, which produces a stable, compliant waste form. The

Agencies selected this as the preferred alternative because it is the best remedy overall. The high rankings of this alternative for short-term effectiveness and implementability were factored in, along with its somewhat lower cost. In particular, the preferred alternative's high system reliability and manageable design complexity led to the Agencies' selection of this technology.

56. **Topic:** The commenting group supports chemical oxidation/reduction conditionally. It is preferred because the temperatures generated in the treatment process remain relatively low. The group has concerns, however, about the complexity of the off-gassing system. With so many filters, condensers, and other collection devices, the group is concerned about filter failures and subsequent release of toxic substances into the atmosphere. [W6-5]

    Response: The off-gas system planned for the chemical oxidation/reduction process is a relatively simple and standard off-gas system, considerably less complex than the other thermal treatment alternatives evaluated. The components of the chemical oxidation/reduction off-gas system are commonly used in numerous industrial applications and have been shown to be highly reliable. Furthermore, it is after the signing of a record of decision (ROD), during the remedial design phase, that the Agencies collectively determine the engineering design (the technical analysis and procedures that resulted in a detailed set of plans and specifications) and verify that all remediation processes and activities will comply with applicable standards in state and federal laws. The technology selected to remediate the V-Tanks—ex situ chemical oxidation/reduction with stabilization—has seen limited past deployments, so additional laboratory and pilot testing on both surrogate and actual V-Tanks waste are planned during the design phase. This testing and the detailed engineering design will help demonstrate, before full-scale implementation, that the technology is effective and low- risk. Laboratory-scale treatability studies are currently underway to verify that a chemical oxidation/reduction approach, followed by stabilization, will meet the requirements associated with remediation of the V-Tanks wastes. It is expected that these laboratory-scale studies will support the Agencies' intention to proceed with ex situ chemical oxidation/reduction/stabilization.

57. **Topic:** While a commenter noted his support for vitrification, he endorsed the preferred alternative for the V-Tanks because the ex situ processing eliminates concerns about the tanks' strength, and grouting will stabilize both cesium-137 (Cs-137) and strontium-90 (Sr-90). The commenter noted the complex mixture of contaminants to be treated. [W5-2]

    Response: We agree. Under this remedy, most or all of the V-Tanks wastes will be disposed of at the INEEL CERCLA Disposal Facility (ICDF), isolating it from the environment for at least 1,000 years, which is sufficient time for Cs-137 and Sr-90 to decay to background levels. Although a vitrified product stabilizes radionuclides with longer half-lives (such as the transuranic contaminants) better than grout, the limited potential for the transuranics to migrate from the lined ICDF results in only a minimal increase in the overall ranking of vitrification relative to the preferred alternative. The commenter is also correct in his assertion that a primary reason for selecting an ex situ form of chemical oxidation/reduction over an in situ form was due to concerns over tank strength and integrity under in situ operations. Other reasons include implementability concerns over heating the tank wastes in situ, and the concerns over runaway chemical oxidation/reduction reactions at tank volume quantities, rather than in the small batches possible with ex situ processing. Finally, the Agencies agree with the commenter's note regarding the complexity of the contaminants that are being treated. It is for this reason that lab-scale treatability studies are underway to verify that the selected remedy will meet the remedial action objectives for the V-Tanks cleanup.

Appendix A

Comment Documents and Responses

Appendix A

Comment Documents and Responses

This appendix accompanies the Responsiveness Summary, which is Part III, Sections 13 and 14 of the Record of Decision Amendment (ROD Amendment) for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North (TAN), Operable Unit 1-10, at the Idaho National Engineering and Environmental Laboratory (INEEL). It contains the scanned images of all written comments received during the comment period on the proposed plan and transcripts of oral comments made during the formal comment session of the public meeting.

The scanned images are annotated with sidebars indicating the identified comments, using a three-part alphanumeric code to designate the document number, comment number within it, and response or responses in the Responsiveness Summary relevant to this comment. Each document number begins with a W or a T, identifying it as a written comment received from the proposed plan (W) or an oral comment made during the formal comment period of a public meeting (T). The number following the letter W or T was assigned to each separately received document according to the order in which it was received. The second number, following the hyphen, identifies comments identified within each document. The final number or numbers in parentheses denote the Section and Topic within the Responsiveness Summary that addresses the comment.

Adjacent to the scanned comments are the Agencies' responses to them. Most responses are presented on the same page as the comment they address. In cases where many comments were identified on a single page, the responses may continue onto following pages. Responses to comments that are identical or very similar in nature are repeated throughout the document. Comments that were grouped under the same issue code for the Responsiveness Summary may not have identical responses, however, depending on which portion of the response is germane to a particular comment.

This Responsiveness Summary identified and responded to more than 58 statements of preferences and concerns, comments, and questions received in 25 pages of written comments from six individuals and interested groups, and as one formal statement at one public meeting. The following indexes summarize the numbers of comments received on the various issues of concern defined in the Responsiveness Summary, and list the individuals and groups who submitted comments in writing or presented them orally at a public meeting.

Table 1. Index of public comments and responses by issue of concern.

Section Number	Issue	Response Numbers	Documents Containing Comments on Issue	Number of Commenters[1] on Issue	Number of Comments on Issue
13.1	Overall Goals of the INEEL Environmental Restoration Program	1–5	W2, W4, T1	3	5
13.2	Public Participation and Community Relations	6–8	W2, W5, W6	3	3
13.3	Content and Organization of the Proposed Plan	9–10	W2, W5, W6	3	2
13.4	OU 1-10 Remediation Planning and Costs	11–16	W2, W4	2	6
13.5	Risk Assessment and Characterization of Contaminants	17–21	W2, W4	2	5
13.6	Remedial Action Objectives and Compliance with ARARs	22–35	W2, W4, T1	3	13
13.7	Development, Implementation, and Evaluation of Alternatives	36–48	W1, W2, W4, W6, T1	5	12
13.8	Vitrification Alternatives 1(a) and 1(b)	49–52	W2, W3, W5, W6, T1	5	4
13.9	Thermal Desorption Alternatives 2(a), 2(b), and 2(c)	None	None	0	0
13.10	Chemical Oxidation/Reduction Alternatives 3(a) and 3(b)	53–57	W1, W3, W5, W6, T1	5	4

1. The number of commenters is an estimate of separate individuals or organizations submitting comments one or more times on the V-Tanks Proposed Plan.

Table 2. Index of public comments and responses by commenter.

Name of Commenter	Organization or Affiliation (as shown or stated in comments)	City (and State, if not Idaho)	Number of Pages Submitted	Document Number Assigned	Number of Comments Identified	Number of Issues of Concern	Appendix Page Numbers
	Coalition 21	Idaho Falls	1	W1	3	3	A-3 to 1-4
	Environmental Defense Institute	Moscow	18	W2	24	30	A-5 to A-30
	Snake River Alliance	Boise	1	W3	2	2	A-31 to A-32
David B. McCoy		Idaho Falls	3	W4	12	12	A-33 to A-41
Robert Wikoff		Jackson, WY	1	W5	3	3	A-42 to A-43
	Keep Yellowstone Nuclear Free	Jackson, WY	1	W6	7	7	A-44 to A-48
David McCoy		Idaho Falls	4	T1	9	9	A-49 to A-57

Commenter: Coalition 21
Document Number: W1
Page: 1 of 2

From: John & Martha Tanner [mailto:pust@srv.net]
Sent: Saturday, April 19, 2003 6:28 AM
To: Hain, Kathleen E
Subject: V Tank Comments

Dear Ms. Hain,

Below are the comments of Coalition 21 on the proposed plan for the V tanks. I mention that the on-line web site at environment.inel.gov didn't show the comment form, or anything else.

John Tanner, Secretary, Coalition 21

Proposed Plan for V-tanks, Comments by Coalition 21

We feel confident that any of the three options with their variations could be carried out safely, and in a manner that protects the environment.

We agree that cost should be an important factor in the process selection. But that would seem not to be much of a factor in this case, given the closeness of the estimates, and given that estimates are likely to be very uncertain before preliminary design has been done.

It was briefly mentioned that there is little data on using the chosen process, oxidation/reduction, with waste similar to ours; and apparently no laboratory or other small scale work has been done locally. This raises the concern that DOE will find some technical show stopper down the road, after a lot of time and money have been invested on full scale equipment, which could have been detected by a little small scale work earlier. It would not be the first time such a thing has happened here. Of course the same applies to the other methods discussed.

Comment W1-1 (Section 13.7.3, Topic 43)

Response: Under the CERCLA evaluation process, an alternative must fully satisfy the criterion of providing overall protection of human health and the environment in order to be selected. All of the technology alternatives considered for the V-Tanks met this threshold criterion. The criterion of short-term effectiveness, which evaluates an alternative's safety to workers, the community, and the environment during implementation, was also satisfied by all of the alternatives, but the Preferred Alternative, ex situ chemical oxidation/reduction with stabilization, was one of only three that received a high ranking for this criterion. In addition, the Preferred Alternative had the highest combined ranking of all the alternatives considered, which led to its selection. ❖

Comment W1-2 (Section 13.4, Topic 16)

Response: Even though the cost differences between the alternatives turned out to be small, cost was used in the CERCLA evaluation process as required. The narrowness of the differences resulted in the cost criterion having a relatively minor impact in the overall evaluation of alternatives.

The cost estimates used to evaluate and present alternatives in a proposed plan are based on the best available information. Changes in various elements of the cost are expected to occur as new information and data are collected during the engineering design of the selected remedy. Because of this expectation that costs will be refined, CERCLA allows presentation of the cost estimates in the proposed plan to range from +50 to –30% of the actual final cost. Changes in cost beyond these limits prompt an explanation of significant differences or a ROD amendment. As was explained in the 2003 Proposed Plan, such a cost change was one factor that prompted the requirement for this ROD Amendment, and the preceding preparation of the 2003 Explanation of Significant Differences (ESD), accompanied by notice to the public of its availability. ❖

Comment W1-3 (Section 13.10.1, Topic 54)

Response: A treatability study was completed in 1998 (INEEL/EXT-98-00739) on actual V-Tank waste that demonstrated the effectiveness of

(Continued on page 6)

(Continued from page 5)

Response to Comment W1-3 (continued):

the chemical oxidation and stabilization process. Furthermore, before operations start at a cleanup site, all necessary conceptual verification, treatability studies, and any other tests required are completed to validate the effectiveness and safety of the chosen treatment technologies. Because of the level of technical, safety, and cost information required to reach this point, the development of the final selected remedy is a lengthy process.

Thus, while a record of decision (ROD) establishes the cleanup technology to be used and the cleanup levels to be achieved, it is only after the signing of the ROD, in the remedial design phase, that the Agencies collectively determine the engineering design (the technical analysis and procedures that result in a detailed set of plans and specifications) and verify that all activities will comply with applicable or relevant and appropriate requirements in state and federal laws. It is for this reason, that laboratory-scale treatability studies are currently underway to verify that a chemical oxidation/reduction approach, followed by stabilization, will meet the V-Tanks remedial action objectives. ❖

Environmental Defense Institute
Troy, Idaho

Comments
on
Revised Proposed Plan
Test Area North

at the

Idaho National Engineering
&
Environmental Laboratory

Submitted by
Chuck Broscious
On behalf of the Environmental Defense Institute
April 2003

INEEL\Cleanup\Tan Com.Final

Note: No comments were identified on this page.

Commenter: Environmental Defense Institute
Document Number: W2
Page: 2 of 26

Environmental Defense Institute Page 2

I. Summary

The Department of Energy's (DOE) Revised Proposed Plan for Waste Area Group 1 - Test Area North (TAN) dated November 1998 [1] and the New Proposed April 2003 remediation Plan [2] contain major discrepancies with the Comprehensive Remedial Investigation / Feasibility Investigation Report data and other internal INEEL waste characterization report data on TAN. [3] These data discrepancies are in the range of many orders-of-magnitude.

Fundamentally, any treatment plan and applied technology for remediation must be based on reliable waste stream data. Otherwise, DOE will face another fiasco that occurred at the INEEL Pit-9 waste treatment program that was eventually terminated because of (among other reasons) inadequate waste characterization. An issue stressed in the comments below, and apparently ignored by DOE and the regulators, is that **both** the TAN V-Tank liquid and the sludge (tank heels) and contaminated soil must be include in the calculus of determining an appropriate remediation treatment technology and the selection of waste disposal sites.

Additionally, the 2003 Plan fails to address all the tanks and other "buried" TAN waste issues. Only four of the V-Tanks are addressed (30,400 gal.) when there are at least six V-Tanks (additional 100,000 gal.) and other TAN waste discharge sites with major radioactive and hazardous waste contaminates.

These crucial issues add to the public's skepticism about DOE's veracity to tell the truth about its radioactive a... ...ely enforce the law that if app... ...EL site as DOE plans.

Therefor... ...ental Protection Agenc... ...d "alpha emitting mixed lo... ...llow this remediation progra... ...ed waste

See next page for remaining comments on this page.

[1] Proposed Plan ... ...ons Office.

[2] New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10, USDOE Idaho Operations Office, April 2003.

[3] DOE 1998 Data refers to the following reports cited here and DOE's 1998 Tan Remediation Plan ;
(a); Work Plan for Waste Area Group 1, Operable Unit 1-10, Comprehensive Remedial Investigation / Feasibility Study, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10527, March 1996. Vol I, RI/FS
(b); Comprehensive Remedial Investigation / Feasibility Study for the Test Area North Operable Unit 1-10, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10557, November 1997. (RI/FS)
(c); Field Sampling Plan for Operable Unit 1-10: Test Area North, D. L. Michael, Lockheed Idaho Technologies Company, Idaho National Engineering Laboratory, March 1996, INEL-95/0304, Vol.III RI/FS..
(d) Federal Register, May 26, 1998, Part II, Environmental Protection Agency, 40 CFR Parts 148 to 271, Land Disposal Restrictions Phase IV Final Rule

[4] Settlement Agreement in United States v. Batt, No CV-91-0065-S-EJL, page 6. Alpha emitting Low-level waste includes waste containing transuranics, generating greater than 10 nano curie per gram (nCi/g).

Comment W2-1 (Section 13.5, Topic 17)

Response: Some of the discrepancies noted by the commenting group stem from a data labeling error in a 1996 INEEL report, which was corrected in the 1997 Remedial Investigation/Feasibility Study (RI/FS). The values presented by the commenting group in their Table A (see page A-6 of Appendix A) for the liquid concentration for the metals

(Continued on page 25)

Comment W2-2 (Section 13.4, Topic 11)

Response: Yes. Both the V-Tanks and the surrounding soils will be remediated in an integrated action. The 2003 Proposed Plan focused on the changes to the remedy previously selected for the V-Tanks in the 1999 Record of Decision (ROD). Although the remedy for the sur-

(Continued on page 25)

Comment W2-3 (Section 13.4, Topic 12)

Response: There are indeed additional underground tanks at TAN that are not addressed by this ROD Amendment. To understand their handling, it is important to note the difference between the term "v-tanks," which identifies a kind of underground storage vessel, and the site name "the V-Tanks," which identifies a particular location to be remediated. The V-Tanks site addressed in this ROD Amendment received that des

(Continued on page 25)

Comment W2-4 (Section 13.4, Topic 14)

Response: The Agencies agreed to remediate the four V-Tanks, the associated piping, and the surrounding contaminated soil as one unit because they are part of an interconnected waste handling system that contains a single consistent waste stream. At this time, sampling has shown no additional, adjacent, related past releases. As stated in the 1999 Record of Decision (ROD), the possibility exists that contami

(Continued on page 27)

Commenter: Environmental Defense Institute
Document Number: W2
Page: 3 of 26

Environmental Defense Institute Page 2

I. Summary

The Department of Energy's (DOE) Revised Proposed Plan for Waste Area Group 1 - Test Area North (TAN) dated November 1998 [1] and the New Proposed April 2003 remediation Plan [2] conta... ...sibility Investigation Repor... These data discrep... ...ust be based on reliable w... ...e INEEL Pit-9 waste trea... ...8) inadequate waste chara... ...d by DOE and the regulato... ...inated soil must be inclu... ...ology and the selection of w...

Additio... ...ste issues. Only four of the... ...itional 100,000 gal.) and other TAN waste discharge sites with major radioactive and hazardous waste contaminates.

See previous page for remaining comments on this page.

These crucial issues add to the public's skepticism about DOE's veracity to tell the truth about its radioactive and hazardous waste crisis, in addition to the regulators willingness to adequately enforce the law that if appropriately applied, would appear to prohibit disposal of this waste on the INEEL site as DOE plans.

Therefore, the Idaho Department of Environmental Quality (IDEQ) and the Environmental Protection Agency (EPA) as regulators (in keeping with the Settlement Agreement that included "alpha emitting mixed low-level waste" be shipped to a geologic repository out of Idaho), [4] must not allow this remediation program to proceed until DOE provides credible justification for the radically reduced waste

[1] Proposed Plan for Waste Area Group 1 - Test Area North INEEL, December 1998, DOE Idaho Operations Office.

[2] New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10, USDOE Idaho Operations Office, April 2003.

[3] DOE 1998 Data refers to the following reports cited here and DOE's 1998 Tan Remediation Plan ;
(a); Work Plan for Waste Area Group 1, Operable Unit 1-10, Comprehensive Remedial Investigation / Feasibility Study, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10527, March 1996. Vol I, RI/FS
(b); Comprehensive Remedial Investigation / Feasibility Study for the Test Area North Operable Unit 1-10, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10557, November 1997. (RI/FS)
(c); Field Sampling Plan for Operable Unit 1-10: Test Area North, D. L. Michael, Lockheed Idaho Technologies Company, Idaho National Engineering Laboratory, March 1996, INEL-95/0304, Vol.III RI/FS..
(d) Federal Register, May 26, 1998, Part II, Environmental Protection Agency, 40 CFR Parts 148 to 271, Land Disposal Restrictions Phase IV Final Rule

[4] Settlement Agreement in United States v. Batt, No CV-91-0065-S-EJL, page 6. Alpha emitting Low-level waste includes waste containing transuranics, generating greater than 10 nano curie per gram (nCi/g).

Comment W2-5 (Section 13.1, Topic 1)

Response: The U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (IDEQ) are jointly responsible for cleanup actions at the INEEL. The Federal Facility Agreement and Consent Order (FFA/CO) designated the State and the EPA (the "support agencies") as part-

(Continued on page 26)

Comment W2-6 (Section 13.6, Topic 21)

Response: The comment is incorrect. All of the applicable or relevant and appropriate requirements (ARARs), (which is the term used in CERCLA cleanup actions to identify the set of all environmental regulations and laws that apply to the action) relevant to this action were identified during preparation of the 2003 Technology Evaluation Report [TER], on which the 2003 Proposed Plan was based. None of the ARARs prohibit disposal of the V-Tanks contents, or the surrounding contaminated soil, at an approved disposal facility on the INEEL. The 2003 Proposed Plan presented and evaluated those technologies found capable of meeting the ARARs. After this ROD Amendment is signed, the selected treatment technologies will move from conceptual design into full remedial design. As part of this remedial design phase, safety plans and other work documents will specify in detail how each individual ARAR will be met. These documents will be placed in the INEEL Information Repository as each is completed and approved. ❖

Comment W2-7 (Section 13.6, Topic 22)

Response: It is correct that the V-Tanks contents are classified as low-level waste (LLW) and that the waste contains alpha-emitting radionuclides. However, it is not correct that this makes the V-Tanks remediation subject to the 1995 Settlement Agreement. By definition, LLW is waste that does not meet the definitions for high-level waste (HLW), transuranic (TRU) waste, spent nuclear fuel, or by-product materials. The 1995 Settlement Agreement requires the removal of all stored TRU waste from Idaho (i.e., waste with greater than 100 nCi/g transuranic content). It does not include LLW in this requirement. (See Topic 20 for additional information on waste-type categories.) ❖

stream characterization data, and the regulators offer credible analysis that the waste treatment and disposal will comply with all environmental regulations. Moreover, the public must then be fully appraised via a new revised Plan, so that informed decisions can be made concerning the remediation alternatives.

II. TAN V-Tank Contaminates of Concern

This discussion is an amalgam of previous (12/98) Environmental Defense Institute comments on TAN with current (4/03) remediation plan Comments in addition to EDI comments on the INEEL CERCLA Disposal Facility (ICDF) because of overlaps of Operational Units (OU), and DOE's intent to dump the TAN waste at the ICDF. Due to the long half-life of the radionuclides and the no-half-life of hazardous chemicals of concern at TAN, there is no credible reason that in the intervening four years there has been any reduction in the waste due to "decay." [5]

The 2003 TAN plan contains data is radically (orders of magnitude) inconsistent with earlier DOE data. Neither DOE nor the regulators offer any evidence justifying these crucial data discrepancies. The 2003 Plan notes the maximum concentration for V-Tanks 1,2,3, and 9, are compared to DOE's 1998 data on the same tanks for a few select contaminates in the Table A below.

