



State of Ohio Environmental Protection Agency

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George V. Voinovich  
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L-0549

December 31, 1997

RE: DOE FEMP  
COMMENTS: A2 PI IRDP

Mr. Johnny Reising  
U.S. Department of Energy, Fernald Area Office  
P.O. Box 538705  
Cincinnati, OH 45253-8705

Dear Mr. Reising:

Ohio EPA, in consultation with the Ohio Department of Health - Bureau of Radiation Protection, has reviewed DOE's October 24, 1997 submittal "Integrated Remedial Design Package for Area 2 Phase 1" and December 5, 1997 submittal "Contract DE-AC24-92OR21972, Certified for Construction Technical Specifications and Construction drawings for Area 2, Phase 1 Excavation Package. Attached are comments on these submittals.

If you have any questions, please contact Tom Ontko or me.

Sincerely,

Thomas A. Schneider  
Fernald Project Manager  
Office of Federal Facilities Oversight

cc: Jim Saric, U.S. EPA  
Terry Hagen, FDF  
Ruth Vandergrift, ODH  
Mark Shupe, HSI GeoTrans  
Francie Barker, Tetra Tech EM Inc.  
Manager, TPSS/DERR.CO

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Ohio Environmental Protection Agency comments on the  
Draft Area 2 Phase I Southern Waste Units Integrated Remedial Design Package  
for Operable Unit 2

1) Commenting Organization: OEPA Commentor: OFFO  
Section #: General Comment Pg. Line # Code: M  
Original Comment #

Comment: Ohio EPA does not believe the document sufficiently defines or justifies the proposed excavation boundaries or approach. Data are not presented in a format to support excavation plans and excavation activities during site preparation suggest the data collected to date are not representative of actual conditions. The IRDP must be revised to incorporate additional sampling data, available information gained during the site preparation activities, and improved data evaluations.

Ohio EPA believes the required changes to this document may result in substantial changes to the scope of the A2P1 contract which DOE and FDF are already moving forward. It is not prudent to continue to issue RFPs prior to EPA review of draft IRDPs due to the like scope changes and additional data needs. Hopefully, DOE and FDF can clearly see the problems associated with continuing on the existing course of RFP release prior to agency comments on the IRDP.

Implementation Plan

2) Commenting Organization: OEPA Commentor: OFFO  
Section #: General Comment Pg #: Line #: Code: g

Comment: Issues such as comparability of RSS data to RTRAK, use of HPGe to quantify Ra-226, and special geometry considerations in this area have yet to be fully resolved. Presumably, this is forthcoming in the SOP's, Limitations, and QA/QC documents being developed.

3) Commenting Organization: OEPA Commentor: OFFO  
Section #: General Comment Pg #: Line #: Code: g

Comment: In general, the dust control measures outline in this plan appear to be adequate to minimize the generation of fugitive dusts and if properly implemented would achieve compliance with the 'best available technology' (BAT) requirement of the Ohio Administrative Code (OAC) 3745-31-05(A)(3). This rule has been cited as an ARAR in both the Operable Unit 2 and Operable Unit 5 RODs.

It has been our position that compliance with BAT will be demonstrated by attaining the visible particulate emission limitations of OAC 3745-17-12. These limitations are more stringent than OAC 3745 -17-07 (B)(4),(5), and (6) which are referenced in Table A-2 of the Plan. Test methods to measure compliance with the rule can be found in 40 CFR Part 60 Appendix A Method 22 and Method 9.

There are three air emission documents referenced in this plan. The Technical Specifications in several locations refers to 'Part 6', but we have not been able to locate it in your submittal. The Contractor is to submit a Dust Control Plan. Ohio EPA would like the opportunity to review and

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approve this Plan. There are several references to "Fugitive Dust Control Requirements" (RM 0047)". Please provide a copy of this, too.

- 4) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: General Pg #: Line #: Code: C  
 Original Comment #  
 Comment: A number of areas in the text uses the term 100 percent coverage with regard to HPGe. This does not appear well defined as the fluence signal generated from an area more radially distant from the detector carries less weighting. For A2 P1 a dense real-time survey protocol seems essential particularly during precertification work in light of the 95% UCL of 6.2 ppm being so close to the 10 ppm FRL for Uranium.
- 5) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 1.0 Pg #: ES-2 Line #: 14-25 Code: C  
 Original Comment #  
 Comment: Excavation volumes included on this page are not consistent with others in the document (e.g. Section 2.1 and Appendix A, pg. 1-1). The entire document should be reviewed for inconsistencies in the reported excavation volumes.
- 6) Commenting Organization: OEPA Commentor: OFFO  
 Section #: ES Pg: ES-3 Line #: Code: C  
 Original Comment #  
 Comment: The document is confusing regarding when/how areas within A2PI but outside of the specific units (IAFP, SF, AFP) will be remediated and certified. Specific areas include underneath non-impacted stockpile #1, the running track area, etc. Please revise the document to clarify when and how these areas will be remediated.
- 7) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 1.0 Pg: 1-3 Line #: 24-28 Code: C  
 Original Comment #  
 Comment: Referenced Section 3.4.2.3 does not exist and should be replaced in line 24 with 3.4.2.2. The reference to Section 3.4.2.2 in line 25 is incorrect and should be replaced with 3.4.2.1. The reference to Section 3.3.2.2 in line 27 is also incorrect and should be replaced by 3.3.2.3.
- 8) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 1.0 Pg: 1-5 Line#5 Code: E  
 Original Comment #  
 Comment: For consistency with the other bullets in this list, the text should be revised to

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accurately indicate the title of Section 5.0. As a result, the word "Matrix" should be deleted.

- 9) Commenting Organization: OEPA Commentor: OFFO  
 Section #: 1.2.1.2 Pg: 1-6 Line #: Code: C  
 Original Comment #  
 Comment: Considering the substantial amount of information gained during site preparation activities concerning waste materials, the effectiveness (or lack thereof) of physical sampling to characterize, etc., Ohio EPA believes it is important to incorporate a discussion of the materials encountered and lessons learned during the site prep work.
- 10) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 1.0 Pg: 1-9 Line #22 Code: E  
 Original Comment #  
 Comment: Replace "from" with "during."
- 11) Commenting Organization: OEPA Commentor: OFFO  
 Section #: 1.3.3 Pg: 1-10 Line #: 28 Code: C  
 Original Comment #  
 Comment: It is Ohio EPA's understanding that the actual construction of Basin 1 has resulted in a berm height of 541 msl thus eliminating the need for sand bags. If this is correct, please revise the document accordingly.
- 12) Commenting Organization: OEPA Commentor: OFFO  
 Section #: 1.5 Pg: 1-13 Line #: Code: C  
 Original Comment #  
 Comment: Are the lessons learned documented at any point in the process? If so Ohio EPA would like to receive a copy of these so that information and lessons can be shared more broadly and that we may understand changes being implemented. Additionally, the lessons learned from site preparation should be incorporated into the revision of this document.
- 13) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 2.0 Pg: 2-3 Line #28 Code: C  
 Original Comment #  
 Comment: This document should include an explanation of the geostatistical modeling used to estimate the extent of the above WAC material. The explanation should include an account of the structural form assumed for the data and the procedures used to assess model accuracy.
- 14) Commenting Organization: OEPA Commentor: OFFO  
 Section #: 2.1.2.1 Pg: 2-3 Line #: 22-24 Code: C

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Original Comment #

Comment: The fact that site prep sampling data showed no above WAC material while significant amount of such material were encountered during the excavation of Basin 2, suggests the current characterization data are inadequate to characterize above WAC areas. The document should be revised to address this issue.

