Appendix M

EPA/IDHW Comments

IDHW/DEQ Technical Review Comments on
Comprehensive Remedial Investigation/Feasibility study for the Central Facilities Area Operable Unit 4-13 (draft)
November 13, 1998

General Comments

1. Alternatives 3a (Conventional Excavation/ICDF Disposal) and 4a (Conventional Excavation/On-INEEL Treatment and ICDF Disposal) are both very dependent, obviously, on the approval and construction of an on-site soil repository. This has not occurred yet, and is dependent on decisions made prior to the signing of the WAG-3 ROD. Even if the soil repository is approved, there is still the unanswered question as to whether the capacity will be available for CFA soils. If, for any reason, the soil repository is not approved, then the onsite (INEEL) disposal alternatives other than the ICDF are not readily apparent based on discussions in this document.

Resolution - Comments incorporated as follows:
a. The ICDF will be designed with the capacity to include WAG 4 soils, as defined to date. This will be clearly stated in the revised report.

b. Disposal options, both on- and off- the INEEL were discussed in Section 9.5.5. On-INEEL disposal capacity for radioactive soils is limited. As stated in Section 9.5.5.1, remaining RWMC soil disposal capacity is approximately 73,000 cy. The FS estimate of total WAG 4 soil volume is approximately 81,500 cy. Current LMITCO direction is to not dispose of CERCLA remediation waste at the CFA landfills. For these reasons cited, the ICDF was selected as a representative process option. If the ICDF is not approved, then the RWMC could potentially be selected as a disposal process option instead, for at least a fraction of OU 4-13 soils. If this option is not available at the time of disposal, then an off-site disposal facility, or containment on site, would likely be selected.

2. In Section 12, "Detailed Analyses of Alternatives", the discussion of the alternatives would read better if immediately up-front in the appropriate section, such as the introductory paragraph to the discussion of each alternative, it is stated what site(s) (CFA-04, CFA-08, CFA-12, or CFA-10) it is felt this alternative is applicable to. A favorable example is Section 12.2.10, Alternative 6 discussion, where it is immediately stated that "This alternative would apply only to CFA-08". An example of a lack of specificity is cited in Specific Comment 24.

Resolution - Comment incorporated.

3. The "No Action with Monitoring" alternative is not well understood. No Action till now has been understood to mean that, literally, the site requires no action and can be left as is. If monitoring is required as part of an alternative, then this is an action, and this alone appears to be a reason why the site should not have been designated a No Action in the first place. This subject needs to be included in the discussion when we begin to resolve comments.

Resolution – While it is true that the no action alternative is intended to be a baseline condition if no action is taken, the assumption is made that DOE will retain control of the sites and would perform any monitoring necessary. Therefore, monitoring is retained in this alternative.

Specific Comments

1. Section 4.1.3.2, page 4-11

In the draft OU 4-13 RI/BRA, Figure 3-1 shows sample locations indicative of sampling contaminated soils at the mercury retort area. The last sentence of section 4.1.3.2 on page 4-11 of the BRA states "*Additional site characterization activities were conducted on the pond sediments, retort equipment staging areas as part of the removal action*". In this current draft of the RI/FS, this sentence is missing from the end of Section 4.1.3.2.

A narrative describing these activities must be added to the RI/FS. This includes, but is not necessarily limited to, a write-up in Section 4, "Nature and Extent of Contamination", and an evaluation in Section 6 (and 7 if necessary). It is known that soil samples were collected from the mercury retort area, and subsequently analyzed for mercury. However, there is no discussion in the RI/FS pertaining to the mercury retort site and associated contaminated soils and their fate.

Resolution – The use of these data affects several sections of the report. The following text was added as described.

Page 3-1, 1st insert after the 4th paragraph
Mercury Retort Area Sampling - 1997

Additional data were collected in November 1997 in the staging area, which was used for retort equipment and tanks, and waste storage (Figure 3-2). The objective of this sampling activity was to determine whether soil contamination occurred as a result of equipment operation and water storage. This objective was met with the collection of 50 samples from the staging area. The samples were analyzed for metals (including mercury), gamma-emitting and uranium radionuclides, nitrate/nitrite, and TCLP metals. No critical samples were designated.

Page 3-1, 2nd insert after 4th paragraph
OU 4-13 RI/FS Sampling - 1998
Additional data were collected during July 1998 to refine the type and volume of contaminated soil in the pond (Figure 3-2). The specific objectives were to:

1. Determine the hazardous waste status of previous sampling locations in the pond bottom where mercury was detected. This included determining whether "hot spot" or "cold spot" locations pass or fail TCLP analysis.
2. Determine the extent of mercury contamination above the PRG to a depth of 1m (3 ft) below the bottom of the pond.
3. Determine the rad added status of the pond sediments using TPR-713 analysis.

These objectives were met with the collection of 93 samples for total mercury and TCLP mercury analysis at the CFA-04 Pond. No critical samples were identified for this sampling activity.

Page 3-2, Figure 3-1
Figure 3-1 was enlarged and moved to Appendix A with the other WAG 4 maps. The additional data collected during the mercury retort project and July 1998 were added, which caused the small figure to be cluttered. The sample locations shown on the new map were revised to be consistent with the descriptions of sample locations for the CFA-04 data in Appendix B.

Page 3-5, insert new Section 3.3

Section 3.3 CFA-10 Transformer Yard Oil Spills

Data were collected at the CFA-10 Transformer Yard Oil Spills site during July 1998 (Figure 3-5). The objectives of this sampling activity were to:

1. Determine the presence, or absence, of lead contamination above 230-mg/kg at depths of 0.61 m (2 ft).
2. Determine the waste status of lead-contaminated soil.

These objectives were met with the collection of 13 samples for total lead and TCLP mercury analysis. No critical samples were identified for this sampling activity.

Revise Table 3-1 on page 3-11

The additional samples for each site and were added to the table.

Appendix B

The CFA-04 data set was revised to include the July 1998 data. In addition, the sample locations shown on the new map in Appendix A were revised to be consistent with the descriptions of sample locations for the CFA-04 data in Appendix B.

2. Section 9.3.6, pages 9-10 and 9-11

Please provide an explanation as to where and when the additional data collected during the July 1998 soil sampling effort, for both CFA-04 and CFA-10, will be incorporated into this document. There is one reference to this data and discussion appearing in the draft final FS, but there should also be a contingency plan if the analyses and discussion cannot be completed in time for incorporation into the FS.

Resolution - These data are incorporated into Appendix B, however, the validation is still in process. Unvalidated data points are flagged with "*None" and footnotes were added as follows: "*None – data not yet validated, collected in July 1998." Total values from the July 1998 sampling are only discussed with respect to maximum contaminant concentrations reported for the sites.

3. Figure 9-1, page 9-19

Please label the specific layers designated to be the "biobarrier" and the "capillary break". The text on page 9-18 (Section 9.5.4.1) provides a good discussion of these two constructed layers and their purpose, but, like the figure, does not identify the specific layers.

Resolution – Comment incorporated.

4. Section 9.5.4.3, SL-1 Type Barrier discussion, and Figure 9-2, pages 9-20 and 9-21 respectively

Again, please briefly identify, and label on the figure, which layer is considered the biobarrier.

Resolution – Comment incorporated.

5. Section 9.5.7.3, first paragraph, page 9-32

The last sentence of this section states that "Volatile organics may be captured or destroyed by oxidation". ISV will induce the capture of organic compounds in the hood and associated treatment train, but the organics will not be destroyed through "oxidation". Insitu destruction would, if it did occur, most likely be accomplished through thermal destruction of the organic compounds. The reference to oxidation should be deleted.

In the discussion of ISV in the following paragraph, please note that ISV research and development has come far since 1989, the date of the Geosafe reference. Dewatering of saturated media before melting is not necessary if a planar melt is employed. The saturation (water) is driven off as the two

melts coalesce. Also, Geosafe has conducted more recent melts at sites that contain substantial portions of rubble and organic material.

