U-003-306.19

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COMMENT RESPONSE SUMMARY FOR THE MAWS TREATABILITY STUDY WORK PLAN

DOE-FN/EPA

23
REPORT

US EPA General Comment 1

Comment

This document states that a key objective of this study is to determine the most appropriate set of parameters to optimize the performance of the overall integrated system, which includes soil washing (for waste volume reduction), vitrification (for waste stabilization), and ion-exchange technologies (for wastewater treatment). The document also states that this objective will be accomplished by evaluating the capability and performance of each individual technology (see Section 4.3.11, paragraph 1). If this is the case, the performance objectives for ion-exchange technology need to be included in Section 3. In Section 6A, which presents the sampling and analysis plan, summary tables for the sampling and analysis program should be presented separately for soil washing, vitrification, and ion-exchange technologies. The table should indicate the sample matrix, field and laboratory parameters, number of investigative and QA/QC samples, and sampling frequency. In addition, the tables in Section 6A should be consistent with overall test objectives, stated in Section 3. For example, one stated objective is to reduce the overall waste volume. However, the tables do not indicate specifically how this will be achieved. DOE should modify the tables accordingly.

Response

Performance objectives for the wastewater treatment system are now identified in Section 3 of the Work Plan. DOE has elected to base performance on the entire wastewater treatment system in lieu of establishing performance objectives for individual processing components such as the ion-exchange units. The performance objective of the wastewater treatment system is to remove contaminants from the soil washing system wastewater to maintain the desired contaminant removal efficiency and volume reduction. The overall efficiency of the wastewater treatment system will be determined by analyzing the wastewater influent and effluent for the following parameters:

- Radionuclides (Analytes include ^{226}Ra, ^{99}Tc, ^{228}Th, ^{230}Th, ^{232}Th, ^{234}U, ^{238}U)
- Total Uranium

The above parameters will be analyzed to determine the overall performance of the wastewater treatment system to determine a correlation between the wastewater and soil washing efficiencies. The specific details for this portion of the sample program is provided in Table 6-1 and Section 6.

The various aspects of the sampling and analysis program were consolidated into a single summary table (see Table 6-1). This consolidated table provides the field and laboratory parameters, rationale/objective of the analysis, sampling methodology, number of samples to be collected, sample preparation requirements, analytical methodology, Analytical Support Level (e.g., Data Quality Objective), and the QA requirements for each sample collection point. In lieu of providing separate tables for soil washing, vitrification, and wastewater treatment; all of the sample and analysis information is provided in a single table to allow an integrated evaluation of the entire MAWS operations. The consolidated table combines and replaces Tables 3-2, 3-3A, 3-3B, 4-2, and 6A-2 contained in the MAWS Treatability Study Work Plan Rev 0. It should be noted that the consolidated table includes activities associated with the process control of the MAWS system. Although the process control information may not directly support the overall

test objectives for the MAWS treatability study, it does provide the reviewer a better understanding of the operational aspects of the processing equipment. The process control results (i.e., pH, temperature, flow rate, pressure, etc.) will not be compiled into the treatability study reports. To assist the reviewer with an overall picture of the sampling and analysis program, the sample locations identified in the new consolidated table are depicted on a MAWS System Sampling Points process flow diagram, Figure 6-1 (Old Figure 4-1 from Rev 0).

Section 6 and the overall test objectives contained in Section 3 were modified to ensure that the reviewer understands the relationship between the individual sample point requirements and the overall test objectives. With respect to the objective for overall waste volume reduction, the amount of each input and output stream will be recorded to determine an overall mass balance for the MAWS system.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Specific Comment 1

Comment

The title for Table 6A-1 should be changed to "Field Equipment Required for the Soil Washing."

Response

The Table 6A-1 was deleted. Field equipment requirements will be determined according to Section 6.7 and Appendix K in the Sitewide CERCLA Quality Assurance Project Plan (SCQ).

Action

No action required; table was deleted.

US EPA Specific Comment 2

Comment

Page 6A-6. The section titled "Vitrification" should be preceded by section number, such as 6A.1.2.2.

Response

Section 6 was rewritten and vitrification is now in Subsection 6.1.3.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Specific Comment 3

Comment

The titles for Table 6A-2 and Figure 6A-1 need clarification. The titles for the table and figure do not indicate that they belong to the vitrification technology.

Response

The title for Figure 6A-1 was clarified to read "Sampling Design - Vitrification Process" and is labeled Figure 6-2. Table 6A-2 was eliminated; the sampling information which was on this table is now part of the new consolidated table (see Table 6-1).

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Specific Comment 4

Comment

Table 6A-2 is not consistent with the text in Section 6A.1.2. For example, data generated during completed slurry batch sampling have not been discussed. In the table, the presentation of QA/QC samples is not clear. The number of QA/QC samples usually depends on the investigative sample number, which varies based on different laboratory parameters. DOE should revise the table accordingly.