Table A (see footnote # 1)

Maximum Individual Tank Contaminate	EPA Standard #	DOE Data 1998 Liquid	DOE Data 1998 Sludge	DOE Data 2003
Antimony	0.006 mg/kg	-	308 mg/kg	11.5 mg/kg
Arsenic	0.01 mg/kg	-	12.4 mg/kg	3.45 mg/kg
Barium	2.0 mg/kg	2,320 mg/kg	600 mg/kg	299 mg/kg
Cadmium	0.005 mg/kg	330 mg/kg	71.7 mg/kg	22.7 mg/kg
Chromium	0.1 mg/kg	286 mg/kg	3,770 mg/kg	1,880 mg/kg
Lead	250 mg/kg	81.7 mg/kg	3,190 mg/kg	454 mg/kg
Cesium-137	200 pC/L	12,500,000 pCi/L	6,370,000 pCi/g 6,370 nCi/g	4,480 nCi/g
Strontium	8 pCi/L	250,000,000 pCi/L	7,070,000 pCi/g 7,070 nCi/g	5,180 nCi/g

[5] Most of the major volatile organic compounds (VOC) are also dense non-aqueous phase liquid (DNAPL) which settle to the bottom of the tank liquids so few would be expected to vaporize out the tank vents over a short period of time.

Comment W2-8 (Section 13.6, Topic 21)

Response: The comment is incorrect. All of the applicable or relevant and appropriate requirements (ARARs) (which is the term used in CERCLA cleanup actions to identify the set of all environmental regu

(Continued on page 27)

Comment W2-9 (Section 13.3, Topic 10)

Response: The Agencies believe that the waste characterization data for the V-Tanks have been fully summarized, as required, in the 2003 Technology Evaluation Report and other documents on which the Proposed Plan was based. The primary source documents for the V-Tanks risk and feasibility evaluation described in the Proposed Plan are listed in Section 2.5 of this ROD Amendment. All relevant documents are in the Administrative Record, available online at http://www.inel.gov/publicdocuments/ or at the Information Repositories listed in Section 1 of this ROD Amendment.

The Proposed Plan summarizes all required information leading to this ROD Amendment. It should be noted that when a remedy requires amendment, CERCLA guidance expresses a preference that the new proposed plan highlight the proposed changes but not repeat in detail any information about the cleanup that has not changed. At each stage of the remediation process, data are reviewed for continued validity.

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Comment W2-10 (Section 13.5, Topic 18)

Response: "Decay," or the expectation that the actual concentration of the contaminants in the V-Tanks contents will decrease, or attenuate, is not part of the remedial strategy, either as selected in the 1999 Record of Decision (ROD) or as amended in this ROD Amendment. Decay of radioactive constituents in the V-Tanks contents will reduce their concentration over time. However, for the purposes of developing this ROD Amendment, the INEEL has chosen not to consider the relatively small reduction in the concentration of radioactive elements that would

(Continued on page 27)

Total transuranics V-Tanks 1,2,3,&9 including plutonium, americium, curium and neptunium	15 pCi/L (for drinking water); * 100 nCi/g (for TRU disposal)	275,406 pCi/L	42,716 pCi/g 42,831 nCi/g	26.4 nCi/g

Notes for Above Table A
* It has been a long-standing criticism of the regulators to allow DOE in joint publications to offer contaminate units different than those in the regulations (MCL) and not to present side-by-side those MCL's with samples in DOE publication data tables. This data unit issue confuses the public and exacerbates distrust.
# The above EPA Maximum Contaminate Level (MCL) Drinking Waste Standards are offered here only to provide perspective on how hazardous the TAN wastes are. See 40 CFR 141.61, 141.62, 141.66.

Since DOE plans to dump V-Tank highly contaminated soils into the tank to absorb the liquid portion of the tank contents, this will add to the total tank contaminate levels. Addition of soil to dilute the concentration of the waste is expressively prohibited in RCRA (40 CFR 268.3). The 2003 Plan acknowledges transuranic waste in the V-Tanks at 26.4 nCi/g (page 6) which is 2 ½ times higher than the greater than 10 nCi/g waste acceptance restriction for the ICDF.[6]

Additionally, a credible argument can be made that both the tank liquid and the sludge must be combined to determine if the waste elevates to the category of transuranic waste. The regulatory definition of transuranic radioactive waste is 100 nano curies per gram (nCi/g) of elements with an atomic number greater than 92 (i.e. above uranium) that also have a half-life greater than 20 years.[7] The above table shows major discrepancies in the sampling data and also suggests that this waste is at the very least "alpha low-level" or "transuranic waste" (assuming inclusion of both liquid and sludge (tank heels) and therefore, cannot be disposed of at INEEL as DOE plans at the ICDF. See discussion below on TAN waste disposal.

Federal Court Justice Edward Lodge issued a ruling on March 31, 2003 that found in favor of the State of Idaho's contention that a 1995 Settlement Agreement/Consent Order stipulates the removal of all buried transuranic waste from INEEL. This ruling ends a long-standing legal battle between the State and the Department of Energy over what waste was included in the Agreement. Judge Lodge's ruling states:

"The express language of the [Settlement] agreement, when taken as a whole, expressly requires that all transuranic waste be removed from INEEL. The parties specifically define transuranic

[6] There are two categories of waste containing transuranics; 1) waste containing transuranic elements in concentrations greater than 10 but less than 100 nCi/g is called alpha low-level waste. Prior to 1984 DOE called this material transuranic waste, but then unilaterally and arbitrarily changed it to alpha LLW; 2) currently, waste containing transuranics in concentrations greater than 100 nCi/g is classified transuranic (TRU) waste.

[7] Also see 10 CFR 61.55(a)(7) sum of the fractions rule for mixtures of radionuclides, and (a)(8) Determination of concentrations in wastes.

Comment W2-11 (Section 13.5, Topic 19)

Response: CERCLA investigations present contaminant data in unit types appropriate to the affected media (e.g., soils, water, or air) or related to the contaminant and the governing regulation (e.g., radionuclides are measured

(Continued on page 28)

Comment W2-12 (Section 13.6, Topic 24)

Response: The RCRA regulation cited does prohibit dilution — for instance through the addition of soil — as a substitute for treatment if that addition is not a contributing part of the treatment process. The alternatives developed for the V-Tanks contents were designed for treatment of the contaminants; no alternatives were considered that would not result in reduction of toxicity

(Continued on page 28)

Comment W2-13 (Section 13.5, Topic 20; Section 13.6, Topic 23; and Section 13.7.2, Topic 38)

Response: INEEL waste types are classified based not just on their chemical content but also on disposal requirements. The V-Tanks contents are classified as a mixed waste, which includes hazardous wastes (heavy metals, volatile organic contaminants [VOCs], and semi-volatile organic contaminants [SVOCs]) and low-level radioactive waste. There are transuranic elements in the V-Tanks, but not TRU waste.

Transuranic *elements* are a group of radioactive chemical elements "beyond uranium" in the periodic table, having atomic numbers greater than 92 (such as plutonium, atomic number 94). Transuranic *waste* is a legally defined category of waste, established for regulatory and management purposes. As a waste category, TRU waste contains more than 100 nanocuries (3,700 becquerels) of alpha-emitting transuranic isotopes per gram of waste and half-lives greater than 20 years (as cited in the 1995 Settlement Agreement). Although low concentrations of several transuranic elements are present in the V-Tanks contents, the concentrations of the combined sludge and liquid (with a combined weighted average of 4.27 nCi/g) are not high enough to meet the TRU waste definition. It is estimated that prior to disposal at the INEEL CERCLA Disposal Facility (ICDF), the treated V-Tanks waste will

(Continued on page 28)

waste without any limitation as to its location within INEEL nor any limitation to amount. Thus the Court is able to unequivocally state that in viewing the document in the light most favorable to the United States, the plain language of Paragraph B.1 [of the Settlement Agreement] clearly represents the parties intent at the time the agreement was drafted that the United States remove all transuranic waste located at INEEL."[8]

Additionally, the 2003 TAN Plan fails to address **all the V tanks** and other "buried" TAN waste issues. Only four of the V-Tanks are addressed in the 2003 Plan when there are at least six V-Tanks with major radioactive and hazardous waste contaminates. V-Tanks 1,2,3,9,13,and 14 volumes are 130,400 gallons. [DOE/ID-10557, Vol. IV, page 9-14] See table B below.

Unfortunately, the TAN plan still fails to provide remedial solutions that meet Applicable or Relevant and Appropriate Requirements (ARAR). Transuranic (TRU) or Greater than Class C LLW (as defined by statute) can not be dumped at the INEEL CERCLA Disposal Facility (ICDF) under current waste acceptance criteria (WAC) restrictions or Nuclear Regulatory Commission regulations on radioactive waste dumps because they must go to a geologic repository.[9] The ICDF itself is questionably in compliance with current regulations. See section III below. The Plans offers no substantive information about discrepancy of the maximum contamination levels related to individual Operational Units (OU). Consequently, the general public is effectively denied essential information upon which to make their own determination of whether the preferred alternatives were appropriate.

The Plan claims to be "the comprehensive" CERCLA investigation into TAN. This is not a "comprehensive" Plan because the ANP Cask Storage Pad, the Area 10 HTRE Reactor Vessel Burial Site, and the TAN Pool have been excluded.

An example of DOE/ID's myopic approach is the Test Area North (TAN) Comprehensive Plan's alternative of insitu vitrification (ISV) of the mixed hazardous/radioactive waste tanks. In 1996, the Oak Ridge National Laboratory (ORNL) tried the same insitu remediation approach despite public challenges to environmental law violations. The ORNL insitu project exploded putting workers and the public at extreme risk. The TAN tank waste characterization is similar to the buried waste in ORNL's insitu project.

Actually, the lessons learned are as much site related as they are complex wide related. INEEL tried a ISV project a few years ago and it exploded as well, and the containment tent got fried (burned up). Similar failed ISV projects can also be found at DOE's Hanford site. Tragically, the IDEQ and EPA, as regulators fail to inform the public about these failed ISV projects, and a member of the public may (based on inadequate information) conclude that ISV is a viable remedial technology for INEEL.

Table B

TAN V-Tank Site	Contaminate	Concentration	Reference
V-1 Tank Liquid (TSF-09/18)	STP Lists Liquid and Sludge	MLLW	STP @ 6-3
	Cobalt-60	101,000 pCi/l	(a) Table A-6-10

[8] Settlement Agreement in United States v. Batt, No CV-91-0065-S-EJL.

[9] 10 CFR 61.56

Comment W2-13 (continued)

Comment W2-14 (Section 13.4, Topic 12)

Response:: There are indeed additional underground tanks at TAN that are not addressed by this ROD Amendment. To understand their handling, it is important to note the difference between the term "v-tanks,"

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Comment W2-15 (Section 13.7.2, Topic 39)

Response: The ICDF was designed and approved by the Agencies (EPA, IDEQ, and DOE) for the disposal of contaminants such as those found within the V-Tanks. The ICDF WAC were developed to limit the concentration and quantity of contaminants to levels that would be protective

(Continued on page 29)

Comment W2-16 (Section 13.4, Topic 19)

Response: CERCLA investigations present contaminant data in unit types appropriate to the affected media (e.g., soils, water, or air) or related to the contaminant and the governing regulation (e.g., radionuclides are measured in Curies per gram). MCLs are standards that set the maximum permissible amount of a contaminant in water delivered to any user of a public system. MCLs are not relevant for the V-Tanks site because water is not an affected medium. For the contaminated media that are

(Continued on page 29)

Comment W2-17 (Section 13.8, Topic 15)

Response: The three sites listed were identified in the 1991 FFA/CO as potential contamination sites to be investigated within WAG 1. The analyses carried out on them were summarized in the 1997 RI/FS and the 1999 ROD.

TSF-06, Area 8, is the designation for the ANP Cask Storage Pad. Part of this site is currently included within the active Radioactive Parts Service

(Continued on page 30)

	Cs-134	16,900 pCi/l	(a) Table A-6-10
	Cs-137	12,500,000 pCi/l	(a) Table A-6-10
	Europium-152	83,800 pCi/l	(a) Table A-6-10
	Europium-154	93,800 pCi/l	(a) Table A-6-10
	Plutonium-238 (liquid) (sediment)	7,030 pCi/l 103 pCi/g	(c) page 15-17
	Plutonium-239 (liquid) (sediment)	3,400 pCi/l 95.8 pCi/g	(c) page 15-17
	Americium-241(liquid) (sediment)	9,230 pCi/l 230 pCi/g	(c) page 15-17
	Gross Beta	16,100,000 pCi/l	(c) 59
	Gross Gamma	24,300,000 pCi/l	(c)59
	Gross Alpha	19,800 pCi/l	(c) 59
	Tritium	11,800,000 pCi/l	(a) Table A-6-10
	Total Strontium	1,840,000 pCi/l	(a) Table A-6-10
	Total Activity Liquid Sediment	 40,400,000 pCi/L 15,000,000 pCi/g	(c) 59
	Mercury Barium Cadmium Chromium Lead Silver	0.842 mg/l 2,320 mg/kg 330 mg/kg 286 mg/kg 81.7 mg/kg 18 mg/kg	Likely Exceeds UTS mercury @ 0.15 mg/l barium @ 7.6 mg/l Cadmium @ .19 Lead @ .37 Silver @ .30 (a) Table A-6-10 & 11
	Tetrachloroethene Trichloroethene	1,800 mg/kg 23 mg/kg	Exceed LDR UTS (a) Table A-6-11
	Vinyl Chloride 1,1 Dichloroethene Chloroform 1,2 dichloroethene Carbontetrachloride Benzene Chlorobenzene		All Exceed LDR UTS (c) 8 through 12
Tank V-2 TSF-09/18	STP Lists Liquid and Sludge	MLLW	STP @ 6-3
	Cobalt-60	10,500 pCi/l	(a) A-6-10

Note: No comments were identified on this page.

	Cesium-137	20,200,000 pCi/l	(a) A-6-10
	Strontium-90	1,450,000 pCi/l	(a) A-6-10
	Gross Beta	23,400,000 pCi/l	(a) A-6-10
	Gross Gamma	38,500,000 pCi/l	(c)59
	Plutonium-238 (liquid) (sediment)	63.9 pCi/L 103.0 pCi/g	(c) page 15-17
	Americium-241(liquid) (Sediment)	18.6 pCi/L 84.0 pCi/L	(c) page 15-17
	Gross Alpha	84.9 pCi/l	(c) 59
	Total Activity Liquid Sediment	 1,090,000 pCi/L 13,000,000 pCi/g	(c) 59
	Trichloroethene Tetrachloroethene Cadmium Vinyl Chloride	All four chemicals/metals Exceed TCLP	(c) 8 through 12
	1,2-Dichloroethane Carbon tetrachloride Benzene	All three chemicals at the TCLP level	(c) 8 through 12
	18 Hazardous Chemicals	Exceed Universal Treatment Standards	(b) 10-44 40 CFR 268.48
V-3 Tank (TSF-09/18)	STP lists	MLLW	STP @ 6-3
	Plutonium-238 (liquid) (Sediment)	33.5 pCi/L 384.0 pCi/g	(c) page 15-17
	Plutonium-239(sediment)	31.1 pCi/g	(c) page 15-17
	Americium-241(liquid) (Sediment)	30.0 pCi/L 206.0 pCi/g	(c) page 15-17
	Uranium-233/234	13,300 pCi/l	(b) A-83
	Strontium-90	12,300,000 pCi/l	"
	Cobalt-60	14,800 pCi/l	"
	Cesium-137	4,230,000 pCi/l	"
	Ruthenium-103	13,600 pCi/l	"
	Tritium	6,090,000 pCi/l	"
	Nickel-63	205,000 pCi/l	"
	Gross Beta	28,300,000 pCi/l	(c) 59

Note: No comments were identified on this page.

	Gross Gamma	2,230,000 pCi/l	(c) 59
	Total Activity Liquid Sediment	 30,500,000 pCi/L 28,000,000 pCi/g	(c) 59
	Trichloroethene Tetrachloroethene Vinyl Chloride	All three chemicals/metals Exceed TCLP	(c) 8 through 12
	1,2-Dichloroethane Carbon tetrachloride Benzene	All three chemicals at the TCLP level	(c) 8 through 12
	18 Hazardous Chemicals	Exceed LDR Universal Treatment Standards	(b) 10-44 40 CFR 268.48
V-9 Tank (TSF-09/18)	STP Lists Liquid and Sludge	MLLW	STP @ 6-3
	Americium-241(liquid) (Sediment)	40,200 pCi/l 5,700 pCi/g	(b) A-91 (c) page 15-17
	Plutonium-238(liquid) (Sediment)	170,000 pCi/l 28,600 pCi/g	(b) A-91 (c) page 15-17
	Plutonium-239/240(Liq.) (Sediment)	45,300 pCi/l 7,180 pCi/g	(b) A-91 (c) page 15-17
	Uranium-233	12,400 pCi/l	(b) A-91
	Uranium-234	211,000 pCi/l	(b) A-91
	Uranium-235	6,900 pCi/l	(b) A-91
	Uranium-236	3,260 pCi/l	(b) A-91
	Uranium-238	972 pCi/l	(b) A-91
	Cesium-137	6,370,000 pCi/g	(b) A-91
	Tritium	353,000,000 pCi/l	(b) A-91
	Total Strontium	250,000,000 pCi/l	(b) A-91
	Cerium-244	5,210 pCi/l	(b) A-91
	Cobalt-60	1,160,000 pCi/l	(b) A-91
	Total Activity Liquid Sediment	 603,918,070 pCi/L 14,225,396 pCi/g	(b) A-91
	26 hazardous chemicals/metals	Exceed UTS Treatment Standards	(b) 10-44 40 CFR 268.48
PM-2A TSF-26 V-13 Tank	50,000 gallon tank	STP lists Liquids and Sludge as MLLW	STP @ 6-3

Note: No comments were identified on this page.

	Cobalt-60	45,900,000 pCi/l	(c) 31
	Europium-154	93,000,000 pCi/l	(c) 31
	Cesium-137	2,900,000,000 pCi/l	(c) 31
	Strontium-90	2,850,000,000 pCi/l	(c) 31
	Cesium-134	18,100,000 pCi/l	(c) 31
	Total Activity Curies	41,380,000,000,000 pico curies 41.38 curies	(c) 31
	31 Hazardous Chemicals/metals	Exceed UTS Treatment Standards	(b) 10-28 to 31 40 CFR 268.48
PMA-2M TSF-26 V-14 Tank	50,000 Gallon Tank	TSP Lists Liquid and Sludge as MLLW	STP @ 6-3
	Cobalt-60	191,000,000 pCi/l	(c) 31
	Cesium-134	2,000,000 pCi/l	(c) 31
	Cesium-137	9,420,000,000 pCi/l	(c) 31
	Europium-154	17,200,000 pCi/l	(c) 31
	Strontium-90	9,260,000,000 pCi/l	(c) 31
	Total Activity Curies	25,900,000,000 pico curies 25.96 curies	(c) 31
	33 hazardous chemicals/metals	Exceed UTS Treatment Standards	(b) 10-28 to 31 40 CFR 268.48
V- Tank soil	STP lists as MLLW	54,120 pCi/g	RE-P-80-090 @6

Sources:
DOE 1998 Data refers to the following reports cited here and DOE's 1998 Tan Remediation Plan ,
(a); Work Plan for Waste Area Group 1, Operable Unit 1-10, Comprehensive Remedial Investigation / Feasibility Study, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10527, March 1996. Vol I, RI/FS
(b); Comprehensive Remedial Investigation / Feasibility Study for the Test Area North Operable Unit 1-10, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10557, November 1997. (RI/FS)
(c); Field Sampling Plan for Operable Unit 1-10: Test Area North, D. L. Michael, Lockheed Idaho Technologies Company, Idaho National Engineering Laboratory, March 1996, INEL-95/0304, Vol.III RI/FS..
(d) Federal Register, May 26, 1998, Part II, Environmental Protection Agency, 40 CFR Parts 148 to 271, Land Disposal Restrictions Phase IV Final Rule

Acronyms:
LDR = Land Disposal Restrictions (40 CFR 148 through 271)
TCLP = Toxicity Characteristic Leachate Procedure (40 CFR 148 through 271)

Note: No comments were identified on this page.

UTS = Universal Treatment Standards (40 CFR 148 through 271)
PRG – Preliminary Remediation Goals (EPA cleanup goals based on risk values 12/18/96)
STP – INEEL Site Treatment Plan generated by statute requirement of the Federal Facility Compliance Act

For more information see Environmental Defense Institute's Comments on Proposed Test Area North Cleanup Plan, December 1998, available on EDI's Website, publications link.

