Department of Energy

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DOE-1349-97

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF RESPONSES TO THE U. S. ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE GEOTECHNICAL SAMPLING AND TESTING PLAN FOR THE FORMER PLANT AREA

The purpose of this letter is to transmit responses to the U.S. Environmental Protection Agency (U. S. EPA) comments on the Geotechnical Sampling and Testing Plan for the Former Plant Area. As discussed in the meeting on August 6, 1997, and outlined in the enclosed comment responses and associated actions, the draft Geotechnical Sampling and Testing Plan for the Former Plant Area will not be revised based on these responses; but, instead, responses will be addressed and incorporated into each applicable Integrated Remedial Design Package (IRDP) associated with the former production area.

As discussed on August 6, 1997, Fernald Environmental Management Project (FEMP) representatives outlined a plan to the U. S. EPA and Ohio Environmental Protection Agency (OEPA) to streamline the development and implementation process for the numerous upcoming soil sampling Project Specific Plans (PSP). The role of these soil-based sampling and radiological survey PSPs is to direct the collection of pre-design soil samples whose results will be used in the development of the area-specific IRDPs. The information and data will be used for such tasks as (1) refining area-specific contaminant of concern lists; (2) conducting pre-screening radiological surveys to identify or confirm areas of elevated radiological contaminants (gamma emitting radiological contaminants); (3) further delineating soil areas which contain concentrations of contaminants that are likely above-Waste Acceptance Criteria (WAC) concentration limits; and, (4) determining required depth of excavation contours to meet Final Remediation Levels (FRL). The FEMP's streamlined

approach to the development and implementation of these PSPs recommended submitting the PSPs informally to the EPAs, obtaining any comments and concerns received from the agencies during weekly conference calls and/or meetings and resolving these comments and/or concerns through the development of the particular IRDP. Recall, the IRDPs represent the formal Operable Unit 5 (OU5) and/or Operable Unit 2 (OU2) Remedial Design Work Plan milestones. This approach allows a more expedited collection and analysis of design data which is necessary given the complexities and short schedules associated with the remaining soil areas. The challenge to this approach is that it requires the FEMP and the EPA to communicate much more frequently and to ensure adequate review and resolution of comments and concerns for a large number of PSPs (potentially) prior to the formal submittal of the 90% design as contained in the draft IRDPs.

If you or your staff should have any questions, please contact Robert Janke at (513) 648-3124.

Sincerely,

Johnny Reising

FEMP:R.J. Janke

Johnny Reising
Fernald Remedial Action
Project Manager

Enclosure: As stated

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RESPONSES TO U.S. EPA COMMENTS ON GEOTECHNICAL SAMPLING AND TESTING PLAN FOR FORMER PLANT AREA

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1 Page #: 1-2 Line #: 22
Original General Comment #: 1

Comment: The text states "vertical migration dominates in the clay." However, the model used to establish the extent of the excavation area focuses on the locations of coarse-grained materials. The U.S. Department of Energy (DOE) should clarify why the clay and fine-grained materials were not considered in modeling the impacted material.

Response: The impacted material model considered both coarse-grained (e.g. sand) and fine-grained material (e.g. clay). Similar to the process used in the On-Site Disposal Facility Pre-Design Investigation (Ref. DOE-1277-95 dated July 27, 1995), coarse-grained stratigraphic "picks" were made from the boring logs at six inch intervals and the extent of the coarse-grained material determined by kriging. The remainder of the material, by definition, is fine-grained (e.g. clay). The subsurface analytical data was segregated into two data subsets: coarse grained and fine grained. These analytical data subsets were kriged separately and then integrated. Lines 9-12 on Page A-1 further define this process.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1 Page #: 1-2 Line #: 23
Original General Comment #: 2

Comment: The text states that "lateral migration is observed in the coarse-grained material." Figures 2-7 and 2-8 are cross sections identifying the proposed limits of excavation. These cross sections also show the locations of the coarse-grained materials. The proposed excavations do not include the entire extent of the coarse-grained materials although, according to the text, lateral migration occurs in these materials. DOE should explain why some coarse-grained materials are to be left in place even though they may serve as lateral migration conduits.