Response

Table 6A-2 was consolidated into a master sampling table (Table 6-1) for clarification and includes a better description of the QA requirements based on individual analysis. The information in Section 6A.1.2 was added to Table 6-1, and the text in Section 6 was revised accordingly to be consistent with the information provided in the consolidated sample table.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Region 5 Radiation Section Comment 1

Comment

Section 1.2.1, Page 1-2
The estimated mass per unit volume of the non-steel and non-concrete Pit 5 waste should be stated. This would allow comparisons of the mass of the waste to the throughput of the vitrification unit, giving some indication as to the time it will take to remediate the Pit 5 wastes.

Response

The description of Waste Pit 5 was taken from the draft *Feasibility Study Report for Operable Unit 1*, dated April 1991. After further investigation, no evidence can be found to support the statement about steel and concrete being deposited into the pit. Since this information was taken from a draft report, it is assumed that this information was erroneously entered into the report. This information will be deleted from subsequent revisions of the Feasibility Study report. Further study of the contents of each of waste pits is being conducted as part of the RI/FS and engineering design phases to facilitate the removal and treatment of OU-1 wastes.

Action

The sentence stating "Waste Pit 5 contains approximately 8,000 pounds of steel and 64,000 pounds of concrete which were deposited into the pit from previous site demolition activities" was deleted from the work plan.

US EPA Region 5 Radiation Section Comment 2

Comment

Section 3.2.2, Page 3-1
Please explain why the uranium concentration goal in the treated soil fraction is 35 pCi/g.

Response

The 35 pCi/g identified in the MAWS Treatability Study Work Plan is not a soil clean up goal. The RI/FS process is the vehicle for determining the final clean-up levels, including radiological levels in soil. The 35 pCi/g uranium treatment goal is not intended to supplant the establishment of the Remedial Action Objectives which are to be specified in the Record of Decisions.

However, the characteristics of the "dirty" and "clean" fractions of the treated soil are dependent on the level of performance for the soil washing process. The "dirty" treated soil fraction characteristics have a direct impact on the vitrification process. As a result, in the absence of approved clean-up standards for uranium in soil, 35 pCi/g was selected to be the operational performance goal for the MAWS soiling washing process. This preliminary treatment goal is consistent with the laboratory scale soil Treatability Studies being conducted for Operable Unit (OU) 5 and is based on the clean-up level for uranium contained in the Nuclear Regulatory Commission Technical Branch Position Paper, *Disposal or On-Site Storage of Residual Thorium or Uranium (Either Natural Ores or Without Daughters Present) From Past Operations*, published in the Federal Register on October 23, 1981.

In addition, the 35 pCi/g uranium treatment goal was established to ensure that the treated "clean" soil fraction would be below the action levels (e.g., 100 pCi/g Uranium) specified in the approved Removal Action #17 Work Plan for the storage of bulk soils in controlled stockpiles. Both the "dirty" and "clean" treated soil fractions will be managed as a waste soil in accordance will Removal Action #17 as specified in Section 10.2 (previously Section 6B.2) of the Treatability

Study Work Plan. This soil will ultimately be managed in accordance with the RODs issued for soil remediation.

Action

Additional text was added to Section 3.2.2 to clarify the use of the 35 pCi/g uranium treatment goal.

US EPA Region 5 Radiation Section Comment 3

Comment

Section 3.2.2, Page 3-1
For the bench-scale study, it would seem appropriate not only to target uranium for analysis throughout the treatability study, but to also analyze the input materials for all radiological contaminants for comparison with contaminant levels in the effluent streams (vitrified glass and "clean" air, water and soil) from the MAWS process.

Response

Uranium is being analyzed in the Contaminated Soil, "Dirty" Treated Soil and "Clean" Treated Soil input/output to determine the performance characteristics of the soil washing process. Based on the OU-1 RI soil characterization effort, uranium is one of the most prevalent contaminants of concern. The MAWS results will be supplemented by the more extensive radiological and chemical analyses being conducted as part of the OU-5 laboratory scale treatability studies for soil washing. It is envisioned that a correlation between the MAWS and OU-5 treatability study results, along with the soil characterization data being developed as part of the OU-5 RI, will be adequate to demonstrate the feasibility of the MAWS soil washing process. If the MAWS/OU-5 treatability studies and OU-5 RI characterization results prove to be inadequate to determine the feasibility of soil washing, supplemental studies will be undertaken.

The vitrified glass gem leachate (e.g., Toxicity Characteristic Leaching Procedure), and the influents and effluents to the off-gas and wastewater treatment/soil washing systems will be analyzed for radionuclides using Gamma Spectroscopy at least once per campaign. The consolidated sample table (see Table 6-1) includes radiological analyses at these locations.

In addition to the above, a one-time HSL sample will be collected at each major sample location (e.g., Contaminated Soil, Treated "Dirty" Soil, Treated "Clean" Soil, Waste Pit 5 Sludge, Vitrified Glass, and Off-gas Discharge.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Region 5 Radiation Section Comment 4

Comment

Section 4.2.1.2, Page 4-2, Paragraph 3
Please describe, either in this section or referenced, what Savannah River PCT testing process is.

Response

The PCT leaching procedure was contained in Appendix B of the Work Plan, but was not properly referenced. The phrase "Savannah River" was eliminated and a reference to the PCT procedure contained in Appendix D (previously Appendix B) was added.