III. Issues Related to Disposal of TAN Waste at ICDF

The Department of Energy (DOE) Idaho National Engineering and Environmental Laboratory (INEEL) issued a Record of Decision in October 1999 to, among other things, construct an on-site mixed hazardous and radioactive waste dump.[10] This decision was made within the Superfund (CERCLA) process with the concurrence of the State of Idaho and the U.S. Environmental Protection Agency (EPA). Initially, this was welcome news since the Environmental Defense Institute has for years criticized DOE's illegal waste "disposal" practices in dumps that would not even meet municipal garbage landfill regulations let alone radioactive and hazardous chemical waste. After detailed analysis of the Record of Decision, it is clear that DOE plans to repeat the mistakes of the past by siting the new dump (called the INEEL CERCLA Disposal Facility) (ICDF) not only in a flood zone, but over top of Idaho's sole source Snake River Aquifer which sustains more than 200,000 families. In short, the issue is not the construction of the new dump, but the issue is **where** it is to be built on the INEEL site. EDI's position is that there are credible alternative sites on the INEEL that are not over the aquifer or in a flood zone.

Additionally, DOE is violating other environmental laws by claiming that the CERCLA process waves the requirements of the National Environmental Policy Act (NEPA) among other laws. Attorneys conversant in the regulations say CERCLA only waive the permitting and NEPA requirements in the direct removal and remediation of a contaminated site. CERCLA does **not** in this case waive the RCRA permitting or NEPA requirements on a major $85 million ICDF dump project. Specifically, the equivalent requirements under NEPA would require DOE to evaluate, in an Environmental Impact Statement, the credible alternative siting locations for the ICDF. This was never done. Yes, DOE evaluated alternatives for on-site vers off-site disposal.......but not alternative on-site locations. Once again, the legal requirements are obfuscated not only by DOE but by the State of Idaho and the Environmental Protection Agency. Since this appears to be a "done deal" between DOE and the regulators, it appears the public's

[10] Final Record of Decision, Idaho Nuclear Technology and Engineering Center, Operable Unite 3-13, Idaho National Engineering and Environmental Laboratory, October 1999

Comment W2-18 (Section 13.7.2, Topic 49)

Response: The "ISV failures" referred to by the commenters resulted during testing of a previous version of this technology. That version was refined and improved based on analysis of these "failures." The result of these improvements is the planar ISV method. Planar ISV is the technology evaluated in the 2003 Technology Evaluation Review (TER) and presented in the 2003 Proposed Plan.

Planar ISV systems were developed to prevent the "failures" experienced during the developmental stages of ISV. These early failures were not true explosions, but rather rapid releases of air and steam bubbles through the ISV melt. As the air and steam bubbles moved through the ISV melt, to ground surface, they caused the "air-lifting" of the molten glass product within the ISV melt to lift above the subsidence crater and flow across ground level.

Details about the ORNL Melt Expulsion are documented in a 1996 report.[1] This event was only a glass flow, not an expulsion into the air (as it has commonly been misidentified by some members of the public). Move

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Comment W2-19 (Section 13.6, Topic 40)

Response: As part of the ICDF planning and design process, U.S. Geological Survey and other research data were evaluated to assess the safety of the proposed facility relative to potential flooding. The ICDF location was determined to be outside the 100-year flood plain. In addition, the ICDF will be surrounded by an engineered berm 15 ft higher than the predicted 100-year flood plain. The ICDF's compliance with key federal and state disposal facility design laws includes a cap compliant with the Resource Conservation and Recovery Act (RCRA), monitoring, and an engineered multiple liner system that includes a leachate collection and removal system, and a leak detection and removal system to inhibit fluid movement below the complex liner system. The landfill will meet additional standards for protectiveness with maintenance, monitoring, and post-closure activities that will verify protection of human health and the environment. More information about the ICDF is available on-line at http://www.inel.gov/publicdocuments/pdfs/cercla01-50671-04.pdf. ❖

Comment W2-18 (continued)

only recourse is litigation. Once again the public's rights have been trampled.

A review of the available US Geological Survey (USGS) reports related to INEEL flooding scenarios and flood control infrastructures, it is clear that DOE and the regulators ignored this information. Moreover, DOE ignored USGS recommendation that additional analyses are conducted prior to any final siting decisions are made for new waste internment and disposition of existing buried waste. Specifically, USGS recommended a two dimensional model to expand the 1998 USGS one dimension model to include the upper 95% confidence flow estimates of 11,600 cubic feet per second for the Big Lost River 100-year flood, and include modeling for the upper range limit of the 500-year estimated flow rate in the Big Lost River flood plain on the INEEL.

DOE is constructing the ICDF as a step toward meeting regulatory requirements in the Resource Conservation Recovery Act (RCRA) Subtitle-C hazardous waste disposal criteria. After 25 years of thumbing its nose at RCRA, DOE finally is making a gesture toward compliance after five decades of mismanagement of its waste streams that cause massive environmental contamination. Estimated cleanup costs of this INEEL debacle are in the range of $19 billion that will come out of our pockets as taxpayers. DOES' decision to finally comply with RCRA is marred by the wrongheaded choice of **location**, when other on-site locations would not pose the same risks to the aquifer that is already severely contaminated from INEEL waste.

DOE is constructing the ICDF immediately south of the Idaho Chemical Processing Plant (ICPP) also now called INTEC mainly for economic reasons. It is close to the ICPP where much of the waste will be generated and it is near/over existing waste water percolation ponds which are on the Superfund cleanup list, and it is over extensive soil contamination caused from ICPP stack releases. In other words, "kill three wasted birds with one stone."

The US Geological Survey released a 1998 report that modeled the **median** 100-year flow rates in the Big Lost River (that flows by the ICPP) down stream of the INEEL Diversion Dam (6,220 cf/s). The USGS report cross section number 22 at the ICPP puts the median flood elevation at 4,912 feet.[11] Again, this is only the mean flow rate (as opposed to the maximum rate of 11,600 cf/s) of just a 100-year flood, and **not** including any additional cascading events like the failure of Mackey Dam. The USGS flood map shows the northern half of the ICPP under water. There are only five-foot differences between the ICDF (south end of ICPP) elevation of 4,917 feet and the USGS predicted elevation of 4,912 feet through the middle of the ICPP. The USGS study also employed current modeling technics and plotted 37 separate cross sections on the INEEL site. The ICPP as a whole is about as flat as a table top with only a couple feet change in elevation north to south.[12] The crucial point here is that even the slightest variation in a Big Lost River flood would put the ICDF underwater assuming the dump was on the surface. Proportionally less variation in floods would inundate the dump the deeper the ICDF is buried below the surrounding terrain.

An earlier USGS study in 1996 also estimated the flow range for the Big Lost River at the INEEL; "The upper and lower 95-percent confidence limits for the estimated 100-year peak flow were

[11] Preliminary Water-Surface Elevations and Boundary of the 100 Year Peak Flow in the Big Lost River at the Idaho National Engineering and Environmental Laboratory, Idaho, US Geological Survey, Water-Resources Investigations Report 98-4065, DOE/ID-22148

[12] Topographic Map of Block 21, National Reactor Testing Station (now called INEEL) showing works and structures, U.S. Atomic Energy Commission, Idaho Operations Office, shows three feet change in elevation between the north and south end of the ICPP.

11,600 and 3,150 cubic feet per second (cf/s), respectively." [13]

Since 1950, INEEL has experienced significant flooding events (localized and site-wide) in1962, 1965, 1969, 1982, and 1984. In an effort to mitigate the flooding problem, DOE built a diversion dam on the Big Lost River that is designed to shunt flood waters to the south and away from INEEL facilities. USGS's 1998 report that modeled the mean (midrange) 100-year flow rate of 7,260 cf/s upstream of the INEEL diversion dam. USGS estimated that the Big Lost median flow rate downstream of the diversion dam at 6,220 cf/s with a thousand cf/s going down the diversion channel for a total median flow rate of 7,260 cf/s upstream of the INEEL diversion dam. [14] "This peak flow was routed down stream [of the Big Lost River] as if the INEEL diversion dam did not exist. On the basis of a structural analysis of the INEEL diversion dam (U.S. Army Corps of Engineers) assumed the dam incapable of retaining high flows. The Corps indicated that the diversion dam could fail if flows were to exceed 6,000 cubic feet per second."[15]

This USGS study acknowledged that the northern half of the ICPP would be flooded with four feet of moving water, even at this midrange (mean) flow rate. If ICDF excavation goes two feet below present surfaces, it will be below the elevation of the mean 100 year flood zone. Plans are to excavate ICDF pits most of the entire 50 feet to bedrock.

Since the radioactive waste will be extremely hazardous for tens of thousands of years and flooding will flush contaminates down into the aquifer, a conservative risk assessment would model the upper 95-percent confidence limits for the estimated 100-year peak flow of 11,600 cf/s. USGS has proposed this additional research to DOE, but the Department is not willing to provide the funding. A USGS hydrologist notes, "The flow of 11,600 cfs represents the upper 95 percent confidence limit flow for the estimated 100-year peak flow (Kjelstrom and Berenbrock, 1996, p6). Future modeling needs are to model the area with this flow. We've expressed this to the INEEL and also have expressed that the WSPRO model used has limitations and that an application of more stringent models (two dimensional) is needed to refine and better delineate the extent of possible flooding of the Big Lost River." [16]

USGS estimates the mean 500-year Big Lost River flood rates at 9,680 cf/s (34% greater flow rate than the mean 100 year flood).[17] This 500-year flood would inundate the ICPP and surrounding area. These potential hazards are being ignored when making hazardous mixed radioactive waste internment decisions in these vulnerable areas despite the long-term consequences and the potential for additional aquifer contamination.

Comment W2-18 (continued)

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[13] Estimated 100-Year Peak Flows and Flow volumes in the Big Lost River and Birch Creek at the Idaho National Engineering Laboratory, Idaho, U.S. Geological Survey, Water-resources Investigations Report 96-4163, L.C. Kjelstrom and C. Berenbrock, 1996, page 9.

[14] Preliminary Water-Surface Elevations and Boundary of the 100 Year Peak Flow in the Big Lost River at the Idaho National Engineering and Environmental Laboratory, Idaho, US Geological Survey, Water-Resources Investigations Report 98-4065, DOE/ID-22148

[15] USGS 98-4065, page 8

[16] Charles E. Berenbrock, U.S. Geological Survey Hydrologist, March 25, 1999 email to Chuck Broscious

[17] Estimated 100 Year Peak Flows and Flow Volumes in the Big Lost River and Birch Creek at the Idaho National Engineering Laboratory, U.S. Geological Survey, Water Resources Investigations Report 96-4163, page 11 shows flow rates for 5-year, 10-year, 100-year, and 500-year floods

Cascading events also are not considered. This is known as a worst case scenario where one event triggers another event. For instance a 500-Year flood plus failure of Mackay Dam (built in 1917) resulting in estimated flows of 9,700 + 54,000 cubic feet per second respectively would be an example of a cascading event. Failure of Mackey Dam is non-speculative in view of the 1976 failure of the Teton Dam of similar construction and the fact that Mackey Dam lies within 11 miles of a major earthquake fault line that produced the 1983 Borah Peak 7.3 magnitude quake. An internal 1986 DOE report that analyzed the impact of Mackey Dam failure scenarios notes that, "Mackay Dam was not built to conform to seismic or hydrologic design criteria," and "the dam has experienced significant under seepage since its construction." [18] This EG&G study acknowledged that the ICPP, Navel Reactors Facility, and the Test Area North (LOFT) facilities would be flooded with at least four feet of water moving at three feet per second.

USGS did not consider cascading events but noted previous studies showing that failure of Mackay Dam alone would result in 6 feet of water at the INEEL Radioactive Waste Management Complex (RWMC) waste burial grounds. Other studies recognized by USGS note that, "Rathburn (1989, 1991) estimated that the depth of water at the RWMC, resulting from a paleo-flood [early] of 2 to 4 million cf/s in the Big Lost River in Box Canyon and overflow areas, was 50-60 feet." "If Mackey Dam failed, Niccum estimated that peak flow at the ICPP would be at 30,000 cfs." [19] Comparing these flow rates with the USGS estimate 100-year mean flow of 6,220 cfs that would flood the north end of the ICPP with four feet of water, and a Mackey Dam failure becomes a real disaster potential with respect to the existing underground waste tanks and underground spent reactor fuel storage at the ICPP.

DOE is relying extensively on the Big Lost River Diversion Dam (located at the western INEEL boundary) to shunt major flood waters away from INEEL facilities. The last comprehensive analysis of this diversion dike system (below the diversion dam) was conducted by USGS in 1986 in a report titled *Capacity of the Diversion Channel below the Flood Control Dam on the Big Lost River at the INEL*. In this study USGS estimated a mean flow rate of 9,300 cf/s, 7,200 of which went into the diversion channel and "2,100 cf/s will pass through two low swells west of the main channel for a combined maximum diversion capacity of 9,300 cfs." "A sustained flow at or above 9,300 cf/s could damage or destroy the dike banks by erosion. Overflow will first top the containment dike at cross section 1, located near the downstream control structure on the diversion dam." [20] This USGS study did not analyze the construction of the diversion dikes but they would likely fail as did the upstream diversion dam, built at the same time, that the Army Corps of Engineers found structurally deficient. "On the basis of a structural analysis of the INEEL diversion dam (U.S. Army Corps of Engineers, written comments, 1997), the dam was assumed incapable of retaining high flows. The Corps indicated that the diversion dam could fail if flows were to exceed 6,000 cfs. Possible failure mechanisms are: (1) erosion of the upstream face of the dam that results from high-flow velocities and loss of slope protections (rip-rap), (2) overtopping of the diversion dam by flows exceeding the capacity of the diversion channel and culverts, (3) piping and breaching of the diversion dam because of seepage around the culverts, and (4) instability of the dam and

Comment W2-18 (continued)

[18] Flood Routing Analysis for a Failure of Mackey Dam, K. Koslow, D. Van Haflten, prepared by EG&G Idaho for U.S. Department of Energy, June 1986, EGG-EP-7184, page 15

[19] USGS 98-4065, page 6

[20] Capacity of the Diversion Channel Below the Flood Control Dam on the Big Lost River at the Idaho National Engineering Laboratory, US. Geological Survey Water Resources Investigations Report 86-4204, C. M. Bennet, page 1 and 25

its foundation because of seepage."[21]

Failure of the diversion dam and/or the diversion channel dikes would also directly impact the Radioactive Waste Management Complex (RWMC) waste burial grounds. A 1976 USGS report notes, "The burial ground is within 2 miles (3.2 km) of the Big Lost River and the surface is approximately 40 feet (12 m) **lower than the present river channel**. Sediments in the burial ground contain grains and pebbles of limestone and quartzite, suggesting that in recent geologic past, flood waters of the Big Lost River flowed through the burial ground basin. Two eroded notches or 'wind-gaps' in the basalt ridge bordering the west of the burial ground also suggest past Big Lost River floods." "A large diversion system on the Big Lost River was constructed by the AEC to control flood waters by diverting water into ponding Areas A, B, C, and D. The nearest of these, Area B is less than a mile [south] from and about 30 feet (9m) **higher** in elevation than the burial ground." [22]

USGS *Arco Hills SE* and *Big Southern Butte* quadrangle topographic maps clearly show the RWMC flooding vulnerability as do other USGS reports that note, "If [diversion] dike 2 [at ponding Area B] fails, large flows will drain directly toward the solid radioactive waste burial grounds." [23] These vulnerabilities must be taken into consideration when DOE attempts to leave the buried transuranic waste at the RWMC and not exhume and relocate it to a safe permanent repository.

Building dams around the INEEL CERCLA Disposal Facility (ICDF) as was done at the RWMC is not an acceptable flood protection answer because lateral water migration will go under the dams and local precipitation will be held in exacerbating the leachate conditions. The liner of the ICDF will not be capable of maintaining integrity with the increased hydraulic pressure during a flood because liners are only capable of blocking what minimal surface water may leak past the cap and infiltrate the waste. There are good legitimate reasons why dumps (even municipal garbage dumps) are not allowed by statute in flood zones or above sole source aquifers. Dams by definition are only functional if there is regular maintenance which cannot be assumed once DOE ends institutional control of INEEL in a hundred years. 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. Regulator's contention that there is a degree of efficiency in co-locating the ICDF with the ICPP percolation ponds that they must be remediated along with the "windblown" soil contamination area around the percolation ponds not only defies' common sense but is also illegal.

DOE must designate another location for the ICDF that is not near a flood plain and not over the aquifer. DOE's own study has identified at least two such sites (on the INEEL) where the Lemi Range meets the Snake River Plain. [24] DOE has not seriously considered these alternative sites as would normally be required under the National Environmental Policy Act (NEPA), stating that the sites were eliminated from consideration due to increased seismic activity. There is no documented evidence of this

[21] USGS 98-4065, page 9

[22] Hydrology of the Solid Waste Burial Ground, as Related to the Potential Migration of Radionuclides, Idaho National Engineering Laboratory. U.S. Geological Survey, Open File Report 76-471, J.Barraclough, August 1976, page 8

[23] Probability of Exceeding Capacity of Flood-Control System at the National Reactor Testing Station, Idaho, U.S. Geological Survey Water Resources Division, P.Carrigan, JR., 1972, page 4

[24] Moriarty, T. P., Feasibility of Locating Dry Storage of Spent Nuclear Fuel on Idaho National Engineering Laboratory Land at a Site That Does Not Overlie the Snake River Aquifer, November 1995

Comment W2-18 (continued)

Comment W2-20 (Section 13.7.1, Topic 26)

Response: The Agencies disagree. Under DOE's CERCLA/NEPA Policy, DOE relies on the CERCLA process for the review of actions to be taken under CERCLA; that is, no separate NEPA document or NEPA process is ordinarily required. NEPA values were addressed, to the extent practicable, in the Operable Unit (OU) 3-13 Remedial Investigation and Feasibility Study (RI/FS) and Record of Decision (ROD), with the associated CERCLA public involvement process. The OU 3-13 ROD, which was signed in 1999, selected remedies for Waste Area Group (WAG) 3 sites, including the creation of the ICDF complex. The ICDF was not permitted under RCRA because, under Section 121 (e) of CERCLA, it is exempted from permitting requirements as long as the applicable substantive requirements of RCRA are met. The ICDF is designed to meet the substantive requirements for a RCRA hazardous waste landfill.

alternative site analysis. No empirical risk assessment was conducted to compare the relative risk of a location over a sole source aquifer and in a flood plain (ICPP) as opposed to a site with a slightly higher seismic risk not over the aquifer or in a flood zone (Lemi Range terminus). Other credible options include purchasing land contiguous to the northern end of the INEEL site near the terminus of the Bitterroot Range that also would be off the aquifer and not in a flood zone and have more soil cover over the bedrock.

Another misguided project outlined in DOE's October 1999 Record of Decision is the construction of new ICPP process waste percolation ponds midway between ICPP and Central Facilities Area to the south. For a detailed analysis of this project see the Environmental Defense Institute's *Ground Water Contamination at INEEL Report* available at http://home.earthlink.net/~edinst/

Nuclear Regulatory Commission restrictions prohibiting citing radioactive waste disposal dumps on 100 year flood plains must be observed. [NRC 10 CFR ss 61.50 The reason for these restrictions is because the flood water will leach the contaminates out of the waste and flush the pollution more rapidly into the aquifer. Since these wastes will remain toxic for tens of thousands of years, they must be disposed of responsibly in a safe permanent repository. These issues must be kept in mind also with respect to the ICPP high-level waste tanks that are some forty feet underground as well as the underground spent reactor fuel storage and calcine storage bins at the ICPP. Water acts as a moderator and if the underground spent fuel vaults are flooded, it could cause a criticality. All of these underground high-level waste sites are extremely vulnerable. Former ICPP workers recall stacking sandbags six feet high around the plant during a Spring flood about ten years ago. The added external hydrologic pressure on the high-level waste tank concrete vaults could collapse the vaults and the tanks inside, and thus release the contents. These risks must be considered when DOE decides to leave the high-level waste tank sediments permanently in place as a cost cutting measure.

The ICDF, siting, engineering design, and waste acceptance criteria (WAC) must be developed with public involvement through a free and open discussion. The legal requirements of the process are spelled out in the National Environmental Policy Act that requires Environmental Impact Statements and public hearings. 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-low-level waste 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 in addition to the NEPA requirements. 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".

USGS reports identified factors favoring downward waste migration. "In order for waste isotopes to be carried downward by water, four basic requirements are needed: 1.) availability of water, 2.) contact of the water with the waste, 3.) solubility or suspendability of the waste in water, 4.) permeability in the geologic media to allow water flow downward." [25] This USGS report describes in detail how all four conditions are met at INEEL including the solubility factor where they note "Hagan and Miner (1970) leached five different categories of solid waste from Rocky Flats [the main source of plutonium in the RWMC] with ground water from the INEL and Rocky Flats and measured the plutonium concentrations and pH of the leachate. They found the highest Pu-239 concentration in leachates from the acidic-graphite wastes, 62,000 to 80,000 ug/l plutonium or (3.8×10^{9} to 4.9×10^{9} pCi/L)." [Ibid]

[25] USGS 76-471 page 68-69

Comment W2-18 (continued)

Comment W2-21 (Section 13.6, Topic 37)

Response: The ICDF meets the CERCLA criteria for "Overall Protectiveness" and "Long-Term Effectiveness" with an engineered design that prevents both potential downward mobility of waste and exposure via surface pathways to current and future workers, future residents, and the environment. DOE will manage institutional controls at the ICDF for a minimum of 100 years to continue its protectiveness. After 100 years, institutional controls will still be required to maintain protectiveness as long as hazardous substances constitute a threat or potential threat to the underlying aquifer, the public, workers, or the environment. The owner of the property after 100 years, whether DOE, another Federal agency, or any other entity, will be required to maintain institutional controls until such time as the land can be released for unrestricted and unlimited use.