The third paragraph ends with the statement that "Residual amounts of mercury remain in the glass at depth, but would be immobilized". Please provide a brief discussion as to how in a regulatory sense (under TSCA) the residual mercury will be allowed to remain in place.
Resolution - a) Comment incorporated, the statement was changed to read "Volatile organics (VOCs) are vaporized or pyrolyzed by ISV. Vaporized VOCs that migrate to the surface are either burned in the hood covering the treatment area, or are treated in the off-gas treatment system (EPA, 1994)." (b) Comment noted, the text and references were updated. (c) Comment incorporated, the need for long-term institutional controls where contaminants remain in place is noted.

6. Section 9.5.7.4, pages 9-32 to 9-33

The phytoremediation discussion is not inclusive of a discussion of the potential for phytoremediation of mercury. This is an obvious omission, and should be corrected. We can provide references if necessary.
Resolution - Comment incorporated, the discussion is revised. Please provide your references.

7. Section 10.4.1.2, last paragraph of section, page 10-6

The next to last statement of the paragraph states that stabilized soils not passing TCLP would be reprocessed. Briefly explain what this reprocessing entails, and the fate, for these reprocessed (and restabilized?) soils. We assume that the reprocessing involves another attempt to stabilize soils that may have not been properly stabilized, and therefore failed TCLP, but this is not clear.
Resolution - Comment incorporated. Yes, reprocessing would involve repeating the processing cycle, this was explicitly stated in the draft-final report.

8. Section 10.4.2.1, top bullet, page 10-7

It is assumed that the reference to Tennessee is the Oak Ridge National Laboratories (ORNL). Based on experience with mercury contaminated soils at WAG-1, it is uncertain at this time as to whether ORNL will even accept, much less retort and treat, mercury contaminated soils. After initially considering this option at WAG-1, it was deleted as it was not considered viable.
Resolution - Comment incorporated. Mercury retorting is deleted from the draft final report, since high-mercury subcategory RCRA hazardous soils are apparently not present at CFA-04.

9. Section 10.5.1, SL-1 Type Cover discussion, page 10-8

This is another instance of the discussion for this alternative including a description of a cover feature not shown in Figure 9-2. In this case there is a brief description of the foundation layer, composed of several compacted lifts of native soil and projected to be 18 inches in thickness. The foundation layer is omitted from Figure 9-2.
Resolution - Comment incorporated, the figure was revised as requested.

10. Section 10.5.3, second paragraph, page 10-9

The discussion states that institutional controls are assumed to begin in the year 2000 and remain effective for at least 100 years. However, in the discussion of RAOs, Section 9.3, page 9-5, the third paragraph cites the *Long-Term Land Use Future Scenarios for the INEL* (DOE 1995a) where it is assumed the INEEL will remain under government management (and hence institutional controls) for at least 100 years starting in 1995. Please discuss this minor discrepancy.
Resolution - Comment incorporated, for consistency the institutional control period was revised and is assumed to begin in 1995.

11. Section 11.2.1, third paragraph, page 11-2

The last sentence of the third paragraph states that land-use restrictions may be specified if government control of the INEEL ceases. Please state how these land-use restrictions will be carried forward in time. The Government Accounting Office (GAO), not DOE, will determine land use restrictions if the land is returned to the private sector.

Resolution - The ROD will include a description of the land-use restriction process similar to that in the OU 4-12 ROD, which is: "The institutional controls will include administrative controls such as placing written notification of this remedial action in the facility land use master plan to ensure that potential future activities would not compromise the integrity of the cover. A copy of the notification will be placed in BLM's property management records for this site."

The *Comprehensive Facility and Land Use Plan,* (DOE/ID-10514) was revised to incorporate the land-use restrictions for the landfills.

12. Section 11.3.3, last sentence of section (top of page), page 11-6

Please specify what the fate of the feeder pipes and drain tiles will be after the sludges have been drained. Residual sludge may remain in the pipes and drains if they are not flushed.

Resolution - Comment incorporated. The feeder pipes and drain tiles would be directly disposed of in the ICDF, after free liquids have drained into soil. This was explicitly stated in the draft final report.

13. Section 11.3.4, first paragraph, page 11-6

This narrative should be changed to reflect the fact that the plans for the ICDF have yet to be subjected to public review. The entire paragraph is speculative at this stage, such as, the ICDF may not have packaging requirements, and the ICDF WAC will be defined based on the maximum contaminant concentrations in soils projected for disposal. This implies the WAC will be whatever DOE wants it to be. Please alter substantially or delete the first two sentences to this paragraph.

Resolution - Comment incorporated. The discussion will be revised to include the most current ICDF planning assumptions. The basis for these assumptions, i.e., requirements would be similar to that for similar facilities elsewhere, will also be stated.

14. Section 11.4.2, second paragraph, page 11-8

The third sentence of this discussion states that "soils excavated from OU 4-13 sites are *assumed* to meet the WAC for the disposal facility." The WAC for Envirocare should be known since it has been an operating facility for some time, and the OU 4-13 soils have been characterized to the point where COC concentrations that may be shipped to Envirocare are established. Again, we are stating assumptions that are too broad. We should know with some certainty whether the soils will be accepted.

Resolution: Comment incorporated. OU 4-13 soil data were compared to the WAC for the representative facility and found acceptable. This is stated explicitly in the revised report.

15. Section 11.6.2, first paragraph, page 11-11

Short-term effectiveness should be ranked as moderate for all sites for Alternative (4b). A high ranking should be reserved for those alternatives (containment, ISV) where exposure is minimal. This alternative has a higher probability of exposure to workers at several stages such as those listed in the second sentence (excavation, transportation, treatment, and disposal).

Resolution - Comment incorporated.

16. Section 11.7, last paragraph, page 11-12

Change section numbers to 11.7.1 though 11.7.4. The present numbers refer to sections under 11.5.

Resolution - Comment incorporated.

17. Section 11.8.1, page 11-18

This section warrants several comments:

-- Verification sampling of the vitrified soils is not discussed.

-- Third paragraph: ISV would not require the series of tasks discussed in this section. ISV is capable of melting all the items discussed. Stabilization in Portland cement would not be necessary prior to ISV.

-- Fourth paragraph: The secondary wastes produced by the air pollution control system should not be incorporated into the treatment area and vitrified. Both ISV and capture of these wastes are concurrent processes and cannot really be mixed. Disposal of the trapped contaminants is the only option. The last sentence should be deleted.

-- Second paragraph beneath **Evaluation**: The extensive underground system of clay drain tiles, gravel, and tiles filled with organic sludge should not affect implementability. ISV has been demonstrated (personal communication with Geosafe) to be capable of incorporating these features into a melt when the presence is known beforehand and the design of the melt can take into account features other than soil to be melted.

Resolution - Comment incorporated. Alternative 6 is deleted from the Draft Final report. ISV is screened out as a technology in Section 9, on the basis of low cost-effectiveness and low technical implementability.

18. Section 12.2.1.2, Compliance with ARARs and TBCs for Alternative 1: No Action With Monitoring, page 12-5.

The no action with monitoring alternative would not require any ARARs under the Idaho Hazardous Waste Management Act (HWMA).

Resolution – Comment noted. None were cited for this alternative, either in the text or in Table 12-1.

19. Section 12.2.2, Compliance with ARARs and TBCs for Alternative 3a: Conventional Excavation /ICDF Disposal, page 12-7, and Table 12-2, page 12-8

This alternative would consist of excavation of the soil contamination at the four sites requiring action and disposal at an on-site (within the boundaries of the INEEL) soil repository site. The on-site repository is not located within the boundaries of the Area of Contamination (AOC) of WAG 4-13.