- 15) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: 2.2.2                      Pg: 2-3 thru 4                      Line #:                      Code: C  
 Original Comment #  
 Comment: This discussion is inadequate to fully address the basis for eliminating above-WAC areas as defined by validated RI/FS data and a signed ROD. Additionally, making such a conclusion on "preliminary results" is unacceptable. The document should be revised to provide additional justification or inclusion of the original WAC areas.
- 16) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: 2.1.2.3                      Pg: 2-4                      Line #: 25-27                      Code: C  
 Original Comment #  
 Comment: In the case of the firing range the lead FRL is rather irrelevant until final certification of the area. The sampling should be aimed at defining the boundaries of the characteristic hazardous waste. For example, if soil containing 200 ppm fails TCLP then this material must also be removed under the lead soil excavation. This is an important distinction from the trap range as all soil in the firing range area will be removed not just that above the lead FRL. If as suggested in this section the sampling was solely aimed at defining areas above 400ppm rather than areas failing TCLP then the characterization was insufficient.
- 17) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: 2.1.2.3                      Pg: 2-5                      Line #: 1-4                      Code: C  
 Original Comment #  
 Comment: All sampling should have been completed and incorporated into this Implementation Plan. The IMP will need to be revised and resubmitted for review and approval with the additional data and any proposed design modifications.
- 18) Commenting Organization: Ohio EPA                      Commentor: OFFO  
 Section #: 2.2                      Pg #: 2-5                      Line #: 6                      Code: e  
 Comment: Is the terminology "excavation ASCOCs" in such wide use that it cannot be changed? We suggest using the term "excavation drivers" because it is more descriptive. "Excavation ASCOC" is easily confused with similar acronyms like "COEC".
- 19) Commenting Organization: OEPA                      Commentor: OFFO

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- Section #:2.2 Pg:2-5 Line #: 25-26 Code: C  
 Original Comment #  
 Comment: Section 2.1.2.2 does not provide a sufficient discussion of data to warrant ASCOC elimination. Additionally, validated RI/FS data hits for Tc-99 do exist. Therefore Tc-99 should be included.
- 20) Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: 2.3.3 Pg #: 2-7 Line #: 10 Code: e  
 Comment: Typographical error " 6700g/L".
- 21) Commenting Organization: OEPA Commentor: OFFO  
 Section #:2.4.2 Pg:2-8 Line #: Code: C  
 Original Comment #  
 Comment: See previous comment regarding inadequacy of excavation based on 400ppm lead.
- 22) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 2.0 Pg: 2-8 Line #28 Code: E  
 Original Comment #  
 Comment: This sentence is redundant with the immediately preceding sentence beginning on Line 24.
- 23) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 2.0 Pg: 2-9 Line #2 Code: E  
 Original Comment #  
 Comment: Replace "excavation" with "material."
- 24) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 3.0 Pg: 3-4 Line #2 Code: C  
 Original Comment #  
 Comment: Referenced ESPEC 02150 discusses traffic control and contains no discussion of turning the wood chip stockpile.
- 25) Commenting Organization: OEPA Commentor: OFFO  
 Section #: 3.1.4 Pg: 3-4 Line #: 1-2 Code: C  
 Original Comment #  
 Comment: The revised specification package states that the chip pile will be the responsibility of FDF with regards to turning. Please clarify.
- 26) Commenting Organization: OEPA Commentor: OFFO

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Section #:3.1.4 Pg: 3-4 Line #: 6 Code: C  
 Original Comment #  
 Comment: Final clearing occurred prior to completion of the storm water management facilities.  
 Please revise.

27) Commenting Organization: OEPA Commentor: OFFO  
 Section #:3.1.7.6 Pg:3-8 Line #: 27-29 Code: C  
 Original Comment #  
 Comment: As stated in a previous comment, Ohio EPA understands the final berm elevation will  
 be at 541 msl thus eliminating the need for the sand bags.

28) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section # 3.0 Pg: 3-9 Line # 24 Code: C  
 Original Comment #  
 Comment: A figure is needed showing the locations of the 17 monitoring wells that will be  
 abandoned. The figure should also indicate the nearest wells in the sitewide network that will  
 remain in tact.

29) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section # 3.0 Pg: 3-9 Line # 24 Code: C  
 Original Comment #  
 Comment: According to Section 3.5.1.2 of the IEMP, wells 3402 and 2402 are included in the 21  
 wells that are planned to be used in monitoring the South Field Extraction area in 1997 and 1998.  
 Please revise Table 3-1 to indicate the status of these wells.

30) Commenting Organization: OEPA Commentor: OFFO  
 Section #:3.1.9 Pg: 3-9 Line #: Code: C  
 Original Comment #  
 Comment: This section does not address the additional pile created within the SF containing  
 material from the radioactively controlled zone. This section and the document should be revised  
 to incorporate a strategy for characterization and removal of this pile.

31) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: 3.0 Pg: 3-13 Line #21 Code: C  
 Original Comment #  
 Comment: Because excavations may extend into material considered to be part of the Great  
 Miami Aquifer (GMA), this Section 3.3.2 should discuss what approach (e.g., soil conditions, the  
 presence of sharp contact between glacial overburden and underlying material, field survey  
 information, etc.) field workers will use to determine when the GMA has been encountered.

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- 32) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #:3.3.2.2                      Pg:3-14                      Line #: 19-21                      Code: C  
 Original Comment #  
 Comment: It is not acceptable to define the top of the above WAC area with real time instruments. Ohio EPA has stated its position regarding the use of real time is only to expand upon previously defined WAC boundaries. In keeping with this use Ohio EPA requires a known elevation for the initiation of WAC excavation with the ability to initiate WAC excavation earlier based upon real-time data. The document should include and justify an elevation at which above WAC excavation will occur.
- 33) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: 3.0                      Pg: 3-15                      Line #13                      Code: C  
 Original Comment #  
 Comment: Referenced Section 3.4.2.3 does not exist. The correct section reference is probably 3.4.2.2.
- 34) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: 3.3.2.2                      Pg:3-1515-22                      Line #:                      Code: C  
 Original Comment #  
 Comment: See previous comment regarding inadequacy of excavation based on 400ppm lead
- 35) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: 3.0                      Pg: 3-15                      Line #27                      Code: E  
 Original Comment #  
 Comment: Replace "Edwg60008" with "EPwgG0008."
- 36) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: 3.0                      Pg: 3-16                      Line #11                      Code: E  
 Original Comment #  
 Comment: Replace "approximately" with "approximate."
- 37) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: 3.0                      Pg: 3-17                      Line #5                      Code: C  
 Original Comment #  
 Comment: The referenced Section 3.4.2.2 is incorrect. The correct section reference is probably 3.4.2.1.
- 38) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.

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Section#: 3.0 Pg: 3-17 Line #29 Code: E  
Original Comment #  
Comment: Replace "-Espec 02205)" with "(Espec 02205)."

39) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
Section #: 3.0 Pg: 3-19 Line #2 Code: C  
Original Comment #  
Comment: The text indicates that temporary excavation sumps will be constructed at the bottom of excavations for dewatering purposes. In areas where above-WAC material is being excavated, the text should indicate how field workers will know when a given excavation is nearing the GMA so that the liner material can be installed in a timely manner. Additionally, what safety factor will be used to account for potential errors in the determining the GMA contact depth? For example, will a sump constructed to 1 foot above the estimated GMA require a liner? It would seem more protective of the GMA if temporary sumps in above-WAC areas were lined as they approach or before they extend into the aquifer instead of after as indicated on page 3-19.

40) Commenting Organization: Ohio EPA Commentor: OFFO  
Section #: 3.4.2 Pg #: 3-25 Line #: 22 Code: c  
Comment: The Plan states that. "Before size reduction, pipe will be inspected to ensure that it contains no process material." This appears to be a rather meaningless commitment. It is hard to imagine how pipes would survive burial for so many years and not be completely plugged with soil.

41) Commenting Organization: OEPA Commentor: OFFO  
Section #: 3.3.5 Pg:3-23 Line #: Code: C  
Original Comment #  
Comment: Ohio EPA disagrees that additional monitoring will not be required during excavation of the South Field Impacted Material Stockpile. Ohio EPA does not believe that above WAC materials were sufficiently excluded from this pile, thus necessitating additional monitoring/characterization during excavation. Additionally the section should address the other pile of material placed in the SF as a result of excavations in the controlled area.

42) Commenting Organization: OEPA Commentor: OFFO  
Section #: 3.4.2.4 Pg:3-24 Line #: 32-33 Code: C  
Original Comment #  
Comment: Reference to the IMPP should be to the version (1997) approved by the EPAs.

43) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
Section #: 3.0 Pg: 3-28 Line #1 Code: C

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Original Comment #

Comment: The reference "EP-0008" is not defined.

- 44) Commenting Organization: OEPA Commentor: OFFO  
 Section #: Figure 3-1 Pg: Line #: Code: C  
 Original Comment #  
 Comment: No soil was placed in non-impacted stockpile 2. The text and drawings should be revised to reflect this.
- 45) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section # 3.0 Pg: Figure 3-7 Line # Code: C  
 Original Comment #  
 Comment: The referenced figure in Note 4 should be Figure 3-9 instead of Figure 3-8. Also Note 6 is not shown on the Figure 3-7.
- 46) Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: 4.2 Pg #: 4-3 Line #: 7 Code: c  
 Comment: Please provide a copy of "Fugitive Dust Control Requirements" (RM 0047). Control of fugitive emissions is discussed in section 4.2.2. While there is a plan for staff to be available for visible dust mitigation during off-duty "dust alerts" there is no mention of what control or detection mechanisms are used at night.
- 47) Commenting Organization: OEPA Commentor: OFFO  
 Section #: 4.2.2 Pg #: 4-5 Line #: 1 Code: c  
 Comment: The plan states that, "...all haul equipment will be required to be covered when hauling potentially dusty material". This conflicts with Section 02205 (page 10 of 19 P.3.) of the Technical Specifications Revision 0 which states, "The cover shall be in place sealed during all periods of vehicular movement on-site, whether empty or full."
- 48) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section # 4.0 Pg: 4-13 Line #17-32 Code: C  
 Original Comment #  
 Comment: Table 3-1 includes nine IEMP monitoring wells four extraction wells that will continue to be sampled. The text indicates that there are 21 IEMP monitoring wells and 4 extraction wells. The text and table should be correct and consistent.
- 49) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section # 4.0 Pg: 4-13 and Dwg. G0004 Line #18 Code: C  
 Original Comment #

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IEMP monitoring wells 3402 and 2402 are not shown on this drawing. The drawing should be revised to show these wells or an explanation is needed regarding their status. In addition, Monitoring Wells 2401 and 4016 could not be located on the drawing.