The Product Consistency Test (PCT) follows the ANS 16.1 method for determining the long-term leaching characteristics of a waste form. The PCT is similar to the TCLP expect that the leachate from the waste sample is withdrawn at various intervals for the PCT as opposed to a single extraction as conducted for the TCLP. To determine the long-term performance of the vitrified glass gems, a sample of the gems will be collected every batch. These samples will be ground and leached using deionized water. A sample of the deionized water will be collected after 7, 14, 28, 56 and 180 days of leaching and analyzed for radionuclides and other chemical constituents.

At the end of the MAWS treatability study, the two most promising glass formulations will be subject to a PCT at 90°C to determine the performance characteristics of the glass at elevated temperatures. These two samples will be analyzed for radiological and other chemical constituents. The two most promising samples will be obtained from archived samples which were splits of the glass gem samples collected for each six hours of operation.

The results of the PCT results will be compared with the results for other vitrified wastes (e.g., High-Level Waste Program) to gauge the performance of the MAWS vitrified glass.

Action

Section 3.2.1 was expanded to clarify the intent of the PCT. The Appendices were rearranged for clarity and a reference to PCT contained in Appendix D (previously Appendix B) was added.

US EPA Region 5 Radiation Section Comment 5

Comment

Section 4.4.2.8, Page 4-21, Paragraph 1
It is stated that three levels of control are provided (Operations, Safety, Monitoring) and are discussed below; it seems that the monitoring control discussion has been left out.

Response

The reference to monitoring/environmental was deleted. All sampling and monitoring are now summarized in the consolidated sample table (see Table 6-1) and described in Sections 4 and 6.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Region 5 Radiation Section Comment 6

Comment

Section 4.4.2.1, Page 4-10
The top of the page states 10 mixing tank characteristic, with characteristic number one stating a one week capacity. Please state the actual volume of the tank.

Response

The actual volume of each tank is 3,000 gallons.

Action

Characteristic number one was changed to read, "3,000 gallon capacity."

US EPA Region 5 Radiation Section Comment 7

Comment

Section 6A.1.2.1, Page 6A-4
The text states that during the soil washing process, the collected influent and effluent samples will be analyzed as described below. The text below only explains sample splitting, routing, and methods; the actual analysis that will be performed is not stated, please clarify.

Response

The consolidated sample table (see Table 6-1) includes analytical parameters and methodologies for each sample location. The text has been revised where appropriate to be consistent with the consolidated table.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Region 5 Radiation Section Comment 8

Comment

Please clarify whether soil sample characteristics will include radionuclide sampling and the means used. If not, please state why such radionuclide sampling of the soil samples is not being performed.

Response

Uranium analysis will be performed regularly (e.g., each drum) for the soil washing process. These uranium samples will be collected from the contaminated soil feed, the "dirty" treated soil and the "clean" treated soil. The samples will be physically separated into six (6) size fractions (+4 mesh, 4 to 10 mesh, 10 to 50 mesh, 50 to 100 mesh, 100 to 30 microns, and -30 microns). Each size fraction will be analyzed, if there is a sufficient quantity, for uranium using Kinetic Phosphorescence Analysis (KPA). The KPA uranium results will be validated as a quality control check using Inductively Coupled Plasma (ICP) techniques. Once for every eight drums of contaminated soil, the six (6) size fractions of the contaminated soil feed sample will be split into two aliquots if there is a sufficient quantity of sample available. One will be analyzed using KPA and the other aliquot will be analyzed using ICP.

In consideration of EPA and Ohio EPA comments, FERMCO will analyze a grab sample for HSLs from the contaminated soil feed, the "dirty" treated soil and the "clean" treated soil. The HSL analysis will include gamma spectroscopy for radionuclides.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Region 5 Radiation Section Comment 9

Comment

Section 6A.1.7, Page 6A-12
Please explain why there are no analytical methods listed in this section or in Appendix B for radionuclide analysis.

Response

The analytical methodology for radionuclides will either be per the Site-Wide CERCLA Quality Project Plan (SCQ) or per analytical procedures included in Appendix D (e.g., Kinetic Phosphorescence Analysis for Uranium) of the Work Plan. The analytical methods for each sample location are presented in the consolidated sample table (see Table 6-1) and Appendix D (previously Appendix B) is now better organized to eliminate any confusion.

Action

The Treatability Study Work Plan was modified as indicated above.

US EPA Region 5 Radiation Section Comment 10

Comment

Section 6A.6, 6A-14
Please explain why there is no text for this section, Quality Assurance Reports to Management.

Response

Section 6A.6 was to provide a reference to Section 16 of the SCQ for the QA reporting function to management. Please excuse the oversight.

Action

The Treatability Study Work Plan was modified to include a reference to the SCQ as indicated above.

