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RESPONSE TO COMMENTS FOR THE PRELIMINARY DESIGN PACKAGE FOR THE ON-SITE DISPOSAL FACILITY

03/19/96

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DOE-FN EPAS
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RESPONSES

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MAR 19 1996
DOE-0670-96

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - SRF-5J
77 W. Jackson Blvd.
Chicago, IL 60604-3590

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

Dear Mr. Saric and Mr. Schneider:

RESPONSE TO COMMENTS FOR THE PRELIMINARY DESIGN PACKAGE FOR THE ON-SITE DISPOSAL FACILITY

The Department of Energy, Fernald Area Office (DOE-FN) is pleased to submit the enclosed Response to Comments for the Preliminary Design Package for the On-Site Disposal Facility. The enclosed comments response package details the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) comments, the DOE-FN response and associated action needed.

Submittal of this document to the U.S. EPA and OEPA is required by March 19, 1996, which is within thirty (30) days of the receipt of U.S. EPA comments on the draft document. If you have any questions regarding the enclosed documents, please contact Rod Warner at (513) 648-3156.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FN:Jalovec

Enclosure: As Stated

Recycled and Recyclable

cc w/enc:

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RESPONSES TO USEPA COMMENTS
PRELIMINARY DESIGN PACKAGE
ON-SITE DISPOSAL FACILITY

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: NA *Page #:* NA *Line #:* NA
Original General Comment #: 1

Comment: *The preliminary design (PD) criteria package contains the functional requirements and associated design criteria for the on-site disposal facility (OSDF). Components of the liner, impacted material excavation and placement, and final cover system are detailed; however, the future waste placement plan for the OSDF should discuss the impact that the distribution of the demolition debris will have on the final cover system.*

Response: A calculation has been prepared for the Intermediate Design Package (IDP) to establish the requirements for the distribution of demolition debris and other categories of impacted material to achieve satisfactory performance of the OSDF final cover system. The Impacted Material Placement (IMP) Plan to be submitted with the IDP will be based on these requirements. Note, for example, that the IMP Plan addresses design measures to achieve satisfactory OSDF performance, including: (i) placement of a 4-ft thick select impacted material/contouring layer to serve as a buffer between demolition debris and the final cover system; (ii) limitations on the size of individual pieces of debris that will be accepted for OSDF disposal; (iii) limitations on the spacing of individual debris pieces so as to allow soil placement and compaction around the pieces; and (iv) requirements for the minimum acceptable compaction of all soil and soil-like impacted materials (roughly 85 percent of the material to be disposed in the OSDF).

Action: See Section 16 of the IDP Calculation for the applicable calculation and Section 8.6 of the IMP Plan for the applicable narrative.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 3.0 *Page #:* NA *Line #:* NA
Original General Comment #: 2
Comment: *Section 3 identifies the administrative and substantive requirements for preparation and issuance of project deliverables for the design package; however, the section does not include a schedule of when the deliverables will be submitted to the regulatory agencies. A schedule of deliverable dates should be incorporated into this section.*

Response: DOE recognizes EPA's desire to understand the schedule of deliverables, however this schedule is all ready published in the approved Remedial Design Work Plan. The DCP is intended to identify requirements and objectives of the project. The schedule for the OSDF deliverables can be found on Table 6-1 in the OSDF Remedial Design Work Plan.

Action: None.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: NA *Page #:* NA *Line #:* NA
Original General Comment #: 3
Comment: *An index should be included in every calculation section of the PD calculation package to help readers locate specific parts of a calculation.*

Response: An index will be included in every calculation section of the IDP.

Action: See the index behind the executive summary of each calculation section in the IDP.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 2.0 *Page #:* NA *Line #:* NA
Original General Comment #: 4
Comment: *The foundation settlement and impacted material settlement calculations are based on established geotechnical equations and reasonable material properties assumptions; however, the assumption that the impacted material consists primarily of soil ignores the effects that demolition*

debris, especially larger reinforced concrete pieces, can have on localized settlement within the OSDF cells. The presence of demolition debris can cause localized ponding of precipitation to occur in the final OSDF cover if the demolition debris is not placed carefully. The placement plan should address the settlement of demolition debris.

Response: See the response to USEPA General Comment No. 1.

Action: See the action under USEPA General Comment No. 1.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 3.0 *Page #:* NA *Line #:* NA
Original General Comment #: 5
Comment: *The foundation stability and slope stability calculations are based on accepted geotechnical analytical methods and conservative material properties assumptions; however, these calculation results should be verified after direct shear testing of the soil-geosynthetic interface is completed.*

Response: An extensive interface direct shear testing program was planned and is currently underway at the GeoSyntec Soil-Geosynthetics Interaction Testing Laboratory in Atlanta, Georgia. Consistent with the goal identified in the comment, the goal of the testing program is to provide project-specific data with which to verify the static and seismic stability of the OSDF.

Action: The testing program being implemented is described in the January 1996 Soil-Geosynthetic Interface Direct Shear Testing Work Plan which was previously provided to USEPA. The required verification will be included as a section in the Soil-Geosynthetic Interface Direct Shear Testing Final Report. This section of the report will also identify any needed modifications to the calculation package, required as a consequence of the interface test program results.

Commenting Organization: U.S. EPA *Commentor:* Saric
Specification #: 02220 *Page #:* NA *Line #:* NA
Original General Comment #: 6

Comment: *The field quality control section of the earthwork specification (Specification 02220) should specify the frequency of in situ moisture and density measurement. As discussed in Requirements for Hazardous Waste Landfill Design, Construction and Closure (EPA 624/4-89/022), in situ moisture and density should be measured with a nuclear density gauge at a frequency of one test per 250 cubic yards of soil, with a minimum of one test per lift and two tests per day. Nuclear density testing should be completed in accordance with American Society of Testing Materials (ASTM) Method D3017/D2922.*

In addition to moisture and density testing with a nuclear density gauge, a minimum of one sand cone test should be completed each day to verify the results of the nuclear density meter. Sand cone testing should be completed in accordance with ASTM D1556. In situ moisture content should also be tested once a day in accordance with ASTM Method D2216 to verify the results of the nuclear density gauge. These additional tests will ensure that the required compaction is achieved in each compacted clay liner lift.

Response: The requirements for field moisture/density testing of the compacted clay liner and cap components of the OSDF can be found in the OSDF CQA Plan that will be submitted with the IDP. The requirements are submitted with the CQA Plan rather than the OSDF Specifications because the testing is to be performed by the CQA Consultant and not the OSDF Construction Contractor. The OSDF Construction Contractor is made aware of the field testing.

As just noted, the CQA Plan provides detailed instructions to perform nuclear/moisture density testing. Specific field testing requirements for the compacted clay liner and cap are contained in Table 8-3 of the OSDF CQA Plan. This table requires:

- in-situ moisture content testing by nuclear methods (ASTM D 3017) at a frequency of at least 5 tests per acre per lift; and
- in-situ dry density testing by nuclear methods (ASTM D 2922) at a frequency of 5 tests per acre per lift.

The OSDF CQA Plan also contains requirements for checking nuclear moisture/density gauge test results using the sand cone method (ASTM D 1556, which utilizes ASTM D 2216 for the moisture content determination) at a minimum frequency of one sand cone test per 50 nuclear moisture/density tests. In addition, to fully address the USEPA comment, the CQA Plan will require: (i) a minimum of two nuclear moisture/density tests each day of active compacted clay liner or cap construction; and (ii) a minimum of one sand cone test per day.

Action: See Section 8.7 of the IDP CQA Plan for the required testing frequencies.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 1.2.3 *Page #:* 1-5 *Line #:* 2
Original Specific Comment #: 1
Comment: *The date of submittal of the OSDF pre-final design package to U.S. EPA is stated as "28 June 1995." This date is incorrect and should be changed to "28 June 1996."*

Response: The correct date is 28 June 1996.