The only RCRA ARAR listed in Table 12-2 for Alternative 3a is: Hazardous waste determination listed as 40 CFR §262.11. All ARARs in which the State of Idaho has primacy of the program should be referred first by the IDAPA citation followed by the federal citation in parentheses, in this case: IDAPA 16.01.05.006 (40 CFR§262.11).

The additional ARARs which should be included in this alternative are as follows:

IDAPA 16.01.05.005 (40 CFR §261.2) Definition of a Solid Waste
IDAPA 16.01.05.005 (40 CFR §261.24) Toxicity Characteristic
IDAPA 16.01.05.008 (40 CFR §264.114) Equipment Decontamination
IDAPA 16.01.05.011 (40 CFR§268) Land Disposal Restrictions (LDR's) including the newly promulgated Phase IV LDRs.
IDAPA 16.01.05.008 (40 CFR Subpart I) Use and Management of Containers

Resolution - Comment noted. For purposes of alternatives 3a and 3b, no RCRA characteristic or listed wastes were assumed to be present at any site, as stated in Section 10.3.1, pp. 10-5. The only site to which this alternative may apply is CFA-08, where no RCRA waste is present. Therefore the additional ARARs cited do not apply.

IDAPA 16.01.05.008 (40 CFR §264.114) Equipment Decontamination
IDAPA 16.01.05.008 (40 CFR Subpart I) Use and Management of Containers
IDAPA 16.01.05.011 (40 CFR§268.40, .45 and .48 except where superceded by 63 FR 28555, Land Disposal Restrictions, Phase IV) Land Disposal Restrictions (LDR's) 63 FR 28555, Land Disposal Restrictions, Phase IV, 40 CFR 268.40, .45, .48. (The new 40 CFR 268.49 is less restrictive than existing state standards and has not yet been formally adopted by Idaho. Adoption of this less restrictive ARAR is at the discretion of DEQ.) Please advise how to proceed with inclusion of 268.49.

Use of the definitions of Solid Waste and TCLP toxic waste is not consistent with previous program documentation and is inherent is conducting a hazardous waste determination. It is not suggested these be cited as ARARs.

20. Section 12.2.3.2, Compliance with ARARs and TBCs section for Alternative 3b: Conventional Excavation /Off-INEEL Disposal

ARARs for Alternative 3b are referenced to Table 12-2 for Alternative 3a. The only RCRA ARAR listed in Table 12-2 for Alternative 3a is: Hazardous waste determination listed as 40 CFR §262.11. The additional ARARs which should be included in this alternative are as follows:

IDAPA 16.01.05.005 (40 CFR §261.2) Definition of a Solid Waste
IDAPA 16.01.05.005 (40 CFR §261.24) Toxicity Characteristic
IDAPA 16.01.05.008 (40 CFR §264.114) Equipment Decontamination
IDAPA 16.01.05.011 (40 CFR§268) Land Disposal Restrictions (LDR's) including the newly promulgated Phase IV LDRs.
IDAPA 16.01.05.008 (40 CFR Subpart I) Use and Management of Containers
CERCLA Off-site Disposal Policy

Resolution - Comment noted. See response to Comment #19.

21. Section 12.2.4.2, Compliance with ARARs and TBCs section for Alternative 4a: Conventional Excavation/On-INEEL Treatment and ICDF Disposal, page 12-11, and Table 12-3, page 12-12

RCRA ARARs for Alternative 4a are listed in Table 12-3. The following RCRA ARARs are identified in Table 12.3.
IDAPA 16.01.05.006 (40 CFR§262.11) Hazardous Waste Determination
IDAPA 16.01.05.008 (40 CFR§264.14) Security
IDAPA 16.01.05.008 (40 CFR§264.114) Equipment Decontamination
IDAPA 16.01.05.008 (40 CFR Subpart I) Use and Management of Containers
IDAPA 16.01.05.008 (40 CFR§264.601, .602) Miscellaneous Units
IDAPA 16.01.05.011 (40 CFR§268.40, .45, .48) Land Disposal Restrictions

The following RCRA ARARs should be added to the list:

IDAPA 16.01.05.005 (40 CFR §261.2) Definition of a Solid Waste
IDAPA 16.01.05.005 (40 CFR §261.24) Toxicity Characteristic
IDAPA 16.01.05.011 (40 CFR§268) Land Disposal Restrictions, Phase IV

Resolution - Comments noted. The new 40 CFR 268.49 is less restrictive than existing state standards and has not yet been formally adopted by Idaho. Adoption of 268.49 is deferred pending guidance from the State on implementation.

Use of the definitions of Solid Waste and TCLP toxic waste is not consistent with previous program documentation and is inherent is conducting a hazardous waste determination. It recommended that these not be cited as ARARS.

22. Section 12.2.5.2 Compliance with ARARs and TBCs section for Alternative 4b: Conventional Excavation/Treatment and Off-INEEL Disposal, page 12-15, and Table 12-4, page 12-16

RCRA ARARs for Alternative 4b are listed in Table 12-4. The following RCRA ARARs are identified in Table 12-4.

IDAPA 16.01.05.006 (40 CFR§262.11) Hazardous Waste Determination
IDAPA 16.01.05.008 (40 CFR§264.114) Equipment Decontamination
IDAPA 16.01.05.008 (40 CFR Subpart I) Use and Management of Containers
IDAPA 16.01.05.008 (40 CFR§264.601, .602) Miscellaneous Units
IDAPA 16.01.05.011 (40 CFR§268.40, .45, .48) Land Disposal Restrictions

The following RCRA ARARs should be added to the list:

IDAPA 16.01.05.005 (40 CFR §261.2) Definition of a Solid Waste
IDAPA 16.01.05.005 (40 CFR §261.24) Toxicity Characteristic
IDAPA 16.01.05.011 (40 CFR§268) Land Disposal Restrictions, Phase IV
CERCLA Off-site Disposal Policy

Resolution - Comments noted. See response to Comment #21. Additionally, the CERCLA Off-Site Policy has typically not been cited as an ARAR in past program documentation and is therefore not included in the table.

23. Section 12.2.6.2, Compliance with ARARs and TBCs section for Alternative 5: Containment and Institutional Controls, page 12-17, and Table 12-4, page 12-18

RCRA ARARs for Alternative 5a, 5b, and 5c are listed in Table 12-5. The following RCRA ARARs are identified in Table 12-4.
IDAPA 16.01.05.006 (40 CFR§262.11) Hazardous Waste Determination
IDAPA 16.01.05.008 (40 CFR§264.114) Equipment Decontamination
IDAPA 16.01.05.008 (40 CFR§264.310(a) 1-5 - Landfill Closure and Post Closure
IDAPA 16.01.05.008 (40 CFR§264.310(b) 1, 5, 6 - Landfill Closure and Post Closure

LDRs do not apply to alternatives where soil consolidation and capping are performed within the AOC so that placement does not occur. Placement occurs when:

- Soils are consolidated from different AOCs into a single AOC;
- Soils are moved outside of an AOC (for treatment or storage, for example) and returned to the same or a different AOC; or
- Excavated from an AOC, placed in a separate unit, such as an incinerator or tank that is within the AOC and redeposited into the same AOC. (*See Superfund LDR Guide #5, Directive: 9347.305FS)

As long as soil consolidation occurs within the respective AOC, LDRs will not apply to the action. If however, the soils are consolidated and moved from one AOC into a different AOC, this constitutes placement which triggers LDRs.

Resolution – Comments noted. LDRs were not cited, and were specifically excluded in the text discussion. The RCRA ARARs that were cited would be considered relevant and appropriate for CFA-04 and -10, if RCRA wastes remain, as stated in Table 12-5.

24. Section 12.2.6.5, second paragraph, page 12-20

Be more specific when referring to sites. This lack of specificity is common throughout Section 12, and here is an obvious example; "Inhalation and ingestion risks due to toxic metals in soil at *other sites* could be minimized...". It is assumed the other sites are CFA-04 and CFA-10.