US EPA Region 5 Radiation Section Comment 11

Comment

Section 6B.1, Page 6B-2
For compliance with the NESHAP for radon-222 (40 CFR 61, Subpart Q) analysis should conform with the requirements of 40 CFR 61, Appendix B, Method 114, Method A-6 (method within Method 114), Radon-222 - Continuous Gas Monitor. This method requires that radon-222 be measured directly in a continuously extracted sample stream by passing the air stream through a calibrated scintillation cell. Radon measurement cannot be accomplished by simply adding a charcoal canister or other gas collection media (except for what is prescribed by Method A-6) to the isokinetic sampler immediately after the 0.45 micron filter. Use of any method other than Method A-6 (with Method 114) requires prior approval of US EPA, Region 5.

Response

Samples for radon will be collected from the melter off-gas system between the melter and the air pollution control equipment and in the stack prior to discharge. The radon samples will be collected one time in accordance with Method 114, A-6 of 40 CFR 61, Appendix B.

Action

The text of the Work Plan was revised to clarify the off-gas monitoring program and to identify the use of Method 114, A-6 of 40 CFR 61, Appendix B.

US EPA Region 5 Radiation Section Comment 12

Comment

Attachment 1, Page [A1]-8
In the discussion of Federal Permits/Notifications for Subpart Q (radon), the text states that the radon gas generation rate was divided by the area of Plant 9 to calculate the flux from the facility. For determining the radon generation (flux) rate from stored materials at the plant, the area for the divisor should be the area of storage at Plant 9. For determining the radon flux rate from off-gas effluent emission points/stacks, the divisor should be the cross-sectional area of the emission point/stack. Please clarify why the entire area of Plant 9 was used as the divisor to calculate the flux from the facility, both in this section and as calculated in the Radon-222 Emission Estimate section (page 8) of Attachment 1.

Response

Radon emissions from DOE facilities are regulated under 40 CFR 61, Subpart Q which specifies that no source shall emit into the air more than 20 pCi/m^2-sec of radon-222 as an average for the entire source. As defined in 40 CFR 61, Subpart Q, source means any building structure, pile impoundment, or area used for interim storage or disposal that is or contains waste material containing radium in sufficient concentrations to emit radon-222 in excess of this standard prior to remedial action.

Since Plant 9 will be used for the storage of radium bearing waste materials for the MAWS treatability study, the predicted maximum radon emanation from the stored material was averaged over the entire building. DOE believes that utilizing the entire Plant 9 area in the flux calculation is consistent with the definitions and requirements contained in 40 CFR 61, Subpart Q and the Federal Facility Agreement between the DOE and US EPA Region V for the Control and Abatement of Radon-222 Emissions, dated November 1991.

As stated in the response to US EPA Region 5 Radiation Section Comment 11, DOE will conduct a one time measurement for radon in the off-gas system both before and after the pollution control equipment.

Action

Revised Attachment 1 and the Radon-222 calculations text to explain that Plant 9 was determined to be a source as defined in 40 CFR 61.191. As such, the entire Plant 9 area is appropriate for calculating the radon flux.

Ohio EPA General Comment 1

Comment

It appears that DOE failed to incorporate a number of Ohio EPA's comments on the MAWS Compliance Plan into this Treatability Study Work Plan. DOE has not sufficiently addressed Ohio EPA's concerns about fully characterizing influents and effluents to the treatment processes. DOE should analyze initial pit 5 waste, initial soil, treated soil, effluent water, and effluent air for full HSL and RADs. These data are essential to determining the effectiveness of these treatments in meeting the goal of reducing mobility, toxicity, and volume. Ohio EPA previously expressed these concerns in comments on the MAWS Compliance Plan.

Response

DOE agrees to analyze the incoming contaminated soil, the "clean" soil fraction after treatment, the "dirty" soil fraction after treatment, the Waste Pit 5 sludge feed, the glass, and the off-gas prior to exiting the stack for HSL, including radiological parameters. These samples will be collected when the system is at optimum operation to allow a mass balance of the entire system to be performed.

Action

The consolidated sample table (Table 6-1) includes HSL/RAD analysis.

Ohio EPA General Comment 2

Comment

As stated in Ohio EPA's comments on the MAWS Compliance Plan, the use of a 35 pCi/g uranium concentration soil clean up goal is unacceptable.

Response

The 35 pCi/g identified in the MAWS Treatability Study Work Plan is not a soil clean up goal. The RI/FS process is the vehicle for determining the final clean-up levels, including radiological levels in soil. The 35 pCi/g uranium treatment goal is not intended to supplant the establishment of the Remedial Action Objectives which are to be specified in the Record of Decisions.

However, the characteristics of the "dirty" and "clean" fractions of the treated soil are dependent on the level of performance for the soil washing process. The "dirty" treated soil fraction characteristics have a direct impact on the vitrification process. As a result, in the absence of approved clean-up standards for uranium in soil, 35 pCi/g was selected to be the operational performance goal for the MAWS soiling washing process. This preliminary treatment goal is consistent with the laboratory scale soil Treatability Studies being conducted for Operable Unit (OU) 5 and is based on the clean-up level for uranium contained in the Nuclear Regulatory Commission Technical Branch Position Paper, *Disposal or On-Site Storage of Residual Thorium*

or Uranium (Either Natural Ores or Without Daughters Present) From Past Operations, published in the Federal Register on October 23, 1981.