Action: See Section 1.2.3 of the IDP DCP.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 1.5.1 *Page #:* 1-9 *Line #:* NA
Original Specific Comment #: 2
Comment: *This section discusses sources of information categories used to design the OSDF. Although the PD criteria package refers to U.S. Department*

of Energy (DOE) and U.S. EPA orders, standards, and guidance, no reference is made to the State of Ohio Administrative Code (OAC) requirements or site-specific applicable or relevant and appropriate requirements (ARAR). These sources of information provided fundamental information needed for the OSDF design. The text should be revised to refer to OAC requirements and ARARs, as appropriate.

Response: The OEPA ARARs have been an integral part of establishing the design criteria. These requirements were implicitly incorporated in the CERCLA-related documents cited in Section 1.5.2 of the IDP DCP.

Action: See Section 1.5 where OEPA requirements are now explicitly referenced.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 2.4.4 *Page #:* 2-27 *Line #:* NA
Original Specific Comment #: 3
Comment: *The section refers to the OAC and states that the compacted clay liner shall be constructed "using loose lifts 8 in. (200 millimeters (mm)) thick, or less, to achieve uniform compaction ..."; however, the PD specification package, specification 02225, page 02225-4, Item E, states that the average loose lift thickness shall be no greater than 9 inches. The discrepancies between the PD criteria package and the PD specification should be resolved.*

Response: The OSDF Specifications in the Preliminary Design Package (PDP) are "*Library Masters*" and were only partially modified for the PDP submittal. Paragraph 3.03E of Section 02225 of the Specifications (i.e., "Compacted Clay Liner and Cap") will be updated for the IDP to state "The loose thickness of the lift shall be no greater than 8 inches".

Action: See Section 02225 of the IDP Specifications.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: Appendix B *Page #:* 3-3 *Line #:* 23 to 24
Original Specific Comment #: 4

Comment: *The text states that the design life of the waste liquid transfer system is 200 years. This estimate ignores the disposition of leachate and collected water from the liquid transfer system after the closure of the OSDF. The life expectancy of the advanced wastewater treatment system is probably significantly less than 200 years and probably less than the 30-year postclosure care period required by 40 Code of Federal Regulations, Part 264. The decrease in the waste liquid transfer system life expectancy because of leachate and storm water after facility closure should either be addressed in the functional design requirements section or the section of the postclosure care plan that discusses this issue should be referenced.*

Response: The disposition of the OSDF leachate will be discussed in the OSDF Post-Closure Plan. DOE will evaluate several options to safely treat and properly dispose of any leachate generated. These options may include continued operation of the AWWT, a portable treatment unit designed to treat and discharge the leachate in accordance with the water quality standards in effect at that time, or collecting the leachate and treating it at a commercial facility.

Action: Submit post closure plan with the pre-final submittal.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: Appendix B *Page #:* 3-1 *Line #:* 16-18
Original Specific Comment #: 5

Comment: *The text states that for planning purposes, remediation activities are assumed to require 10-year period for completion. The text also states that, depending on the availability of funding, the implementation period could either be as little as 7 years or increase to 25 years or more. Text should be added to address how changes in the assumed implementation period will impact key elements of the design.*

Response: The following narrative is included in Section 2.2.1 of the IDP to address the potential for changes in the implementation period: "Lastly, the OSDF should be laid out so that it can be progressively developed in phases, utilizing contiguous cells that can be constructed, filled, and closed on a flexible schedule consistent with the final schedule for final remediation of the FEMP operable units. The design of the OSDF must be flexible to accommodate on active life ranging from 7 to 25 years."

Action: See Section 2.2.1 of the IDP DCP.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: Appendix B *Page #:* 3-3 *Line #:* 15-19
Original Specific Comment #: 6
Comment: *The text provides specifications for the haul road. The haul road will be subject to heavy loads throughout remedial action activities. The text should include information regarding the haul road's load capacities or limits.*

Response: The functional requirements were established to direct the development of the design criteria package (DCP) and are provided as reference. As these have been finalized, no changes can be made to this appendix. DOE agrees that the haul road will be subject to heavy loads and the design requirements are contained in Section 2.9.2.7 of the DCP ("Construction Haul Roads and Leachate Transmission System Access Corridor"). Haul roads for other operable units will be designed to meet the specific needs of the impacted material to be transported. The haul road preliminary design package was submitted to USEPA in January. This design will specifically detail the haul road requirements outside the battery limits of the OSDF.

Action: None.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: Appendix B *Page #:* 8-1 *Line #:* 1 through 12
Original Specific Comment #: 7
Comment: *The project milestone dates indicated in this section differ from the milestone dates presented in the remedial design work plan. The milestone dates in this section indicate submittal of documents sooner than indicated in the work plan. The dates should be checked and adjusted if incorrect.*

Response: DOE agrees with USEPA's comment. The DCP is intended to identify requirements and objectives of the project plan. See the asnwer to USEPA, General Comment number 2.

Action: Remove the schedule from the DCP.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: Appendix F *Page #:* NA *Line #:* NA
Original Specific Comment #: 8
Comment: *Appendix F consists of a table that provides the quantities of soil and rubble from each operable unit (OU) that will be disposed of in the OSDF. The table should be revised to include the following information: units associated with the quantities provided, quantities of remediation waste requiring interim storage or staging, and quantities of investigation-derived waste. Text should be added to Appendix F to provide the following information: the purpose of the tables, a description of the method used to determine these quantities, a description of the relative accuracy of the quantities, a definition of the material categories of soil and rubble, and an explanation of how the material quantities will be monitored and updated.*

A draft final copy of Table 7-3 from the OU5 feasibility study is included in Section 15.1 of the PD calculation package. Table 7-3 provides material quantities in cubic yards for OU2 through OU5. The text to be added to Appendix F should explain the discrepancies between the material quantities in Table 7-3 and the quantities in the Appendix F table.

Response: DOE regrets the confusion the table in Appendix F has generated. The intent of this table was to provide our designer a gross estimate of material flow in the cell. DOE is refining its material flow concepts and would propose a presentation to USEPA in the future.

Action: Remove Appendix F from the DCP and set up a meeting to make the presentation at a future date.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 12.2 *Page #:* 1 of 2 *Line #:* NA
Original Specific Comment #: 9
Comment: *The conclusion section of the perimeter berm flow protection calculations states that the crest of the flood protection berm on the west side of the OSDF should be constructed to a minimum elevation of 596.0 feet above mean sea level (amsl). Drawing G-41, Detail 55, presents a profile of the top of the west perimeter berm. A low elevation at point of vertical intersection (PVI) station 39 + 18 indicates an elevation of 591.46 feet amsl. This elevation is 4.5 feet lower than the elevation of 596.0 feet amsl. In addition, an area approximately 1,500 feet long along the perimeter berm is below the 596-foot amsl elevation. This discrepancy should be addressed and corrected.*

Response: In the PDP, the layout of the perimeter of facility was locally inconsistent with the requirement to prevent surface-water runon during the design storm event. As stated in the DCP, the long-term design storm for the OSDF is the 2,000-year, 24-hour event. For the IDP, the perimeter details for the OSDF are redesigned and revised runon/runoff control calculations are presented in Section 13.1 of the IDP Calculation Package (entitled, "*Stormwater Runon/Runoff and Drainage Control Structures*"). These revised calculations now demonstrate that runon and runoff from the 2,000-year, 24-hour design storm is fully controlled by the OSDF surface-water management system. Additionally, the maximum flood elevation from this design storm does not encroach upon the OSDF.