- 50) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section # 4.0                      Pg: 4-13 and Dwg. G0004                      Line #17-32, 1-15                      Code: C  
 Original Comment #  
 The text indicates that there are 21 IEMP monitoring wells on Drawing G0004. The drawing only shows 20.
- 51) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #:6.1.1                      Pg:6-2 Line #:                      Code: C  
 Original Comment #  
 Comment: The subsequent section should include a discussion of the WAO and its role in determining waste acceptance and categorization.
- 52) Commenting Organization: Ohio EPA                      Commentor: OFFO  
 Section #: 6.4.1                      Pg #: 6-16 Line #: 3                      Code: c  
 Comment: The Ohio EPA would like access to both the contractor's daily report (or log) and the construction manager's daily report. At a minimum, we would like to receive these reports via fax (937-286-6404) every day. If these reports are prepared using commonly available word processing software, we would prefer to receive them either by e-mail or to download them by an ftp link on the FEMP website.
- 53) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: 6.0                      Pg. Table 6-3                      Line #                      Code: E  
 Original Comment #  
 Comment: In row four (entitled "Piping and Sumps") column three ("Protocols") replace "mange" with "manage."
- 54) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: Table 6-3                      Pg: Line #:                      Code: C  
 Original Comment #  
 Comment: a) Non-pressurized containers - Ohio EPA believes drums excavated must be treated as process related metal at a minimum. If it is not possible to complete a visual inspection/survey of all portions of the drum then it should be designated for off-site disposal.  
 b) Uranium metal - Any uranium metal encountered during excavation of these waste units is a waste and should be dispositioned as such. It is unacceptable to contemplate these materials as nuclear materials considering they were previously disposed of as wastes and not managed as

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nuclear material.

- 55) Commenting Organization: OEPA Commentor: OFFO  
 Section #: Figure 6-2 Pg: Line #: Code: C  
 Original Comment #  
 Comment: As stated in a previous comment, it is unclear how/when areas outside of the specific units will be addressed. Please clarify in the document and this schedule.

Design Criteria Package

- 56) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: App. A Pg: 1-7 Line # Code: C  
 Original Comment #  
 Comment: In the fourth line of section 1.5.5 the qualifier radiological is too specific as impacted material above chemical (lead) and physical WAC will also be segregated.
- 57) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App. A Pg:1-5 Line #: Code: C  
 Original Comment #  
 Comment: Bullet 8 - Ohio EPA understands that double-walled pipe was not used for the complete transfer system but only for that within the GMA. Please clarify the text.
- 58) Commenting Organization: OEPA Commentor: OFFO  
 Section #: Appendix A Pg:2-11 Line #: Code: C  
 Original Comment #  
 Comment: Pipeline - Ohio EPA understands that double-walled pipe was not used for the complete transfer system but only for that within the GMA. Please clarify the text.

Surface Water Management Plan

- 59) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: App. B Pg: ES-1 Line # Code: C  
 Original Comment #  
 Comment: On the last line replace 1952 with 1951 as some disposal activities had taken place by 1952 (Section 1.1).
- 60) Commenting Organization: OEPA Commentor: OFFO.  
 Section #: App. B; Section 4.2.5 Pg. 4-3 Line # Code: C  
 Original Comment #

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Comment: As stated in Ohio EPA comments on the Technical Specifications Package, permanent vegetation should not be established prior to site restoration implementation. Seeding with some turf type grasses will negatively impact the effectiveness of the restoration.

- 61) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: App. B; Section 4 Pg. 4-4                      Line #                      Code: C  
 Original Comment #  
 Comment: The statement that interceptor ditches 1-3 are designed based on a 25-year, 24-hour storm is not consistent with the statement regarding storm frequency design in Attachment B, Sheet B1. Additionally, the Sheet B-34 reference is not relevant to Ditches 2 and 6 and Interceptor Ditches 1-3.
- 62) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: App. B; App. A; Attach B Pg. Sheet B-3                      Line #                      Code: C  
 Original Comment #  
 Comment: Sheet B-3 shows Table 1 of Attachment B to Appendix B to Report Appendix A. Table 1 is incomplete as it does not show the 25 year frequency storm flow calculations performed on Ditch 6.

Predesign Data Summary

- 63) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: App.D      Pg.                      Line #                      Code: M  
 Original Comment #  
 Comment: Ohio EPA finds this section to be entirely inadequate to meet its objectives. The data presented are insufficient to justify elimination of any of the above WAC areas defined in the OU2 RI/FS. In addition for the one WAC area carried forward, DOE has failed to bound the area horizontally or vertically (neither upper or lower). Ohio EPA expects that additional data collection will be necessary as well as significant revision of this section before the document will be acceptable.

The section should be revised to include a presentation of all data supporting DOE's conclusions regarding the boundaries of above WAC and above FRL excavations. Simply referencing the use of a 3D model is not acceptable. The document must justify the excavation boundaries defined in the drawings package.

- 64) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: App.D      Pg. D-1                      Line #                      Code: C  
 Original Comment #

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Comment: 1st Paragraph: All data should be included in the Implementation Plan. DOE must revise the document to incorporate all data to be used in the design of the remedial action within this Implementation Plan. For all future Implementation Plan submittals, DOE should ensure all data collection is complete and incorporated prior to submittal for review.

- 65) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: App. D Pg. D-2 Line # Code: C  
 Original Comment #  
 Comment: In the first paragraph on this page, the depth of measurement and coverage area for the HPGE should be discussed for the 15 minute scan time and 1.0 meter detector height.
- 66) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-2 Line # Code: C  
 Original Comment #  
 Comment: Second Paragraph: Ohio EPA believes the 1.0 meter height is not appropriate for most WAC determination analyses due to the dilution effect of such a wide view. Additionally, the document should discuss the negative impacts the unlevel surface of the waste units had on detector efficiency.
- 67) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-2 Line # Code: C  
 Original Comment #  
 Comment: Last Paragraph: The section discusses collection of data from the retention basins but presents no discussion of the data or calculations to support characterization for reuse. It would seem appropriate to incorporate such data herein to justify reuse of the soil rather than dispositioning as waste.
- 68) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
 Section #: App. D Pg. D-3 Line # Code: C  
 Original Comment #  
 Paragraph two discusses the extent of the soil sampling effort. Soil boring depths are indicated to vary in accordance with the depth of the fill to be excavated. The text should summarize the range of depths for the soil samples.
- 69) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-4 Line # Code: C  
 Original Comment #  
 Comment: As stated previously, Ohio EPA does not concur with collection of WAC data at 1 meter; has concerns with the topographical effect; and does not believe sufficient coverage was

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obtained for each WAC unit.

- 70) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-4 Line # Code: C  
 Original Comment #  
 Comment: Soil Sample Collection: Ohio EPA believes the method used for screening samples was inappropriate considering the circumstances of the waste unit. By only sampling the highest cpm interval and bounding intervals if necessary, an above WAC interval could have existed at elevated cpm but still not analyzed since it was lower than the highest number and did not bound the highest sample.
- 71) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-5 Line # Code: C  
 Original Comment #  
 Comment: 1st paragraph: Ohio EPA data from split samples are attached to these comments.
- 72) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-5 Line # Code: C  
 Original Comment #  
 Comment: 1st paragraph: Since data was collected at only five locations for each units 1-4, for the data may indicate contamination at one compass point moving away from unit. The 418 ppm sample in SWU-3 appears to indicate such, though it is not possible to tell since the figures fail to include sample location identification. Additionally, the use of "preliminary data" to over-ride validated RI/FS data is unacceptable. Information should be provided regarding the ASL for these data as well as their validation status.
- 73) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-5 Line # Code: C  
 Original Comment #  
 Comment: 2nd paragraph: DOE's proposal to eliminate an ASCOC based upon incomplete, invalidated data is unacceptable. Additionally, Ohio EPA believes it is inconsistent with the methodology proposed in the SEP for determining ASCOCs.
- 74) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-5 Line # Code: C  
 Original Comment #  
 Comment: SWU-5: Ohio EPA does not believe DOE has adequately defined the upper limit of the above WAC zone. Due to the method of sample screening employed by DOE, above WAC samples may never have been analyzed. Additionally, upon review of the data in Table D-9, it is