In addition, the 35 pCi/g uranium treatment goal was established to ensure that the treated "clean" soil fraction would be below the action levels (e.g., 100 pCi/g Uranium) specified in the approved Removal Action #17 Work Plan for the storage of bulk soils in controlled stockpiles. Both the "dirty" and "clean" treated soil fractions will be managed as a waste soil in accordance will Removal Action #17 as specified in Section 10.2 (previously Section 6B.2) of the Treatability Study Work Plan. This soil will ultimately be managed in accordance with the RODs issued for soil remediation.

Action

Additional text was added to Section 3.2.2 to clarify the use of the 35 pCi/g uranium treatment goal.

Ohio EPA General Comment 3

Comment

The document discusses a number of sampling events within the MAWS treatability process but fails to list chemicals to be analyzed for, their respective detection limits, and number of samples to be collected. DOE should clarify how it intends to fully characterize influent and effluent media from these treatment processes.

Response

The various aspects of the sampling and analysis program were consolidated into a single summary table (see Table 6-1). This consolidated table provides the field and laboratory parameters, rationale/objective of the analysis, sampling methodology, number of samples to be collected, sample preparation requirements, analytical methodology, Analytical Support Level (e.g., Data Quality Objective), and the QA requirements for each sample collection point. In lieu of providing separate tables for soil washing, vitrification, and wastewater treatment, all of the sample and analysis information is provided in a single table to allow an integrated evaluation of the entire MAWS operations. The consolidated table combines and replaces Tables 3-2, 3-3A, 3-3B, 4-2, and 6A-2 contained in the MAWS Treatability Study Work Plan Rev 0. It should be noted that the consolidated table includes activities associated with the process control of the MAWS system. Although the process control information may not directly support the overall test objectives for the MAWS treatability study, it does provide the reviewer a better understanding of the operational aspects of the processing equipment. It is envisioned that the results from the process control samples will not be compiled into the treatability study reports. To assist the reviewer with an overall picture of the sampling and analysis program, the sample locations identified in the new consolidated table are depicted on a MAWS System Sampling Points process flow diagram, Figure 6-1 (Old Figure 4-1 from Rev 0).

Section 6 and the overall test objectives contained in Section 3 were modified to ensure that the reviewer understands the relationship between the individual sample point requirements and the overall test objectives.

Action

The Treatability Study Work Plan was modified as indicated above.

Ohio EPA Specific Comment 1

Comment

Section 1.2.1, Page 1-2
The fact that concrete and structural steel were added to Pit 5 is new information and this should be stated in this report. Any other information about when this occurred and where and how the material was deposited should be given to the EPA's in a separate letter report.

Response

The description of Waste Pit 5 was taken from the draft *Feasibility Study Report for Operable Unit 1*, dated April 1991. After further investigation, no evidence can be found to support the statement about steel and concrete being deposited into the pit. Since this information was taken from a draft report, it is assumed that this information was erroneously entered into the report. This information will be deleted from subsequent revisions of the Feasibility Study report. Further study of the contents of each of waste pits is being conducted as part of the RI/FS and engineering design phases to facilitate the removal and treatment of OU-1 wastes.

Action

The sentence stating "Waste Pit 5 contains approximately 8,000 pounds of steel and 64,000 pounds of concrete which were deposited into the pit from previous site demolition activities" was deleted from the work plan.

Ohio EPA Specific Comment 2

Comment

Section 1.3.1, Page 1-8, Table 1-1
Are the units in this table correct? The Aroclor 1254 of 750 ppm does not match up with the value of 75 ug/kg reported on page 1-4.

Response

The units for Table 1-1, Organics, were incorrect. The units were shown as ppm instead of μg/kg. The value (75 μg/kg) for Aroclor 1254 reported on page 1-4 was incorrect. The correct value is 750 μg/kg.

Action

The Table 1-1 was reformatted into separate radionuclide, inorganic, and organic characterization tables. See Tables 1-1, 1-2, and 1-4. The units for inorganic and organic characterization were corrected to mg/kg and μg/kg, respectively. The text reference for Aroclor 1254 was corrected to 750 μg/kg.

Ohio EPA Specific Comment 3

Comment

Section 2.2, Page 2-2, 3rd Paragraph, 3rd Sentence
Please clarify.

Response

The sentence was rewritten to clarify.

Action

Sentence now reads, "The concentrated contaminated (e.g., dirty) soil fraction will be one of the major components of the glass feed."

Ohio EPA Specific Comment 4

Comment

Section 3.1, Page 3-1
The first objective should be "overall waste volume reduction with minimum uncontaminated additives."

Response

Whether or not the additives are contaminated is not an issue. Both contaminated and non-contaminated additives may be used. The overall objective is to minimize overall waste volumes by using the "dirty" treated soil fraction as a substitute for other raw materials that would otherwise be required.

Action

No action is necessary.

Ohio EPA Specific Comment 5

Comment

Section 3.2.2, Page 3-1, fourth line
This is not a sentence.