Action: See Section 13.1 of the IDP Calculation Package and drawing G 30.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 15.1 *Page #:* 5 of 15 *Line #:* NA
Original Specific Comment #: 10

Comment: *Section 15.1 provides data verification for the required OSDF volume. Page 5 of 15 identifies the values for material composition fractions (F1 through F6). These values were obtained by dividing the impacted material volume for each material category from Table 7-3 of the OU5 draft feasibility study by the total volume of the OSDF (2.5 million cubic yards). The material composition fractions are incorrect, subsequently affecting the calculation of the OSDF's required volume. The correct material composition fractions are identified below:*

Incorrect Material Composition Fraction	*Correct Material Composition Fraction*
0.7708	*0.7480*
0.0704	*0.0683*
0.0074	*0.0072*
0.0779	*0.0756*
0.0198	*0.0192*
0.0536	*0.0507*

The corrected material composition fraction values result in a OSDF required volume at 85 and 90 percent relative compaction of approximately 2,792,000 and 2,666,000 cubic yards, respectively. The current required volumes for 85 and 90 percent relative compaction are 2,880,000 and 2,750,000 cubic yards. These calculations should be reviewed and corrected.

Response: Based on the comment, the calculations on page 5 of 15 of the OSDF Required Volume Calculation were re-reviewed and are believed to be correct. Consider that the fractions in the table (which represent the fractions of the various impacted material types destined for the OSDF) must add up to 1.0. This is achieved by dividing the individual material component volumes in Table 7-3 of the OU5 draft feasibility study by

the total volume of material accounted for in the table (i.e., is 2,425,960 cubic yards), not by the 2,500,000 cubic yard total capacity of the facility (bank/unbulked). Please also note that this is a design basis calculation and in reality disposal volumes may vary. The potential for this variation is addressed through the development of the landfill in cells, provision of a contingency cell if needed, and other flexibilities built into the design.

Action: None.

Commenting Organization: U.S. EPA *Commentor:* Saric
Section #: 15.1 *Page #:* 11 of 15 *Line #:* NA
Original Specific Comment #: 11
Comment: *The text states that the shrink/swell factor for bank/bulked concrete is assumed to be 1.3. The text should be revised to include the basis for this assumption.*

Response: The selected shrink/swell factor of 1.3 for concrete was chosen based on a number of factors and assumptions. These are: (i) concrete will consist of (on an unbulked volume basis) 75 percent broken-up concrete pieces (including concrete rubble and masonry) placed in lifts and 25 percent individual concrete pieces (including columns and footings); and (ii) the bulking factors for these pieces are 1.4 for the broken-up concrete and 1.0 for the individual concrete pieces. The average bulking factor for these two components is thus 1.3. The bulking factor of 1.4 is based on an assumed broken-up concrete porosity of 35 percent, which is a typical porosity for a granular material. (Note, bulked volume = unbulked volume divided by (1-porosity)). The bulking factor for individual concrete pieces recognizes the fact that these pieces will be placed intact in the OSDF and soil will be placed and compacted around the pieces.

Action: See Section 2.1 of the IDP Calculation Package for the requested discussion of the concrete bulking factor.

Commenting Organization: U.S. EPA *Commentor:* Saric
Specification #: 02225 *Page #:* 02225-4 *Line #:* NA
Original Specific Comment #: 12

Comment: *The material placement specification in Section 3.02, Item E, states that the average loose lift thickness for the compacted clay liner should be no greater than 9 inches. The PD criteria package states that the loose lift thickness should be 8 inches or less. This discrepancy should be resolved.*

In addition, Item I of the PD specification package does not specify the clod size in material borrowed from the stockpiles or borrow area. The PD criteria package states that OAC specifies that the maximum clod size of soil should be 3 inches (75 millimeters) or half of the compacted lift thickness, whichever is less. The PD specification package should specify the clod size, which should be consistent with the clod size in the PD criteria package.

Response: The OSDF Specifications in the PDP are "*Library Masters*" and were only partially modified for the PDP submittal. Item E of Paragraph 3.02 of Section 02225 (i.e., "Compacted Clay Liner and Cap") of the IDP Specifications will be updated to read "The loose thickness of the lift shall be no greater than 8 inches". Item H of the same IDP Specification will state "The maximum acceptable soil clod size is 3 inches".

Action: See Section 02225 of the IDP Specifications.

Commenting Organization: U.S. EPA *Commentor:* Saric
Drawing #: G-24 and G-27 *Page #:* NA *Line #:* NA
Original Specific Comment #: 13

Comment: *On Sheet No. G-24, the liner and cover system component summary table lists one geocomposite drainage layer, but this component is not shown in the details of liner system or final cover system. On Sheet No. G-27, portions of the geocomposite liner are shown in the interim closure details, but the areal extent of the liner is not shown. It is not clear whether this liner will remain in place during final cover installation or whether it will only be constructed for interim closure. This issue should be clarified before the next PD submittal.*

Response: The only location in the PDP design where a geocomposite drainage layer was used was in the interim closure detail (see PDP Drawing G-27). However, the interim closure detail, including the geocomposite drainage layer, has been removed from the IDP. This change was made based on comments from USEPA at the 6 November 1995 project meeting at USEPA Region 5 offices in Chicago. Therefore, the IDP contains neither an interim closure detail or a geocomposite drainage layer.

Action: None.

Commenting Organization: U.S. EPA *Commentor:* Saric
Drawing #: G-35 and G-36 *Page #:* NA *Line #:* NA
Original Specific Comment #: 14
Comment: *Sheet G-35, Detail 30, shows that the leak collection system manhole will be constructed of Class 100 high-density polyethylene (HDPE); however, Sheet No. G-36, Detail 37, shows that the construction material will be Class 160 HDPE. This discrepancy should be resolved.*

Response: The comment is noted. The drawings for the IDP show all manholes as being fabricated from Class 100 HDPE. The only Class 160 HDPE in the IDP is for the primary containment of the permanent lift station. The heavier class (i.e., Class 160) HDPE is needed for this latter application.

Action: See Drawings M-5, M-6, and M-9 of the IDP for relevant manhole details.

Commenting Organization: U.S. EPA *Commentor:* Saric
Drawing #: G-36 *Page #:* NA *Line #:* NA
Original Specific Comment #: 15
Comment: *Section A shows that the height of the manhole will be "20" ±". This figure appears to be a typographical error that should be corrected to "20 feet ±" or "20' ±".*

depths in the PDP. As part of the redesign, the error identified in the comment was corrected.

Action: See IDP Drawings M-5, M-6, and M-9 for relevant manhole details.

Commenting Organization: U.S. EPA *Commentor:* Saric
Drawing #: G-41 *Page #:* NA *Line #:* NA
Original Specific Comment #: 16
Comment: *Detail 55 presents a profile of the top of the west perimeter berm. A low elevation at PVI station 39 + 18 indicates an elevation of 591.46 feet amsl. This elevation is approximately 4.5 feet lower than the minimum elevation of 596 feet amsl indicated in Section 12.2 of the PD calculation package, Page 1 of 2. The conclusion section of the PD calculation package states that "the crest of the flood protection berm on the west side of the OSDF should be constructed to a minimum elevation of 596." This discrepancy should be resolved.*

Response: See response to USEPA Comment No. 9 (Specific).

Action: See action for USEPA Comment No. 9 (specific).

Commenting Organization: U.S. EPA *Commentor:* Saric
Drawing #: G-61 *Page #:* NA *Line #:* NA
Original Specific Comment #: 17
Comment: *The type of grate for the equipment decontamination facility should be specified in the drawing and in text discussing this facility.*

Response: The type of collector grate for the equipment decontamination facility will be specified for the Pre-Final Design Package (PFDP). The collector grate specification will be based on the final detailed design of the decontamination facility.