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evident little if any correlation exists between cpm and total uranium. Finally, the uppermost sample in each of the following borings exceeds the WAC (SWU-5-15, SWU-5-9, SWU-5-18)

- 75) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc./OFFO  
 Section #: App. D Pg. D-5 Line # Code: C  
 Original Comment #  
 Paragraph three indicates that the maximum boring depth was 27 feet and that the extent of above-WAC total uranium samples were observed to a depth of 26.5 feet. Samples from depths greater than 27 feet are necessary to confirm this assertion since the assumed base of above-WAC material is very close to the maximum sample depth. DOE has not provided sufficient data to support a conclusion that the above WAC material terminates at 27 feet.
- 76) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. D-6 Line # Code: C  
 Original Comment #  
 Comment: Lead Delineation: It does not appear the data collected, when presented, will be sufficient to bound the extent of the characteristically hazardous material within the firing range. Ohio EPA is still unclear concerning the basis for sampling to address the 400ppm FRL. It is the experience of this review that total lead values do not correlate well with TCLP data. Thus it is likely as substantial sampling program will be needed to evaluate TCLP boundaries for this unit.
- 77) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. Figure D-12 Line # Code: C  
 Original Comment #  
 Comment: Revise the figure to include sample location identifiers.
- 78) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.D Pg. Figure D-13 Line # Code: C  
 Original Comment #  
 Comment: Revise the figure to include sample location identifiers.

#### Appendix E

- 79) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.E Pg. Line # Code: C  
 Original Comment #  
 Comment: Ohio EPA is unclear on the specific intent of this section and does not concur with a substantial portion of it. If the intent is to suggest collection of HPGe data during certification, that should be in the certification design letter, not the IRDP, according to the SEP. With regard

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to the use of XRF, previous Ohio EPA comments address our concern that total lead numbers do not relate well to TCLP results and do not provide adequate documentation of remediation completion. Ohio EPA believes the individual aspects of this section should be incorporated into the appropriate portions of the Implementation Plan (e.g., WAC scanning in excavation section).

- 80) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.E Pg. E-6 Line # 28-31 Code: C  
 Original Comment #  
 Comment: Any proposal regarding trigger levels should be incorporated into the Implementation Plan and not submitted as a separate memorandum.
- 81) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.E Pg. E-8 Line # 1-9 Code: C  
 Original Comment #  
 Comment: In a response to this comment, please provide details regarding on-site lab turnaround time for physical soil samples analyzed for total uranium using both bromo-pdap and KPA. Include information regarding laboratory sample capacity and possible mechanisms to expand field laboratory capacity.
- 82) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.E Pg. E-8 Line # 22-23 Code: C  
 Original Comment #  
 Comment: Ohio EPA has not seen sufficient documentation/justification to support consideration of HPGe data as Level D.
- 83) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.E Pg. E-13 Line # 6-9 Code: C  
 Original Comment #  
 Comment: It is interesting to note that DOE appropriately chose to daily calibrate the XRF against a know soil standard but continues to not perform a similar assessment of the HPGe or RTRAK.
- 84) Commenting Organization: OEPA Commentor: OFFO  
 Section #: App.E Pg. E-13 Line # 31-32 Code: C  
 Original Comment #  
 Comment: As stated in previous comments, Ohio EPA does not agree with the suggestion that above WAC soil has been delineated by predesign investigations.
- 85) Commenting Organization: OEPA Commentor: OFFO

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Section #: App.E Pg. E-14 Line # 29-35 Code: C

Original Comment #

Comment: Ohio EPA is not familiar with any data supporting or procedures for using HPGe or RTRAK on a vertical surface.

86) Commenting Organization: OEPA Commentor: ODH  
Section #: App.E Pg. Line # Code: C

Original Comment #

Comment: The text in sections E.3.4.3 and E.3.5.2 state that assurance of FRL attainment will be provided by taking HPGe measurements above designated certification sample locations post excavation and precertification. While this will provide additional data which may ultimately allow the use of HPGe solely for certification decisions, it also seems to provide a method whereby "random" physical samples are pre-screened (biased clean) before submission to the labs. Please clarify if this is the correct interpretation of this information.

Technical Specifications

87) Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.  
Section #: Tech Specs. 02150 Pg. 5 Line # Code: E

Original Comment #

Comment: In the first line of Section 3.6A "at any crossing" should be deleted.

88) Commenting Organization: OEPA Commentor: OFFO  
Section #: Tech Specs. 02205 Pg. 3 Line # Code: C

Original Comment #

Comment: In 1.4(1), please clarify what "...steps taken to optimize WAC.." means.

89) Commenting Organization: OEPA Commentor: OFFO  
Section #: Tech Specs. 02205 Pg. 5 Line # Code: C

Original Comment #

Comment: In 1.7(c), all soil that are characterized as hazardous waste must be excavated as lead contaminated soil. It is insufficient to use 400 ppm of lead as the cut-off point. The FRL is irrelevant in the case of the SWU, since all material will be removed including that below the FRL for lead. If soils below the FRL of 400 ppm fail TCLP then they must also be removed under this category.

90) Commenting Organization: OEPA Commentor: OFFO  
Section #: Tech Specs. 02205 Pg. 6 Line # Code: C

Original Comment #

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Comment: For 1.7(D) & (E), these section must be revised to be consistent with the final WAC Plan. All inaccessible metals must be treated as process related metals unless proven otherwise.

- 91) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
 Section #: Tech Specs. 02205                      Pg. 6                      Line #                      Code: C  
 Original Comment #  
 Comment: In Section 1.7E.2. containers do not have to be "in-tact" to be "special materials" for this work.
- 92) Commenting Organization: Ohio EPA                      Commentor: OFFO  
 Section #: Division 02205                      Pg #: 9 of 20                      Line #: 3.1 Paragraph F                      Code: c  
 Comment: This Paragraph refers to a Dust Control Plan and implies that "Part 6" also contains information relevant to dust control measures. We can not find either of these references in the submittal package. Please provide Ohio EPA with two copies of each.
- 93) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: Tech Specs. 02205                      Pg.11                      Line #                      Code: C  
 Original Comment #  
 Comment: In Q.2, the WAC Plan also addresses free liquid content limitations and should be referenced herein.
- 94) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: Tech Specs. 02205                      Pg. 11                      Line #                      Code: C  
 Original Comment #  
 Comment: In R.1, the document doesn't address decon of vehicles leaving the OU1 stockpile area. More detail should be provided concerning decon of these vehicles.
- 95) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: Tech Specs. 02205                      Pg. 12                      Line #                      Code: C  
 Original Comment #  
 Comment: In T., Ohio EPA does not concur that monitoring will not be required during excavation of the South Field Impacted Material Stockpile. Ohio EPA does not believe sufficient controls were in place to prevent above WAC material from being placed in this pile thus necessitating additional characterization efforts during excavation.
- 96) Commenting Organization: OEPA                      Commentor: OFFO  
 Section #: Tech Specs. 02205                      Pg. 13                      Line #                      Code: C  
 Original Comment #  
 Comment: Ohio EPA is concerned that excavation of 3 foot lifts will result in missing above

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WAC material and subsequent placement of that material in the OSDF. Additional detail should be provided regarding how the excavation will be managed to prevent violation of the WAC.

- 97) Commenting Organization: OEPA Commentor: OFFO  
 Section #: Tech Specs. 02205 Pg. 14 Line # Code: C  
 Original Comment #  
 Comment: In 3.3.B, it is unclear what "unclassified impacted material overburden" is being referenced here. Ohio EPA would expect that all soil within the boundaries would be lead contaminated and that no "overburden" layer would exist within the boundaries.
- 98) Commenting Organization: Ohio EPA Commentor: OFFO  
 Section #: 02205 Pg #: 19 of 20 Line #: 3.7 B2 Code: c  
 Comment: It is unclear what part of the WAC Attainment Plan applies to the HDPE liner size reduction. Please clarify the size specification for the liners and the waste category that applies to liners.
- 99) Commenting Organization: OEPA Commentor: OFFO  
 Section #: Tech Specs. 02212 Pg. Attachment I Line # Code: C  
 Original Comment #  
 Comment: This attachment does not appear to be consistent with the WAC Plan nor the form currently being used for waste placement in the OSDF. The form should be revised or additional justification provided.
- 100) Commenting Organization: OEPA Commentor: OFFO  
 Section #: Tech Specs. 02900 Pg. 2 Line # Code: C  
 Original Comment #  
 Comment: It is unclear why "asphalt emulsion tackifier" is required in this specification whereas in specification 02275.2.1.F "asphaltic type emulsions" are specifically prohibited. If it is inappropriate to use for a dust suppressant, it would seem equally unacceptable for seeding.
- 101) Commenting Organization: OEPA Commentor: OFFO  
 Section #: Tech Specs. 0200 Pg. 3 Line # Code: C  
 Original Comment #  
 Comment: In 2.1.B, Ohio EPA does not concur with the proposed temporary seeding mixture. Ohio EPA recommends the usage of the same temporary seeding mixture used in the A2P1 Site Preparation Package Technical Specification - 100% Annual Ryegrass. Ohio EPA's concern is that DOE has simply replaced the word permanent with temporary rather than used the appropriate seed mixture for stabilizing the area prior to final remediation. The mixture provided in the existing specification could negatively impact final restoration success.