Response

This sentence was clarified.

Action

Sentence was moved to the third paragraph, line 1 and rewritten to read, "For the purpose of this study, the goal for soil volume reduction is 50 to 80 percent while achieving a uranium concentration of 35 pCi/g in the "clean" treated soil fraction."

Ohio EPA Specific Comment 6

Comment

Section 3.2.2, Page 3-1
The fact that uranium is the most prevalent contaminant in OU1 is not reason enough to only target it during the treatability study. Other contaminants may be more mobile, less removable and thus concentrated in the "cleaned" soil, or introduced during treatment. Full HSL and RAD characterization of the "to be treated" and the "cleaned" soils needs to be performed.

Response

Uranium is being analyzed in the Contaminated Soil, "Dirty" Treated Soil and "Clean" Treated Soil input/output to determine the performance characteristics of the soil washing process. Based on the OU-1 RI soil characterization effort, uranium is one of the most prevalent contaminants of concern. The MAWS results will be supplemented by the more extensive radiological and chemical analyses being conducted as part of the OU-5 laboratory scale treatability studies for soil washing. It is envisioned that a correlation between the MAWS and OU-5 treatability study results, along with the soil characterization data being developed as part of the OU-5 RI, will be adequate to demonstrate the feasibility of the MAWS soil washing process. If the MAWS/OU-5 treatability studies and OU-5 RI characterization results prove to be inadequate to determine the feasibility of soil washing, supplemental studies will be undertaken.

The vitrified glass gem leachate (e.g., Toxicity Characteristic Leaching Procedure), and the influents and effluents to the off-gas and wastewater treatment/soil washing systems will be analyzed for radionuclides using Gamma Spectroscopy at least once per campaign. The consolidated sample table (see Table 6-1) includes radiological analyses at these locations.

In addition to the above, a one-time HSL sample will be collected at each major sample location (e.g., Contaminated Soil, Treated "Dirty" Soil, Treated "Clean" Soil, Waste Pit 5 Sludge, Vitrified Glass, and Off-gas Discharge.

Action

The Treatability Study Work Plan was modified as indicated above.

Ohio EPA Specific Comment 7

Comment

Section 4.2.1.3, Page 4-3, 3rd Paragraph
No schedule is provided for the submission of these work plan addenda. The long-term stability of this waste form is critical and needs to be evaluated. DOE should provide a schedule for submission of these addenda.

Response

This paragraph was moved to Section 13 as part of the rewriting effort for Section 4 and 6. The Scope of Work for the additional work elements identified in this paragraph and associated schedules have not been finalized. As these details become firmer, DOE will provide additional schedule information.

Action

No changes required. Keep US EPA and Ohio EPA apprised of future Treatability Study activities.

Ohio EPA Specific Comment 8

Comment

Figure 4-1, Page 4-5
DOE should be characterizing all inputs materials and output waste streams shown on this figure.

Response

Figure 4-1 was revised to indicate where samples will be collected; this figure was moved to Section 6 and is now Figure 6-1. The specific sample collection and analytical requirements for each sample location is presented in the consolidated sample table (see Table 6-1).

Action

The Treatability Study Work Plan was modified as indicated above.

Ohio EPA Specific Comment 9

Comment

Page 4-5
What is the disposition of prefilter and filter sand media?

Response

The pre-filter cartridges will be drummed and characterized for proper disposition. The sand filter media will be sent to the melter as an additive for vitrification.

Action

Text was added to Section 10 to address the disposition of these items.

Ohio EPA Specific Comment 10

Comment

Page 4-9
How is the output increased to 1000 kg/day in a nominal design unit of 300 kg/day? Is this unit over designed? What modifications are necessary for the rate increase?

Response

The information contained on page 4-9 was incorrectly stated. The vitrification unit is expected to produce up to 1000 kg of glass per day with an average production rate of 300 kg per day.

Action

This statement and Table 4-1 were rewritten to clarify.

Ohio EPA Specific Comment 11

Comment

Page 4-11
What is the disposition of the 55-gallon drums and the 6 drum overpacks after the treatability test is completed?

Response

The alternative to transfer the sludge from the pit to the MAWS system in 55-gallon drums has been eliminated from the work plan. The sludges will be transferred from Waste Pit 5 to Plant

9 in a trailer-mounted, double-walled tank. The contaminated soil will still be brought to the soil washing system in 55-gallon drums placed in a 6-pack container.

At the completion of the MAWS treatability study the 55-gallon drums and 6-pack containers will be decontaminated. The decontamination fluids will be discharged to either the MAWS wastewater treatment system or the contaminated side of the general sump for treatment. If decontamination of the containers is not feasible, the drums and 6-pack containers will be managed as a contaminated debris in accordance with the Removal Action 17 Work Plan.

Upon completing all of the sludge transfers, the tank will be washed-out, and the wash residues discharged to either the MAWS wastewater treatment system or the contaminated side of the general sump for treatment. The tank will be retained for potential use on other projects.

Action

The above management description was added to Section 10.6 of the Treatability Study Work Plan.