Action: See the Equipment Decontamination Facility drawing in the PFDP.

Commenting Organization: U.S. EPA *Commentor:* Saric
Drawing #: G-61 *Page #:* NA *Line #:* NA
Original Specific Comment #: 18

Comment: *The welded wire designations in details 91, 92, and 93 do not comply with ASTM Method A615 Grade 60 as called for by Note 3 on Sheet G61. Typically, welded wire should comply with ASTM Method A185. The welded wire designation should be checked and clarified. Grade 60 welded wire may not be adequate reinforcement for an 8-inch thick concrete slab and should be reviewed.*

Response: The welded wire mesh specifications will be checked and clarified as necessary for the PFDP. The specifications will be based on the final detailed design for the equipment decontamination facility.

Action: See the Equipment Decontamination Facility drawing in the PFDP.

RESPONSES TO OEPA COMMENTS
PRELIMINARY DESIGN PACKAGE
ON-SITE DISPOSAL FACILITY

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #:* *Line #:* *Code: G*
Original Comment # 1

Comment: *As stated on page 2-8 of the Design Criteria Package, there are five categories of long term landfill performance which must be addressed to achieve the design life goal of a minimum 200 years and 1,000 years to the extent reasonable. All of these categories except groundwater protection are addressed in the calculation package. Thus, the design life has not been fully evaluated in this design package. On page 2-11 of the Design Criteria Package, the Final Period of the landfill is discussed. If the geomembrane liner system lasts the minimum 200 years (which is only an estimate at this time), would the natural earth components of the liner and final cover provide protection for the 1,000 year goal?*

Calculations of the time required for infiltration into the landfill to reach the groundwater aquifer from OU5 RI/FS need to be referenced. It has been stated in this package, that long term protection will be due to the natural earth components utilized in this design, so these calculations should assume that all geomembranes and HDPE pipes have failed after 200 years. This work has been done in modeling efforts which were to determine the Waste Acceptance Criteria in the OU2 documents. These calculations should be referenced.

Response: DOE agrees that the previous work and information relative to long-term groundwater protection should be referenced.

Action: The text within Section 2.3, OSDF Performance, and specifically within Section 2.3.1, Design Life, has been modified in the Intermediate Design package version of the DCP, to provide reference to previous work and information. Additional discussion has been added to the text previously

located at p. 2-11 of the Preliminary Design package version of the DCP.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #:* *Line #:* *Code: G*
Original Comment # 2

Comment: *Design requirements seem to be left out of the specifications in many instances. An example of where a requirement has been omitted occurs in Specification 13010 Impacted Material Placement. In Section 2.2 of the Preliminary Design Calculation Package, calculations of settlement of the final cap assume that engineering soil properties will describe the settlement of impacted material placed in the landfill. It was assumed that the impacted material would be placed and compacted at optimum water content and 85 to 90% of maximum compaction. However, these compaction requirements are not carried through to the design specifications in Section 13010. A reference is made to an Impacted Material Placement Plan, however, the specific requirements listed above should be included as a specification. The design performance of the landfill, in this specific case the final cover system, depend on these requirements and they should be specifications.*

Response: The OSDF Specifications in the Preliminary Design Package (PDP) are "*Library Masters*" and were only partially modified for the PDP submittal. Design requirements from the PDP Design Criteria Package (DCP), and from the design calculations in the PDP, will be included in the specifications for the Intermediate Design Package (IDP).

Action: See the IDP Specifications which contain design requirements from the DCP and design calculations.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #:* *Line #:* *Code: G*
Original Comment # 3

Comment: *Specifications for the surface preparation and grade control of the compacted clay layer should be strengthened, due to the effects of*

tightness of contact between the geomembrane and compacted soil layer on the leakage through a geocomposite liner. Surface preparation is important in obtaining a good contact between the geomembrane and compacted soil layer. This relationship is described in the article "Leakage through Liners Constructed with Geomembranes, Part II: Composite Liners" by J.P. Giroud and R. Bonaparte. This reference is given on the top of page 2-38 in the Design Criteria Package. The addition of the geotextile clay liner between the geomembrane and the compacted soil layer will certainly negate some of the effect of an imperfect preparation of the compacted soil layer surface. However, the specification for the surface preparation does not reflect the importance of this interface.

Response: Additional detailed language will be added to Section 02225 (Compacted Clay Liner and Cap) of the OSDF Specifications on preparation of the top surface of the compacted clay liner and cap to achieve close contact with the overlying geosynthetics.

Action: See Section 02225 of the IDP Specifications for the additional language.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #:* *Line #:* *Code: G*
Original Comment # 4
Comment: Some of the sections in the Preliminary Design Specification Package appear to have been borrowed from other design packages without modification. These need to be reworked, updating the referenced section numbers and making them specific to this project.

Response: See response to OEPA Comment No. 2.

Action: See the action for OEPA Comment No. 2.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #:* *Line #:* *Code: G*
Original Comment # 5

Comment: *In general, applicable design criteria from the Design Criteria Package need to be specifically listed in the appropriate specification sections. As an example, the hydraulic conductivity of each lift of the compacted clay layer must be a maximum of 1 x 10^{-7} cm/s as stated in the Design Criteria Package and ARAR: OAC 3745-27-08(C)(1)(a). However, this is not specifically stated in Section 02225 of the Preliminary Design Specification Package. These types of omissions should be rectified throughout the Preliminary Design Specification Package.*

Response: See the response to OEPA Comment No. 2.

Action: See the action for OEPA Comment No. 2 and, in particular, see the additional requirements that are included in Section 02225 of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg #:* *Line #:* *Code: C*
Original Comment #: 6

Comment: *Section 3.0 "Design Criteria Package" of the Final Remedial Design Work Plan for Remedial Actions at Operable Unit 2 (December 15, 1995) states that the DCP will identify system functions, technical requirements, design constraints, and design limitations. While the DCP Revision B (December 1995) does include system functions and technical requirements, the DCP does not address design constraints or design limitations.*

Response: The DCP contains numerous design constraints and limitations. For example, Section 2.1 of the DCP contains constraints and limitations on the location of the OSDF, Section 2.2 contains constraints and limitations on the layout of the OSDF, etc. DOE feels the constraints affecting the design of the OSDF are fully identified in the DCP.

Action: None.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg #:* *Line #:* *Code: C*
Original Comment #: 7

Comment: *Section 3.0 "Design Criteria Package" of the Final Remedial Design Work Plan for Remedial Actions at Operable Unit 2 (December 15, 1995) states that the DCP will describe how the project design will satisfy compliance with the ARARs, TBCs, and DOE Orders identified for the project. The DCP does not adequately describe how the project design will satisfy compliance with ARARs, TBCs, and DOE Orders. While the ARARs are included in Appendix C and the text occasionally refers to the associated Ohio Administrative Code requirements, a direct comparison between the design criteria and ARARs is not provided. For example, Table A-2, page A-32 and A-47 of Appendix C include ARARs for Groundwater Monitoring and Environmental Monitoring; however, the text does not clearly describe how the OSDF design will address these programs. One approach to improving the description would be to revise Appendix C to include a column that indicates the portion of the text that satisfies the corresponding ARAR.*

Response: The Permitting Crosswalk attachment to the OSDF Permitting Plan describes where in the design package each ARAR, TBC, and DOE order is addressed. The DCP does, however, identify those ARARs, specifically relevant to the OSDF design.