Resolution - Comment incorporated.

25. Section 12.2.10.2, Compliance with ARARs and TBCs section for Alternative 6: In Situ Treatment with In Situ Vitrification, page 12-27, and Table 12-5, page 12-28

The In Situ Vitrification (ISV) alternative is only being considered for CFA-08, where the depth and extent of contamination is sufficient to perform ISV. According to the site characterization data presented in the feasibility study, there are no hazardous constituents regulated under RCRA at the site. Cesium 137 is reported to be the only COC.

RCRA ARARs for Alternative 6 are listed in Table 12-5. The following RCRA ARARs are identified in Table 12-5.

IDAPA 16.01.05.006 (40 CFR§262.11) Hazardous Waste Determination
IDAPA 16.01.05.008 (40 CFR§264.114) Equipment Decontamination
IDAPA 16.01.05.008 (40 CFR§264.310(a) 1-5 - Landfill Closure and Post Closure
IDAPA 16.01.05.008 (40 CFR§264.310(b) 1, 5, 6 - Landfill Closure and Post Closure

We are in agreement with the RCRA ARARs that are presented in Table 12-5, and at this time have no further ARARs to add.

Resolution – Comments noted. Alternative 6 was deleted from the Draft Final report. Additionally, those ARARs cited as "Not ARAR" in Table 12-5 are deleted altogether from the Draft Final Report.

26. Table 12-7, Page 12-32

The ARAR evaluation of Closure and Post Closure, and Use and Management of Containers, and Equipment decontamination with Alternative 6 states, "Would meet ARAR for CFA 04, if RCRA HW present". This statement does not belong there since Alternative 6 is only proposed for site CFA 08 where hazardous constituents are not reported to be present.

Resolution - Comment incorporated. Alternative 6 was deleted from the Draft Final report.

Comments on Resolution to RI/BRA Comments

(Comments will be addressed under the original Section and page designation to avoid confusion.)

Comment 16, *Section 4.1.10.3, second and third paragraphs, page 4-33*

The reference to migration of contaminants not occurring beyond the 9.9m depth due to the presence of basalt was not changed as requested. This is an inaccurate statement that needs changing or clarification, and if there is another reason behind making this statement, it is still not clear.

Original Comment
Section 4.1.10.3, second and third paragraphs of section, page 4-33
The last portion of the second paragraph appears to be an incomplete sentence, and needs editing. In the third paragraph, the second sentence, which states that the "migration of contaminants beyond 9.9 m (32.4 ft) cannot occur.", is not an accurate statement. The 9.9m depth represents the soil/basalt interface. Contaminants can easily migrate into basalt. The discussion should be changed to reflect this fact.
Original Resolution
The text in the 2nd paragraph was revised per comment. The text in the 3rd paragraph was revised to indicate that this depth of migration was an assumption that will overestimate potential risk.

Resolution for the draft final document
The 3rd paragraph of Section 4.1.10.3 is revised in the draft-final document as follows: "Data collected from 1994 to 1997 indicate that soils overlying the basalt are contaminated with Cs-137, Pu-239/240, and U-235. Although, actual basalt depths range from 6.1 to 9.9 m (20 to 32.4 ft), the assumed depth for the risk assessment is 9.9 m (32.4 ft). This assumption ensures that potential risks are not underestimated because the volume of contaminated soil is greater than actual."

Comment 17, *Section 4.1.10.5, second paragraph of section, page 4-35*
This comment still was not addressed. Regardless of the intent of the D&D sampling, it still leaves unanswered the questions as posed in the original comment regarding the potentially inadequate characterization of the site.

Original Comment
Section 4.1.10.5, second paragraph of section, page 4-35
It is unclear in this discussion why sampling in the shallow soils to 3.7 meters bgs (0 to 12 feet), is not mentioned. If samples were not obtained from this interval (and analyzed), then this should be explained. Contamination found at depth could not have arrived there without traveling through, and contaminating, shallower soils. The significance of 3.7 meters bgs is not obvious, and the apparent lack of sampling in the shallow soils appears to represent a data gap, and in turn could represent the potential elimination of exposure pathways.
Original Resolution
The shallow samples collected by D&D were focused on the buildings and did not apply to potential environmental releases. The reference to "surface" samples was deleted.

Resolution for the draft-final - The 2nd paragraph in Section 4.1.10.5 was revised as follows:
"The primary structures at the treatment plant were constructed below the surrounding grade, approximately 3m (10 ft). In addition, some of the piping for the plant is below this level. Samples were collected in 1996 in the vicinity of the treatment plant at depths ranging from 3.7 to 8.3m (12 to 27.25 ft) to determine if leakage of effluent had occurred from the structures and piping which would have caused migration of potential contaminants from the plant. The analytical data from the samples indicate that soils overlying the basalt at a depth of 8.3m (27.25 ft) are contaminated with Ra-226, and U-235. Although, actual basalt depths range from 6.1 to 9.9m (20 to 32.4 ft), the assumed depth for the risk assessment is 9.9m (32.4 ft). This assumption ensures that potential risks are not underestimated because the volume of contaminated soil is greater than actual."

Comment 18, *Section 4.1.12, page 4-40*
This comment resolution and the text discussion still do not address the question that arises as to the adequacy of the characterization of the shallow soils. It is hard to believe that 55,400 gallons of

fuel passed through the vadose soils and they do not exhibit greater contamination. If these are demonstrably coarse soils where a leak would result in an immediate migration of the diesel to the basalt/soil interface, then possibly the characterization was adequate. If this is not the case, then more diesel should have been retained in the soils and therefore the five boreholes were not strategically placed.

Original Comment
Section 4.1.12, page 4-40
It does not appear that the characterization of overburden soils, based on the discussion presented here, is complete. Since the discussion does not indicate a removal action, how can 55,000 gallons of diesel spill on soils, and the soils not exhibit contamination? The "Nature and Extent of Contamination" section states that TPH was detected at depth but "overburden soils at CFA-26 are not contaminated". The discussion does not provide an indication of the timing of the construction of building CFA-623, and begs the question as to whether the construction of this building interfered with the thorough characterization of soils.

The "Previous Investigation" section does indicate that boreholes were drilled, samples collected, and analyses performed. Please provide discussion as to why these boreholes and subsequent sampling are thought to provide an adequate characterization. First indications (contamination found at depth but not in overlying soils) are that boreholes were placed too far laterally from the center of the spill to provide adequate characterization for the entire soil column.
Original Resolution
The spill at CFA-26 was evaluated in the Work Plan and in Section 6.3.3.3 of this BRA. Both evaluations showed potential risks to groundwater to be less than or within the acceptable risk range. Text was added to clarify the depth of contamination.

Resolution for the draft-final
The text in several sections is revised as follows:

Page 4-39 insert – replace sections 4.1.12.1/ 2/&3 with
Section 4.1.12.1. CFA-26 is the site of a 209,700-L (55,400-gal) potential loss of diesel fuel. The 227,600 L (55,000 gal) above-ground storage tank was constructed in 1950 and removed in 1986. The loss of fuel occurred over the period from January to March 1979 and was discovered as a result of tank gauging measurements. The heating system was designed to circulate the fuel oil in the tank through the manifold to keep it warm during the winter. The sump consisted of a square concrete-walled structure approximately 6' x 6' in size with the top of the sump at the ground surface. The floor of the sump, located 1.2 m (4 ft) bgs, was open to the soil/gravel. The heating manifold was accessed through a manhole cover at the ground surface.

The cause of the leak was determined to be a small hole in a steam heating manifold, which was located in a piping sump adjacent to the tank. The leak would have discharged directly to the subsurface soils via the gravel bottom of the sump [1.2 m (4 ft) bgs], over a 3-month period, which would have required a minimum discharge rate of 0.4275 gallons/minute.