Ohio EPA Specific Comment 12

Comment

Section 4.4.3, Page 4-22, 4th Paragraph
Include PCT tests at 90 C as described in Section 4.2.1.2, Page 4-2.

Response

The PCT leaching procedure was contained in Appendix B of the Work Plan. The consolidated sample table (Table 6-1) identifies when this sample preparation method will be used and Appendix D (previously Appendix B) is now better organized to eliminate any confusion. For a detailed description of the PCT procedure see the response to US EPA Region 5 Radiation Section Comment 4.

Action

The Treatability Study Work Plan was modified as indicated above.

Ohio EPA Specific Comment 13

Comment

Section 6A.1.1.1, Page 6A-1, Paragraph, 5th bullet
DOE's justification for analyzing treated soils for Full TCLP is unclear. If non-hazardous soils are used, sampling for full TCLP will not yield any useful information. DOE should use full HSL and Rads for analysis of treated soils.

Response

The need to analyze the treated soils for TCLP parameters was eliminated. DOE agrees to collect and analyze a sample of the incoming contaminated soil, the "clean" soil fraction, and the "dirty" soil fraction for HSL, including radiological parameters. These samples will be collected when the system is at optimum operation to allow a mass balance of the entire system to be performed. (See Table 6-1)

Action

The Treatability Study Work Plan was modified as indicated above.

Ohio EPA Specific Comment 14

Comment

Section 6B.1, Page 6B-1
Sampling should not be aimed solely at achieving compliance, but with the goal of determining the fate of contaminants within the treatment process and the reduction of toxicity, mobility, and volume.

Response

Section 6B was meant only to address the sampling required by regulatory requirements. Additional analyses for these waste streams were also included in Section 6A. To provide the reviewer a better picture of all of the sample and analysis, Sections 6A and 6B were combined. The environmental monitoring and treatability study analytical requirements are both identified in the consolidated table (see Table 6-1). The HSL analyses will used in an attempt to determine the fate of the contaminants within the treatment process. Sections 3 and 6 were revised to specifically address the reduction of toxicity, mobility, and volume.

Action

The Treatability Study Work Plan was modified as indicated above.

Ohio EPA Specific Comment 15

Comment

Section 13.1, Table 13-1
DOE's cover letter suggests treatment of soils and water will begin in January. If this is the case then the NTP must have been issued and the schedule should be revised to include actual dates. The schedule needs to be updated to reflect the current plans of DOE.

Response

The Notice to Proceed date was identified on Table 13-1 to be "07/01/92". This table was revised to provide target dates.

Action

The Treatability Study Work Plan was modified as indicated above.

Ohio EPA DHWM (RCRA) Comment 1

Comment

Data provided in Section 1.2.2 and Table 1-1 is insufficient to adequately characterize the contents of Pit 5. For example, Section 1.2.2 states that the sludge was determined not to exhibit a hazardous waste characteristic based on EP-Toxic analysis. However, Table 1-1 provides no EP analytical results. The concentrations provided for some of the metals, assumed to indicate total metal concentrations, are at levels which appear to be high enough to fail EP regulatory levels (i.e. 36,939 ppm for Barium, 236 ppm for Lead, etc.). In addition. detectable concentration of organics are attributed to laboratory contamination without providing further data, explanation, or justification. The fact that Pit 5 received listed wastes is also ignored in this characterization discussion. Additional data, clarification, and/or explanation must be provided in this section.

Response

The Characterization Investigation Study (CIS) concludes that the RCRA parameters measured from Waste Pit 5 were within the limits for corrosivity, ignitability, and reactivity. The CIS report also concluded that the EP-TOX metals from each borehole were below the maximum allowable concentrations (Weston 1987).

The data for Table 1-1, Organics, was taken from the CIS. The CIS reported that the indicated organics could be attributed to laboratory contamination.

Text will be added regarding the hazardous waste designation of Waste Pit 5.

Action

Table 1-3, Waste Pit 5 Inorganics Characterization - EP Leachate, was added to include the results of the EP-Toxic analysis from the CIS, Appendix B, Table B-9 (Weston 1987). The following paragraph from the CIS was included for clarification.

> "A review of the RCRA parameters measured showed that all of the borehole samples from Waste Pit 5 were within the established limits for corrosivity, measured by pH; ignitability; and reactivity. The EP-TOX metals from each of the six boreholes were below the maximum allowable concentration. (Weston 1987)"

A reference to the CIS was added to the paragraph to account for the reference to laboratory contamination.

The following paragraph was added to Section 1.2.2.

> "Both 1,1,1-trichloroethane (TCA) and trichloroethylene (TCE) were regularly used at the FEMP as a solvent to degrease machinery. The spent solvents, TCA and TCE, are classified as listed hazardous wastes (F002) under RCRA. Pursuant to the "mixture" and "derived from" rules (40 CFR 261.3(a)(1)(iii) and 40 CFR 261.3(c), respectively), any treatment residues and mixtures involving a listed hazardous waste is also designated as a listed hazardous waste. The spent TCA and TCE were assumed to have entered the plant wastewater treatment system. Therefore, the treatment residues from the wastewater treatment system (e.g., sludges) are designated as listed hazardous wastes by application of the "mixture" and "derived from" rules. The sludges from the wastewater treatment process were taken to various units at the FEMP, including Waste Pit 5. As a result of applying the "mixture" rule, the entire contents of Waste Pit 5 are designated as a listed hazardous waste (F002)."