Action: See the Permitting Crosswalk to be submitted with the IDP.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: General *Pg #:* *Line #:* *Code:*
Original Comment #: 8

Comment: *Once construction of the cell liner and test pads begins, the results of all non-destructive liner tests and non-destructive and destructive test pad tests should be faxed (513)285-6404 to the Ohio EPA daily.*

Response: DOE agrees that OEPA should receive the CQA testing results. However, DOE cannot commit to the requested frequency of transmittal. The time to complete the CQA tests, compile the results and provide a

useable summary does not support a daily reporting schedule. As an alternative, DOE proposes that OEPA be present during the initial construction of the liner system to observe the testing protocols and verify test results. During this activity, OEPA could identify the level/amount of information, format, and frequency for the CQA reports that would satisfy OEPA's needs. We believe this will achieve OEPA's goals and still allow CQA personnel to spend as much time as possible in the field observing the construction.

Action: None.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 1.2.3 *Pg #: 1-5* *Line #: 2* *Code: E*
Original Comment #: 9
Comment: The submittal date of the OSDF Pre-Final Design Package should be June 1996 rather than June 1995.

Response: The comment is noted. The DCP will be revised for the IDP to reflect the 28 June 1996 date.

Action: See Section 1.2.3 of the IDP DCP.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2 *Pg. #: 2-26* *Line #: 2nd bullet Code: c*
Original Comment # 10
Comment: Ohio EPA agrees that independent monitoring of flows from the leak detection system and the leachate collection system should be a design consideration. These flows should also be modeled in order to have performance criteria that can be used to evaluate whether an individual cell is achieving the design goals. Important parameters for this modeling should include leachate volume and concentration as a function of time. Consideration should also be given to developing action levels for the leak detection system.

Response: DOE agrees that performance criteria is desirable in evaluating the cell's

design goals. The performance criteria for the OSDF was developed using EPAs HELP model. The criteria developed can be found in anticipated preliminary design calculation 7.1 "Leachate Generator Notes." Baseline flow rates are also identified in this calculation. Action rates will be identified in the Post Closure Plan.

Action: None.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.5.3 *Pg #: 2-46* *Line #: 2nd bullet Code: c*
Original Comment #: 11

Comment: This is an adequate paraphrasing of the Ohio Administrative Code, however Ohio EPA expects that DOE will only seek such authorization in the case of extreme emergency. It is our expectation that leachate and run-on will be managed to minimize both the time and the quantity that water is in contact with impacted materials.

Where will leachate be stored? What will the maximum storage time be? Additionally, what priority will leachate be given in the AWWTP in relation to other incoming waste streams?

Response: DOE generally agrees with this comment. DOE would seek authorization only during upset conditions at the AWWT. The leachate will be managed to minimize both the time and quantity of water in contact with the impacted materials.

During the upset conditions, the leachate will be stored int the permanent lift station, the active leachate transmission line, and the active portion of the OSDF. The maximum storage time can not be determined because the cause and duration of the upset condition at the AWWT is not known. The maximum storage capacity is 1,422,000 gallons. Once the AWWT is operational, the OSDF leachate will be given priority over other waste streams.

Action: None.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.5.3 *Pg #: 2-48* *Line #:* *Code: c*
Original Comment #: 12

Comment: *Non-catastrophic failure of the gravity and force lines is a potential source of soil and ground water contamination. How will this be monitored, tested, and repaired/remediated?*

Response: In the IDP, all leachate transmission system (LTS) gravity lines and forcemains are provided with secondary containment. All leachate collection system (LCS) and leak detection system (LDS) manholes are provided with liquid level sensors. These systems are designed to prevent failure of the LTS and provide the ability for prompt response should unforeseen events occur. The OSDF Operations and Maintenance (O&M) Plan provides requirements for leachate transmission monitoring, operations, and maintenance, including procedures for responding to liquids in secondary containment systems.

Action: See Section 3 of the O&M Plan submitted with the IDP. Post closure requirements will be addressed in the forth coming Post Closure Plan to be issued with the pre-final review package.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2 *Pg. #: 2-55* *Line #:1st bullet* *Code: c*
Original Comment #: Unnumbered comment after comment 12

Comment: *Please be more specific on the 21 inch thickness of the vegetative soil layer. How was this thickness determined to be optimal?*

Response: The thickness of the vegetative soil layer was established as part of a remedial alternative in the Operable Unit 2 Feasibility Study and was identified as part of the selected remedy in the Operable Unit 2 Record of Decision (ROD). Calculations presented with the PDP; 11.3 - Cover Frost Penetration; demonstrate the adequacy of this thickness with respect to erosion control and frost penetration.

Action: None.

000026

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2 *Pg. #: 2-57* *Line #: 1st bullet Code: c*
Original Comment # 13

Comment: *It is unclear why gravel-sized fractions are included as acceptable materials for the bio-intrusion barrier. The inclusion of gravel seems to conflict with the free draining consideration in that the gravels may settle and interfere with flows.*

Response: Some gravel is allowed in the biointrusion barrier to provide a greater degree of flexibility for local material procurement. The gravel component will not impede the free-draining design criterion for the biointrusion barrier. Clean gravels have hydraulic conductivities in excess of 1 cm/s. A hydraulic conductivity of 1 cm/s will be about five orders of magnitude larger than the hydraulic conductivity of the overlying vegetative soil layer component of the OSDF final cover system. Gravel with this hydraulic conductivity will maintain free drainage of infiltration through the topsoil/vegetative soil layer with a very large factor of safety.

Action: None.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2.6.8 *Pg. #:2-60* *Line #:* *Code:*
Original Comment # 14

Comment: *The design of the OSDF cap does not include a feature called a "capillary break". Please provide a brief discussion of the pros and cons of capillary breaks in high rainfall climates.*

Response: A capillary break is either: (i) a high permeability layer with particle sizes large enough to prevent the development of soil pore capillary suction (i.e., subatmospheric pore pressure) of sufficient magnitude to draw soil moisture from surficial layers down through the final cover system into the waste; or (ii) a nonporous medium across which capillary suction cannot be sustained. Both types of capillary break exist in the OSDF final cover system: (i) the required particle size distribution of the biointrusion barrier is coarse enough to essentially preclude the

development of capillary suction in that layer; and (ii) the HDPE geomembrane cap, which is nonporous, is a material across which capillary suction cannot be maintained.

A capillary break has some limited desirability in a final cover system in a moist climate. A capillary break will help to minimize the potential for moisture migration through the cover system. However, the presence of the capillary break is only of limited relative benefit in a moist climate because: (i) advective flow under essentially saturated conditions is a more significant transport mechanism than capillary suction in moist climates; and (ii) if soils are moist with high degrees of saturation, the magnitude of the capillary suction is small.

Action: None.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.8.3 *Pg #: 2-73* *Line #:* *Code:*
Original Comment #: 15

Comment: The FEMP has underestimated the size of storm events in the past. The storm water retention basins were designed to handle large, infrequent storm events. However, they overflow several times yearly. This will not be acceptable for the OSDF. The DOE will be held accountable for the future performance of the OSDF. If storm events have been miscalculated, the DOE will be required to undergo construction efforts to remedy all such situations.

Response: DOE is committed to managing all storm water run-on and run-off at the OSDF. Any necessary modifications will be made to meet the 25 year design Storm Water requirements.

Action: None.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.8.3 *Pg #: 2-74* *Line #: 2nd bullet, 3rd item*
Code:
Original Comment #: Unnumbered comment after Comment No. 15
Comment: This language is too vague. Remove "to the extent possible".

Response: The suggested change to the design criteria will be implemented for the IDP.

Action: See Section 2.8.3 of the IDP DCP.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.8.3 *Pg #: 2-75* *Line #:* *Code:*
Original Comment #: Second unnumbered comment after Comment No. 15
Comment: The life expectancy of the OSDF is 2000 years. The emergency Spillway should be constructed to reflect this, and should, at least, be constructed for a 2000 year storm event.