Response: The geotechnical investigation is focused on the Plant Area where deep excavations are envisioned to remove impacted soils above the FRL with Total Uranium concentrations above 20 ppm. The enhanced model indicates some lateral migration within the coarse-grained soils within the impacted area. These areas, however, are bounded by Total Uranium data with concentrations below 20 ppm. The kriging model considers all data and is believed to be a conservative representation of the nature and extent of contamination. Also, the FRLs developed in the OU5 FS considers the lateral migration pathway of any residual contamination. The certification process which is further defined in the Sitewide Excavation Plan (see DOE-1191-97 dated July 14, 1997) will be used to assure that remediation goals are achieved.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table 7-1 Page #: 7-12 Line #: Not Applicable (NA)
Original General Comment #: 3

Comment: Table 7-1 summarizes the sampling strategy for geotechnical analyses. DOE has selected various sampling intervals for a variety of analyses. DOE should describe the rationale used to select analytical parameters for each particular sampling interval.

Response: The geotechnical sampling and testing program focused on the data needs to evaluate slope stability, construction dewatering and material handling. Data from the geotechnical reports supporting Plant Area foundation design were first reviewed and compiled to establish a baseline. This review indicated that the majority of the existing geotechnical data suitable for slope stability analysis (e.g. unit weight, Unconfined Compressive Strength) were from samples of fine-grained materials (e.g. clay) at depths generally no greater than 12 to 15 feet below ground level.

At the new boring locations, sampling is essentially continuous (i.e. 2-foot intervals) with testing focused on data gaps. Unconfined Compressive Strength (UCS), Consolidated Undrained Triaxial Compressive (CU) and Consolidated Drained Triaxial Compression (CD) tests are focused on obtaining strength data for slope stability analysis. Grain size analyses are focused on determining variability of the coarse-grained soils (e.g. sand) to further evaluate hydraulic conductivities and the moisture contents and Atterburg limit tests are focused on material handling properties of fine-grained soils (e.g. clay). Also the grain size and Atterburg limit tests are used to verify engineering soil classifications.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A.4 Page #: A-5 Line #:
Original General Comment #: 4

Comment: The text states that "one of the goals for implementing this geotechnical sampling and testing plan is to provide more accurate geotechnical information about the subsurface soil conditions within the former plant area." However, the plan does not explain how the model used for the former plant area will be calibrated using the data obtained from the geotechnical sampling and testing task. DOE should clarify the procedures to be used to calibrate the model.

Response: Stratigraphic control within the Former Plant Area is extensive. As previously noted, all previous geotechnical borings have been added to the model providing enhanced data beneath many of the building foundations. The new boring logs will be compared to the predicted model and adjustments made, if warranted.

Action: The stratigraphic model will be revised based on the geotechnical borings, if necessary, and presented in the geotechnical report.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.1 Page #: 7-1 Line #: 20
Original Specific Comment #: 1

Comment: The text states that "geotechnical testing of samples will be conducted at the on-site laboratory, and at an off-site geotechnical laboratory licensed by the Nuclear Regulatory Commission." However, the text does not specify which analyses will be performed on site and which off site. DOE should specify which samples will be analyzed either on or off site.

Response: The archive samples designated for grain size and Atterberg Limit testing and the samples from the new borings that called for only moisture contents were tested on-site. All other testing is to be performed at the off-site laboratory.

Action: Location of testing will be defined in the geotechnical report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.2.2 Page #: 7-2 Line #: 21
Original Specific Comment #: 2

Comment: The text states that the photo ionization detector (PID) will be used to monitor for "organisms." The text should be revised to state that the PID will be used to monitor for organic compounds.

Response: Agree.

Action: A variance will be issued to the GSTP documenting this clarification.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.2.2 Page #: 7-3 Line #: 13
Original Specific Comment #: 3

Comment: The text states that "the depths of the borings are planned to not extend into the Great Miami Aquifer." It is very important that the borings not extend into the Great Miami Aquifer because of the potential for cross-contamination. DOE should provide a contingency plan describing measures that will be taken in the event that a boring penetrates the Great Miami Aquifer.

Response: A protection factor was incorporated into the sampling plan in that all specified boring depths have been designated at least three feet less than the depth to the bottom of till, as based on RI/FS till thickness modeling. By designating boring depths less than the till thickness, the likelihood of drilling into the GMA is greatly reduced.

During drilling, sampling, and grouting operations, a FDF geologist experienced with drilling operations within the Former Plant Area will be assigned to oversee work activities. Field crews (including the FDF geologist) are to pay special attention to the drilling operations as the drilling depths approach the bottom of the planned boring depths. Grouting equipment and supplies are to be located at the drill site for quick response in the event of an actual GMA penetration. In addition, the field

geologist will be given the authority to lessen the depth of the boring, based on observed changes in test samples or drill cuttings pulled to the surface (e.g., unexpected deep sands within the glacial till).

If the GMA is penetrated, then the cement plug will not be placed at the top of the boring for at least several days to assure that settlement of the grout into the GMA is not occurring. If settlement is observed, then additional grout will be placed in the hole and observed until settlement stops.