Construction Drawings

- 102) Commenting Organization: OEPA                      Commentor: OFFO  
Section #: Drawings Pg.    Line #                                      Code: C  
Original Comment #  
Comment: The drawing package nor the Implementation Plan provide data to support the cross sections and areas presented for excavation. Ohio EPA believes it is important to provide a data summary portion of the IRDP that supports the proposed site model, three-dimensionally, with data/boring logs from previous investigations.
  
- 103) Commenting Organization: OEPA                      Commentor: OFFO  
Section #: Drawings Pg.    Line #                                      Code: C  
Original Comment #  
Comment: The drawing package should be revised to show actual conditions resulting from site preparation activities to date. Appropriate changes include no use of Soil Stockpile #2, the creation of an additional pile on the Southfield, changes in the transfer line status, changes to the design of Basin #2, etc.
  
- 104) Commenting Organization: OEPA                      Commentor: HSI GeoTrans, Inc.  
Section #: Dwg G0006:                                      Pg.                                      Line #                                      Code: C  
Original Comment #  
Comment: The thickness of Above WAC Material at Station 4100 is not consistent from plan (38 ft) to section (26 ft).
  
- 105) Commenting Organization: OEPA                      Commentor: OFFO  
Section #:Dwg G0018                      Pg.    Line #                                      Code: C  
Original Comment #  
Comment: Note 2 refers to Specification 02205 for additonal detail regarding the spill containment pan. No reference to the spill containment pan is included in 02205.
  
- 106) Commenting Organization: OEPA                      Commentor: OFFO  
Section #:Dwg G0004                      Pg.    Line #                                      Code: C  
Original Comment #  
Comment: This drawing does not appear to include locations from the most recent sampling during the pre-design investigations. It should be revised to include all existing sampling locations.
  
- 107) Commenting Organization: OEPA                      Commentor: OFFO  
Section #:Dwg G0006                      Pg.    Line #                                      Code: C

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Original Comment #

Comment: Note 10 references removal of material outside the WAC area in 4 foot lifts. This is inconsistent with the Implementation Plan requirement of 3 foot lifts outside the above WAC area.

- 108) Commenting Organization: OEPA                      Commentor: OFFO  
Section #:Dwg G0014 & G0015      Pg.      Line #                      Code: C  
Original Comment #  
Comment: What basis does DOE have for concluding such a significant portion of the IAFP will be made up of just flyash as suggested in the cross sections? Ohio EPA believes this cross-section significantly down plays the likelihood of encountering debris/fill throughout the IAFP and may lead the contractor to overestimate excavation rates.
- 109) Commenting Organization: OEPA                      Commentor: OFFO  
Section #:Dwg G0008              Pg.      Line #                      Code: C  
Original Comment #  
Comment: As stated in previous comments, Ohio EPA does not believe the firing range has been adequately characterized. Following acceptable characterization it is likely the excavation boundaries will change. Unlike other drawings, this one does not include a note referring to likely changes to excavation boundaries. The figure should be revised following acceptable characterization.

# THERMO NUtech

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OHIO EPA  
OCT 02 1997  
SOUTHWEST DISTRICT

Ohio EPA Data Package  
AIP: PROJECT FERNALD

SDG 9708269

Document Inventory:

Case Narrative

DVD Report

Chains of Custody

Data Review by: *[Signature]* Date: 09/26/97

QC Review by: *Kathy Burnham* Date: 9/26/97

**Case Narrative**

**Ohio EPA  
Case Narrative  
Sample Delivery Group 9708269**

**Sample Receipt**

Five soil samples were received in good condition at the Thermo NUtech Albuquerque Laboratory, on 29 August, 1997, for radiological analysis using standard analytical procedures. Charges for this sample delivery group are as follows.

Analysis	Requested	Reported
Total Uranium	05	05
Technetium 99	04	04

**Analyses for this SDG are complete.**

**Data Review**

Some results are negative beyond their counting errors; this arises from small fluctuations in background and is of no concern so long as the absolute value of the result is less than the sample's MDA, which is the case for each of the negative results here. This merely reflects the fact that counting errors do not adequately account for the uncertainty in results below the MDA.

Results are reported as pCi/g (dry).

**Total Uranium**

Evaluation of the quality control data indicates that the blank result is nominal, the spike result agrees with the known value, and the replicates are in agreement.

Sample 970825-05 (9708269-05) has an MDA exceeding the RDL of 0.1 ug/g due to dilution necessary to fit within the calibration curve. Otherwise, the reported sample data show no anomalies.

**Technetium 99**

Evaluation of the quality control data indicates that the blank result is nominal, the spike result agrees with the known value, and the replicates are in agreement.

The reported sample data show no anomalies.

CN 1

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**Report**

**000026**

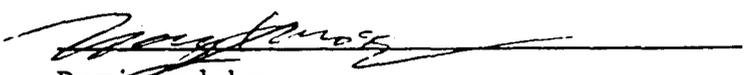
THE RMO NUTECH  
OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

Client Ohio EPA  
Contract P.O. # A56199

S U M M A R Y   D A T A   S E C T I O N

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Reviewed by

Lab id ABQ  
Protocol -  
Version 1  
Form DVD-TOC  
Version 3.08  
Report date 09/26/97

10921121

**THERMO NUTECH**  
OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

**REPORT GUIDE**

Client Ohio EPA  
Contract P.O. # A56199

**ABOUT THE DATA SUMMARY SECTION**

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

**SAMPLE SUMMARIES**

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

**PREPARATION BATCH SUMMARY**

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

**WORK SUMMARY**

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

**METHOD BLANKS**

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

**LAB CONTROL SAMPLES**

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

**DUPLICATES**

**REPORT GUIDES**

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**SUMMARY DATA SECTION**

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OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

**GUIDE, cont.**

Client Ohio EPA  
Contract P.O. # A56199

**ABOUT THE DATA SUMMARY SECTION**

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

**MATRIX SPIKES**

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

**DATA SHEETS**

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

**METHOD SUMMARIES**

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

**REPORT GUIDES**

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

**REPORT GUIDES**  
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**SUMMARY DATA SECTION**  
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Report date 09/26/97

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LAB SAMPLE SUMMARY

SDG 9708269  
 Contact Mary Kamoss

Client Ohio EPA  
 Contract P.O. # A56199

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAS NO	COLLECTED	RECEIVED
9708269-01	970825-01		SOIL			08/25/97 13:38	08/29/97
9708269-02	970825-02		SOIL			08/25/97 13:39	08/29/97
9708269-03	970825-03		SOIL			08/25/97 13:55	08/29/97
9708269-04	970825-04		SOIL			08/25/97 13:56	08/29/97
9708269-05	970825-05		SOIL			08/25/97 17:41	08/29/97
9709062-01	Duplicate (9708269-04)		SOIL			08/25/97 13:56	
9709062-03	Lab Control Sample		SOIL				
9709227-02	Method Blank		SOIL				
9709227-03	Lab Control Sample		SOIL				
9709227-08	Duplicate (9708269-02)		SOIL			08/25/97 13:39	

LAB SUMMARY

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SUMMARY DATA SECTION

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 Protocol -  
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OHIO EPA FORMALD

1189

SDG 9708269  
 Contact Mary Kamoss

Client Ohio EPA  
 Contract P.O. # A56199

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	MOIST	SAMPLE AMOUNT	BASIS AMOUNT	DAYS FROM/TO		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
							COLL	RCVD		
9708269		970825-01	SOIL		107 GR		4	28	9708269-01	
		970825-02	SOIL		122 GR		4	28	9708269-02	
		970825-03	SOIL		81 GR		4	28	9708269-03	
		970825-04	SOIL		128 GR		4	28	9708269-04	
		970825-05	SOIL		130 GR		4	28	9708269-05	
		Method Blank	SOIL						9709227-02	
		Lab Control Sample	SOIL						9709062-03	
		Lab Control Sample	SOIL						9709227-03	
		Duplicate (9708269-02)	SOIL		122 GR		4	28	9709227-08	
		Duplicate (9708269-04)	SOIL		128 GR		4	28	9709062-01	

Lab id ABQ  
 Protocol -  
 Version 1  
 Form DVD-QS  
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OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kanoss

PREP BATCH SUMMARY

Client Ohio EPA  
Contract P.O. # A56199

TEST MATRIX	METHOD	PREPARATION ERROR BATCH	PLANCHETS ANALYZED				QUALI- FIERS
			2σ	CLIENT MORE	RE BLANK	LCS DUP/ORIG MS/ORIG	
<b>Laser Fluorometer</b>							
TU	SOIL	Total Uranium in soil/sed	9709227	10.0	5	1 1	1/1
<b>Liquid Scintillation</b>							
TC99	SOIL	Technetium 99 in soil	9709060	12.4	4	1	1/1

Blank, LCS, Duplicate and Spike planchets are those in the same preparation batch as some Client sample.