Comment W2-22 (Section 13.2, Topic 27)

Response: NRC regulations prohibit the disposal of radioactive waste in 100-year flood plains. Although these NRC regulations are not applicable to the ICDF, the ICDF complies with this requirement. The INEEL CERCLA Disposal Facility (ICDF) is outside the 100-year flood plain. In addition, the ICDF will be surrounded by an engineered berm 15 feet higher than the predicted 100-year flood plain elevation. As part of the ICDF planning and design process, research data from the U.S. Geological Survey and other sources were evaluated to confirm the safety of the proposed facility relative to potential flooding.

Comment W2-23 (Section 13.1, Topic 5; Section 13.2, Topic 8; and Section 13.6, Topic 26)

Response: Development of new missions at the INEEL is a separate issue from the remediation of contamination resulting from past activities. Cleanup activities at Test Area North (TAN), including the V-Tanks remediation, are required by the long-standing obligation of

(Continued on page 32)

The most reliable indicators of contaminate migration are onsite sampling data. Cesium-137, plutonium-238,-239,-240 were all found at the 240 foot interbeds under the RWMC. [illegible] Forty-one % of the samples from the 240 foot interbeds contained radionuclides. [illegible] Other literature confirmation of plutonium at 240 feet includes: "Radionuclides (including Pu-238,-239,-240, Am-241, Cs-137, Sr-90) have been detected in soils and in sedimentary interbeds to a depth of 240 feet beneath the RWMC, (Hodge et al, 1989)." "Positive values for Pu-238,-239,-240 were detected in samples obtained from the 240 foot interbed in bore hole DO2."[illegible] Radionuclides are also confirmed in the aquifer under the RWMC. [illegible] USGS water sampling data at the 600 foot levels, expressed in pico curies per liter (pCi/l) show: .

For more information on the contaminate migration from INEEL buried waste see EDI website publication on "Snake River Aquifer at Risk". http://perosonalpages.tds.net/~edinst

In summary of Section III, ICDF site selection is illegal under statutes Nuclear Regulatory Commission (NRC) rules that prohibit siting of radioactive waste dumps in 100 year flood plains (10 CFR 61.50) which the agencies are obliged to conform to if their commitment to Applicable or Relevant and Appropriate Requirement (ARAR) is genuine

This particular argument revolves around the fundamental definition of the 100-yr flood zone. USGS conducted an extensive study in 1998 that defined the upper and lower 95% confidence level on the flow rates for a 100-year flood.

1. The upper rate is estimated at 11,600 cfs and the lower rate is 3,150 cfs
2. USGS chose for some unknown reason (perhaps pressure from DOE) to plot only the mean flow rate (average between upper and lower) of 6,220 cfs
3. USGS assumptions base on previous Army Corps of Engineers and other EG&G studies that the Diversion Dam would fail with flows in excess of 6,000 cfs so the diversion dam was mostly discounted.
4. USGS ploting of the mean 100 year flow rate does **not define the flood zone.** It only shows where the likely areas that will be effected during an average flood. This mean plot should never be used for making major facility siting decisions.
5. The appropriate definition of the 100 year flood zone is to plot the upper bound 95% confidence level flow rate, which USGS attempted to convince DOE to fund, but were refused funding.
6. No credible empirical rationale can be presented to define the 100 year flood zone based on the plotting of the mean flow rate as DOE and the regulators are doing.
7. Given that the upper bound 95% confidence level flow rate is nearly twice what the mean flow rate ....this is a significant spread.

The apparent top of the ICDF berm is about 10 feet above the USGS plotted **mean** of the 100 year flood at INTEC. Absent a through USGS study that plots the upper level flow rate and the resultant flooding given the near level topography of the INTEC environs, there is a lot of uncertainty about whether the berm is high enough.

Additional uncertainty is the ability of the berm to survive the three feet per second rush of the flood and the erosion that would be expected to occur.

The ten foot berm would also be expected to erode over time from natural wind and precipitation which would eliminate that minimal flood barrier. Who is going to be around in 200 years to maintain that berm? If the berm was breached, is the liner adequate to maintain integrity with a hydriodic head of nearly 50 feet?

500 year flood MEAN is estimated at 9,600 cfs.....Claims of 1,000 year durability of ICDF mandates inclusion of the 500 year flood impact. Cascading event of Macky Dam.....++ 54,000 cfs

Comment W2-18 (continued)

Comment W2-24 (Section 13.6, Topics 25 and Topic 28)

Response: Grouting is the process of adding appropriate stabilization agents such as portland cement that will chemically bind with the hazardous metals. This stabilization step reduces the leachability of these metals, making it harder for these contaminants to be released into the environment. This reduction in leachability is required to meet both RCRA LDRs and the WAC for any disposal facility. The U.S. Environmental Protection Agency (EPA) has reviewed the inherent dilution that takes place during stabilization treatment processes. This dilution is considered acceptable when there is a significant reduction in leachability of hazardous contaminants and when appropriate volumes of stabilization materials are used. The selected remedy will deploy a stabilization process that meets those goals.

The Agencies recognize that when hazardous metals are stabilized, there is not only a dilution of the hazardous metals as discussed above in Topic 24 but also a dilution of the other constituents, including the radioactive contaminants. The Agencies concur that this inherent dilution is acceptable when this dilution occurs as a result of treatment necessary to meet either Resource Conservation and Recovery Act (RCRA) land disposal restrictions (LDRs) or disposal facility waste acceptance criteria (WAC).

No. The selected remedy includes stabilization as a treatment step. WAC maximum contaminant concentration levels apply to the waste as received at the disposal facility. (See response to Topic 24 for further details that may relate to this concern.)

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Cost benefit analysis did not take in to account long term impact on the potential further contamination of the sole source Snake River Aquifer and how it would affect health and safety not to mention agriculture.

Comment W2-18 (continued)

(Continued from page 8)

Response to Comment W2-1 (continued):
barium, cadmium, chromium, and lead have inappropriate unit labels. These values appear to have been taken from the *Work Plan for Waste Area Group 1, Operable Unit 1-10, Comprehensive Remedial Investigation/Feasibility* Study (S. M. Lewis, et al., 1996 [DOE-ID/10527]), which mistakenly labeled the Toxicity Characteristic Leaching Procedure (TCLP) values for those metals as mg/kg instead of µg/L. This error by the INEEL makes the reported values appear 1,000 times higher than they actually were. The error was found and the data reported correctly in all follow-up documents. As these data are TCLP values, which represent the quantity of each metal that can leached from a waste with an acidic solution, they should not be taken as representing the liquid waste in the V-Tanks. It is inappropriate to contrast these leachate concentrations to the total concentrations reported in the rest of the commenting group's Table A.

The sludge values cited by the commenting group in the same table appear to show a consistent drop from data referenced in the 1998 Proposed Plan to the values listed in the 2003 Proposed Plan. The INEEL does not make this claim. The apparent decrease in concentrations is the result of an inappropriate comparison of the solids in one tank to the combination of solids and liquids in a different tank. Because most of the contamination is in the sludge phase, the overall waste stream, which combines both the sludge and water, has a lower overall concentration. This lower overall waste concentration is more representative of the waste that is actually in the tanks and that must be treated to meet disposal criteria.

Information on contaminants is refined and updated whenever new data becomes available from sampling, or when regulatory requirements change. The Agencies evaluate the potential impact of any substantial change in data regarding a cleanup site. As of the 2003 Proposed Plan, the most recent comprehensive presentation of data on the contaminants in the V-Tanks contents can be found in the Engineering Design File EDF-3868, which is available in the Administrative Record.

Data are also reviewed for continuing validity at each stage of the remediation process. As described in Section 10.1 of this ROD Amendment, a labo

Response to Comment W2-1 (continued):
ratory error in calculating the concentration of inorganic contaminants was found and corrected in Table 2-2 of this document. These data changes, while different from the 2003 Proposed Plan and previous documents, would not have significantly affected the technology evaluation and do not affect the remedy selected in this ROD Amendment. ❖

(Continued from page 8)

Response to Comment W2-2 (continued):
rounding contaminated soil has not changed in any substantive way from the 1999 ROD, the details of how remediation of the surrounding soil will be carried out have been clarified (see Section 11.2). The V-Tanks contents remedy described in this ROD Amendment is part of an overall cleanup strategy that will eliminate risk to human health and the environment from both the V-Tanks contents and the surrounding contaminated soil. ❖

(Continued from page 8)

Response to Comment W2-3 (continued):
ignation in the Federal Facility Agreement and Consent Order (FFA/CO), and was defined as containing only four v-type tanks: Tanks V-1, V-2, V-3, and V-9. These are the four described in the 2003 Proposed Plan and this ROD Amendment. The amended remedy for the V-Tanks site properly addresses only the four tanks contained in this site, as established by the FFA/CO.

Besides the four v-type tanks in the V-Tanks site, two other v-type tanks that were in use at TAN require remediation. These are Tanks V-13 and V-14, which were designated in the FFA/CO as TSF-26 and are also referred to as the PM-2A tanks. The PM-2A tanks are currently being cleaned up under the remedy selected in the 1999 ROD (see Section 7 of that ROD). Since the remedy for the PM-2A tanks is unchanged from the 1999 ROD, it was not addressed in the 2003 Proposed Plan.

Other v-type tanks (e.g., Tank V-4) were located in TAN Building 616. The building and its contents, including these other v-type tanks, are being, or have already been, removed under the INEEL's Deactivation, Decommissioning, and Dismantlement (D&D&D) Program. Those components of Building 616 that managed hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) are also being addressed under a RCRA closure plan. (Topic 13 provides more information on the closure plan.) ❖

(Continued from page 9)

Response to Comment W2-5 (continued):
ners to and regulators of DOE (the "lead agency"). Cleanup activities at the INEEL are directed by project managers who represent each of the three Agencies. The project managers or their support staff meet or con fer weekly on cleanup status during all phases of each remediation. Through this coordinated effort, the Agencies jointly develop the necessary work plans, technical investigations, and other documents, including proposed plans and records of decision (RODs).

The State and EPA review and comment on all key documents for cleanup. In addition, State and EPA representatives are active participants in meetings, briefings, and workshops, either in person or by teleconference. Both the State and EPA may also hold meetings and briefings on the cleanup program. This ROD Amendment, like all INEEL RODs, is the result of a substantial and sustained process of regulatory enforcement and oversight by the support agencies.

Questions and comments about INEEL activities, and the State's and EPA's oversight, can be addressed to the Agencies:

Nick Ceto
INEEL Program Manager
U.S. Environmental Protection Agency Region 10
712 Swift Boulevard, Suite 5
Richland, WA 99352
Phone: (509) 376-9259

Daryl Koch
Manager of Federal Facilities Section,
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706
Phone: (208) 373-0492

Response to Comment W2-5 (continued):

Kathleen E. Hain, Director
DOE Environmental Restoration Program
U.S. Department of Energy Idaho Operations Office
P.O. Box 1625
Idaho Falls, ID 83415-3911
Phone: (208) 526-4392

In addition to mailings and public meetings, the INEEL provides additional avenues for public involvement, including tours and briefings. These are described in each proposed plan and on-line at http://cleanup.inel.gov/getinvolved/. The INEEL Community Relations Plan (available on-line at http://cleanup.inel.gov/publicdocuments/remediation/) explains more about these opportunities for comment and involvement. Community Relations Plan Coordinator Joseph Campbell can be reached at (208) 526-3183.

The investigation and cleanup process and schedule for Test Area North (TAN) have complied with the FFA/CO. Every reasonable effort is made to ensure that TAN remediation activities contribute to the ultimate goal of protecting human health and the environment by use of recognized engineering and institutional responses that meet standards for protectiveness identified by the Agencies. These standards (the applicable and relevant or appropriate requirements, or ARARs) were originally identified in the 1999 ROD and in this ROD Amendment and will be enforced by the Agencies. The remedies proposed for Waste Area Group (WAG) 1 sites are in no way illegal.

The cleanup process carried out for TAN has included all required community relations activities to ensure that the public has been provided appropriate opportunities for involvement in a wide variety of site□related decisions, including site analysis and characterization, alternatives analysis, and remedy selection. The public meetings, the proposed plans and associated comment periods, and the Administrative Record all provided opportunities for the community to learn about the WAG 1 remediation and to inform the Agencies about their concerns. The Agencies hope that the WAG 1 CERCLA process with its public comment opportunities, in conjunction with other regulatory hearing processes required by the Resource Conservation and Recovery Act (RCRA), will help build trust in the INEEL's path forward to cleanup completion. ❖

Response to Comment W2-4 (continued):
nated environmental media not identified by the Federal Facility Agreement and Consent Order (FFA/CO) or in the 1999 ROD will be discovered in the future as a result of routine operations, maintenance activities, or dismantlement, decommissioning, and decontamination (D&D&D) activities at TAN. Newly discovered sites will be addressed using the process for new site inclusion as defined in the FFA/CO and refined in the 1999 ROD and will be assessed and remediated under CERCLA pursuant to the process agreed upon by the Agencies at the time of the new site identification. Where appropriate, the remedial action objectives (RAOs) and final remediation goals (FRGs) identified in the 1999 ROD and this ROD Amendment will be used to complete any necessary cleanup. ❖

(Continued from page 10)
Response to Comment W2-8 (continued):
lations and laws that apply to the action) relevant to this action were identified during preparation of the 2003 Technology Evaluation Report [TER], on which the 2003 Proposed Plan was based. None of the ARARs prohibit disposal of the V-Tanks contents, or the surrounding contaminated soil, at an approved disposal facility on the INEEL. The 2003 Proposed Plan presented and evaluated those technologies found capable of meeting the ARARs. After this ROD Amendment is signed, the selected treatment technologies will move from conceptual design into full remedial design. As part of this remedial design phase, safety plans and other work documents will specify in detail how each individual ARAR will be met. These documents will be placed in the INEEL Information Repository as each is completed and approved. ❖

(Continued from page 10)
Response to Comment 2-9 (continued):
As described in Section 10.1 of this ROD Amendment, a laboratory error in calculating the concentration of inorganic contaminants was found and corrected in Table 2-2 of this document. These data changes, while different from the 2003 Proposed Plan and previous documents, would not have significantly affected the technology evaluation and do not affect the remedy selected in this ROD Amendment. The three Agencies believe that the Proposed Plan for this ROD Amendment represents a complete document and see no need to develop a more extensive Proposed Plan.

The ICDF waste acceptance criteria (WAC) will be completely satisfied by the treated V-Tanks waste submitted for disposal. The concentration of the transuranics in the tanks is currently 4.27 nCi/g and will be reduced even further through treatment. These concentrations are well below the ICDF waste acceptance levels. See Sections 14.5 and 14.6, below, for more discussion of the ICDF WAC and other ARARs that will be met by this cleanup. ❖

(Continued from page 10)
Response to Comment 2-10 (continued):
have occurred since the original data were collected. The discrepancies noted by the commenting group stem from a data labeling error in a 1996 INEEL report combined with Comment 2-10 (continued): an inapplicable data comparison by the commenting group. Given that the 1996 data cited are incorrectly labeled, the commenting group's conclusion that this represents "decay" is also inapplicable here. The correct data for the V-Tanks radioactive constituent concentrations are in the 1997 Remedial Investigation/ Feasibility Study (RI/FS) and all following documents for this action. (See Topic 17 for more information on contaminant characterization.) ❖

(Continued from page 11)

Response to Comment 2-11 (continued):
in Curies per gram). MCLs are standards that set the maximum permissible amount of a contaminant in water delivered to any user of a public system. MCLs are not relevant for the V-Tanks site because water is not an affected medium. For the contaminated media that are present in the V-Tanks contents and contaminated soil, risk reduction goals use other measurement standards as appropriate, which are presented in the 1999 Record of Decision (ROD), the 2003 Proposed Plan, and this ROD Amendment in sections on remediation objectives and goals.

Because regulatory compliance for CERCLA remediation is generally so complex, details cannot be fully specified in the Proposed Plan. They are presented in the supporting documents, which are available in the Administrative Record. The commenting group's suggestion for development of clearer explanations of contaminant concentration data, and how the treated waste will comply with regulatory requirements, will be forwarded to the INEEL Community Relations office for improved presentation in future public documents. Reduction of toxicity, mobility, and volume through treatment is a CERCLA evaluation criterion, and data for the comparison are also available in the Administrative Record for those who are interested. For the V-Tanks amended remedy, Section 5 of the 2003 Technology Evaluation Report (TER) compares estimated concentrations of the treated waste for key contaminants to the regulatory levels, in equivalent units. ❖

(Continued from page 11)

Response to Comment W2-12 (continued):
and the mobility of the contaminants. Several of the alternatives, as described in the 2003 Proposed Plan, would add some of the contaminated soil surrounding the V-Tanks to enhance the treatment process. For example, vitrification would add soil as a source of silicon to allow the melting process to produce a more stable glass waste form. While this would dilute the concentration of contaminants, it would not be done to avoid treatment but rather to improve treatment effectiveness and control during the treatment process.

Response to Comment W2-12 (continued):
This is allowed by the U.S. Environmental Protection Agency's (EPA's) RCRA program (as documented in the June 1, 1990, *Federal Register* at 55 FR 22666). The selected remedy, using chemical oxidation/reduction, does not add any soil to the treatment process. As noted in the response to Topic 21, above, the average concentration of 4.27 nCi/g in the V-Tanks contents is well below the ICDF's waste acceptance criterion of 10 nCi/g, even prior to treatment. ❖

(Continued from page 11)

Response to Comment W2-13 (continued):
have a transuranic concentration of approximately 2 nCi/g, well below the 10 nCi/g limit for the ICDF and the 100 nCi/g TRU waste designation.

It is correct that the V-Tanks contents are classified as low-level waste (LLW) and that the waste contains alpha-emitting radionuclides. However, it is not correct that this makes the V-Tanks remediation subject to the 1995 Settlement Agreement. By definition, LLW is waste that does not meet the definitions for high-level waste (HLW), transuranic (TRU) waste, spent nuclear fuel, or by-product materials. The 1995 Settlement Agreement requires the removal of all stored TRU waste from Idaho (i.e., waste with greater than 100 nCi/g transuranic content). It does not include LLW in this requirement. (See Topic 20 for additional information on waste-type categories.)

The V-Tanks contents do not meet the definition of TRU waste (>100 nCi/g; see response to Topic 20.) The response to Topic 21 explains in more detail how the concentrations are measured. The highest concentration of contaminants in the V-Tanks is that shown in Table 2 of the 2003 Proposed Plan, which is in the sludge. When the contents of all four tanks are combined for remediation, the overall concentration of transuranics in the V-Tanks is below 10 nCi/g before treatment. After treatment, the V-Tanks waste will have a TRU concentration of approximately 2 nCi/g, well below the 10 nCi/g limit for the ICDF and the 100 nCi/g threshold for TRU waste designation. Since the 1995 Settlement Agreement applies to TRU waste and the V-Tanks contents are not TRU waste (even though they contain transuranic elements), the V-Tanks waste is not required to be removed from Idaho. ❖

(Continued from page 12)

Response to Comment W2-14 (continued):
which identifies a kind of underground storage vessel, and the site name "the V-Tanks," which identifies a particular location to be remediated. The V-Tanks site addressed in this ROD Amendment received that designation in the Federal Facility Agreement and Consent Order (FFA/CO), and was defined as containing only four v-type tanks: Tanks V-1, V-2, V-3, and V-9. These are the four described in the 2003 Proposed Plan and this ROD Amendment. The amended remedy for the V-Tanks site properly addresses only the four tanks contained in this site, as established by the FFA/CO.

Besides the four v-type tanks in the V-Tanks site, two other v-type tanks that were in use at TAN require remediation. These are Tanks V-13 and V-14, which were designated in the FFA/CO as TSF-26 and are also referred to as the PM-2A tanks. The PM-2A tanks are currently being cleaned up under the remedy selected in the 1999 ROD (see Section 7 of that ROD). Since the remedy for the PM-2A tanks is unchanged from the 1999 ROD, it was not addressed in the 2003 Proposed Plan.

Other v-type tanks (e.g., Tank V-4) were located in TAN Building 616. The building and its contents, including these other v-type tanks, are being, or have already been, removed under the INEEL's Deactivation, Decommissioning, and Dismantlement (D&D&D) Program. Those components of Building 616 that managed hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) are also being addressed under a RCRA closure plan. (Topic 13 provides more information on the closure plan.) ❖

(Continued from page 12)

Response to Comment W2-15 (continued):
of human health and the environment, including the aquifer. Concentrations and quantities in excess of these levels are not accepted for disposal. Although NRC regulations do not apply to the ICDF, the contents of the V-Tanks would be acceptable for disposal under those regulations.