Response: The ARAR governing the design life of the OSDF is described in Section 2.3.1 of the PDP DCP. This section states "The function of the OSDF is to isolate impacted material from the environment throughout the facility design life (i.e., for 1,000 years, to the extent reasonable, and in any case for 200 years) (ARAR: 40 CFR § 192.02(a))." Thus, the design life of the OSDF is "1,000 years, to the extent reasonable, and in any case 200 years".

The design criteria for selecting the design-basis storm for purposes of designing the surface-water management system, which is different than the design life of the OSDF, is given on page 2-78 of the PDP DCP: "Permanent runon control structures for the OSDF shall be designed to limit interruption and damage (i.e., washout) of the OSDF in the 2,000-year, 24-hour storm event (design criterion for assumption of a DOE Performance Category 2 facility)." Temporary E&S basins, which will only be installed downgradient of the OSDF, need not meet this criterion because these structures pose no risk of interruption and damage (i.e., washout) to the OSDF. Instead, these facilities, including emergency

spillways, are being designed to satisfy OEPA design criteria.

Action: None.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.8.3 *Pg #: 2-76* *Line #:* *Code: Original*
Comment #: 16
Comment: *The text does not read smoothly from the end of 2-75 to the beginning of 2-76. Is there missing text?*

Response: The text referred to by the comment has been revised for the IDP and is now clearer. With respect to channel bottom widths, the text in Section 2.8.3 now states "*Channel bottom widths may be zero.*"

Action: See Section 2.8.3 of the IDP DCP.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.8.4 *Pg #: 2-78* *Line #: Bullet 1* *Code: Original Comment #: 17*
Comment: *It is Ohio EPA's expectation that DOE will commit to repairs of the OSDF that are caused by storms that exceed the design capacity of the storm water management system.*

Response: DOE agrees with this comment and comments to maintain the integrity of the OSDF for the design life.

Action: None.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.8.5 *Pg #: 2-81* *Line #: bullet 1* *Code: Original Comment #: 18*
Comment: *What happens if the 25 year storm event is exceeded during this period?*

Response: The OSDF cell has been designed with a 6-in. freeboard allowance for

the 25-year, 24-hour storm event. This freeboard allowance provides an additional "in cell" storage capacity. Also, it is noted that this minimum (i.e., 25-year, 24-hour) in-cell storage capacity only occurs at a single point in time (i.e., when a given cell is filled as illustrated on Drawing G-14 of the IDP). At that time, the next cell will have already been constructed and will be ready to receive waste. Should an extreme storm event hit the site at that time, operations personnel will divert impacted runoff into the new cell. This diversion activity is described in Section 3 of the OSDF O&M Plan.

Action: See Section 3 of the OSDF O&M Plan.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.11.2.1 *Pg #: 2-97* *Line #: bullet 3* *Code:*
Original Comment #: 19
Comment: Remove "to the extent possible".

Response: The suggested change to the design criteria will be implemented for the IDP. In the IDP, this change occurs in Section 2.10.2.1.

Action: See Section 2.10.2.1 of the IDP DCP.

Commenting Organization: OEPA *Commentor: DDAGW*
Section #: 2.11.2.1 *Pg #: 2-97* *Line #:* *Code:*
Original Comment #: 20
Comment: The borrow area should be maintained such that soils are not subject to saturation from precipitation. If ponding is prevalent, it will be very difficult to attain proper soil moisture content.

Response: DOE agrees with this comment. The following criterion will be added to the appropriate section (i.e., Section 2.10.2.2) of the DCP. "The borrow area should be graded to promote stormwater runoff and prevent ponding of surface water."

Action: See Section 2.10.2.2 of the IDP DCP.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2.12.1 *Pg #: 2-101* *Line #:* *Code: e*
Original Comment #: 21
Comment: *Please change the reference related to the "Impacted Materials Placement Plan" from Section 3.2.4.2 to Section 3.2.6.2.*

Response: This correction will be implemented in the appropriate section (i.e., Section 2.11.1) of the IDP DCP.

Action: See Section 2.11.1 of the IDP DCP.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2.12.3.4 *Pg #: 2-107* *Line #:* *Code: c*
Original Comment #: 22
Comment: *This section states that ALARA goals should apply to all impacted-material excavation, removal, handling, and placement activities. What about the cleanup levels established within the ROD? Is there a mechanism in place to use the lowest cleanup numbers, if these two numbers differ?*

Response: Section 2.12.3.4, Impacted Material Excavation, Removal, Handling, and Placement of Section is intended to present considerations for management of impacted materials within the OSDF area. As such, the ALARA goals presented within this first bullet should be read within that focus. That focus becomes more evident as this bullet is read in context with the other bullets within the subsection.

ALARA principles as pertains to worker protection are covered within various FEMP policies and implemented through various procedures, including the establishment of radiological and other worker protection programs and plans. With regard to the question posed in the comment, the principles of ALARA as pertains to protection of public health and the environment have been applied throughout the CERCLA selection of remedy process which has been recorded in the CERCLA documentation — RIs, FSs and RODs — for the various FEMP operable units. In particular, for the impacted soils destined for the OSDF, within the

Operable Unit 2 and Operable Unit 5 FSs and RODs; for the impacted debris likely destined for the OSDF (identified preferred alternative), within the Operable Unit 3 FS and Proposed Plan, and likewise within the forthcoming ROD for Final Remedial Action. DOE will implement the selected alternatives for each operable unit as they are identified in the ROD for that operable unit.

Action: None .

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2.12.3.5 *Pg. #:2-109* *Line #: 1st bullet* *Code:c*
Original Comment #23
Comment: ALARA goals should be applied to the control of fugitive emissions during impacted material transport.

Response: ALARA goals will be applied to fugitive emissions during impacted material transport. The major source fugitive emission during transport of impacted material would be due to wind borne particulates from the excessively dry material. The impacted material will be either conditioned at the source or other engineering controls will be used to impede the generation of fugitive emissions.

Action: None.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2.12.3.5 *Pg. #:2-110* *Line #: 2nd bullet* *Code: c*
Original Comment #24
Comment: Crusting agents should be evaluated for compatibility with the liner components.

Response: The following criterion will be added to the appropriate section (i.e., Section 2.11.2.4) of the IDP DCP: "Crusting agents should be evaluated for compatibility with the OSDF liner system components and only agents that contain constituents known to be compatible with the liner system components should be used (design consideration)."

Action: See Section 2.11.2.4 of the IDP DCP. See Section 9.3 of the DCP IMP Plan for the actions that will be required of the OSDF Construction Contractor to establish crusting agent acceptability.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2.12.3.6 *Pg. #2-110* *Line #:* *Code:*
Original Comment #25

Comment: The "Impacted Materials Placement "sub-section does not mention that the models used to develop the WACs in some cases specify that the material be spread throughout the length of the OSDF. Specifically, the WAC for Tc-99 in the debris from the production area was modeled assuming a homogeneous placement of debris. Please add a requirement reflecting this.

Please provide a schedule within the text for the submittal of the impacted materials placement plan.

Response: This comment expresses two basic concerns — (1) placement restrictions for technetium-99 impacted debris from OU3 remediation activities in light of the model approach used to develop the technetium-99 WAC for debris, and (2) request for revision of the text of the DCP to provide a schedule for submittal of the Impacted Material Placement Plan — each of which will be addressed separately, as presented below.