Lab id ABQ  
Protocol -  
Version 1  
Form DVD-PBS  
Version 3.08  
Report date 09/26/97

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OHIO EPA FORMALD

SDG 9708269  
Contact Mary Kamoss

LAB WORK SUMMARY

Client Ohio EPA  
Contract P.O. # A56199

LAB SAMPLE	CLIENT SAMPLE ID								
COLLECTED	LOCATION	MATRIX		SUF-					
RECEIVED	CUSTODY	SAS no	PLANCHET	TEST	FIX	ANALYSED	REVIEWED BY	METHOD	
9708269-01 08/25/97 08/29/97	970825-01	SOIL		TC99 TU		09/23/97 09/25/97		Technetium 99 in soil Total Uranium in soil/sed	
9708269-02 08/25/97 08/29/97	970825-02	SOIL		TC99 TU		09/23/97 09/25/97		Technetium 99 in soil Total Uranium in soil/sed	
9708269-03 08/25/97 08/29/97	970825-03	SOIL		TC99 TU		09/23/97 09/25/97		Technetium 99 in soil Total Uranium in soil/sed	
9708269-04 08/25/97 08/29/97	970825-04	SOIL		TC99 TU		09/23/97 09/25/97		Technetium 99 in soil Total Uranium in soil/sed	
9708269-05 08/25/97 08/29/97	970825-05	SOIL		TU		09/25/97		Total Uranium in soil/sed	
9709062-01 08/25/97 08/29/97	Duplicate (9708269-04)	SOIL		TC99		09/23/97		Technetium 99 in soil	
9709062-03	Lab Control Sample	SOIL		TC99		09/23/97		Technetium 99 in soil	
9709227-02	Method Blank	SOIL		TU		09/25/97		Total Uranium in soil/sed	
9709227-03	Lab Control Sample	SOIL		TU		09/25/97		Total Uranium in soil/sed	
9709227-08 08/25/97 08/29/97	Duplicate (9708269-02)	SOIL		TU		09/25/97		Total Uranium in soil/sed	

Lab id ABQ  
Protocol -  
Version 1  
Form DVD-LWS  
Version 3.08  
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OHIO EPA FERRALD

**WORK SUMMARY, cont.**

SDG 9708269  
 Contact Mary Kross

Client Ohio EPA  
 Contract P.O. # A56199

COUNTS OF TESTS BY SAMPLE TYPE										
TEST	SAS no	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
TC99		Technetium 99 in soil	EICHRON TCS01, 1993	4				1	1	6
TU		Total Uranium in soil/sed	ASTM D 5174	5			1	1	1	8
<b>TOTALS</b>				<b>9</b>			<b>1</b>	<b>2</b>	<b>2</b>	<b>14</b>

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**000034**

**THERMO NUTECH**  
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**METHOD BLANK**

9709227-02

Method Blank

SDG 9708269 Client Ohio EPA  
 Contact Mary Kamoss Contract P.O. # A56199  
 Lab sample id 9709227-02 Client sample id Method Blank  
 Dept sample id \_\_\_\_\_ Material/Matrix \_\_\_\_\_ SOIL

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total U (ug/g dry)		0		0.030	1.0	U	TU

Lab id ABQ  
 Protocol -  
 Version 1  
 Form DVD-DS  
 Version 3.08  
 Report date 09/26/97

THERMO NUTECH

OHIO EPA FORMALD

9709062-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 9708269

Client Ohio EPA

Contact Mary Kamoss

Contract P.O. # A56199

Lab sample id 9709062-03

Client sample id Lab Control Sample

Dept sample id

Material/Matrix SOIL

ANALYTE	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Technetium 99 (dry)	15	2.0	0.48	2.0	TC99	15.5	1.1	94	78-122	

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 9

Lab id ABQ

Protocol -

Version 1

Form DVD-LCS

Version 3.08

Report date 09/26/97

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THERMO NUTECH

OHIO EPA FORMALD

9709227-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 9708269 Client Ohio EPA  
 Contact Mary Kamoss Contract P.O. # A56199  
 Lab sample id 9709227-03 Client sample id Lab Control Sample  
 Dept sample id \_\_\_\_\_ Material/Matrix \_\_\_\_\_ SOIL

ANALYTE	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LIMITS (TOTAL)	PROTOCOL LIMITS
Total U (ug/g dry)	5.2	0.52	0.030	1.0		TU	5.00		104	84-116	

Lab id ABQ  
 Protocol -  
 Version 1  
 Form DVD-LCS  
 Version 3.08  
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**THERMO NUTECH**

OHIO EPA FORMALD

**DUPLICATE**

9709227-08

970825-02

SDG <u>9708269</u>	Client <u>Ohio EPA</u>
Contact <u>Mary Kamoss</u>	Contract <u>P.O. # A56199</u>
<b>DUPLICATE</b>	<b>ORIGINAL</b>
Lab sample id <u>9709227-08</u>	Lab sample id <u>9708269-02</u>
Dept sample id _____	Dept sample id _____
	Received <u>08/29/97</u>
	Client sample id <u>970825-02</u>
	Location/Matrix _____ <b>SOIL</b>
	Collected/Amount <u>08/25/97 13:39</u> <u>122 GR</u>
	Chain of custody id _____

ANALYTE	DUPLICATE pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (TOTAL)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT LIMIT	PROT
Total U (ug/g dry)	1.7	0.18	0.030	1.0		TU	1.6	0.17	0.030		6	22	

Lab id ABQ  
 Protocol -  
 Version 1  
 Form DVD-DUP  
 Version 3.08  
 Report date 09/26/97

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THERMO NUTECH

OHIO, EPA FORMALD

DUPLICATE

9709062-01

970825-04

SDG <u>9708269</u>	Client <u>Ohio EPA</u>
Contact <u>Mary Kanoss</u>	Contract <u>P.O. # A56199</u>
DUPLICATE	ORIGINAL
Lab sample id <u>9709062-01</u>	Lab sample id <u>9708269-04</u>
Dept sample id _____	Dept sample id _____
	Received <u>08/29/97</u>
	Client sample id <u>970825-04</u>
	Location/Matrix <u>SOIL</u>
	Collected/Amount <u>08/25/97 13:56 128 GR</u>
	Chain of custody id _____

ANALYTE	DUPLICATE pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (TOTAL)	MDA pCi/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Technetium 99 (dry)	-0.980	0.50	0.84	2.0	U	TC99	0.46	0.44	0.73	U	-	

Lab id <u>ABQ</u>
Protocol <u>-</u>
Version <u>1</u>
Form <u>DVD-DUP</u>
Version <u>3.08</u>
Report date <u>09/26/97</u>

**THERMO NUTECH**

OHIO EPA FERNALD

**DATA SHEET**

9708269-01

970825-01

SDG <u>9708269</u>	Client <u>Ohio EPA</u>
Contact <u>Mary Kamoss</u>	Contract <u>P.O. # A56199</u>
Lab sample id <u>9708269-01</u>	Client sample id <u>970825-01 411</u>
Dept sample id _____	Location/Matrix _____ <u>SOIL</u>
Received <u>08/29/97</u>	Collected/Amount <u>08/25/97 13:38</u> <u>107 GR</u>
	Chain of custody id _____

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total U (ug/g dry)		2.7	0.28	0.030	1.0		TU
Technetium 99 (dry)		0.51	0.50	0.82	2.0	U	TC99

Lab id <u>ABQ</u>
Protocol <u>-</u>
Version <u>1</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>09/26/97</u>

THERMO NUTECH

OHIO EPA FORMALD

DATA SHEET

9708269-02

970825-02

SDG <u>9708269</u>	Client <u>Ohio EPA</u>
Contact <u>Mary Kamoss</u>	Contract <u>P.O. # A56199</u>
Lab sample id <u>9708269-02</u>	Client sample id <u>970825-02 412</u>
Dept sample id _____	Location/Matrix _____ <u>SOIL</u>
Received <u>08/29/97</u>	Collected/Amount <u>08/25/97 13:39</u> <u>122 GR</u>
Chain of custody id _____	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total U (ug/g dry)		1.6	0.17	0.030	1.0		TU
Technetium 99 (dry)		0.31	0.45	0.75	2.0	U	TC99