Only INEEL CERCLA wastes are acceptable for disposal at the ICDF. These wastes can include low-level radioactive waste (LLW), mixed low-level radioactive waste (MLLW), hazardous waste, and non-liquid waste subject to the Toxic Substances Control Act (TSCA). Prohibited wastes include not only non-CERCLA wastes and non-INEEL wastes but also waste with transuranic constituents greater than 10 nCi/g, liquid waste, explosives and reactives, spent nuclear fuel, and high-level waste (HLW). The contents of the V-Tanks currently meet all of these criteria except the prohibition against liquid waste. The contents will be solidified to meet that criterion prior to disposal at the ICDF. Any INEEL CERCLA waste that fails to meet the ICDF WAC will be refused for disposal at the ICDF. ❖

(Continued from page 12)

Response to Comment W2-16 (continued):
present in the V-Tanks contents and contaminated soil, risk reduction goals use other measurement standards as appropriate, which are presented in the 1999 Record of Decision (ROD), the 2003 Proposed Plan, and this ROD Amendment in sections on remediation objectives and goals.

Because regulatory compliance for CERCLA remediation is generally so complex, details cannot be fully specified in the Proposed Plan. They are presented in the supporting documents, which are available in the Administrative Record. The commenting group's suggestion for development of clearer explanations of contaminant concentration data, and how the treated waste will comply with regulatory requirements, will be forwarded to the INEEL Community Relations office for improved presentation in future public documents. Reduction of toxicity, mobility, and volume through treatment is a CERCLA evaluation criterion, and data for the comparison are also available in the Administrative Record for those who are interested. For the V-Tanks amended remedy, Section 5 of the 2003 Technology Evaluation Report (TER) compares estimated concentrations of the treated waste for key contaminants to the regulatory levels, in equivalent units. ❖

(Continued from page 12)

Response to Comment W2-17 (continued):
and Storage Area (RPSSA) facility, which will be evaluated during future dismantlement, decommissioning, and decontamination (D&D&D) activities at TAN. Sampling during the risk assessment indicated that the soil contamination at this site is below the levels at which remediation is required. More information on this site is available in the Administrative Record for Waste Area Group (WAG) 1 in the 1997 Remedial Investigation and Feasibility Study (RI/FS) and the 1999 ROD. (More information about the Administrative Record is presented in Section 1 of this document. Section 2.5 of this document lists key documents used to prepare this ROD Amendment.)

TSF-06, Area 10, is the designation for the HTRE Reactor Vessel Burial Site. This potential release site was evaluated as part of the WAG 1 comprehensive RI/FS and, as documented in the 1999 ROD, it was determined to be a No Action site. The irradiated empty reactor vessel is contained in a metal storage tank and is believed to be more than 10 feet below ground surface. No pathway to human or ecological receptors exists; thus, no cleanup is required. However, based on the commenter's questions about this site, a review was conducted of the relevant documentation. It was determined that although no pathway exists, potential residual contamination precludes unrestricted land use. Thus, the site should be protected with institutional controls. The WAG 1 Institutional Control Plan (INEEL 2000b) will be modified to include appropriate institutional controls for this site. Detailed language has been added in Section 11.3 of this ROD Amendment directing this change to the 1999 ROD. The Agencies appreciate the dedication of the commenter in bringing this oversight to their attention. The Agencies are pleased that this matter confirms the effectiveness of the design of the CERCLA public involvement process.

The TAN Pool (which is part of the TAN-607 Hot Shop) is currently being emptied under a deactivation process but remains within an active facility. Potential threats to human health and the environment from this site will be addressed during the facility D&D&D. More information on this site is available in the Administrative Record for WAG 1. As part of an active facility, the TAN Pool is not being addressed under WAG 1 CERCLA actions. ❖

(Continued from page 17)

Response to Comment W2-18 (continued):
ment of steam and air bubbles through the melt did result in some splatter into the air as the bubbles broke — on the order of a few pounds of glass fragments. The radioactive material was not released into the air, but was contained within the matrix of the glass. The expelled glass fragments containing the radioactivity were easily collected and sent for appropriate disposal.

Subsequent analysis of the ambient air collected by the ORNL project's three air samplers did not reveal any airborne contamination resulting from the melt expulsion. There was no risk to human health or the environment, certainly not the "extreme risk" suggested in the comment. The reasons for the ORNL melt expulsion are detailed in a formal DOE report.[2]

Other melt expulsions that the commenters refer to are as follows:

a. A private, full-scale test, conducted by Geosafe in support of their eventual ISV processing of 55-gal drums of moist soil contaminated with up to 1.4 wt% PCBs, at the GE Spokane site. In this test, wet soils in the sealed drums that were being processed caused a sudden release of pressurized steam into the melt, that resulted in an "air lifting" and melt splattering similar to what happened at ORNL. The melt expulsion was exacerbated, however, by the fact Geosafe was using a fabric hood containing a flammable sealant. Contact with the molten glass splatter caused the sealant to ignite, and burned up the hood as well as adjacent combustible equipment and materials (such as the electrical cable insulation). Details of this incident are reported in Geosafe's 1994 test report.[3]

b. A pilot-scale test, conducted by Pacific Northwest Laboratory at the INEEL on simulated waste in 1989. During this demonstration test, sealed 5-gal containers containing canola oil placed within the melt location resulted in numerous pressure build-ups and releases of vapors through the pilot-scale ISV melt that also caused molten glass splatter sufficient to ignite the fabric hood material. Details of this expulsion are recorded in Callow et al.[4]

(Continued on page 31)

(Continued from page 30)

Response to Comment W2-18 (continued):

A summary of ISV melt expulsions to date was prepared by R. K. Farnsworth as part of the *Operable Unit 7-13/14 In Situ Vitrification Treatability Study Work Plan.*[5]

Based on the lessons learned from the initial demonstrations of ISV technology, planar ISV was developed and successfully tested in 1998. Planar ISV precludes the types of failures mentioned above by melting the waste material from the sides in rather than the top down. This modification to the process prevents the buildup of a layer of untreated waste trapped beneath a layer of molten glass. Safe operation of the planar ISV process on subsurface tanks containing substantial quantities of vaporizable material, was demonstrated as part of a simulated treatability study performed in support of the 1998 V-Tanks Proposed Plan and 1999 ROD. The results of this treatability study indicated that planar-ISV could safely process subsurface tanks containing substantial quantities of vaporizable material without the potential for subsurface pressure build-up or melt expulsion. The results of this successful treatability study are available in the Administrative Record. The Agencies have reviewed this information and consider planar ISV a viable and safe option for remediation of the V-Tanks.

The Agencies believe that an adequate review has been made of the information on the failures associated with the early stages of the development of ISV. The early failures mentioned by the commenters are no longer considered relevant or representative of the current state of development of planar ISV technology and would not aid the Agencies in the selection of a preferred treatment alternative. The Agencies selected planar ISV as a technology alternative for the V-Tanks in the TER because the test data indicate that planar ISV is no longer subject to the failures experienced during the early development of ISV. This same issue was addressed in the Responsiveness Summary section of the 1999 Record of Decision (see pages 3-24 through 3-26).

Response to Comment W2-18 (continued):

Notes:

1. Spalding, B.P., July, 1996. *Technical Evaluation Summary of the In Situ Vitrification Melt Expulsion at the Oak Ridge National Laboratory on April 21, 1996,* ORNL/ER-377, Oak Ridge National Laboratory, Oak Ridge, Tennessee.
2. DOE, 1996. *In Situ Vitrification Workshop, October 15-17, 1996, Oak Ridge, Tennessee.*
3. Geosafe, 1994. *Investigation into the Causes and Application of the Melt Displacement Event During Geosafe Operational Acceptance Test #2 (OAT-2),* GSC-2301, Geosafe Corporation, Richland, Washington.
4. Callow, R. A., L.E. Thompson, J.R. Weidner, C.A. Loehr, B.P. McGrail, and S.O. Bates. August, 1991. *In Situ Vitrification Application to Buried Waste: Final Report of Intermediate Field Tests at Idaho National Engineering Laboratory,* EGG-WTD-9807, EG&G, Inc., Idaho National Engineering Laboratory, Idaho Falls, ID.
5. Farnsworth, R.K., et al. January, 1999. DOE/ID-10667, Rev. 1, Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID. "Appendix E: A Preliminary Assessment of Concerns Over Melt Expulsion Potential During ISV Processing." ❖

(Continued from page 22)

Response to Comment W2-23 (continued):
DOE to complete CERCLA cleanup at all its facilities. These remedial actions are not related to the mission change, and must continue regardless of any future missions that may or may not be given by Congress to the INEEL. The question of applicability of the National Environmental Protection Act (NEPA) to such future missions is therefore not relevant for the V-Tanks cleanup, or for other INEEL locations scheduled for cleanup under CERCLA.

The V-Tanks remediation activities are structured so they do not limit future industrial missions at TAN or the INEEL, but instead allow for the creation of new opportunities by removing contamination that would preclude other uses.

The INEEL carefully meets or exceeds all public information opportunity requirements, and did so for the ICDF development process. The Operable Unit (OU) 3-13 Record of Decision (ROD), which was signed in 1999, selected remedies for Waste Area Group (WAG) 3 sites, including the creation of the ICDF complex. The OU 3-13 RI/FS and ROD, with the associated public involvement process, address NEPA values, such that no separate NEPA document or NEPA process is required. The waste acceptance criteria (WAC) for the ICDF were developed during the ICDF remedial design process. This included public meetings and opportunity for public comment. As part of the public process for the OU 1-10 ROD Amendment, the Proposed

Response to Comment W2-23 (continued):
Plan specifically informed the public about the potential use of the ICDF for the disposal of the V-Tanks waste, debris, and contaminated soils.

For more information about the ICDF, contact Joseph Campbell, the INEEL Community Relations representative for the ICDF, at 208-526-3183 or at campjl@inel.gov. For general information, call 1-800-708-2680, or send mail to P.O. Box 1625, Idaho Falls, ID 83415-3940.

The Agencies disagree. Under DOE's CERCLA/NEPA Policy, DOE relies on the CERCLA process for the review of actions to be taken under CERCLA; that is, no separate NEPA document or NEPA process is ordinarily required. NEPA values were addressed, to the extent practicable, in the Operable Unit (OU) 3-13 Remedial Investigation and Feasibility Study (RI/FS) and Record of Decision (ROD), with the associated CERCLA public involvement process. The OU 3-13 ROD, which was signed in 1999, selected remedies for Waste Area Group (WAG) 3 sites, including the creation of the ICDF complex. The ICDF was not permitted under RCRA because, under Section 121(e) of CERCLA, it is exempted from permitting requirements as long as the applicable substantive requirements of RCRA are met. The ICDF is designed to meet the substantive requirements for a RCRA hazardous waste landfill. ❖

Commenter: Snake River Alliance
Document Number: W3
Page: 1 of 2

Snake River Alliance

Box 1731 • Boise ID 83701 • 208/344-9161

May 14, 2003

Kathleen E. Hain
Environmental Restoration Program
DOE Idaho Operations Office MS 3911
PO Box 1625
Idaho Falls, Idaho 83403-9987

Dear Kathleen Hain,

Please accept the following public comments from the Snake River Alliance regarding what actions to take for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10.

The Alliance supports either *In Situ Vitrification* or *Ex Situ Vitrification* of the 10,000 gallons of liquid waste, 2,000 gallons of sludge, Cesium-137 contaminated soil and the V-Tanks themselves. This position is based on the selection criteria as outlined in the 1999 Record of Decision and vitrification's proven history as a stable and reliable treatment method.

Vitrification technology is the most durable and mature treatment technology available. Vitrification provides the highest reduction in toxicity, mobility and volume and will treat a greater amount of contaminated soil that would otherwise be disposed of without treatment.

Vitrification provides the least risk to humans and the environment in storage and transportation of radioactive waste.

We do not support the preferred alternative, In Situ Chemical Oxidation/Reduction with Stabilization because it least satisfies the reduction of toxicity, mobility, and volume through treatment.

Thank you for your consideration.

Sincerely,

Gary E. Richardson
Executive Director

Comment W3-1 (Section 13.8, Topic 50)

Response: Compared to the other alternatives, vitrification does provide the highest reduction in toxicity, mobility, and volume, is the most durable, and is the most mature technology, or one of the most mature technologies, of those evaluated for the V-Tanks cleanup. The commenting group is also correct that a greater amount of contaminated soil would be treated with this technology, than under the other technologies. These are some of vitrification's strengths, and have been documented in the 2003 Technology Evaluation Report (DOE/ID-11038). However, these strengths were contrasted against several weaknesses of the vitrification process relative to the other technologies considered, such as System Complexity, Ease of Additional Remedial Actions, Monitoring Concerns, Administrative Feasibility, Increased (potential) Worker Hazards, Secondary Waste Volumes and

(Continued on page 34)

Comment W3-2 (Section 13.10.2, Topic 55)

Response: Although the preferred alternative received a lower ranking than several others on this CERCLA criterion, it does address it acceptably. It will reduce toxicity by destroying the volatile organic contaminants (VOCs) and semi-volatile organic contaminants (SVOCs) through oxidation or reduction, and will reduce mobility of metals and radionuclides by grouting. As noted in the 2003 Technology Evaluation Report (TER) and the 2003 Proposed Plan, the primary reason ex situ chemical/oxidation reduction with stabilization was rated low in this category relative to vitrification was the increase in volume of the primary waste stream through the treatment process. This increase in volume results from the addition of the oxidant (or reductant) and the grout. Reduction of toxicity and mobility are achieved, which produces a stable, compliant waste form. The Agencies selected this as the Preferred Alternative because it is the best remedy overall. The high rankings of this alternative for short-term effectiveness and implementability were factored in, along with its somewhat lower cost. In particular, the Preferred Alternative's high system reliability and manageable design complexity led to the Agencies' selection of this technology. ❖

(Continued from page 33)

Response to Comment W3-1 (continued):

Cost. Based on this, it appeared that ex situ chemical oxidation/reduction and stabilization had the highest overall ranking of the seven technologies considered. Furthermore, there has been less public support for thermal treatment technologies than for technologies performed at temperatures below 100°C (such as ex situ chemical oxidation/reduction and stabilization).

As to the greater durability of the vitrified waste form after disposal, however, while data does indicate that the durability of a vitrified waste form is over 100 times that of a grouted waste form, the effect of this difference provides only a small difference in rankings, since the ICDF is a lined facility designed to last over 1,000 years. There is limited potential for contaminant migration from the ICDF following its 1,000-year lifetime, as well. Finally, given that nearly all waste from the V-Tanks would be disposed of at the ICDF under most alternatives, the transportation risks associated with vitrification would be similar to those associated with the preferred alternative. ❖

Commenter: David B. McCoy
Document Number: W4
Page: 1 of 9

mccoydb01@msn.com
05/09/2003 05:07 AM

To: hainko@id.doe.gov
cc:
Fax to:
Subject: Comments on New Proposed Plan for the V-Tanks Contents

Below is the result of your feedback form. It was submitted by (mccoydb01@msn.com) on Friday, May 9, 2003 at 05:07:42

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email: mccoydb01@msn.com

name: David B. McCoy

comments: May 8, 2003

Comments of David B. McCoy
for the Department of Energy (DOE)
New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18)
at Test Area North, Operable Unit 1 10 (April 2003)

In dealing with the V Tank wastes with its proposed plan, the Department of Energy ("DOE") has attempted to bifurcate the CERCLA aspects from the RCRA aspects evolving the CERCLA plan without first giving due consideration to RCRA requirements. The hazardous wastes contained in the Idaho Nation Engineering and Environmental Laboratory ("INEEL") Test Area North ("TAN") V Tanks clearly are RCRA listed and characteristic wastes. Thus, the compliance with applicable or relevant and appropriate requirements (ARARs) cannot be met unless the plan is in compliance with RCRA standards applicable to generators of hazardous waste, owners and operators and land disposal restrictions.

The CERCLA plan ignores RCRA requirements at the outset by not taking into account the fact that RCRA waste cannot be diluted to reduce material to achieve a level below EPA concentration limits to achieve land disposal. 40 CFR 268.3. Such dilution is being used for the V-Tank wastes in the form of addition of soils and grout materials to reduce the RCRA wastes to levels that would allow land disposal at the INEEL CERCLA Disposal Facility ("ICDF"). In order to properly consider the V Tank wastes under RCRA requirements, the levels of hazardous constituents must be considered prior to the dilution of those wastes by the addition of soils whether contaminated or not, and/or addition of grout.

Levels of radioactive and other contaminants in the V-9 Tank are much higher in concentration than the V-1,2 or 3 Tanks. Although not set out in the proposed plan, the V-9 Tank, which may contain the highest levels of radioactive contaminants in RCRA mixed waste form should be considered individually in order to contain the transuranics and prevent them from being dumped by land disposal over the Snake River Aquifer where the transuranics will enter the groundwater and aquifer and Snake River.

The additional V Tanks in building 616 have not been described in the proposed plan and there is a question as to how much transuranic concentration, if any, may be present there in addition to V Tanks 1, 2, 3 and 9. Not presenting the full scope of the TAN V Tank problem for public review is a major weakness in

Comment W4-1 (Section 13.6, Topic 29)

Response: This CERCLA action fully complies with all applicable or relevant and appropriate requirements (ARARs) for CERCLA actions. Both RCRA and CERCLA prohibit dilution — for instance through the addition of soil — as a substitute for treatment. While several alternatives discussed in the 2003 Proposed Plan would add contaminated soil prior to the treatment process, this would not be done to avoid treatment but rather to improve treatment effectiveness and control of the operation. Several other alternatives would add grout as the last

(Continued on page 39)

Comment W4-2 (Section 13.6, Topic 30)

Response: The four V-Tanks form a complete system. It is the system that is being remediated. Thus, it is the concentration of the contaminants in the entire system that forms the basis for developing a final remediation design for the selected remedy so that it will meet RCRA land disposal restrictions (LDRs) and the disposal facility waste acceptance criteria (WAC). This strategy produces a single homogenous

(Continued on page 39)

Comment W4-3 (Section 13.7.2, Topic 41)

Response: The higher concentrations of hazardous and radioactive contamination found in Tank V-9 are primarily due to the higher concentration of sludge (solids) in that tank, which was designed to function as a sludge removal unit prior to storage of the waste in the other

(Continued on page 39)

Comment W4-4 (Section 13.4, Topic 13)

Response: TAN Building 616 does contain multiple vessels with the "v" designation (e.g., Tank V-4). However, these tanks are not part of the V-Tanks remediation project and are not identified in the Federal

(Continued on page 39)

Commenter: David B. McCoy
Document Number: W4
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the current proposed plan.

The proposed plan intends to send transuranic waste to the ICDF. Transuranic waste is not approved for land disposal. Concentration of transuranics are at a high level of 26.4 nCi/g within the V Tank system. The plan proposes, without specifically bringing it to the attention of the public, to reduce this concentration below 10 nCi/g by 1) flushing the contents of all the tanks together into a mass; 2) addition of soil wastes, and; 3) addition of grout. The specific facts to justify the reduction of concentration of transuranics to permissible levels have not been set forth. In any case there is a dilution of the waste to accomplish this task.

No notice of the proposed ICDF activity to dispose of TAN V Tank wastes including transuranics within the INEEL floodplain has been given in the Federal Register as required by 10 CFR 1022 et seq. See, 10 CFR 1022.2(a),1022.3(3), and1022.4(g) .

Although the transuranics might be removed from the TAN site, the transuranics will not be removed from the INEEL site and thus long term effectiveness is not high as claimed in the proposed plan. The long term effectiveness of protection of health and the environment is not achieved because the transuranics are not being removed from the INEEL site if disposed of at the ICDF which lies above the Snake River Aquifer and is within the 100-year flood zone at INEEL. The contamination of the aquifer over the long term by transuranics constitutes an irreversible and irretrievable commitment of resources which must clearly be set forth in an environmental impact statement ...rizing such commitment ...NEEL sets forth this ... to contamination by ...rder interpreting the ...NEEL.

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David B. McCoy

See next page for remaining comments on this page.

Comment W4-5 (Section 13.5, Topic 21, and Section 13.6, Topic 31)

Response: The commenter is correct in noting that Table 2 of the 2003 Proposed Plan lists the highest single reading for transuranics as 26.4 nCi/g. This sample came from Tank V-9 (as reported in Table 3 of the 2003 Technology Evaluation Report [TER]). All readings from Tanks

(Continued on page 40)

Comment W4-6 (Section 13.7.1, Topic 36)

Response: The addition of contaminated soil and/or grout under some of the technology alternatives presented in the 2003 Proposed Plan is not for the purpose of dilution, but as an integral and necessary part of treatment. See responses to Topics 24 and 25, above, for more details on the use of soil to enhance treatment effectiveness and the use of grout as a required stabilizing agent. The use of these materials, as part of treatment effectiveness and/or reduction of mobility, does incidentally dilute the constituent concentrations, but this is in no way the justification. ❖

Comment W4-7 (Section 13.6, Topic 32)

Response: Federal regulation 10 CFR 1022 establishes the notification requirements for projects in wetlands and floodplains. Since the ICDF is not located within identified wetlands or floodplains, such notice is not required for this remedial action. ❖

Comment W4-8 (Section 13.1, Topic 3, and Section 13.7.3, Topic 44)

Response: At the V-Tanks location, the selected remedy does satisfy the CERCLA criterion of long-term effectiveness and permanence because it will ensure protection of human health and the environment over time through high reliability of the technology involved, and high certainty that the protection achieved by this remedy will be maintained. Chemical oxidation or reduction will destroy the volatile and semi-volatile compounds in the tank contents, eliminating them as a risk. The technology will not destroy the metals and radionuclide contaminants;

(Continued on page 41)

the current proposed plan.