Ohio EPA DHWM (RCRA) Comment 2

Comment

The RCRA permitting issue is ambiguously addressed in the MAWS work plan. On page [A1]-1 it is stated that the treatability study is exempt from the procedural requirements to obtain Federal, State, or local permits in accordance with Section 121(e) of CERCLA and Section XIII.A of the Amended Consent Agreement under CERCLA Sections 120 and 106(a). However, on page [A1]-5, DOE cites ORC 3734.02(E) and Paragraph 3.2 of the 1988 Ohio EPA/DOE Consent Decree as reasons why a state hazardous waste permit would be required. Yet the work plan does not propose the submittal of any permit applications. This issue must be resolved and clarified within the Work Plan.

Response

Page 62 of the US EPA *Guide for Conducting Treatability Studies Under CERCLA*, (EPA/540/2-89/058, December 1989) states, "Onsite treatability studies under CERCLA may be conducted without any Federal, State or local permit; however, such studies must comply with applicable or relevant and appropriate requirements (ARARs) under Federal and State environmental laws. The waiver of these permitting requirements is consistent with the provisions of CERCLA Section 121(e), 40 CFR 300.400(e), and the Amended Consent Agreement Section XIII.A. As such, a RCRA permit application will not be submitted for the MAWS program. Although no permit application will be submitted for the MAWS project, the equipment and operations will comply with ARARs.

Section XIII.B of the Amended Consent Agreement requires DOE to provide specific information regarding the permits that would be required in the absence of the CERCLA permit exemption for onsite response actions. This permit information is required to include:

1) Identification of each permit that would otherwise be required,
2) Identification of the standards, requirements, criteria, or limitations that would have had to have been met to obtain each permit, and
3) Explanation of how the response action will meet the standards, requirements, criteria, or limitations identified in item 2 above.

The discussion contained on page [A1]-5 was meant to do nothing more than to identify why a RCRA permit would be required in the absence of the CERCLA permit exemption in relationship to the scope of the MAWS project. An explanation of how the MAWS project will achieve compliance with environmental requirements is presented on pages [A1]-10 through [A1]-15, and summarized in Table 1 of the Permit Information Summary Document.

The format of the Permit Information Summary Document is consistent other US EPA approved projects undertaken at the FEMP.

Action

Revised page [A1]-1 to clarify the need for the Permit Information Summary Document.

Ohio EPA DHWM (RCRA) Comment 3

Comment

Regardless of whether a hazardous waste permit is required or not required, so long as hazardous waste is stored, treated or disposed through implementation of this project, DOE will be expected to demonstrate compliance with applicable and appropriate hazardous waste regulations. Some of these requirements are briefly outlined in Table 1 of Attachment 1 and in the discussion on pages [A1]-1 and [A1]-5. However, this section of the plan does not address all ARARs nor does it provide enough detail to demonstrate compliance with some of the regulations that are cited.

For example, if hazardous waste is stored or treated in tanks, OAC 3745-66-90 through 3745-66-991 apply. Table 1 merely refers to the single requirement of inspecting tanks daily for leaks. A second example would be the fact that OAC 3745-68-70 through 68-81, which are regulations specific to the thermal treatment of hazardous waste, are not cited nor discussed in this section.

Ohio suggests DOE expand Table 1 and the discussion in this section to cite all ARARs and provide documentation demonstrating compliance with these regulations. IF DOE feels information already provided in the work plan satisfies the requirements of some of these ARARs, Table 1 can be used to indicate the location of the existing information. Otherwise, the Work Plan should be revised to include all necessary information to demonstrate compliance with applicable and appropriate hazardous waste regulations.

Response

Attachment 1 was revised (specifically Table 1 and page [A1]-13) to expand on some additional hazardous waste regulatory requirements for the MAWS system. These regulatory requirements

include provisions of the Ohio Hazardous Waste Tank and Thermal Treatment Unit Standards under OAC 3745-55-90 to 3745-55-99 and 3745-68-70 to 3745-68-81, respectively.

The provisions of OAC 3745-66-90 to 3745-66-991 were not addressed as identified in this comment since these standards apply to interim status a tank facility; in the absence of CERCLA, the MAWS tanks would need to be permitted under the rules for the issuance of a Part B permit. There are, however, administrative requirements (i.e., submission of tank assessment reports and certifications) under OAC 3745-55-92 that DOE does not intend to prepare. DOE believes that these reporting requirements are non-substantive environment standards and do not qualify as an ARAR which needs to be addressed as part of an on-site CERCLA response action. As such, DOE is not intended to submit tank assessment and certification reports for the MAWS project.

The classification of the vitrification process was changed from a miscellaneous unit to a thermal treatment unit based on this Ohio EPA comment.

Action

The Treatability Study Work Plan was modified as indicated above.