Lab id <u>ABQ</u>
Protocol <u>-</u>
Version <u>1</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>09/26/97</u>

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THERMO NUTECH

OHIO EPA FERRALD

DATA SHEET

9708269-03

970825-03

SDG 9708269 Client Ohio EPA  
 Contact Mary Kamoss Contract P.O. # A56199  
 Lab sample id 9708269-03 Client sample id 970825-03 451  
 Dept sample id \_\_\_\_\_ Location/Matrix \_\_\_\_\_ SOIL  
 Received 08/29/97 Collected/Amount 08/25/97 13:55 81 GR  
 Chain of custody id \_\_\_\_\_

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total U (ug/g dry)		3.1	0.32	0.030	1.0		TU
Technetium 99 (dry)		0.35	0.48	0.79	2.0	U	TC99

Lab id ABQ  
 Protocol -  
 Version 1  
 Form DVD-DS  
 Version 3.08  
 Report date 09/26/97

**THERMO NUTECH**  
**OHIO EPA FERNALD**  
**DATA SHEET**

9708269-04

970825-04

SDG <u>9708269</u>	Client <u>Ohio EPA</u>
Contact <u>Mary Kamoss</u>	Contract <u>P.O. # A56199</u>
Lab sample id <u>9708269-04</u>	Client sample id <u>970825-04 452</u>
Dept sample id _____	Location/Matrix _____ <u>SOIL</u>
Received <u>08/29/97</u>	Collected/Amount <u>08/25/97 13:56 128 GR</u>
	Chain of custody id _____

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total U (ug/g dry)		1.3	0.14	0.030	1.0		TU
Technetium 99 (dry)		0.46	0.44	0.73	2.0	U	TC99

Lab id <u>ABQ</u>
Protocol <u>-</u>
Version <u>1</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>09/26/97</u>

THERMO NUTEC H

OHIO EPA FORMALD

DATA SHEET

9708269-05

970825-05

SDG <u>9708269</u>	Client <u>Ohio EPA</u>
Contact <u>Mary Kamoss</u>	Contract <u>P.O. # A56199</u>
Lab sample id <u>9708269-05</u>	Client sample id <u>970825-05</u> <u>5234</u>
Dept sample id _____	Location/Matrix _____ <u>SOIL</u>
Received <u>08/29/97</u>	Collected/Amount <u>08/25/97 17:41</u> <u>130 GR</u>
	Chain of custody id _____

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (TOTAL)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total U (ug/g dry)		180	19	3.0	1.0		TU

Lab id <u>ABQ</u>
Protocol <u>-</u>
Version <u>1</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>09/26/97</u>

**THERMO NUTECH**  
OHIO EPA FORMALD

**LAB METHOD SUMMARY**

TOTAL URANIUM IN SOIL/SED  
LASER FLUOROMETER

Test TU Matrix SOIL  
SDG 9708269  
Contact Mary Kamoss

Client Ohio EPA  
Contract P.O. # A56199

**RESULTS**

LAB	RAW	SUF-		Total U	
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT SAMPLE ID	(ug/g dry)
Preparation batch 9709227					
9708269-01				970825-01	2.7
9708269-02				970825-02	1.6
9708269-03				970825-03	3.1
9708269-04				970825-04	1.3
9708269-05				970825-05	188
9709227-02				Method Blank	U
9709227-03				Lab Control Sample	ok
9709227-08				Duplicate (9708269-02)	ok
Nominal values and limits from method					RDLs (pCi/g) 1.0

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PRKP	DILU-	YIELD	KFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST	FIX	CLIENT SAMPLE ID	pCi/g	GRAMS	FAC	TION	%	%	min keV	KeV	HELD	PREPARED	YIELD	DETECTOR
Preparation batch 9709227					2σ prep error 10.0 % Reference										
9708269-01			970825-01	0.030	1.06					0		31	09/25/97	09/25	KPA
9708269-02			970825-02	0.030	1.06					0		31	09/25/97	09/25	KPA
9708269-03			970825-03	0.030	1.06					0		31	09/25/97	09/25	KPA
9708269-04			970825-04	0.030	1.04					0		31	09/25/97	09/25	KPA
9708269-05			970825-05	3.0	1.10					0		31	09/25/97	09/25	KPA
9709227-02			Method Blank	0.030	1.00					0			09/25/97	09/25	KPA
9709227-03			Lab Control Sample	0.030	1.00					0			09/25/97	09/25	KPA
9709227-08			Duplicate (9708269-02)	0.030	1.06					0		31	09/25/97	09/25	KPA
Nominal values and limits from method					1.0	1.00									

PROCEDURES REFERENCE ASTM D 5174  
PRP-01S Preparation of soil/sediment.  
U-17W Total Uranium in water.

AVERAGES ± 2 SD MDA 0.40 ± 2.1  
FOR 8 SAMPLES YIELD ±

Lab id ABQ  
Protocol -  
Version 1  
Form DVD-LMS  
Version 3.08  
Report date 09/26/97

**THERMO NUTEC**  
OHIO EPA FORMALD

**LAB METHOD SUMMARY**  
TECHNETIUM 99 IN SOIL  
LIQUID SCINTILLATION

Test TC99 Matrix SOIL  
SDG 9708269  
Contact Mary Kamoss

Client Ohio EPA  
Contract P.O. # A56199

**RESULTS**

LAB	RAW SUP-			Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	99 (dry)
Preparation batch 9709060				
9708269-01			970825-01	U
9708269-02			970825-02	U
9708269-03			970825-03	U
9708269-04			970825-04	U
9709062-01			Duplicate (9708269-04)	- U
9709062-03			Lab Control Sample	ok
Nominal values and limits from method				RDLs (pCi/g) 2.0

**METHOD PERFORMANCE**

LAB	RAW SUP-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	pCi/g	Gram	PAC	TION	%	%	min	keV	KeV	HELD PREPARED	YIELD DETECTOR
Preparation batch 9709060 2σ prep error 12.4 % Reference												
9708269-01		0.82	8.28			88	16	60			29 09/23/97	09/23 LSC
9708269-02		0.75	8.87			88	17	60			29 09/23/97	09/23 LSC
9708269-03		0.79	8.32			88	17	60			29 09/23/97	09/23 LSC
9708269-04		0.73	9.02			88	17	60			29 09/23/97	09/23 LSC
9709062-01		0.84	7.63			88	17	60			29 09/23/97	09/23 LSC
9709062-03		0.48	8.42			88	27	60			09/23/97	09/23 LSC
Nominal values and limits from method		2.0	10.0			30						

PROCEDURES REFERENCE EICHROM TCS01, 1993

AVERAGES ± 2 SD	MDA	0.74 ± 0.26
FOR 6 SAMPLES	YIELD	88 ± 0
	EFFICIENCY	19 ± 8.4

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**THERMO NUTECH**  
OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

**REPORT GUIDE**

Client Ohio EPA  
Contract P.O. # A56199

**SAMPLE SUMMARY**

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- \* LAB SAMPLE ID is the lab's primary identification for a sample.
  - \* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
  - \* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
  - \* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.
- QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- \* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id ABQ  
Protocol -  
Version 1  
Form DVD-RG  
Version 3.08  
Report date 09/26/97

**THERMO NUTECH**

OHIO EPA FERRALD

SDG 9708269  
Contact Mary Kamoss

**REPORT GUIDE**

Client Ohio EPA  
Contract P.O. # A56199

**PREPARATION BATCH SUMMARY**

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- The preparation batches are shown in the same order as the Method Summary Reports are printed.
- Only analyses of planchets relevant to the SDG are included.
- Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SDG 9708269  
Contact Mary Kamoss

**REPORT GUIDE**

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Contract P.O. # A56199

**WORK SUMMARY**

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- \* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- \* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- \* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- \* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- \* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- \* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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**THERMO NUTECH**

OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

**REPORT GUIDE**

Client Ohio EPA  
Contract P.O. # A56199

**DATA SHEET**

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- \* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- \* ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- \* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- \* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity). If the MDA is blank, the ERROR is used as the limit.

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**THERMO NUTECH**  
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**GUIDE, cont.**

Client Ohio EPA  
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**DATA SHEET**

- J** The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B** A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L** Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H** Similar to 'L' except the recovery was high.
- P** The RESULT is 'preliminary'.
- X** Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2** There were two or more results available for this analyte. The reported result may not be the same as in the raw data.
- Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- \* An MDA is underlined if it is bigger than its RDL.
- \* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA

Lab id ABQ  
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**THERMO NUTECH**

OHIO EPA FERNALD

**GUIDE, cont.**

SDG 9708269  
Contact Mary Kanoss

Client Ohio EPA  
Contract P.O.# A56199

**DATA SHEET**

may not be a good estimate of the 'real' minimum detectable activity.