Response 1: The model used to develop the technetium-99 WAC for disposing debris from the production area in the OSDF was based on several assumptions in the OU3 RI/FS Report, one of which related to uniformly distributing debris within the footprint of the debris disposal area. In the modeling, the smallest possible area was assumed for the debris disposal footprint, based on the maximum volume of debris and minimum soil to debris ratio expected in the OSDF, in order to determine a conservative technetium-99 WAC. Although a minimum areal footprint was assumed for modeling purposes in the

OU3 RI/FS, this assumption was extremely conservative based on the decontamination and dismantlement schedule of OU3 production facilities. D&D activities and excavation of production facility foundations will be ongoing throughout the majority on OSDF construction and impacted materials placement activities. Likewise, placement of impacted debris that meets WAC in the OSDF will be ongoing as these materials are generated. This will naturally result in the distribution of impacted debris throughout the north-south length of the OSDF.

Action 1: A requirement that debris from the former production area be placed in several cells will be included in the Impacted Material Placement Plan.

Response 2: The forthcoming draft Impacted Material Placement Plan will be submitted as a supporting document to the Draft OSDF RAWP. The Draft OSDF RAWP will be submitted in accordance with the submittal schedule established in Table 6-1 of the Final OU2 RDWP. See also the response to USEPA Original General Comment #2.

Action 2: None.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 2.12.3.7 *Pg. #:2-113* *Line #:* *Code: c*
Original Comment #26
Comment: There are several potential problems with using impacted soils as seasonal cover specifically dust control and storm water run-off control. Have the additional costs associated with monitoring these releases been estimated and factored into the potential decision to use impacted material for seasonal cover? It may be less expensive to use clean on-site soil for seasonal cover.

The import of clean, off-site soils should be minimized.

Response: DOE recognizes that there may be potential problems with using the impacted soils as seasonal cover. DOE is evaluating alternative methods such as surfactants, on-site clean borrow, etc. to impede fugitive dust emission.

Action: DOE will provide by the 90 percent submitted an evaluation seasonal cover options.

Commenting Organization: OEPA *Commentor: GIS Manager*
Section #: 3.1.2 *Pg. #:3.1* *Line #:* *Code: c*
Original Comment #27

Comment: Ohio EPA would like a digital copy of all drawings and maps created using Microstation or a compatible system. This request includes all active design files as well as the reference design files used to produce these maps and drawings. In addition any data which is included in the reports should be provided in Oracle dump files or in a format compatible with Lotus 123. Ohio EPA would also like any 3D models produced with Microstation or Modelview as well as any aerial photos which were used in the mapping process.

Response: DOE generally agrees with the comment. In order to insure document control DOE will provide OEPA the latest version of the drawings. All previous versions need to be returned to DOE upon receipt of the new versions. Returning these previous versions will ensure that both the agency and DOE have the latest version of the drawings. In addition these electronic files should be treated as business sensitive and no copies of these files should be made without the written consent of DOE.

Reports will be provided in Oracle dump files or a format compatible with Lotus 123. Again, DOE will provide the latest versions of these files and upon receipt OEPA will return all previous versions. DOE will provide any 3D models produced with microstation or modelview, if models are not proprietary.

Action: DOE to provide copies of the latest version of all microstation drawings, reports and models.

Commenting Organization: OEPA *Commentor: OFFO*
Section #: 3.2.10 *Pg. #:3-11* *Line #:* *Code: c*
original Comment # 28

Comment: Please incorporate the list of deliverables from Section 1.6 into the list of response documents in this section. The Ohio EPA expects to have comments on several of these documents. It is our recollection that the Intermediate Design Package is being supplied to the regulators for informational purposes only and no formal comments and comment responses are planned.

Response: The commitments for the deliverables in section 3.2.10 are provided in the last bullet of section 1.6.

Action: A sentence will be added in section 1.6 referring the readers to section 3.2.10.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 1 *Pg. #: 7/18* *Line #:* *Code: c*
Original Comment # 29

Comment: Page 7/18 states that the short-term shear angle of a dry, unreinforced GCL is 25 degrees and for a reinforced hydrated GCL is 30 degrees. Please provide a source for those data.

Response: The source of the data on GCL shear strengths is the paper by Bonaparte et al. (1996) "*Evaluation of Various Aspects of GCL Performance*" to be published by the USEPA National Risk Management Laboratory in the report "*Report of 1995 Workshop on Geosynthetic Clay Liners*" (publication pending).

Action: See Section 1.3 of the IDP calculations for a copy of the cited paper.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 1 *Pg. #:8/18* *Line #:* *Code: c*
Original Comment # 30

Comment: *Page 8/18 states that installation quality for geomembranes will be no worse than 1 defect per acre and may be as good as zero defects per acre. These numbers would appear to be extremely good. Please provide some justification that this quality level can be consistently achieved for large area geomembrane installation.*

Response: DOE acknowledges that the narrative on page 8 of 18 of Section 1 of the PDP Calculations is unclear with respect to the rationale for the selected geomembrane defect density (defined as area of geomembrane defect per unit area of liner) described on that page. This rationale is described below.

The defect density values described on page 8 of 18 of Section 1 of the PDP Calculation Package apply only to estimating the leachate generation rate for the OSDF after closure. The defect densities reported on this page were selected to be conservative from the standpoint of estimating long-term leachate generation rates. A calculation for this purpose will be conservative if the final cover system geomembrane has a defect density as large or larger than the likely value (so that infiltration through the final cover will be as large or larger than the likely value) while the liner system geomembrane has a defect density as small or smaller than the likely value (so that leakage through the geomembrane component of the liner system is as small or smaller than the likely value and consequently leachate collection system flow is as large or larger than the likely value, i.e., conservative). With respect to the likely defect density, Bonaparte and Giroud (1989) suggested that defect densities for geomembranes installed with strict CQA would be on the order 0.06 square centimeter per acre. Subsequently, Laine (1991) presented data indicating geomembrane defect densities even lower than those reported by Giroud and Bonaparte. On the basis of this information, defect densities of 1 square centimeter per acre for the geomembrane final cover system and 0 square centimeter per acre for the liner system geomembrane will result in a conservative estimation of leachate generation rate in the OSDF after final closure.

Please also note that Section 1 of the PDP Calculations did not address an assumption made in Section 8 (i.e., Leak Detection System) of the PDP with respect to the assumed geomembrane defect density for calculation of the performance of the OSDF leak detection system. Section 1 of the IDP Calculation Package will be expanded to include this latter information.

(Note: the two references cited above are: (i) Giroud, J.P. and Bonaparte, R. (1989). "Leachate Through Liners Constructed with Geomembranes, Part I: Geomembrane Liners", *Geotextiles and Geomembranes*, Vol. 8, No. 1, pp. 26-67; and (ii) Laine, D.L. (1991). "Analysis of Pinhole Seam Leaks Located in Geomembrane Liners Using the Electrical Leak Location Method", *Proceedings, Geosynthetics '91 Conference*, Vol. 1, Atlanta, pp. 239-254.)

Action: See Section 1.1 of the IDP Calculation Package for the additional discussion of geomembrane defect density.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: Subsection 3-1 *Pg. #:* *Line #:* *Code: c*
Original Comment # 31
Comment: Subsection 3.1, Foundation Stability - These calculations have been confirmed using the XSTABL software and they appear sound, based on the soil properties presented in the report.

Response: The comment is noted.

Action: None.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #:Sub-section 3.2 *Pg. #:6-13* *Line #:* *Code: c*
Original Comment # 32
Comment: Subsection 3.2, Short-term Stability of Liner System on Side Slopes - Please present the source of the data on GCL properties (page 6/13),

particularly the shear angles of 25 to 30 degrees (see comments on Section 1).

Response: Please see the response to OEPA Comment No. 29.

Action: Please see the action for OEPA Comment No. 29.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 3.3 Interim/Final Waste Slope Stab. *Pg. #: 7 of 48*
Line #: *Code:*

Original Comment # 33

Comment: It is assumed that the primary GCL bentonite is unhydrated because it is sandwiched between geomembrane layers. For these calculations, it would be prudent to assume this bentonite is hydrated.