Integrity tests performed on the tank after the incident revealed that the tank was not the source of leakage. The location of the former tank is now occupied by building CFA-623, the Multicrafts Shop (see Figure 4-21). Interviews with personnel who worked on the foundation construction revealed that diesel fuel odor or stained soil was not noticed during the construction period. The above information indicates that the discharge occurred primarily to the subsurface soil.

Section 4.1.12.2 Previous Investigations. A Track 2 investigation was performed at CFA-26 in 1995. The information in Section 4.1.12.2 was gathered during the investigation and prior to field data collection. As a result, subsurface samples were collected from five boreholes at the soil-basalt interface in the vicinity of the former tank. The boreholes were placed as close to the former tank location as possible, however the presence of CFA-623 interfered with borehole placement directly over the former tank or sump location. The depth to basalt, based on these boreholes, ranges from 2.9 to 3.4 m (9.5 to 11.2 ft).

Samples collected from the boreholes were analyzed for VOCs, SVOCs, and TPH. Four of the five samples contained TPH at concentrations below the INEEL screening level of 1,000 mg/kg. The TPH concentration in the fifth borehole was 3,470 mg/kg at a depth of 3.4 m (11.2 ft). Three other contaminants were detected, chlorodifluoromethane (0.1 mg/kg), phenol (0.31 mg/kg), and di-n-butylphthalate (0.49 mg/kg), which were screened from further evaluation in the Work Plan.

4.1.12.3 Nature and Extent of Contamination. Data collected during the Track 2 investigation indicate that surface soils to a depth of 3-m (10 ft) are not contaminated and that TPH contamination was detected in the soil at approximately 3 to 4.4 m (10 to 11.2 ft). All contaminants at CFA-26 were eliminated in the contaminant screen in the Work Plan, therefore eliminating a supplemental contaminant screen. However, the potential exists for petroleum contamination in the basalt, consequently, the groundwater exposure pathway to assess cumulative risk to groundwater is evaluated in Section 6.

Comment 22, *Section 4.1.15.2, pages 4-44 to 4-48*

The original comment was not addressed. The results of these analyses should be briefly discussed in this section.

Original Comment

Section 4.1.15.2, pages 4-44 to 4-48

This section refers to soil samples that were collected from between 0 and 5.8 m in depth bgs and analyzed for radionuclides, VOCs, metals, and PCBs. However, there is no discussion of the results of these analyses. Please discuss the results in this section. Also, provide the justification for the first sentence of section 4.1.15.3, stating that "no further remedial action is necessary for CFA-05 soils".

Resolution.

The Track 2 investigation for the site (Gianotto et al, 1996) estimated the volume of contaminated material left at the site. The 0.15m depth was derived from this estimate.

Resolution for the draft-final – replace sections 4.1.15.1/2/3 with:

4.1.15.1 Site Summary. The CFA-05 Motor Pool Pond consists of an unlined evaporation pond located in an abandoned borrow pit approximately 3,656 (12,000 ft) east of the CFA Equipment Storage Yard (see Figure 4-25). The site includes the sediments of the pond, sediments along the inlet ditch, and at the discharge pipe. The pond received wastes from the wash bay and outside sumps at the Service

4.1.15.2 Previous Investigations. The CFA Motor Pool Pond (OU 4-11) was investigated in 1989 to support a RCRA closure plan. These data were later evaluated in the OU 4-11 RI/FS (Spry et al. 1992) and were the basis of a Record of Decision (DOE 1992). The scope of the RI was limited to surface sediments and did not include characterization of the subsurface geology or groundwater. As stated in Section 1.1 of the OU 4-11 RI/FS, "the potential for groundwater contamination as a result of past waste disposal practices, and the potential for exposures to contaminated groundwater, would be evaluated in a future investigation." The investigation consisted of

collection of 41 soil samples from sediments in the pond and along the inlet ditch. Thirty-eight of the samples were analyzed for gamma-emitting radionuclides and three for alpha-emitting radionuclides. Four of the samples were analyzed for metals and VOCs.

4.1.15.3 Nature and Extent of Contamination. Analytical data from the investigation indicate that metals are present in the sediments above background concentrations. These include barium; 92.4 to 434, beryllium; 0.22 to 1.4 mg/kg, cadmium: 0.53 to 38.8 mg/kg, chromium; 8.2 to 91.3 mg/kg, lead; 10.6 to 631 mg/kg, mercury; 0.06 to 1.2 mg/kg, and thallium; 0.3 to 1.0. The highest concentrations of metals were found in the sediments along the ditch from 0 to 2 m (0 to 7 ft) in depth, and in sediments along the ditch. The VOC data indicate that four compounds (acetone - 90 ug/kg, 2-butanone – 40 ug/kg, 4-methyl 2-pentanone – 40 ug/kg, methylene chloride – 40 ug/kg, and tetrachloroethylene – 76 ug/kg) were detected at a depth of 4 m (13 ft) in the pond sediments. Aroclor-1260 was detected in sediments near the outlet pipe at a concentration of 1,470 ug/kg. Radionuclides (Am-241 - 2.72 pCi/g, Cs-137 - 8.4 pCi/g, and Pu-239 - 4.29 pCi/g) were detected in surface sediments of the ditch and pond. The OU 4-11 BRA for the site indicates that the potential risks to human health are within the acceptable risk range for future residential exposure pathways and consequently, the ROD documents a "no further action decision."

These data from the investigation were evaluated in a supplemental contaminant screen to determine the groundwater COPCs for the groundwater exposure pathway. The results of the screen are presented in Table C-41 of Appendix C. The summary statistics for COPCs are shown in Tables C-42 and C-43, Appendix C. The COPCs retained for the groundwater risk evaluation are: Aroclor-1260, Ac-228, Am-241, arsenic, Bi-212, Bi-214, Cs-137, lead, Pb-212, Ra-226, and Tl-208. Figure 4-26 shows the source term estimates used to evaluate risk associated with the groundwater pathway in Section 6 of this BRA.

Comment 30, *Figure 4-32, page 4-67*
The comment still stands in regards to the contouring errors noted. These were not corrected in the draft RI/FS.

Original Comment
Figure 4-32, page 4-67
The chromium concentration contours need to be redone, and also the accuracy of the data may need to be verified. For example, the 30 µg/L contour appears to cross the 40 µg/L contour, and the circled contours, based probably on data from one well, may represent programmed contouring, but not contouring with any thought behind it. Also, the trend represented by these contours may be more representative of faulty contouring than anything real. Please delete or revise his figure.
Resolution
Figure was revised to show dashed lines where data is not specific.

Resolution
The figures are revised for the draft final document.

Comment 38, *Section 6.2.2, page 6-10*
Resolution is accepted, with one additional comment. The Region 10 endorsement of the dermally-based Region 9 table suggests a shift in Region 10 position regarding assessment of dermal exposure. Future risk assessments will undoubtedly incorporate dermal exposure more fully, for a wider range of contaminants.

Resolution
No response required.

COMMENTS ON THE WAG 4 DRAFT RI/FS REPORT
Reviewer: Keith Rose

1) Page 4-70, second paragraph. Eliminate the sentence which states that a peak concentration of 872 pCi/L of I-129 was predicted in the aquifer in 1994. More recent modeling has revised the predicted concentrations of I-129 in the aquifer, and monitoring results have shown that model predictions are very conservative.

Resolution – The sentence was deleted.

2) Page 5-2, Section 5.3.1. How could the supplemental contaminant screen, which was conducted in Chapter 4, have included supplemental RI data from CFA-04 and CFA-08 when this data was not yet available? This data was not available until October 1998.

Resolution – Please review the 3 bullets in this section, wherein the sites and data for which the supplemental contaminant screen were performed are listed. The 1998 data is not included in this supplemental contaminant screen. Text was added to the 2nd bullet indicating that additional site characterization was conducted in 1997.