... waste to the ICDF. Transuranic ... entration of transuranics are at ... stem. The plan proposes, ... n of the public, to reduce ... the contents of all the tanks ... and; 3) addition of grout. ... entration of transuranics ... ny case there is a ...

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Although t... will not be ... not high as ... protection of ... e, the transuranics ... effectiveness is ... ctiveness of ... use the transuranics are not being removed from the INEEL site if disposed of at the ICDF which lies above the Snake River Aquifer and is within the 100-year flood zone at INEEL.

See previous page for remaining comments on this page.

The contamination of the aquifer over the long term by transuranics constitutes an irreversible and irretrievable commitment of resources which must clearly be set forth in an environmental impact statement and in the decision to grant a license or permit authorizing such commitment of resources. No environmental impact statement for INEEL sets forth this irretrievable and irreversible commitment of resources to contamination by transuranics coming from TAN. A recent federal court order interpreting the 1995 Bat!
t Agreement requires removal of all transuranics from INEEL.

The National Environmental Protection Act (NEPA) requirements have not been satisfied. DOE is required, to the extent possible, to accommodate the requirements of Executive Orders 11988 and 11990 through applicable DOE NEPA procedures. 10 CFR 1022.2(2)(b). No Environmental Impact Statement has been performed prior to the construction of the ICDF. CERCLA allows for cleanup, but it is not contemplated within CERCLA that an entire facility for cleanup can be constructed without an Environmental Impact Statement.

The plan states (p.6) that the long range land use plan for Test Area North is for non nuclear industrial facilities. This statement is erroneous because on July 15, 2002, the DOE announced a Mission Change for the entire INEEL for nuclear research and development including the building of commercial nuclear power stations at the site. This Mission Change statement has not been factored into the current proposed plan for the TAN V Tanks. Nor has there been any Environmental Impact Statement addressing the Mission Change even though substantial federal resources are currently being committed to the new mission of INEEL for nuclear industrial activities which could continue into the foreseeable and distant future.

These written comments are submitted in addition to any oral comments made by myself at the Public Meeting of April 30, 2003 at Idaho Falls, Idaho.

David B. McCoy

Comment W4-9 (Section 13.6, Topics 20, 23, and 33; and Section 13.7.2, Topic 42)

Response: INEEL waste types are classified based not just on their chemical content but also on disposal requirements. The V-Tanks contents are classified as a mixed waste, which includes hazardous wastes (heavy metals, volatile organic contaminants [VOCs], and semi-volatile

(Continued on page 42)

Comment W4-10 (Section 13.6, Topic 34)

Response: See response to Topic 33 for an explanation of why separate NEPA requirements, including an environmental impact assessment, do not apply to the use of the ICDF. The same policy applied to the development of the ICDF complex, which was authorized under the Operable Unit (OU) 3-13 ROD, which was signed in 1999. ❖

Comment W4-11 (Section 13.1, Topic 4)

Response: The announced mission change does not alter or detract from CERCLA cleanup activities now in progress at the INEEL and is, in that sense, an unrelated matter. The INEEL's current mission is available on the Internet (at http://www.inel.gov/about/mission-vision.shtml). Further information on the INEEL mission change also can be found on the Internet (at http://www.inel.gov/elizabeth_sellers_message.pdf). It is not yet known what the details of the proposed new INEEL nuclear research mission will be, relative to

(Continued on page 42)

Comment W4-12 (Section 13.1, Topic 5, and Section 13.6, Topic 35)

Response: Development of new missions at the INEEL is a separate issue from the remediation of contamination resulting from past activities. Cleanup activities at Test Area North (TAN), including the V-Tanks remediation, are required by the long-standing obligation of DOE

(Continued on page 43)

Commenter: David B. McCoy
Document Number: W4
Page: 4 of 9

3940 Redbarn Lane
Idaho Falls, ID 83404

submit: Send Comments

Note: No comments were identified on this page.

Response to Comment W4-1 (continued):
step in treatment, in order to stabilize constituents in the waste that could otherwise be mobile in the environment. Such additions are allowed by RCRA (as documented in the June 1, 1990, *Federal Register* at 55 FR 22666). The selected remedy using chemical oxidation/reduction does not add any soil to the treatment process; however, it does add grout or other stabilizing agent to reduce leachability, in order to meet RCRA LDRs and the waste acceptance criteria (WAC) for disposal. The hazardous waste constituent concentrations that are measured for the RCRA LDRs are required to be measured at the end of treatment. Addition of stabilizing material under the selected remedy is part of the treatment for reduction of mobility of metals. ❖

(Continued from page 35)
Response to Comment W4-2 (continued):
waste stream that will allow the optimization of the treatment process; this should reduce any potential difficulties that might arise in treating this complex waste stream.

The higher concentrations of hazardous and radioactive contamination found in Tank V-9 are primarily due to the higher percentage of sludge (solids) in that tank. (Most of the contaminants are found in the solid phase.) However, the same contaminant constituents are found in the sludge in all four tanks. Tank V-9 was designed to function as a sludge removal unit prior to the waste being stored in the other tanks. Comparison of the sludge between the various tanks (without taking into consideration the liquid) reveals similar wastes in all four V-Tanks. ❖

(Continued from page 35)
Response to Comment W4-3 (continued):
tanks. The waste in the four tanks is similar, however, and resulted from the same generation processes; therefore, the Agencies have agreed that all the waste in the four V-Tanks will be treated as one waste stream, and combined to the extent practical for treatment. This will allow a more optimized and effective treatment process. The final design for the selected remedy will treat the combined waste stream, including Tank V-9 waste, so that all residual waste from the V-Tanks site meets the ICDF waste acceptance criteria (WAC). The ICDF WAC is designed to prevent the disposal of waste such that a future release from the ICDF could result in concentrations of contaminants, including transuranics, that exceed the Idaho groundwater quality standards (drinking water standards) in the underlying Snake River Plain Aquifer. If a waste exceeds the ICDF WAC, it cannot be disposed of at the ICDF. ❖

(Continued from page 35)
Response to Comment W4-4 (continued):
Facility Agreement and Consent Order (FFA/CO). TAN Building 616 and its contents, including the tanks, are being addressed under the INEEL's Deactivation, Decommissioning, and Dismantlement (D&D&D) Program, because there have been no identified releases of contaminants to the environment; therefore, the building is not a CERCLA site. The components within this building are also being addressed by a Closure Plan under the Resource Conservation and Recovery Act (RCRA). The cleanup of Building 616 is currently being completed and is expected to be finalized by the end of 2003. Sampling will be conducted during D&D&D inside the building and underneath it, and if releases to the environment are discovered, these releases would be cleaned up under CERCLA pursuant to the procedures established in the 1999 ROD. ❖

(Continued from page 36)

Response to Comment W4-5 (continued):
V-1, V-2, and V-3 were lower (11.0, 4.02, and 2.03 nCi/g, respectively). This variability results because waste typically was routed first through Tank V-9 for solids removal before distribution to Tank V-1, V-2, or V-3 (depending on which had the most available capacity).

The Agencies have agreed that because the waste in the four tanks resulted from the same processes, but varies in concentrations of individual contaminants due to the use history described, all the waste in the four V-Tanks will be managed as one waste stream, and will be combined for treatment. Thus, although the concentrations of specific hazardous constituents vary from tank to tank, the average concentration of the hazardous waste constituents for all tanks is the one that will be used. The average concentration of 4.27 nCi/g is well below the INEEL CERCLA Disposal Facility's (ICDF's) waste acceptance criterion (WAC) of 10 nCi/g. Furthermore, the estimated transuranic concentration of the treated waste to be disposed of at ICDF is 2 nCi/g. It is the concentration of transuranics (and other contaminants) following treatment that will be used to show compliance with disposal requirements (WAC) at ICDF.

Beginning several years ago, the INEEL's proposed plans have included the "lowest" and "highest" readings in response to public comments. Some commenters said they would be better able to assess whether the expense of remediation was necessary if they could see the range of extremes from the sampling suite. CERCLA guidance does not require that maximum readings be presented.

Table 2 of the 2003 Proposed Plan (included in this ROD Amendment as Table 2-2) presents information on the primary contaminants in the V-Tanks that affect the selection of an effective remedy. The overall average concentration values are used in evaluating the effectiveness and operability of vari-

Response to Comment W4-5 (continued):
ous treatment alternatives. The reader is urged to use caution in comparing this data to other sources of information on the V-tanks or in comparing these values to regulatory levels. U.S. Environmental Protection Agency (EPA) regulations and guidance require different statistical treatment of analytical data when it is used for risk assessment, waste characterization, acceptability of treatment options, or compliance with disposal facility accep tance criteria. For example, risk assessments require 95% upper confidence limit (ucl) values, while waste characterization requires 90% ucl values on the amount of material that will leach from the waste in a given timeframe, and acceptability at treatment facilities usually looks at average concentrations along with maximum and minimum values. Compliance with disposal facility WAC is usually based on 90% ucl on total concentrations. It is generally inappropriate to compare data supplied for one purpose with data intended for another use. The data presented in the 2003 Proposed Plan were supplied to show what contaminants are present, and to help the reader evaluate the cleanup alternatives described. Other information to support risk assessment and waste characterization can be found in the documents in the Administrative Record.

This is correct. The ICDF's WAC restrict disposal of waste to less than 10 nCi/g of transuranic contaminants. As discussed in the response to Topic 29, compliance with WAC limits is evaluated after treatment requirements are met. Whether treatment is done as one consolidated waste stream or for individual tanks, the remedy selected in this ROD Amendment will meet the required treatment levels and produce a waste stream for disposal with a transuranic concentration less than 10 nCi/g, which meets the ICDF WAC. ❖

(Continued from page 36)

Response to Comment W4-8 (continued):
there are no commercially available technologies that can do this. Instead, grouting will reduce the mobility of metals and radionuclides, thereby lowering their risk to human health and the environment. Subsequent disposal of the stabilized residuals at the ICDF will isolate this remaining contamination from potential exposure to human and ecological receptors, completing the goals of the cleanup action.

A lined, covered, and monitored landfill such as the ICDF helps meet CERCLA's overall goal of long-term protection by reducing uncontrolled access to the waste and inhibiting mobility of contaminants. The ICDF has been designed to meet the substantive requirements of a landfill permitted under the Resource Conservation and Recovery Act (RCRA) and was approved by the Agencies under the WAG 3 Record of Decision (ROD). The ICDF is also designed to meet the substantive requirements of DOE Orders governing radioactive waste disposal. Regardless of whether the immobilized waste residuals are disposed of at the ICDF or sent to a facility off the INEEL, the material will meet waste acceptance criteria (WAC) designed to ensure protection of human health and the environment. An alternative that includes disposal off the INEEL would not be more protective than one that uses disposal at the ICDF with regard to the risk factors that would have to be considered if the material were transported through communities off the INEEL.

DOE will provide institutional controls for sites subject to land-use restrictions (including the V-Tanks site and ICDF) over at least the next 100 years unless a 5-year review concludes that unrestricted land use is allowable.

Response to Comment W4-8 (continued):
After 100 years, DOE may no longer manage INEEL activities and controls will take the form of land use restrictions. Though land use after 100 years is highly uncertain, it is likely that industrial applications will continue at WAG 1 and at the ICDF. The Hall Amendment of the National Defense Authorization Act of 1994 (Public Law 103-160) requires concurrence from EPA on the lease of any National Priorities List sites during the period of DOE control and CERCLA (42 USC 9620 Section 120(h) requires that the state be notified of a lease involving contamination. When DOE no longer manages INEEL activities and controls are needed, CERCLA (42 USC 9620 Section 120(h) requires that DOE indicate the presence of contamination and any restrictions in property transfer documentation.

The CERCLA criteria for "Overall Protectiveness" and for "Long-Term Effectiveness" require the removal of V-Tanks waste from the V-Tanks site to an approved disposal facility. The INEEL CERCLA Disposal Facility (ICDF) meets these CERCLA criteria by providing an engineered design that inhibits both potential downward migration of waste and exposure via surface pathways to current and future workers, future residents, and the environment. Institutional controls at the ICDF will be in place for a minimum of 100 years to continue its protectiveness. The ICDF cap is a 1,000-year design. The INEEL is currently implementing a Long-Term Stewardship Program, which will remain after programs and projects are completed, as long as institutional controls, monitoring, maintenance, or other post-closure care is required. ❖

(Continued from page 37)

Response to Comment W4-9 (continued):
organic contaminants [SVOCs]) and low-level radioactive waste. There are transuranic elements in the V-Tanks, but not TRU waste.

Transuranic *elements* are a group of radioactive chemical elements "beyond uranium" in the periodic table, having atomic numbers greater than 92 (such as plutonium, atomic number 94). Transuranic *waste* is a legally defined category of waste, established for regulatory and management purposes. As a waste category, TRU waste contains more than 100 nanocuries (3,700 becquerels) of alpha-emitting transuranic isotopes per gram of waste and half-lives greater than 20 years (as cited in the 1995 Settlement Agreement). Although low concentrations of several transuranic elements are present in the V-Tanks contents, the concentrations of the combined sludge and liquid (with a combined weighted average of 4.27 nCi/g) are not high enough to meet the TRU waste definition. It is estimated that prior to disposal at the INEEL CERCLA Disposal Facility (ICDF), the treated V-Tanks waste will have a transuranic concentration of approximately 2 nCi/g, well below the 10 nCi/g limit for the ICDF and the 100 nCi/g TRU waste designation.

It is correct that the V-Tanks contents are classified as low-level waste (LLW) and that the waste contains alpha-emitting radionuclides. However, it is not correct that this makes the V-Tanks remediation subject to the 1995 Settlement Agreement. By definition, LLW is waste that does not meet the definitions for high-level waste (HLW), transuranic (TRU) waste, spent nuclear fuel, or by-product materials. The 1995 Settlement Agreement requires the removal of all stored TRU waste from Idaho (i.e., waste with greater than 100 nCi/g transuranic content). It does not include LLW in this requirement. See Topic 20, above, for additional information on waste-type categories.

An environmental impact statement is not required before wastes can be stored at the ICDF. The ICDF was selected and designed under the Waste Area Group (WAG) 3 comprehensive cleanup, which addressed NEPA values. Under DOE's policy on application of NEPA to CERCLA cleanup actions (July 11, 2002), DOE relies on the CERCLA process for the review of actions to be taken under CERCLA. That is, no separate NEPA document or NEPA process is ordinarily required, because DOE addresses NEPA values,

Response to Comment W4-9 (continued):
to the extent practicable, in the Operable Unit (OU) 3-13 RI/FS and ROD, along with the associated CERCLA public involvement process.

In accordance with the waste acceptance criteria (WAC) for the ICDF, no transuranic waste can be disposed of at the facility. No transuranic waste will be generated during the V-Tanks cleanup. Low-level radioactive waste (LLW) will be generated during the V-Tanks cleanup and will be sent to the ICDF for disposal. This LLW will contain concentrations of transuranic radionuclides that are well below the ICDF's WAC.

The ICDF's design incorporates a complex liner system beneath the waste to inhibit downward migration of wastes from the landfill, a leachate collection system, a leak-detection monitoring system, and groundwater monitoring wells to insure long-term effectiveness of this CERCLA disposal facility, especially protection of the aquifer.

An EIS is not required for V-Tanks waste to be disposed of at the ICDF, as detailed in the response to Topic 26. ❖

(Continued from page 37)

Response to Comment W4-11 (continued):
activities at TAN. However, the mission change will not hinder or delay cleanup of the V-Tanks or other sites scheduled for remediation. In fact, under the 2002 Agency agreement to pursue accelerated risk reduction and cleanup at the INEEL, many ongoing and projected remediation activities have been consolidated for more efficient management and to ensure that cleanup is completed.

The DOE is not changing its commitment to clean up all inactive waste sites at the INEEL that pose a risk to human health or the environment, including the V-Tanks. This cleanup is required to eliminate health and environmental threats posed by hazardous waste sites to current and future workers and future residents. The program also includes a review process that reevaluates the effectiveness of remedial actions at least once every five years where residual contamination remains at levels that do not allow for unrestricted access. At TAN, this review process will provide continuing opportunities, no matter what TAN's mission is or becomes, to ensure the long-term effectiveness of cleanup levels achieved by the V-Tanks remedy, should some contaminants remain in place. ❖

(Continued from page 37)

Response to Comment W4-12 (continued):
to complete CERCLA cleanup at all its facilities. These remedial actions are not related to the mission change, and must continue regardless of any future missions that may or may not be given by Congress to the INEEL. The question of applicability of the National Environmental Protection Act (NEPA) to such future missions is therefore not relevant for the V-Tanks cleanup, or for other INEEL locations scheduled for cleanup under CERCLA.

The V-Tanks remediation activities are structured so they do not limit future industrial missions at TAN or the INEEL, but instead allow for the creation of new opportunities by removing contamination that would preclude other uses.

The National Environmental Protection Act (NEPA) does require all federal agencies to assess potential environmental impacts from major proposed new actions. However, as described in the response to Topic 5, above, the cleanup of the V-Tanks is a CERCLA action in response to past activities that resulted in contamination, and is unrelated to any NEPA requirements that may arise from the INEEL's mission change. ❖

Commenter: Robert Wikoff
Document Number: W5
Page: 1 of 2

Please return this form by May 14, 2003

Tell Us What You Think

*The Agencies want to hear from you to decide what actions to take for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10.**

Comments: I appreciate being on your mailing lists and read with great interest how the INEEL Clean up is going. While I am a fan of Vitrification I believe Alternative 3b ex situ chemical oxidation/Reduction w/ stabilization makes good sense. Ex situ is better as you need not worry about the tank strength and mixing with motor should be effective for the life of both the cesium 137 and Strontium 90. What a great mess of mixed chemicals in a tank.

Again Thank you for your thoroughness and evaluation in an easy to read format.

Robert Wikoff

** If you want a copy of the Record of Decision and Responsiveness Summary, please make sure your mailing label is correct.*

307-733-9677

INEEL

INEEL Environmental Restoration Program
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Comment W5-1 (Section 13.2, Topic 6)

Response: The Agencies encourage citizen involvement in decision-making at the INEEL. In addition to the mailings and public meetings, the INEEL provides other avenues for public involvement including tours and briefings. Mailing addresses, telephone numbers, e-mail addresses, and internet addresses are provided in each proposed plan for citizens to get additional information, briefings, or tours from Agency and project representatives. The INEEL Community Relations office can be contacted by telephone toll-free at 1-800-708-2680, or by mail at P.O. Box 1625, Idaho Falls, Idaho 83415-3940. Joseph Campbell, the INEEL Community Relations representative for Test Area North, can be contacted by e-mail at campjl@inel.gov or by telephone at (208) 526-3183. ❖

Comment W5-2 (Section 13.8, Topics 51 and Topic 57)

Response: The Agencies agree with these points. While vitrification provides more durability in the stabilization of these wastes relative to grouting, the fact that all V-Tanks wastes will be disposed of at the ICDF guarantees that the waste will be isolated from the environment for at least 1,000 years, which is sufficient time for cesium-137 (Cs-137) and strontium-90 (Sr-90) to decay to background levels. Although a vitrified product will stabilize radionuclides with longer half-

(Continued on page 45)

Comment W5-3 (Section 13.3, Topic 9)

Response: The Agencies appreciate all suggestions from the public on the types of information and format that help the INEEL's proposed plans better serve their purpose. Proposed plans are a key community relations activity undertaken as part of the CERCLA process. The Agencies want the proposed plans to be clear and understandable to all readers, whether or not they are previously familiar with the CERCLA activities at the INEEL, so as to allow the fullest possible public participation in the decision-making process. Proposed plan language and organization are continuously evaluated and improved in response to public feedback, such as this. ❖

(Continued from page 44)

Response to Comment W5-2 (continued):
lives (such as the transuranic contaminants) better than grout, the limited migration potential of the transuranics from the engineered ICDF facility is only a minimal increase to the overall ranking of vitrification, relative to ex situ chemical oxidation/reduction with its stabilization through grouting. The Agencies also agree regarding the complexity of the contaminants that are being treated. It is for this reason that lab-scale treatability studies are currently underway to verify that a chemical oxidation approach, followed by stabilization, will meet the requirements associated with remediation of the V-Tanks wastes.