DOE will notify both the USEPA and the OEPA in the event that the GMA is penetrated during this investigation.

Action: A variance to the GSTP will be issued documenting this requirement. Actions taken will be adressed in the geotechnical report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table 7-1 and Figure 7-1 Page #: 7-16 Line #: NA
Original Specific Comment #: 4

Comment: Table 7-1 indicates that the planned depth for geotechnical soil borings G3-009 and G3-010 are 20 and 22 feet below ground surface (bgs). However, the planned excavation limits in these areas is 22 and 24 feet bgs. The purpose of the plan is to obtain geotechnical data for the proposed areas of excavation; therefore, geotechnical data should be collected for the entire depth to be excavated. DOE should revise the table to indicate that geotechnical soil borings G3-009 and G3-010 will be extended to the proposed base of the excavations at 22 and 24 feet bgs.

Response: For protection of the GMA, the depths of all borings would be at least three feet less than the depth to bottom of till (based on RI/FS till thickness modeling). Designating boring depths less than the till thickness reduces the likelihood of drilling into the GMA. In general, the till is thicker toward the northern portions of the Former Production Area and are thinner towards the southern portion (see Figure G-1). Due to the close proximity of the GMA, it was decided not to drill boring G3-009 and G3-010 to the full excavation depth as shown in Figure 7-1.

From a slope stability standpoint, this is conservative as the till generally increases in density and compressive strength with depth. Also see response to Specific Comment 3 above regarding borings penetrating into the GMA.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table 7-1 Page #: 7-16 Line #: NA
Original Specific Comment #: 5

Comment: According to Table 7-1, one sample from nearly every depth interval at each soil boring location will be analyzed for moisture content. A rationale should be provided for analyzing such a large number of soil samples for moisture content.

Response: A complete moisture profile of a boring is useful to the geotechnical engineer in slope stability applications in identifying potential zones of saturated soft materials, and the properties of clay soils relative to its plasticity indices. Additionally, these data will

be used by the excavation contractor to estimate the degree of soil moisture conditioning required prior to disposition.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Figures 7-1 and 7-2 Page #: NA Line #: NA
Original Specific Comment #: 6
Comment: Figures 7-1 and 7-2 indicate that no geotechnical soil borings are proposed for the 24-foot deep excavation at location coordinates 480500, 1349900. In addition, no archived samples exist for this area. This area is proposed for deep excavation, and coarse-grained materials are expected to be present. The plan should include a boring location in this area or provide a rationale for not investigating this area.

Response: Boring locations were selected where deep excavations are envisioned to remove soils above the FRLs. Also see response to Specific Comment 4.

The kriged model near coordinates 480500, 1349900 indicates good stratigraphic control and based on engineering judgement, strength data can be extrapolated from nearby locations. Consistency of strength data in the glacial till overburden at FEMP is demonstrated both in the historical Plant Area geotechnical reports as well as the geotechnical report for the OSDF (Ref. DOE-0430-96 dated January 17, 1996).

Action: USEPA/OEPA will be notified should in-situ strength data in the Plant Area be observed outside the historical range and a mutually agreeable path forward identified.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Figures 7-1 and 7-2 Page #: NA Line #: NA
Original Specific Comment #: 7
Comment: No information is provided regarding how the proposed soil borings will be located in the field. DOE should clarify this matter by providing a table identifying each boring's northing and easting coordinates.

Response: Agree. A table of coordinates should have been included.

Action: A variance will be issued to the GSTP adding a table of coordinates. The table of coordinates is attached.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Figure A-4 Page #: Line #: NA
Original Specific Comment #: 8
Comment: The contour lines in the figure are not labeled, making it difficult to visualize the depths of cut and fill. DOE should revise the figure to label the contour lines.

Response: Agree.

Action: Figure A-4 has been revised and is attached.

BORING COORDINATES

Boring	Easting	Northing
G3-001	1350398.90	481932.37
G3-002	1348897.22	481726.46
G3-003	1349517.46	481488.52
G3-004	1348809.49	480857.28
G3-005	1348628.74	480668.11
G3-006	1349039.49	480862.50
G3-007	1348559.88	480276.26
G3-008	1348910.95	480384.21
G3-009	1350088.00	480032.51
G3-010	1348521.46	479746.63

LEGEND

- 10F — FILL AREA - Major (10') Contour
- 2F — FILL AREA - Minor (2') Contour
- 10C — CUT AREA - Major (10') Contour
- 2C — CUT AREA - Minor (2') Contour
- 0 — ZERO Fill Line

FIGURE A-4. DEPTH OF CUT AND FILL, 1952 TO 1992

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