- \* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- \* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison:

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THERMO NUTECH  
OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

Client Ohio EPA  
Contract P.O. # A56199

REPORT GUIDE

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- \* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The error of RESULT, including that introduced by rounding the result prior to printing.  
  
If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

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**THERMO NUTECH**

OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

**REPORT GUIDE**

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Contract P.O. # A56199

**DUPLICATE**

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

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## THERMO NUTECH

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SDG 9708269  
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## GUIDE, cont.

Client Ohio EPA  
Contract P.O. # A56199

## DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- The RPD is underlined if it is greater than either limit.
- If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

Lab id ABQ  
Protocol -  
Version 1  
Form DVD-RG  
Version 3.08  
Report date 09/26/97

# THERMO NUTECH

OHIO EPA FERNALD

SDG 9708269  
Contact Mary Kamoss

## REPORT GUIDE

Client Ohio EPA  
Contract P.O. # A56199

### MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.  
  
If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.
- \* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.  
  
An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.
- \* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.  
  
If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- The second limits are protocol defined upper and lower QC limits for the recovery.

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#### SUMMARY DATA SECTION

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SDG 9708269  
Contact Mary Kamoss

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MATRIX SPIKE

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

The recovery is underlined (out of spec) if it is outside either of these ranges.

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**THERMO NUTECH**

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**REPORT GUIDE**

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**METHOD SUMMARY**

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- \* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- \* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- \* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- \* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data' means no amount ADDED was specified. 'LOW' and 'HIGH'

**REPORT GUIDES**

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**SUMMARY DATA SECTION**

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GUIDE, cont.

METHOD SUMMARY

correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

- If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- \* Aliquots are underlined if less than the nominal value specified for the method.
- \* Preparation factors are underlined if greater than the nominal value specified for the QC batch.
- \* Dilution factors are underlined if greater than the nominal value specified for the method.
- Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.
- Count times are underlined if less than the nominal value

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Contact Mary Kamoss

**GUIDE, cont.**

Client Ohio EPA  
Contract P.O. # A56199

**METHOD SUMMARY**

specified for the method.

- \* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- \* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- \* Days Held (Analyzed - Collected) are underlined if greater than the holding time specified in the protocol.
- \* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included.

**REPORT GUIDES**

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**SUMMARY DATA SECTION**

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GUIDE, cont.

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METHOD SUMMARY

No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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**Chains of Custody**

000062

**CUSTODY TRANSFER AND ANALYSIS REQUEST RECORD**

CONTROL #: T0005

97-08-269-

A

Thermo Nutech  
7021 Pan American Highway, NE  
Albuquerque, NM 87109-3874  
  
Attn: Ernie Sanchez (505) 345-3461

Purchase Order #: A56199  
Project #: TNU970825:CR:Fernald  
Lab Contact: ERNIE SANCHEZ

Ohio Environmental Protection Agency  
Southwest District Office  
Office of Federal Facilities Oversight  
401 East Fifth Street  
Dayton, Ohio 45402-2911  
Contact: Donna Bohannon (937) 285-6453

SAMPLE INFORMATION					REQUESTED ANALYSIS										METHOD		Required Detection Limit	Condition on Receipt (Lab)	
Sample Identification	Description	Matrix	Collection Date	Time	Total Uranium	Isotopic Thorium	Isotopic Uranium	Radium-226	Radium-228	Tc-99	Particle Size	TOC	Preservative	KPA	EERF 00-05	EEFRE-01			Other
970825-01	SWU-4-1-1-yS	S	8/25/97	1338	X					X				X			X	16 oz. PLASTIC	Tc-99: 2 pCi/g
970825-02	SWU-4-1-2-yS	S	8/25/97	1339	X					X				X			X	16 oz. PLASTIC	TTL U: 1 ppm
970825-03	SWU-4-3-1-yS	S	08/25/97	1355	X					X				X			X	16 oz. PLASTIC	"
9780825-04	SWU-4-5-2-yS	S	08/25/97	1356	X					X				X			X	16 oz. PLASTIC	"
970825-05	SWU-5-2-3-yS	S	08/25/97	1741	X					X				X			X	16 oz. Plastic	"
970825-06		S	08/25/97		X					X				X			X	16 oz. Plastic	"
970825-07		S	08/25/97		X					X				X			X	16 oz. Plastic	"

1. Relinquished by: *[Signature]* 8/25/97 1824 Date/Time  
Signature/Affiliation: *[Signature]*  
2. Relinquished by: *William C. Whiterman* 8/27/97 1708 Date/Time  
Signature/Affiliation: *Donna Bohannon* 8-27-97 5:12pm Date/Time  
1. Received by: *[Redacted]* Date/Time  
Signature/Affiliation: *[Redacted]*  
2. Received by: *[Redacted]* Date/Time  
Signature/Affiliation: *[Redacted]*

MATRIX CODES:  
S - SOIL  
SE - SEDIMENT  
W - WATER  
AF - AIR FILTER  
X - OTHER

Possible Hazard Identification:  
 Non Hazard  
 Flammable  
 Skin Irritant  
 Other

Sample Disposal:  Return to Client  
 Return to Lab  
Archive 12 (months)  
ALBUQUERQUE, LA.

Turnaround Time Required:  Normal  
 RUSH

REPORT REQUIRED BY: Regular turnaround 8/29/97

Bill to: Pat Campbell  
OEPA/DERRCO  
1800 WATERMARK DRIVE  
COLUMBUS, OH 43216-1049

Report to: Donna Bohannon  
OEPA/SWDO/OFFO  
401 E. FIFTH STREET  
DAYTON, OH 45402-2911

Not required per IATA activity < 0.002 uCi  
COC sealed in container  
Return cooler F-3 to Donna Bohannon (937)285-6453

SAMPLES SHIPPED VIA: \_\_\_\_\_  
TRACKING NUMBER: \_\_\_\_\_

000063

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## OHIO DEPARTMENT OF HEALTH

RECEIVED  
OHIO EPA

OCT 14 1997

SOUTHWEST DISTRICT

246 N. HIGH STREET  
Post Office Box 118  
Columbus, Ohio 43266-0118  
Telephone: (614) 466-3543



GEORGE V. VOINOVICH  
Governor

PETER SOMANI, M.D., Ph.D.  
Director of Health

8 October 1997

Mr. Rex Brown  
Data Manager  
Office of Federal Facilities Oversight  
Southwest District Office  
401 East Fifth Street  
Dayton, OH 45402-2086

OEPA project # TNU 970825  
Site and Fund: Fernald CR  
SDG # 9708269  
Media: Soil  
Sample date: 8-25-97  
ODH project# 97-10-66

Dear Mr. Brown,

The Ohio Department of Health - Bureau of Radiation Protection (ODH/BRP) submits this evaluation to the Ohio EPA (OEPA) of Fernald soil sampling generated from sampling events dated August 25, 1997. This action is consistent with the *Memorandum of Understanding* in support of the Ohio/DOE Cost Recovery grant. The submittal of data review is for analytical data from the contract laboratory Thermo NuTech. To provide traceability, ODH/BRP referenced the sampling data in this evaluation by OEPA sample number.

The samples were analyzed for: total uranium and technetium-99. During the conduct of this validation, the analytical data was reviewed for the presence of the analytes within the sample.

In addition to the analytical data evaluation, the following sampling and analysis parameters were also evaluated:

- Analytical MDA's (compared to EPA detection limit criteria);
- Chain of custody forms;
- Sample preparation and transfer data including pH, holding times when applicable, temperature receipt, sample integrity, and
- Analytical methodology.

### Sample Analysis Review

Five (5) soil samples were acquired during sampling evolutions conducted on 25 August 1997. The sample numbers instituted are as follows: **970825-01 through 970825-05**. The samples were analyzed for total uranium via ASTM D 5174 and for technetium-99 via EICHROM TCS01, 1993.

Laboratory quality assurance/quality control samples were performed via: sample duplicate; method blank; and laboratory control sample.

The blank analytical data was in accordance with guidelines. The percent recovery for the isotopic laboratory control sample was in accordance with guidelines for each of the analytes. The duplicate analytical data was within relative percent recovery control limits for the analyses.

Sample 970825-05 (9708269-05) had an MDA greater than its requested detection limit due to dilution of the sample; this result does not affect the useability of the data due to the high sample result.

The laboratory data sheets indicate that the samples were received in good condition. Review of the chain of custody indicates that the samples were placed in the appropriate containers and handled in accordance with guidelines. In summary, the data is validated without qualification.

If you have any questions concerning this evaluation, please do not hesitate to call the Bureau at (614) 644-2727.

Respectfully,



Celeste Lipp

Senior Health Physicist

Contaminated Sites Program

Ohio Department of Health/Bureau of Radiation Protection

246 N. High Street

Columbus, OH 43266-3534