Under this remedy, most or all of the V-Tanks wastes will be disposed of at the INEEL CERCLA Disposal Facility (ICDF), isolating it from the environment for at least 1,000 years, which is sufficient time for Cs-137 and Sr-90 to decay to background levels. Although a vitrified product stabilizes radionuclides with longer half-lives (such as the transuranic contaminants) better than grout, the limited potential for the transuranics to migrate from the lined ICDF results in only a minimal increase in the overall ranking of vitrification relative to the preferred alternative. The commenter is also correct in his assertion that a primary reason for selecting an ex situ form of chemical oxidation/reduction over an in situ form was due to concerns over tank strength and integrity under in situ operations. Other reasons include implementability concerns over heating the tank wastes in situ, and the concerns over runaway chemical oxidation reactions at tank volume quantities, rather than in the small batches possible with ex situ processing. Finally, the Agencies' agree with the commenter's note regarding the complexity of the contaminants that are being treated. It is for this reason that lab-scale treatability studies are underway to verify that the selected remedy will meet the remedial action objectives for the V-Tanks cleanup. ❖

Commenter: Keep Yellowstone Nuclear Free
Document Number: W6
Page: 1 of 5

"Tom Patricelli"
<indy@wyoming.com>
06/24/2003 05:36 PM

To: campjl@inel.gov
cc: indy@wyoming.com
Fax to:
Subject: Vtank comments

Joe: This message got bounced back to me a couple weeks ago. Trying again.

Concerning treatment of VTank waste, Keep Yellowstone Nuclear Free prefers NON-THERMAL technologies to treat waste, as well as technologies with the least amount of off-gassing and airborne emissions. We cannot support an untested technology. We oppose vitrification as we see it as essentially a proxy for incineration.

We support, conditionally, chemical oxidation because it uses far lower tem... ...o have serious concerns, ...ng system. With so many filte... ...her collection systems, w... ...subsequent release of toxic su...

Generally s... ...technologies for use in waste... ...we must be involved ear... ...be verified to be effective an... ...nity to comment.

See next page for remaining comments on this page.

Comment W6-1 (Section 13.7.3, Topic 45)

Response: The preference is noted. The INEEL agrees that operating temperatures are an important area of consideration when selecting a technology. With all else being equal, lower temperature systems will generally be ranked higher on the criterion of short-term effectiveness because of the lower potential risk to workers; however, they may re

(Continued on page 48)

Comment W6-2 (Section 13.7.3, Topic 46)

Response: The preference is noted. ❖

Comment W6-3 (Section 13.7.3, Topic 47)

Response: All of the technologies retained for evaluation in the technical evaluation leading to this ROD Amendment were required to have a reliable use record and to be viable technologies, even if they have not been used on the particular mix of constituents present in the site to be remediated, such as the V-Tanks. More detailed testing, as necessary, to opti

(Continued on page 48)

Comment W6-4 (Section 13.8, Topic 52)

Response: Not only is vitrification not a proxy for incineration, it is quite different in its means of operation. As a consequence, incineration and vitrification differ considerably in their potential risk to human health and the environment. The Agencies evaluated vitrification as a potential technology for cleanup of the V-Tanks because of its advantages. The U.S. Code of Federal Regulations (CFR 263.515, Subpart O) defines incineration as enclosed devices that thermally treat hazardous wastes using controlled flame combustion. Vitrification is not incineration because it does not involve primary treatment via controlled flame combustion in an enclosed device. As a result, the U.S. Environmental Protection

(Continued on page 49)

Commenter: Keep Yellowstone Nuclear Free
Document Number: W6
Page: 2 of 5

"Tom Patricelli" <indy@wyoming.com>
06/24/2003 05:36 PM

To: campjl@inel.gov
cc: indy@wyoming.com
Fax to:
Subject: tank comments

Joe: This message got bounced back to me a couple weeks ago. Trying again

Concern... ear Free
prefers ...
technologi... ne
emissions. ... ose
vitrificati... ion.

See previous page for remaining comments on this page.

We support, conditionally, chemical oxidation because it uses far lower temperatures in the treatment process. We do have serious concerns, however, about the complicated off-gassing system. With so many filters (carbon and HEPA), condensers, and other collection systems, we are concerned about filter failures and subsequent release of toxic substances into the atmosphere.

Generally speaking, KYNF would like to fully support technologies for use in waste treatment, however, in order to do so, we must be involved early in the process and the technology can be verified to be effective and low-risk. We thank DOE for the opportunity to comment.

Comment W6-5 (Section 13.10.2, Topic 56)

Response: The off-gas system planned for the chemical oxidation process is a relatively simple and standard off-gas system, considerably less complex than the other thermal treatment alternatives evaluated. The components of the chemical oxidation off-gas system are commonly used in numerous industrial applications and have been shown to be highly reliable. Furthermore, it is after the signing of a record of decision (ROD), during the remedial design phase, that the Agencies collectively determine the engineering design (the technical analysis and procedures that resulted in a detailed set of plans and specifications) and verify that

(Continued on page 49)

Comment W6-6 (Section 13.2, Topic 7, and Section 13.7.3, Topic 48)

Response: A variety of opportunities for early public information and involvement exist, and have been expanded continuously over the years of INEEL's cleanup program. The INEEL's Community Relations Office began contacting individuals and community groups during the early stages of planning for the V-Tanks by making phone calls, providing technical briefings as desired, and actively soliciting early feedback. This process is described in Section 3 of this ROD Amendment. Opportunities for information and comment on an ongoing basis are also available (as noted in the response to Topic 6.) The web page of the INEEL Community Relations Office (at http://www.inel.gov/environment/) provides information about the current status of cleanup projects.

The feasibility study (in this case, the 2003 Technology Evaluation Re view [2003 TER]) and proposed plan present all applicable and relevant or appropriate requirements (ARARs) that must be met, and they identify

(Continued on page 50)

Comment W6-7 (Section 13.3, Topic 9)

Response: The Agencies appreciate all suggestions from the public on the types of information and format that help the INEEL's proposed plans better serve their purpose. Proposed plans are a key community relations activity undertaken as part of the CERCLA process. The Agen-

(Continued on page 49)

(Continued from page 46)

Response to Comment W6-1 (continued):
ceive lower rankings on the criteria of long-term effectiveness and reduc tion of toxicity, mobility, and volume because of lower destructive capabilities. That caveat of "all else being equal" is always the difficult part of an evaluation such as this. The tradeoffs between the higher efficiencies obtained at higher temperatures versus the off-gas control issues associated with those higher temperatures will continue to be an important factor in future technology selections. ❖

(Continued from page 46)

Response to Comment W6-3 (continued):
mize the performance of the selected remedy may be performed during the remedial design phase following the signing of this ROD Amendment. The Agencies have the option of using models, treatability studies, readiness reviews, and other procedures as necessary, to confirm a remedy's feasibility and fully define its engineering design prior to use. The Preferred Alternative has been previously demonstrated to be viable through a treatability study conducted in 1998 (INEEL/EXT-98-00739). This technology test, conducted on actual V-Tanks waste, demonstrated sufficient organic destruction efficiencies to meet regulatory requirements. Furthermore, similar chemical oxidation and stabilization processes have been conducted, or are planned, that increase the confidence level that the process will be successful. Based on the previous tests and operations on similar waste streams, plus additional testing planned during the design phase, the preferred alternative appears to be a viable alternative for treating V-Tanks waste.

Citizens have raised questions about the quality of data used in investigations, and how the State of Idaho and U.S. Environmental Protection Agency (EPA) ensure quality. For a remedial investigation, the Agencies identify data quality objectives, which specify the quality of data required to support decisions in the feasibility study and cleanup program. The development of data quality objectives follows guidance in CERCLA, the National Contingency Plan, and EPA documents. Existing data are used whenever data quality objectives are met or can be validated.

A fundamental goal of cooperative efforts by the agencies in implementing the action plan is to emphasize remedial action. This goal recognizes that no reasonable amount of investigation can resolve all uncertainty and that remedial actions must accommodate changes from what was originally expected. Such an approach encourages timely selection of a remedy, flexibility for remedial action, and the ability to respond to information discovered during investigations. ❖

(Continued from page 46)

Response to Comment W6-4 (continued):

Agency considers vitrification technologies (both in situ and ex situ) as non-incineration thermal treatment processes, not subject to the same regulations as incinerators.

One important difference for protection of human health and the environment is that unlike incinerators, vitrification is carried out under a reducing environment. In situ vitrification is carried out in the subsurface; ex situ vitrification is carried out in a specially designed vessel located aboveground. The reducing conditions do not favor the formation of dioxins or furans, as are common in incineration. Furthermore, because of the presence of overburden in both in situ and ex situ vitrification, the off-gas hood remains cool enough that there is minimal potential for a reaction to form dioxins and furans in the hood, as it encounters oxygen.

In prior operations involving the treatment of chlorinated organics, vitrification has been demonstrated to meet stringent regulatory limits relative to products of incomplete combustion and species such as dioxins and furans. Vitrification has also been shown in tests to result in greater than 99.9999% destruction or removal of PCBs.

Another distinction between vitrification and incineration is that vitrification's different thermal conditions, and its much more controllable off-gas filtration system, results in far less off-gas particulates and more radionuclide retention in the melt (greater than 99.9%). This means orders of magnitude less contamination in the off-gas from vitrification than would be encountered in incineration devices. In Australia, where high temperature incineration of hazardous waste is effectively banned (due to a lack of public and political support), vitrification has been publicly accepted and identified as an alternative to incineration. ❖

(Continued from page 47)

Response to Comment W6-5 (continued):

all remediation processes and activities will comply with applicable standards in state and federal laws. The technology selected to remediate the V-Tanks — ex situ chemical oxidation/reduction with stabilization — has seen limited past deployments, so additional laboratory and pilot testing on both surrogate and actual V-Tanks waste are planned during the design phase. This testing and the detailed engineering design will help demonstrate, before full-scale implementation, that the technology is effective and low-risk. Laboratory-scale treatability studies are currently underway to verify that a chemical oxidation/reduction approach, followed by stabilization, will meet the requirements associated with remediation of the V-Tanks wastes. It is expected that these laboratory-scale studies will support the Agencies' intention to proceed with ex situ chemical oxidation/ stabilization. ❖

(Continued from page 47)

Response to Comment W6-7 (continued):

cies want the proposed plans to be clear and understandable to all readers, whether or not they are previously familiar with the CERCLA activities at the INEEL, so as to allow the fullest possible public participation in the decision-making process. Proposed plan language and organization are continuously evaluated and improved in response to public feedback, such as this. ❖

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(Continued from page 47)

Response to Comment W6-6 (continued):
and evaluate technologies that are capable of meeting those ARARs. Thus, the 2003 TER and the proposed plan that is based on it present a general strategy, a pre-conceptual design rather than a detailed process. CERCLA Guidance does not require final development and demonstration of a proposed treatment technology prior to the proposed plan and record of decision (ROD), because the cost and time involved in testing multiple potential remedial designs would substantially delay the beginning of the cleanup and add substantially to the final costs.

A number of conceptual verification, treatability studies, and other required tests may be required to confirm the effectiveness and safety of the chosen treatment technologies before operations start at a cleanup site. The level of technical, safety, and cost information required to reach this point makes the development of the final selected remedy a lengthy process.

The feasibility study phase of a cleanup is the beginning of the remedy development process. Its purpose is to identify multiple technologies known to be able to address comparable waste, and to provide the information necessary for the Agencies to determine which of them could be used successfully. The feasibility study, on which the proposed plan is based, is always placed in the Administrative Record and is available for public review. During the proposed plan comment period, readers may address their comments to the data developed in the feasibility plan and other supporting documents, as well as to the proposed plan; some of the groups who commented on the V-Tanks action have taken the opportunity to do this.

Building on the proposed plan, the ROD establishes the cleanup technology to be used and the cleanup levels to be achieved. However, it is only after the signing of the ROD, in the Remedial Design phase, that the Agencies collectively determine the engineering design (including schedule, cost estimates, and disposal options for wastes generated) and verify that all remediation activities will comply with applicable standards in state and federal laws. The technology selected to remediate the V-Tanks — ex situ chemical oxidation/reduction with stabilization — has seen limited past deployments, so additional laboratory and pilot testing on both surrogate and actual V-Tanks

Response to Comment W6-6 (continued):
waste are planned during the design phase. This testing and the detailed engineering design will help demonstrate that the technology is effective and low-risk.

As part of advance public information and involvement opportunities for this amendment to the V-Tanks remedy, the INEEL's Community Relations Office began contacting individuals and community groups by phone, providing technical briefings as desired, and actively soliciting early feedback. This process is described in Section 3 of this ROD Amendment.

Conceptual validation, treatability studies, and other tests that may be required to verify the effectiveness and safety of the selected remedy are part of a lengthy development and selection process. This begins well before a proposed plan is written with the feasibility study phase (in this case, the technology evaluation documented in the 2003 Technology Evaluation Report), and continues after the Agencies' sign a record of decision (ROD) with the remedial design phase. Because of the cost and time involved in testing multiple potential remedial designs, which would substantially delay the start of the cleanup and add considerably to the overall cost, CERCLA guidance only requires a ROD to present a general strategy for satisfying cleanup requirements, rather than a detailed process. Thus, while a ROD establishes the cleanup technology to be used and the cleanup levels to be achieved, it is only in the following remedial design phase that the Agencies determine the engineering design (including schedule, cost estimates, and disposal options for wastes generated) and verify that all remediation activities will comply with applicable standards in state and federal laws identified in this ROD Amendment. The technology selected to remediate the V-Tanks – ex situ chemical oxidation/reduction with stabilization – has seen limited past deployments, so additional laboratory and pilot testing on both surrogate and actual V-Tanks waste are planned during the design phase. This testing and the detailed engineering design will help demonstrate, before full-scale implementation, that the technology is both effective and low-risk.

As described in the response to Topic 7, above, opportunities for additional information and comment about the V-Tanks remediation process are available on an ongoing basis. The web page of the INEEL Community Relations Office (at http://www.inel.gov/environment/) provides information on the current status of cleanup projects. ❖

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will go ahead and start on the public comments. Okay. All right. Let's get going on that. I would like to invite anyone. I will come around with the microphone. It seems to be working somewhat. You can speak your mind. The agencies aren't going to respond here, but as we talked about earlier, they will respond in the final ROD.

A couple ground rules. We don't seem to have too rowdy of a crowd tonight, but with respect to whoever has the floor, when you're commenting, please give your full name, your address so we can send you a copy of that ROD when it's issued. If anyone would like to make a comment, please raise your hand.

AUDIENCE MEMBER: I have some comments. I think the plan fails to address all the tanks that are out there at TAN, apparently, only four of six are addressed. There may be some buried-waste issues, additionally, to what you've addressed here.

The four tanks as I understand have about 30,400 gallons. That leads remaining 100,000 gallons of some of the other tanks out there.

Then, under the 1995 Settlement Agreement, the alpha-emitting mixed low-level waste has to be shipped to a repository outside Idaho. Then, you've

Comment T1-1 (Section 13.4, Topic 12)

Response: There are indeed additional underground tanks at TAN that are not addressed by this ROD Amendment. To understand their handling, it is important to note the difference between the term "v-tanks," which identifies a kind of underground storage vessel, and the site name "the V-Tanks," which identifies a particular location to be remediated. The V-Tanks site addressed in this ROD Amendment received that designation in the Federal Facility Agreement and Consent Order (FFA/CO), and was defined as containing only four v-type tanks: Tanks V-1, V-2, V-3, and V-9. These are the four described in the

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Comment T1-2 (Section 13.4, Topic 14)

Response: The Agencies agreed to remediate the four V-Tanks, the associated piping, and the surrounding contaminated soil as one unit because they are part of an interconnected waste handling system that

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Comment T1-3 (Section 13.6, Topic 23)

Response: It is correct that the V-Tanks contents are classified as low-level waste (LLW) and that the waste contains alpha-emitting radionuclides. However, it is not correct that this makes the V-Tanks remediation subject to the 1995 Settlement Agreement. By definition, LLW is waste that does not meet the definitions for high-level waste (HLW), transuranic (TRU) waste, spent nuclear fuel, or by-product materials. The 1995 Settlement Agreement requires the removal of all stored TRU waste from Idaho (i.e., waste with greater than 100 nCi/g transuranic content). It does not include LLW in this requirement. See Topic 20 for additional information on waste-type categories. ❖

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got a March 31, 2003, federal court ruling that says, "Remove all buried transuranic wastes from Idaho," and "all" means all.

So, I have a little problem still with the 3-B alternative. It would seem the addition of the grouting and everything would, in fact, lead to a dilution, which then is for the purposes of land disposal here. So, I think there may be a clear legal issue in that. In one of those categories, the high concentration shows that you're two and a half times over the limit. Obviously, if you are claiming you now have a 1- to 2-nanogram amount, there has been a dilution there.

I don't think the plan is comprehensive. It omits the ANP cask storage pad, the Area 10 HTR 80 Reactor Vessel Burial Site.

On the in situ vitrification alternative, it's my understanding that Oak Ridge National Laboratory had an in situ project, and there was some kind of explosion that threatened workers and the public. If that's the case, then I think that that should be addressed in your documentation here so that the public is aware of that, that may be a possible risk, if it is in fact. There may have been similar experiences at the INEEL with

Comment T1-3 (continued)

Comment T1-4 (Section 13.6, Topic 25, and Section 13.10.1, Topic 53)

Response: Grouting is the process of adding appropriate stabilization agents such as portland cement that will chemically bind with the hazardous metals. This stabilization step reduces the leachability of these metals, making it harder for these contaminants to be released into the

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Comment T1-5 (Section 13.4, Topic 15)

Response: The three sites listed were identified in the 1991 FFA/CO as potential contamination sites to be investigated within WAG 1. The analyses carried out on them were summarized in the 1997 RI/FS and the 1999 ROD.

TSF-06, Area 8, is the designation for the ANP Cask Storage Pad. Part of this site is currently included within the active Radioactive Parts Service and Storage Area (RPSSA) facility, which will be evaluated

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Comment T1-6 (Section 13.7.2, Topic 49)

Response: The "ISV failures" referred to by the commenters resulted during testing of a previous version of this technology. That version was refined and improved based on analysis of these "failures." The result of these improvements is the planar ISV method. Planar ISV is the technology evaluated in the 2003 Technology Evaluation Review (TER) and presented in the 2003 Proposed Plan.

Planar ISV systems were developed to prevent the "failures" experienced during the developmental stages of ISV. These early failures

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problematic in situ projects.

As far as the ICDF goes, I really object to the siting of that. It's in the flood plain and it's over the aquifer. There has been a failure to do an environmental-impact statement. Now, you can say that where there's direct removal in remediation CERCLA project can waive the NEPA requirements, but here what you've got going is an $85 million dump project being proposed and constructed, and I think that that does fall under the NEPA requirements.

I think that the credible siting alternatives are not considered for the INEEL location. There's other sites which should be considered at the INEEL which would not pose a risk to the aquifer from the location near the ICPP. You've got the ICDF -- sorry about all these acronyms -- being built on or over or near the former unlined percolation ponds.

I think there's some real potential hazards there with respect to the aquifer. There's plenty of geological information that indicates that your maximum potential flood in that area would pretty well cover half of the ICPP.

I don't think that together these two projects are, you know, adequately addressing those

Comment T1-6 (Continued)

Comment T1-7 (Section 13.7.2, Topic 40)

Response: As part of the INEEL CERCLA Disposal Facility (ICDF) planning and design process, U.S. Geological Survey and other research data were evaluated to assess the safety of the proposed facility relative to potential flooding. The ICDF location was determined to be outside the 100-year flood plain. In addition, the ICDF will be surrounded by an engineered berm 15 ft higher than the predicted 100-year flood plain. The ICDF's compliance with key federal and state

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Comment T1-8 (Section 13.6, Topic 26)

Response: The Agencies disagree. Under DOE's CERCLA/NEPA Policy, DOE relies on the CERCLA process for the review of actions to be taken under CERCLA; that is, no separate NEPA document or NEPA process is ordinarily required. NEPA values were addressed, to the extent practicable, in the Operable Unit (OU) 3-13 Remedial Inves-

(Continued on page 58)

Comment T1-9 (Section 13.1, Topic 2)

Response: The ICDF was authorized under the comprehensive remediation of WAG 3 (the Idaho Nuclear Technology and Engineering Center (INTEC]). Although the ICDF is located at INTEC, it was designed to be the repository for waste generated from CERCLA actions across the INEEL. The ICDF was designed to accommodate the waste types and volumes expected to be generated under CERCLA cleanup

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Comment T1-9 (continued)

concerns when you look at them together. My name is David McCoy, for the record.

MR. CAMPBELL: Thanks, Dave. Is there anyone else who would like to comment on the record? Anyone else? Okay. All right. Well, we've been moving right along. It's now 7:55. The comment session is now over. If you have any other questions, some people from the project will hang around for a little while and answer any that you have.