3) Page 9-6, RAOs. The EPA guidance recommending a residential land use cleanup concentration for lead of 400 mg/kg cannot be cited as an RAO.
In the heading "Protection of the Environment After 2095", eliminate the words "After 2095" since the objective is to protect the environment immediately.

Resolution - Comment incorporated.

4) Page 9-8, second paragraph. The next to last sentence should end,"...provided that the pond would be backfilled as part of any remedy." Eliminate the last sentence of this paragraph. It is okay to assume that excavation down to 10 ft bgs at the CFA-04 pond would eliminate direct human health and ecological exposure pathways, however if recent TCLP results indicate that mercury contamination below this depth is RCRA hazardous waste, excavation below 10 ft bgs should be included in Alternatives 3a, 3b, 4a, and 4b to remove this waste.

Resolution – The WAG 4 and Remedial Project Managers may evaluate removal of contaminated soil at depths greater than 10 ft if it is discovered during remedial activities. However, the characterization in the RI was based on the future residential pathway, which assumes that exposure to contaminants would occur when contamination exists from 0 to 10 ft. Consequently, remedial cost estimates in the FS, which are also based on this assumption, would be inaccurate if contamination was discovered below 10 ft. See also response to comment # 9. Land-use restrictions and 5-year reviews were added to those alternatives where contamination exceeding PRGs would remain at the site at depths greater than 10 ft bgs.

5) Page 9-17. For buried or contained contamination, deed restrictions can be effective in preventing human and ecological exposure currently and beyond the institutional control period. In fact, deed restrictions would only be considered if WAG 4 property is transferred from the government to a private party. In the fifth paragraph, the unrestricted release level for CS-137 should be 23 pCi/g, not 2.3 pCi/g.

Resolution - Comment (a) incorporated, for human exposure. This was stated as an assumption in the FS Section 9.2.1. Comment (b) noted. The Cs-137 PRG assumes 100 years of institutional

control, in which time the initial activity of 23 pCi/g will decay to approximately 2.3 pCi/g, which is the unrestricted release criterion.

6) Page 9-27, Soil Washing. It seems that the possible disadvantages of soil washing to treat Pb contaminated soil may have been overstated. The EPA document, *Technology Alternatives for the Remediation of Soils Contaminated with As, Cd, Cr, Hg, and Pb*, reports that soil washing is potentially applicable to soils with "...a single principle contaminant metal that occurs in dense, insoluble particles that report to a specific, small mass fraction(s) of the soil..." This is likely the form of Pb associated with welding activities that occurred at CFA-10. This document also points out that recycling the leachate back through the process can be a solution to the large volume of secondary waste that is mentioned as a major concern associated with this technology.

Resolution - Comments noted. This site-specific technology was screened from further consideration on the basis of no demonstrated effectiveness in INEEL soils. Treatability studies would be required to determine effectiveness, which would likely require selection of an alternative post-ROD.

7) Page 9-33, next to last paragraph. Phytoremediation can't be retained for further consideration pending results of the ANL field demonstration, these results will not be available for two more years. Instead evaluate the potential for phytoremediation to be effective based on the percent reduction of Cs-137 required to meet the RAO, the number of potential growing seasons required to meet this RAO, and the ability for plant roots to reach the depth required to extract all the Cs-137 exceeding the RAO.

Resolution - Comments noted. A "white paper" containing additional detail on phytoremediation was submitted to the agencies on 11/19. Based on the results of the additional information, phytoremediation was screened out for all sites, on the basis of low effectiveness and technical implementability.

8) Page 10-1, Alternatives 3a and 3b. Currently, Alternatives 3a and 3b do not include treatment of any RCRA characteristic waste which may be present at CFA-04 (Hg) or CFA-10 (Pb) prior to disposal. If the supplemental RI TCLP data show that either site contains hazardous waste, treatment of that waste to meet LDRs prior to disposal must be included in these alternatives.

Resolution - Comments noted. See the response to IDHW comment #19.

9) Page 10-5 and 10-6, Institutional Controls. Under Alternatives 3 and 4 contaminants exceeding RAOs would only be excavated to a depth of 10 feet bgs. If contaminants exceeding RAOs are left in place below that depth, land use restrictions to prevent access to contamination and 5-years reviews to evaluate the protectiveness of the remedy would be necessary for both sets of alternatives.

Resolution - Comment incorporated. Land use restrictions and 5-year reviews will be added to those alternatives where contamination exceeding PRGs would remain at the site at depths greater than 10 ft bgs.

10) Page 10-5, Alternatives 3a and 3b. Where would soils be stockpiled pending ICDF availability? Would this situation be limited to the two-year maximum operation of a Temporary Unit and, if so, would the ICDF be available within this period of time? If the ICDF is not available by the expected date, is there another onsite disposal alternative?

Resolution Comment incorporated. The response to IDHW comment #1 notes that about 73,000 cy of disposal capacity remains at the RWMC, however, not all of this will likely be available for soil disposal. Reference to stockpiling will be deleted from the Draft Final Report. Instead, operations would be staged to begin excavation at small sites (CFA-10), which the RWMC could likely accommodate, in order to defer excavation of larger sites until the ICDF is available.

11) Page 10-8, paragraphs 4 and 5. In both paragraphs, "46 m" should be "46 cm".

Resolution - Comment incorporated.

12) Page 10-9. Alternative 5c should not be a stand-alone alternative because it addresses only a small fraction of the contamination exceeding RAOs and relies on institutional controls, which do not have adequate long-term effectiveness, for the balance of the risk. This alternative is not significantly different from Alternative 2 to warrant it being independently evaluated. However, concrete caps for small areas of contamination can be incorporated into Alternatives 5a and 5b.

Resolution - Comment incorporated, this alternative was deleted, because the site for which it was most applicable (CFA-12) was also deleted.

13) Page 10-9. For Alternative 6 to be a complete alternative, it should include a description of monitoring and institutional controls necessary for 100 years to prevent access to areas of contamination not addressed by treatment.

Resolution - Comment incorporated, this alternative was deleted per the 11/30 agency conference call discussion.

14) Page 11-6, Section 11.3.6. The first sentence should say that excavated areas will be backfilled with clean material "to grade". Section 11.3.8, Disposal. Include a description of treatment for to meet LDRs if supplemental RI data indicates that soil at CFA-04 or CFA-10 is hazardous waste.

Resolution - Comment noted. Alternatives 3a and 3b, all soils were assumed to be non-hazardous in the draft document. These alternatives are revised in the draft final version to reflect the July 1998 sampling data indicating that a fraction of soils at CFA-04 and –10 failed TCLP, and will require treatment prior to disposal outside the AOC.

15) Page 11-12, fifth paragraph. The references to section 11.5 in this paragraph should be to section 11.7.

Resolution - Comment incorporated, this paragraph was deleted since only one capping option is retained.

16) Page 11-17, Alternative 6. This alternative should be screened out as an ineffective alternative at this point because institutional controls for 100 years, which would apply to contaminated areas other than CFA-08, would not provide adequate long-term effectiveness in reducing risk at the site. This is the same rationale which was used previously for screening out Alternative 2 as an ineffective remedy.

Resolution - Comment incorporated, this alternative was deleted as per discussions on the 11/30 agency conference call.

17) Page 11-19, Section 11.9.3. Eliminate the end of the last sentence which reads, "and signature of the WAG 3 ROD which will either initiate or terminate design and construction of the ICDF." Detailed analysis of Alternatives 3a and 3b should not depend on whether the final decision has been made to construct the ICDF. The WAG 3 ROD will be signed before the WAG 4 ROD so that if decision is made not to construct the ICDF, and Alternative 3 is the preferred alternative for WAG 4, another INEEL disposal site or another alternate could than be selected in the WAG 4 ROD. This same comment applies to the discussion of Alternative 4 in the second paragraph on page 11-20.

Resolution - Comment incorporated.

18) Page 12-8, Table 12-2. If CFA-04 or CFA-10 contain hazardous waste, include LDRs as an ARAR for Alternative 3a and 3b. In addition, the ARARs for Alternative 3b and Alternative 4b (Table 12-4) should include 40 CFR 300.440, "Procedures for Planning and Implementing Off-site Response Actions".

Resolution - (a) Comment noted. As noted previously, Alternatives 3a and 3b assumed that no hazardous wastes are present. These alternatives only apply to CFA-08, where no RCRA wastes are present and soils could be disposed of untreated. Alternatives 4a and 4b were modified in the Draft Final Report to reflect the hazardous status of some soils at CFA-04 and –10. (b) This regulation has not previously been cited as an ARAR for any INEEL off-site action.

19) Page 12-17, 12.2.5.6, Implementability. Since off-INEEL full-scale MLLW mercury retorting facilities may not be available, what about the option of retorting the contaminated soil on-site and then disposing the treated soil off-site?

Resolution - Comment noted. Since no high-mercury RCRA hazardous soils are present, mercury retorting was eliminated as a treatment option for Alternatives 4a and 4b.

20) Page 12-24, Section 12.2.8.3. The last two sentences of the second paragraph should be replaced with, "Human intrusion through the cap would be prohibited by land use restrictions."

Resolution - Comment incorporated.

21) Page 12-33, table 12-7. Eliminate Storm Water discharges, 40 CFR122.26, as an ARAR for all alternatives since no storm water discharges will occur under any alternatives.

Resolution - Comment incorporated. The sites proposed for remediation are outside of the INEEL's storm water corridor, and therefore storm water regulations don't apply. Also, the areas of construction at each of the sites are less than 10 acres, which is the threshold for applicability of storm water regulations.

22) Page 12-39, Table 12-8. Eliminate the third column "Potential RCRA Characteristic Waste Sites" if no RCRA waste is expected based on most recent TCLP data. Under "implementability" eliminate the statement that 3a and 4a are not implementable and rank alternatives 3a and 4a above 3b based on the assumption that a soil repository will be constructed at ICDF.

Resolution - Comments incorporated. RCRA waste occurs at CFA-04 and -10, based on the July 1998 sampling results, and the alternatives were revised to reflect this. The direction regarding the implementability of the ICDF was incorporated.

23) Page 12-40, first paragraph. The long-term effectiveness of alternative 5a (SL-1 cover) is ranked lower than alternative 5b (ET cover) based on greater resistance to intrusion of soil into the biobarrier. This does not appear to be a significant justification for the relative ranking of these two covers. The SL-1 cover has a 12" cobble and two 8" gravel layers under the rip rap layer which should prevent intrusion of plant roots into the contaminated soil zone. Given that the ET cover would also be more susceptible to erosion forces, the ET cover would require more long-term maintenance than an SL-1 cover and should be ranked lower on that basis.

Resolution - Comment noted. This discussion was deleted, because the ET-type cap was selected as the representative capping process option, since presence of RCRA waste was verified at 2 of 3 sites of concern. The ET-type cap would not meet RCRA 40 CFR 264 substantive cap requirements.

24) Page 12-42, Implementability. Alternatives requiring ICDF disposal should be ranked according to the assumption that ICDF will be constructed. If disposal at ICDF is the preferred remedy for WAG 4, a contingent remedy should also be identified so that if the ICDF is not constructed in a reasonable time, the contingent remedy could be implemented.

Resolution - Comment incorporated.

INTRODUCTION

At the request of the US Environmental Protection Agency (EPA), Gannett Fleming, Inc. (GF) reviewed the *Comprehensive Remedial Investigation/Feasibility Study for the Central Facilities Area Group 4-13, Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho* dated September 1998 and prepared by LMITCO and Parsons Infrastructure Group. The purpose of GF's review was twofold (1) to determine whether the authors responded sufficiently to EPAs previously submitted comments on the hydrogeologic portions of this RI; and (2) to ensure the technical accuracy of the FS portion of this document and that the document meets all relevant USEPA guidance and policy.

Comments are divided into response to resolution of the comments on the RI Section and the comments on the FS Section.

GENERAL HYDROGEOLOGY COMMENTS AND RESPONSE TO PROPOSED RESOLUTIONS

1. The contoured contaminant concentration in ground water diagrams presented in Section 4 require editing. The contours generally extend too far beyond any data points and, as such illustrate interpretations that the available ground water quality data do not sufficiently support. In some cases, two data points located two thousand feet apart are contoured for miles in both directions away from the wells. In addition, the inclusion of a solid 0.00 contour implies that the extent of the contaminant plumes are more precisely delineated than these data can support.

Resolution – The figures are revised in the draft final document.

2. Of the 21 COPCs identified at the CFA two are identified in the report having potential sources attributable to the CFA while the source of 12 COPCs could not be resolved due to insufficient data. The ground water data available at CFA both in regards to quality and gradient are limited. This lack of data limits the accuracy, reliability and confidence levels in the ground water quality modeling included in the BRA for WAG 4. A refined understanding of the contaminants sources

on and up gradient of the site, the potential release mechanisms for contaminants and a thorough understanding of site specific hydrogeologic conditions are necessary to insure a conservative model.

Response to proposed resolution:

Comment # 2 was intended to indicate that the available ground water quality data for CFA is limited to sporadic sampling events that, in the reviewers opinion, limit the degree of confidence that the model will produce estimates that can be substantiated by actual sampling results. The resolution text added to the conclusion of the Nature and Extent of Contamination section does provide a improved focus on the data limitations.

It was the intent of this comment to initiate discussion regarding the quality of the ground water data at present, the difficulty of verifying the ground water model predictions with these data, and the need for the implementation of a more rigorous ground water monitoring program at the CFA. A preferred ground water quality monitoring program would include the implementation of the acquisition of several consecutive years of consistently collected (methodology and time of year) and analyzed data for all COPC.

Resolution – Text was added to Section 8 Conclusion, that discusses the results of the groundwater evaluation.

RESPONSE TO RESOLUTIONS FOR SPECIFIC COMMENTS

1. **Section 2.2.3, Page 2- 23, Last Paragraph.** Resolution accepted.

2. **Section 2.0, Figure 2-9.** Resolution accepted.

3. **Section 4.3, Page 4-57, Nature and Extent of Contamination at WAG 4, First Paragraph.** Resolution accepted.

4. **Table 4-2, Page 4-61, Ground Water Data.** Resolution accepted.

5. **Figure 4-31, Page 4-62.** Resolution accepted with the following additional comment.
The analysis included in Appendix F provides insight into the ground water model sensitivity to the parameters suggested for evaluation. The significance of the thickness of the interbeds on contaminant arrival times is noteworthy considering the limited amount of data on the interbed thickness and its extent particularly down gradient of the site. The present ground water monitoring system provides little information on the potential effects of COPC on ground water quality down gradient of the site. Additional ground water sampling locations should be considered in future site activities.
Resolution – Text was added to Section 6.3.3.3, Unsaturated Zone Parameters, that stresses the limited data on interbed thickness in the vicinity of CFA.
Also see comment #9 for text added to Chapter 8.

6. **Section 4.3.1.2.9, Page 4- 69, Second Paragraph.** Resolution accepted.

7. **Section 4.3.1.2.17, Page 4-78, Third Paragraph.** Resolution accepted.

8. **Table 4-4.** Resolution accepted.

9. **Section 6.3.3.3, Ground Water Exposure Pathway, Table 6-5, Page 6-26.** Resolution accepted with the following additional comment. There is little data regarding the nature and occurrence of the interbeds over much of the INEEL. These interbed zones are poorly understood with regards to their actual effect on contaminant movement through the vadose zone. The interbeds have been variously described as either silty sedimentary deposits resulting from long periods of erosion between basalt flows or as unconsolidated rubble zones separating individual basalt flow lobes. Either description may be accurate at different locations within INEEL and could result in very different effects on the migration of liquids through the vadose zone. If any interbed sampling events, either physical (lithologic) or chemical in nature, have occurred or are planned in the vicinity of CFA in the future these data should be considered in additional refinement of the ground water pathway model sensitivity analysis included in Appendix F.