The comment opportunity extend through May 14th, so if you have any comments, feel free to send them in. There is a form on the inside back cover of the proposed plan that is at our outside table, so go ahead and grab a copy of that on your way out and send them in.

To reiterate again that the Record of Decision for this is due out in December, and you'll see the responses made to your comments at that time. On behalf of the Department of Energy, the Environmental Protection Agency, and the state of Idaho, I would like to thank everyone for coming out tonight. I guess that is it, so the meeting is adjourned.

(Meeting adjourned at 7:54 p.m.)

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Response to Comment T1-1 (continued):
2003 Proposed Plan and this ROD Amendment. The amended remedy for the V-Tanks site properly addresses only the four tanks contained in this site, as established by the FFA/CO.

Besides the four v-type tanks in the V-Tanks site, two other v-type tanks that were in use at TAN require remediation. These are Tanks V-13 and V-14, which were designated in the FFA/CO as TSF-26 and are also referred to as the PM-2A tanks. The PM-2A tanks are currently being cleaned up under the remedy selected in the 1999 ROD (see Section 7 of that ROD). Since the remedy for the PM-2A tanks is unchanged from the 1999 ROD, it was not addressed in the 2003 Proposed Plan.

Other v-type tanks (e.g., Tank V-4) were located in TAN Building 616. The building and its contents, including these other v-type tanks, are being, or have already been, removed under the INEEL's Deactivation, Decommissioning, and Dismantlement (D&D&D) Program. Those components of Building 616 that managed hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) are also being addressed under a RCRA closure plan. (Topic 13 provides more information on the closure plan). ❖

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Response to Comment T1-2 (continued):
contains a single consistent waste stream. At this time, sampling has shown no additional, adjacent, related past releases. As stated in the 1999 Record of Decision (ROD), the possibility exists that contaminated environmental media not identified by the Federal Facility Agreement and Consent Order (FFA/CO) or in the 1999 ROD will be discovered in the future as a result of routine operations, maintenance activities, or dismantlement, decommissioning, and decontamination (D&D&D) activities at TAN. Newly discovered sites will be addressed using the process for new site inclusion as defined in the FFA/CO and refined in the 1999 ROD and will be assessed and remediated under CERCLA pursuant to the process agreed upon by the Agencies at the time of the new site identification. Where appropriate, the remedial action objectives (RAOs) and final remediation goals (FRGs) identified in the 1999 ROD and this ROD Amendment will be used to complete any necessary cleanup. ❖

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Response to Comment T1-4 (continued):
environment. This reduction in leachability is required to meet both RCRA LDRs and the WAC for any disposal facility. The U.S. Environmental Protection Agency (EPA) has reviewed the inherent dilution that takes place during stabilization treatment processes. This dilution is considered acceptable when there is a significant reduction in leachability of hazardous contaminants and when appropriate volumes of stabilization materials are used. The selected remedy will deploy a stabilization process that meets those goals.

The Agencies recognize that when hazardous metals are stabilized, there is not only a dilution of the hazardous metals as discussed above in Topic 24 but also a dilution of the other constituents, including the radioactive contaminants. The Agencies concur that this inherent dilution is acceptable when this dilution occurs as a result of treatment necessary to meet either Resource Conservation and Recovery Act (RCRA) land disposal restrictions (LDRs) or disposal facility waste acceptance criteria (WAC).

Grouting is an integral part of the stabilization step in the waste treatment. Any dilution of constituent concentrations as a result of this occurs as a part of a necessary step in treatment, not solely for the purpose of land disposal. (Also see response to Topic 26 for more details on this issue.) ❖

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Response to Comment T1-5 (continued):
during future dismantlement, decommissioning, and decontamination (D&D&D) activities at TAN. Sampling during the risk assessment indicated that the soil contamination at this site is below the levels at which remediation is required. More information on this site is available in the Administrative Record for Waste Area Group (WAG) 1 in the 1997 Remedial Investigation and Feasibility Study (RI/FS) and the 1999 ROD. (More information about the Administrative Record is presented in Section 1 of this document. Section 2.5 of this document lists key documents used to prepare this ROD Amendment.)

TSF-06, Area 10, is the designation for the HTRE Reactor Vessel Burial Site. This potential release site was evaluated as part of the WAG 1 comprehensive RI/FS and, as documented in the 1999 ROD, it was determined to be a No Action site. The irradiated empty reactor vessel is contained in a metal storage tank and is believed to be more than 10 feet below ground surface. No pathway to human or ecological receptors exists; thus, no cleanup is required. However, based on the commenter's questions about this site, a review was conducted of the relevant documentation. It was determined that although no pathway exists, potential residual contamination precludes unrestricted land use. Thus, the site should be protected with institutional controls. The WAG 1 Institutional Control Plan (INEEL 2000b) will be modified to include appropriate institutional controls for this site. Detailed language has been added in Section 11.3 of this ROD Amendment directing this change to the 1999 ROD. The Agencies appreciate the dedication of the commenter in bringing this oversight to their attention. The Agencies are pleased that this matter confirms the effectiveness of the design of the CERCLA public involvement process.

The TAN Pool (which is part of the TAN-607 Hot Shop) is currently being emptied under a deactivation process but remains within an active facility. Potential threats to human health and the environment from this site will be addressed during the facility D&D&D. More information on this site is available in the Administrative Record for WAG 1. As part of an active facility, the TAN Pool is not being addressed under WAG 1 CERCLA actions. ❖

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Response to Comment T1-6 (continued):

were not true explosions, but rather rapid releases of air and steam bubbles through the ISV melt. As the air and steam bubbles moved through the ISV melt, to ground surface, they caused the "air-lifting" of the molten glass product within the ISV melt to lift above the subsidence crater and flow across ground level.

Details about the ORNL Melt Expulsion are documented in a 1996 report.[1] This event was only a glass flow, not an expulsion into the air (as it has commonly been misidentified by some members of the public). Movement of steam and air bubbles through the melt did result in some splatter into the air as the bubbles broke — on the order of a few pounds of glass fragments. The radioactive material was not released into the air, but was contained within the matrix of the glass. The expelled glass fragments containing the radioactivity were easily collected and sent for appropriate disposal.

Subsequent analysis of the ambient air collected by the ORNL project's three air samplers did not reveal any airborne contamination resulting from the melt expulsion. There was no risk to human health or the environment, certainly not the "extreme risk" suggested in the comment. The reasons for the ORNL melt expulsion are detailed in a formal DOE report.[2]

Other melt expulsions that the commenters refer to are as follows:

a. A private, full-scale test, conducted by Geosafe in support of their eventual ISV processing of 55-gal drums of moist soil contaminated with up to 1.4 wt% PCBs, at the GE Spokane site. In this test, wet soils in the sealed drums that were being processed caused a sudden release of pressurized steam into the melt, that resulted in an "air lifting" and melt splattering similar to what happened at ORNL. The melt expulsion was exacerbated, however, by the fact Geosafe was using a fabric hood containing a flammable sealant. Contact with the molten glass splatter caused the sealant to ignite, and burned up the hood as well as adjacent combustible equipment and materials (such as the electrical cable insulation). Details of this incident are reported in Geosafe's 1994 test report.[3]

Response to Comment T1-6 (continued):

b. A pilot-scale test, conducted by Pacific Northwest Laboratory at the INEEL on simulated waste in 1989. During this demonstration test, sealed 5-gal containers containing canola oil placed within the melt location resulted in numerous pressure build-ups and releases of vapors through the pilot-scale ISV melt that also caused molten glass splatter sufficient to ignite the fabric hood material. Details of this expulsion are recorded in Callow et al.[4]

A summary of ISV melt expulsions to date was prepared by R. K. Farnsworth as part of the *Operable Unit 7-13/14 In Situ Vitrification Treatability Study Work Plan.*[5]

Based on the lessons learned from the initial demonstrations of ISV technology, planar ISV was developed and successfully tested in 1998. Planar ISV precludes the types of failures mentioned above by melting the waste material from the sides in rather than the top down. This modification to the process prevents the buildup of a layer of untreated waste trapped beneath a layer of molten glass. Safe operation of the planar ISV process on subsurface tanks containing substantial quantities of vaporizable material, was demonstrated as part of a simulated treatability study performed in support of the 1998 V-Tanks Proposed Plan and 1999 ROD. The results of this treatability study indicated that planar-ISV could safely process subsurface tanks containing substantial quantities of vaporizable material without the potential for subsurface pressure build-up or melt expulsion. The results of this successful treatability study are available in the Administrative Record. The Agencies have reviewed this information and consider planar ISV a viable and safe option for remediation of the V-Tanks.

The Agencies believe that an adequate review has been made of the information on the failures associated with the early stages of the development of ISV. The early failures mentioned by the commenters are no longer considered relevant or representative of the current state of development of planar ISV technology and would not aid the Agencies in the selection of a preferred treatment alternative. The Agencies selected planar ISV as a technology alternative for the V-Tanks in the TER because the test data indicate that planar ISV is no longer subject to the failures experienced during the early

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Response to Comment T1-6 (continued):

development of ISV. This same issue was addressed in the Responsiveness Summary section of the 1999 Record of Decision (see pages 3-24 through 3-26).

Notes:

1. Spalding, B.P., July, 1996. *Technical Evaluation Summary of the In Situ Vitrification Melt Expulsion at the Oak Ridge National Laboratory on April 21, 1996,* ORNL/ER-377, Oak Ridge National Laboratory, Oak Ridge, Tennessee.
2. DOE, 1996. *In Situ Vitrification Workshop, October 15-17, 1996, Oak Ridge, Tennessee.*
3. Geosafe, 1994. *Investigation into the Causes and Application of the Melt Displacement Event During Geosafe Operational Acceptance Test #2 (OAT-2),* GSC-2301, Geosafe Corporation, Richland, Washington.
4. Callow, R. A., L.E. Thompson, J.R. Weidner, C.A. Loehr, B.P. McGrail, and S.O. Bates. August, 1991. *In Situ Vitrification Application to Buried Waste: Final Report of Intermediate Field Tests at Idaho National Engineering Laboratory,* EGG-WTD-9807, EG&G, Inc., Idaho National Engineering Laboratory, Idaho Falls, ID.
5. Farnsworth, R.K., et al. January, 1999. DOE/ID-10667, Rev. 1, Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID. "Appendix E: A Preliminary Assessment of Concerns Over Melt Expulsion Potential During ISV Processing." ❖

(Continued from page 53)

Response to Comment T1-7 (continued):

disposal facility design laws includes a cap compliant with the Resource Conservation and Recovery Act (RCRA), monitoring, and an engineered multiple liner system that includes a leachate collection and removal system, and a leak detection and removal system to inhibit fluid movement below the complex liner system. The landfill will meet additional standards for protectiveness with maintenance, monitoring, and post-closure activities that will verify protection of human health and the environment. More information about the ICDF is available on-line at http://www.inel.gov/publicdocuments/pdfs/cercla01-50671-04.pdf. ❖

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Response to Comment T1-8 (continued):

tigation and Feasibility Study (RI/FS) and Record of Decision (ROD), with the associated CERCLA public involvement process. The OU 3-13 ROD, which was signed in 1999, selected remedies for Waste Area Group (WAG) 3 sites, including the creation of the ICDF complex. The ICDF was not permitted under RCRA because, under Section 121(e) of CERCLA, it is exempted from permitting requirements as long as the applicable substantive requirements of RCRA are met. The ICDF is designed to meet the substantive requirements for a RCRA hazardous waste landfill. ❖

(Continued from page 53)

Response to Comment T1-9 (continued):
activities at the INEEL, including CERCLA waste generated from Operational Unit (OU) 1□10. The waste from the V-Tanks that is disposed of at the ICDF will comply with the ICDF waste acceptance criteria (WAC). The ICDF waste acceptance criteria are, in turn, based on a thorough performance assessment, which evaluated the potential for impacts to the environment (e.g., the aquifer) assuming the entire ICDF were filled with CERCLA waste and then designed the ICDF facility and WAC to prevent such impacts from occurring. As long as each waste stream disposed of at the ICDF meets these criteria, which the V-Tanks waste will, the ICDF will remain protective of human health and the environment.

Although each cleanup activity is carried out separately, project managers coordinate technical knowledge and lessons learned from previous cleanup actions at the INEEL and elsewhere. All CERCLA cleanup activities at the INEEL are integrated under a structure established by the 1991 Federal Facility Agreement and Consent Order (FFA/CO). The FFA/CO placed the INEEL facilities into 10 waste area groups (WAGs). WAG 1 is Test Area North (TAN).

Response to Comment T1-9 (continued):
Each WAG is further broken down into operable units (OUs) for more efficient management. Each OU takes in a group of sites with similar contamination problems. Most OU numbers identify site investigations or early actions. The FFA/CO established 10 OUs within TAN. The V-Tanks cleanup is part of OU 1-10, the comprehensive remediation for WAG 1, which assessed the results of preceding site investigations, carried out investigations of sites not previously evaluated, and determined the overall risk posed by this WAG.

Similarly, the comprehensive investigations of WAGs 2 through 9 each examined the cumulative risk for that WAG. Under WAG 10, these documents and the results of analysis of areas between the INEEL facilities are comprehensively assessed to provide a picture of INEEL-wide risk.

In May 2002, the Agencies formalized an agreement to pursue an accelerated cleanup plan at the INEEL that will further improve the INEEL's cleanup approach, both for better risk reduction and for more efficient and timely cleanup. ❖

Appendix B

Administrative Record Index

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY
ADMINISTRATIVE RECORD FILE INDEX FOR THE WAG 1 COMPREHENSIVE RI/FS
INCLUDING: TSF PAINT SHOP FLOOR DRAIN LEACH FIELD OU 1-10
RECORD OF DECISION AMENDMENT FILE INDEX
3/15/04

FILE NUMBER

ADMINISTRATIVE RECORD BINDER I

AR1.1 BACKGROUND

A
Document #: DKJ-42-02
Title: Recommended Path Forward For Operable Unit 1-10 V-Tanks Remedial Action
Author: Jantz, A. E.
Recipient: Hain, K. E.
Date: 3/4/02

A
Document #: EM-ER-02-040
Title: Concurrence With V-Tanks Path Forward
Author: Hain, K. E.
Recipient: Jorgensen, D. K.
Date: 3/14/02

A
Document #: EM-ER-02-058
Title: Request for Concurrence With V-Tanks Path Forward
Author: Hain, K. E.
Recipient: Pierre, W.; Nygard, D.
Date: 3/18/02

A
Document #: DKJ-141-02
Title: Transmittal of Technology Evaluation Scope of Work for V-Tanks, TSF-09 and TSF-18 for Test Area North, Operable Unit 1-10
Author: McDannel, G. E.
Recipient: Hain, K. E.
Date: 7/10/02

A
Document #: EM-ER-02-116
Title: Transmittal of the Technology Evaluation Scope of Work for the V-Tanks, TSF 09/18, for the Test Area North, Operable Unit 1-10
Author: Hain, K. E.
Recipient: Pierre, W.; Nygard, D.
Date: 7/10/02

A
Document #: 24747
Title: A Community Relations Update Fact Sheet—New Alternatives Considered for V-tanks at Waste Area Group 1
Author: Not Specified
Recipient: Not Specified
Date: 08/01/02

A
Document #: 24746
Title: DOE Approval to Open an Administrative Record File for the Record of Decision Amendment, Operable Unit 1-10
Author: Hain, K. E.
Recipient: Stuart, J. C.
Date: 9/16/02

FILE NUMBER

AR1.1 **BACKGROUND (continued)**

A
Document #: INEEL/EXT-2000-01135
Title: Technical Support Facility-06 and Technical Support Facility-26 Calendar Year 2000 Sampling and Remediation Summary Report for Waste Area Group 1, Operable 1-10
Author: Bruce, J. E.
Recipient: N/A
Date: 10/21/02

A
Document #: EM-ER-02-185
Title: Transmittal of the Technical Support Facility-06 and Technical Support Facility-26 Calendar Year 2000 Sampling and Remediation Summary Report for Waste Area Group 1, Operable Unit 1-10
Author: Hain, K. E.
Recipient: Pierre, W.; Nygard, D.
Date: 10/29/02

A
Document #: INEEL/EXT-02-01310
Title: Pre-Conceptual Designs of Various Alternatives for the V-Tanks, TSF-09/18 at Waste Area Group 1, Operable Unit 1-10
Author: McDannel, G.
Recipient: Not Specified
Date: 11/26/02

A
Document #: DOE/ID-11038
Title: Technology Evaluation Report for the V-Tanks, TSF-09/18 at Waste Area Group 1, Operable Unit 1-10
Author: McDannel, G.
Recipient: Not Specified
Date: 4/8/03

A
Document #: INEEL/EXT-02-01448
Title: V-Tanks Decision Support Model Design Report
Author: Richardson, J. G.; Chamber, A.
Recipient: Not Specified
Date: 4/1/03

ADMINISTRATIVE RECORD BINDER II

A
Document #: INEEL/EXT-03-00438
Title: Conceptual Design Report for Ex Situ Chemical Oxidation/Reduction and Stabilization of the V-Tanks at Waste Area Group 1, Operable Unit 1-10
Author: Jessmore, J. J.
Recipient: Not Specified
Date: 6/25/03

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY
ADMINISTRATIVE RECORD FILE INDEX FOR THE WAG 1 COMPREHENSIVE RI/FS
INCLUDING: TSF PAINT SHOP FLOOR DRAIN LEACH FIELD OU 1-10
RECORD OF DECISION AMENDMENT FILE INDEX
3/15/04

FILE NUMBER

AR1.8 ENGINEERING DESIGN FILE

A Document #: EDF-3868
Title: V-Tank Analytical Data: Calculated Averages and Upper Confidence Limits
Author: Tyson, D.
Recipient: N/A
Date: 12/5/03

A Document #: EDF-3077
Title: Risk-Based Approach for Management of PCB Remediation of Waste From V-Tanks
Author: Becker, W. J.; Eaton, D. L.; Nitschke, R. L.
Recipient: N/A
Date: 12/5/03

A Document #: EDF-3938
Title: Use of Tanks V-1, V-2, and V-3 for Storing, Blending, and Accumulating Waste During Remediation of the V-Tanks
Author: Eaton, D. L.
Recipient: N/A
Date: 12/5/03

AR3.10 SCOPE OF WORK

A Document #: DOE/ID-10999, Rev. 1
Title: Technology Evaluation Scope of Work For the V-Tank, TSF-09/18, at Waste Area Group 1, Operable Unit 1-10
Author: McDannel G.; Jantz, A.
Recipient: N/A
Date: 7/10/02

AR4.3 PROPOSED PLAN

A Document #: 24783
Title: New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) At Test Area North, Operable Unit 1-10
Author: DOE
Recipient: N/A
Date: 4/1/03

A Document #: EM-ER-03-105
Title: Transmittal of the Final Technology Evaluation Report for the V-Tanks, TSF-09/18, at Waste Area Group 1, Operable Unit 1-10 (DOE/ID-11038 Revision 0, April 2003), and the New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10
Author: Hain, K. E.
Recipient: Pierre, W; Nygard, D.
Date: 4/6/03

AR5.2 AMENDMENT TO RECORD OF DECISION

A Document #: EM-ER-03-206
Title: Transmittal of the Draft V-Tanks Record of Decision Amendment and Supporting Engineering Design Files for Operable Unit 1-10, Waste Area Group 1, at Test Area North
Author: Not Specified
Recipient: Pierre, W.; Nygard, D.
Date: 8/20/03

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY
ADMINISTRATIVE RECORD FILE INDEX FOR THE WAG 1 COMPREHENSIVE RI/FS
INCLUDING: TSF PAINT SHOP FLOOR DRAIN LEACH FIELD OU 1-10
RECORD OF DECISION AMENDMENT FILE INDEX
3/15/04

FILE NUMBER

A Document #: DOE/ID-10682AMENDMENT
Title: Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10
Author: Not Specified
Recipient: Not Specified
Date: 2/20/04

AR10.3 PUBLIC NOTICES

A Document #: 24786
Title: Notice of Availability—Agencies Announce Public Comment Period For Test Area North Cleanup Sites
Author: Not Specified
Recipient: Not Specified
Date: 4/10/03

AR12.3 DOE RESPONSE TO COMMENTS

A Document #: 24784
Title: DOE Response to IDEQ Comments on the New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) At Test Area North, Operable Unit 1-10
Author: DOE
Recipient: IDEQ
Date: 2/26/03

A Document #: 24785
Title: DOE Response to EPA Comments on the New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) At Test Area North, Operable Unit 1-10
Author: DOE
Recipient: EPA
Date: 2/25/03

AR12.4 EXTENSION REQUESTS AND APPROVALS

A Document #: EM-ER-03-287
Title: Extension of the Comment Resolution Period For: OU 1-10, Record of Decision Amendment and OU 3-13, Group 3, Phase I, Remedial Design/Remedial Action Work Plan
Author: DOE
Recipient: Nygard, D.; Pierre, W.
Date: 11/24/03

NOTE: Sampling data can be examined at the Technical Support Building, 1580 Sawtelle Street, Idaho Falls, Idaho.