Resolution – Text was added to Section 6.3.3.3, Unsaturated Zone Parameters, that stresses the limited data on interbed thickness in the vicinity of CFA.
Also the following Section was added to in Chapter 8.

Section 8.4.12. The cumulative assessment of the groundwater exposure pathway at WAG 4 indicates that potential excess cancer risks do not exceed the EPA permissible risk levels for the occupational and residential exposure scenarios. This assessment was made using site-specific soil contamination data, groundwater data, subsurface data from well logs, and GWSCREEN modeling. The limitation of these data, especially groundwater and subsurface data, from well logs is discussed in Sections 4 and 6.

Subsurface data from well drilling logs was used to determine overall interbed thickness in the vadose zone. The assumed continuity of the interbeds, used in the GWSCREEN model, is based on these data, which are limited.

Groundwater data was collected infrequently from monitoring wells upgradient from CFA since the 1950's. However, the primary focus of past monitoring programs has been contaminants from INTEC and other upgradient sources. While several monitoring wells were added downgradient of the CFA Landfills in 1995, these wells are not downgradient of most of the WAG 4 potential release sites. Three additional monitoring wells, drilled in 1996, are downgradient WAG 4, however monitoring data is limited.

10. **Section 6.3.3.3, Ground Water Exposure Pathway, Assumptions, Page 6-37.** Resolution accepted.

11. **Section 6.3.3.3, Page 6-40, Saturated Zone.** Resolution accepted.

12. **Section 6.3.3.3, Source Area Parameters, Page 6-40.** Resolution accepted.

INTRODUCTION TO FEASIBILITY STUDY TECHNICAL REVIEW

At the request of the US Environmental Protection Agency (EPA), Gannett Fleming, Inc. (GF) reviewed the *Comprehensive Remedial Investigation/Feasibility Study Assessment for the Central Facilities Area Operable Unit, 4-13(draft)* dated September, 1998 prepared by Lockheed Martin Idaho Technologies Company. This review effort focused on the Feasibility Study (FS) portion of the report (Chapters 9 - 12). Overall, this FS report is well organized and well written; however, there a few concerns identified below under the General and Specific Comment sections below that may have an impact on the alternative evaluation and selection process.

GENERAL COMMENTS

1. The text indicates on page 9-9 that several data gaps became apparent while preparing the report. The primary data gap is that the depth of contamination for CFA-04, CFA-08, and CFA-10 was not assessed and the RCRA characterization for soil in CFA-04 and CFA-10 is incomplete. Some conservative assumptions are presented on page 9-10 to account for the data gaps. However, until the actual field data is collected the impact on the FS can only be estimated. It is important that any assumptions relative to the data gaps be explicitly incorporated into the detailed analysis of alternatives in section 12. Please include a discussion in section 12 of the importance of the data gaps as they pertain to each of the detailed alternatives.

Resolution - Comment incorporated. The data were received and are incorporated into the draft final report.

2. The waste characteristics and waste acceptance criteria for the on-site disposal facilities (ie. the RWMC and ICDF) should be clearly identified in Chapter 9, so that a comparison of waste characteristics to the acceptance criteria can be made. Without this information, it cannot be determined if the alternatives that include on-site disposal as an option would be feasible. The RWMC facility is currently accepting low-level radioactive soil and it is permitted to accept these wastes. However, in the recent past low-level radioactive soils have not been accepted at the facility due to concerns with capacity. It is uncertain how long the facility will continue to accept these wastes. If this is still true, then this should be stated in the report.

Resolution - Comment incorporated. OU 4-13 soil contaminant concentrations are compared to those cited in the RRWAC in the revised report. The RWMC remaining capacity and soil acceptance policy were discussed in the original draft report. The ICDF WAC are currently under development, however, preliminary indications are that all WAG 4 soils could be disposed of at the facility.

3. Throughout the text, it is mentioned that field screening techniques for metals and radioactive contaminants will be used to screen soil for contaminants. However, there is no discussion of the detection limits of the field screening instruments for the contaminants of concern (COCs). Please present in the text the detection limits of the field screening instruments, so that this can be compared against the PRGs to be sure that COCs do not go undetected.

Resolution - Comment noted. Detection limits for field screening instruments are compared to PRGs in Section 9.5.3.

4. Waste contaminants in the vitrification alternative will be either entrainment into the stable waste form or collection in the off-gas treatment system. Please describe in the text which waste constituents are expected to enter into the off-gas and what the method of ultimate disposal of these constituents will be so that it can be determined whether adequate treatment has been provided.

Resolution - Comment incorporated.

5. For those containment alternatives where the waste is left in-place, a deed restriction to limit access to contaminated areas should be included as a component of the alternative.

Resolution - Comment incorporated.

Specific Comments

1. **Section 9.3.2, page 9-7, par. 1.** The media of concern for CFA-04 does not mention the pond water. Please clarify in the text whether the pond water, if there is any, is contaminated and what disposal alternatives are available.

Resolution - Comment incorporated. No water is present, this was stated in the Draft Final report.

The following additions were made to the text for clarification.
1. Table 8-6 was revised.

Operable Unit	Site	Contaminant of Concern	Receptors		Further Evaluation
			Ecological	Human Health	
4-02	CFA-13	Radium 226		•	Naturally occurring, not evaluated further in the FS
		Lead	•		Evaluate in the OU 10-04 RI/FS
		Mercury	•		Evaluate in the OU 10-04 RI/FS
	CFA-15	Radium-226		•	Naturally occurring, not evaluated further in the FS
4-04	CFA-41	Lead	•		Evaluate in the OU 10-04 RI/FS
4-05	CFA-04	Mercury	•	•	Evaluate in the FS
	CFA-17/-47	Xylene	•		Evaluate in the OU 10-04 RI/FS
		Lead	•		Evaluate in the OU 10-04 RI/FS
4-07	CFA-12	Cesium-137		•	Exposure pathway not complete due to presence of contaminant in basalt, not evaluated further in the FS
		Pentachlorophenol	•		Evaluate in the OU 10-04 RI/FS
4-08	CFA-08	Cesium-137		•	Evaluate in the FS
		Chloromethane	•		Evaluate in the FS
4-09	CFA-10	Lead	•	•	Evaluate in the FS
		Copper	•		Evaluate in the FS
4-12	CFA-05	Cadmium	•		Evaluate in the OU 10-04 RI/FS
		Copper	•		Evaluate in the OU 10-04 RI/FS
		Lead	•		Evaluate in the OU 10-04 RI/FS
		Mercury	•		Evaluate in the OU 10-04 RI/FS
		4-methyl-2-pentanone	•		Evaluate in the OU 10-04 RI/FS
4-12	CFA-02	Lead	•		Evaluate in the OU 10-04

					RI/FS
		4-methyl-2-pentanone	•		Evaluate in the OU 10-04 RI/FS
		Acetone	•		Evaluate in the OU 10-04 RI/FS
		Dibenzofuran	•		Evaluate in the OU 10-04 RI/FS
		Pentachlorophenol	•		Evaluate in the OU 10-04 RI/FS

The following text was inserted in Section 8.4.7

Cs-137 was detected in a fracture of the basalt bedrock at a depth of 2.6 m (8.5 ft) and is considered inaccessible to a future residential receptor. It is assumed in the BRA that a resident would excavate to a depth 3.2 m (10 ft) and bring potentially contaminated soil to the surface where exposure would occur. The primary exposure pathway at this site however is not complete due to the fact that all contaminated soil was removed from the site and remaining contaminant is present only in a fracture of the basalt, which is inaccessible to the resident.