Response: Please note that the bentonite in the primary GCL is assumed to be hydrated for long-term conditions. In the subject calculation, the bentonite in the primary GCL is assumed to be unhydrated under short-term conditions only. This is a very reasonable assumption as the GCL can be placed so that it does not get wet during installation, and the underlying and overlying geomembranes prevent hydration once installed. Calculations show that an unhydrated geomembrane sandwiched between HDPE geomembranes will remain unhydrated for many years.

Action: None.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #:Sub-section 3.3 *Pg. #:11/48* *Line #:* *Code: c*

Original Comment # 34

Comment: Subsection 3.3, Interim Final Waste Slope Stability - Same questions about GCL properties. Page 7/48 states that "reinforced GCL tan ϕ peak = 2 tan ϕ peak unreinforced GCL", based on test data in GeoSyntec files. Please provide the supporting data for this claim. The plots on page 11/48 do not deal with reinforced GCL materials. It

seems unlikely that the shear strength angle of a reinforced GCL should vary directly as the unreinforced strength. The contribution of reinforcement to strength should not be a function of applied normal stress, thus the ϕ angle of a reinforced GCL would not be expected to be a constant multiple of that of an unreinforced GCL.

Response: The supporting data used for the PDP Calculations is contained in Bonaparte et al. (1996), a copy of which is now included in Section 1.3 of the IDP Calculations. Please note that an OSDF project-specific laboratory direct shear interface testing program is ongoing to further evaluate the internal and interface shear strengths of the types of GCLs proposed for the OSDF project. The results of this testing will be presented in the Soil-Geosynthetic Interface Testing Program Final Report. This report will also verify that the GCL internal and interface shear strengths used in the PDP and IDP Calculations are appropriate and conservative.

With respect to long-term stability of the final cover system, the appropriate measure of GCL internal strength for use in the slope stability analysis is the consolidated-drained (CD) strength. The technical literature does not currently contain information on the CD shear strength of reinforced GCLs. The technical literature does however contain the results of a limited number of consolidated-quick (CQ) direct shear tests on reinforced GCLs. As discussed in Bonaparte et al. (1996), the results of CQ tests may be considered to provide a lower bound of the CD shear strength of reinforced GCLs. A comparison of the CD tests on unreinforced GCLs and the CQ tests on reinforced GCLs indicates that the relationship ("reinforced GCL tan ϕ_{peak} = 2 tan ϕ_{peak} unreinforced GCL") is conservative for peak CQ (and hence CD) conditions. Thus, the assumptions made in the PDP Calculation Package for peak shear strengths for reinforced GCLs are conservative. Also, based on the CQ test results, reinforced GCL shear strengths exhibit limited stress dependency and have a relatively high peak shear strength followed by a significant degree of strain softening.

Action: As noted above, project-specific direct shear testing of the unreinforced and reinforced GCLs proposed for use in the OSDF is ongoing. The

GCL shear strength values assumed in the PDP calculations will be confirmed, or modified as appropriate, when results from this project-specific test program are available. Please see the Soil-Geosynthetic Interface Testing Program Final Report once issued.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: Sub-section 3.4 *Pg. #:7/14* *Line #:* *Code: c*
Original Comment # 35

Comment: *Subsection 3.4, Cover System Stability - Page 7/14 states that the thickness of water in the drainage layer is approximately 6 inches. Section 11 reports a maximum liquid thickness of 8.4 inches, which represents a short-term peak value. Would the slope stay stable under that high-flow drainage condition (head of 8.4 inches)?*

Response: The peak maximum hydraulic head in the cover system drainage layer is calculated to be approximately 8.4 in. This peak maximum hydraulic head is the peak value measured at a single location along a parabolic drainage surface; this hydraulic head is not representative of the hydraulic head acting over the entire drainage layer. The use of a peak maximum hydraulic head in final cover system slope stability analyses would be very conservative. It is more appropriate, yet still conservative, to use the peak average hydraulic head rather than the peak maximum value. For a calculated peak maximum hydraulic head of 8.4 in., the peak average hydraulic head along the cover system drainage layer is approximately 4.4 in. The value for hydraulic head used in the OSDF cover system stability analysis was conservatively assumed to be slightly larger than 4.4 in.; specifically, a value of 6 in. was assumed.

It is also noted that should the final cover system drainage layer somehow be subjected to a peak average hydraulic head of 8.4 in., the cover system would remain stable with a factor of safety of at least 1.5.

Action: None.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 3.4 *Pg. #:7/14* *Line #:* *Code: c*
Original Comment # 36

Comment: *The thickness of water at the toe of the slope tw* is given as 3.4 feet (page 7/14). Is this correct? That seems to be very deep.*

Response: The larger the assumed tailwater thickness, the lower the calculated slope stability factor of safety for the final cover system. Thus, it is conservative to assume a relatively large tailwater thickness. The assumed value for the tailwater thickness at the toe of the slope is conservatively assumed to be 3.4 ft. Because the drainage layer in the OSDF final cover system is designed to free discharge at the toe of slope, the actual tailwater thickness will be less than the assumed value. Therefore, the slope stability calculation for the final cover system is conservative.

Action: None.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: Sub-section 4.1 *Pg. #:* *Line #:* *Code: c*
Original Comment # 37

Comment: *Subsection 4.1, Seismic Hazard Assessment - This section lists three seismic regions which may impact the Fernald Site. Those include the Grenville and Illinois Seismic Source Zones and the Reelfoot Rift Complex Subzone B (see map on page 16). Not included were the Anna-Champaign Fault of the Fort Wayne Rift System, which caused the March 9, 1937 earthquake near Anna, Ohio (worst recorded in Ohio history) and the West Hickman-Bryan Station Fault near Maysville, Kentucky, which caused the 1980 earthquake across southwestern Ohio. Please explain what impact these systems could have on the stability of the OSDF.*

Response: The seismic source zones (i.e., Grenville, Illinois, and Reelfoot Rift Complex Subzone B) that were used for the seismic hazard assessment of the OSDF include the faults, rift zones, and past seismic activity in

those zones. The Anna-Champaign Fault of the Fort Wayne Rift System and the West Hickman-Bryan Station Fault near Maysville, Kentucky are examples of faults and seismic events that are used to define these seismic source zones. For each seismic source zone, a maximum magnitude and acceleration is conservatively applied for the entire area represented by the zone. Therefore, these faults and seismic events are implicitly incorporated into the seismic hazard assessment.

For the seismic hazard assessment presented in the PDP Calculation Package, the magnitude, acceleration, and distance from the closest edge of each seismic source zone is used in the seismic hazard assessment. The results of the seismic hazard assessment indicate that the peak ground acceleration at the site due to a maximum credible earthquake in any of the identified seismic source zones is less than the peak ground acceleration obtained in accordance with EPA 40 CFR §258. Therefore, the use of the value for peak ground acceleration obtained in accordance with EPA 40 CFR §258 is judged to form a conservative basis for design.

Action: Please see the additional clarifying language added to Section 4.1 of the IDP calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 4.3 *Pg. #: 1/77* *Line #:* *Code: c*
Original Comment # 38

Comment: Subsection 4.3, Seismic Performance Evaluation - Page 1/77, note that 0.1 ft = approximately 3 cm, not 3 mm.

Response: The calculated permanent seismic deformation is in all cases is less than 0.1 in. (3 mm). The write-up on page 1 of 77 has been clarified.

Action: Please see the revised narrative in Section 4.3 of the IDP calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 4.3 *Pg. #:5/77* *Line #:* *Code: c*
Original Comment # 39

Comment *On page 5/77 the second paragraph is unclear. The sentence states that "For the three cases for which the calculated peak average acceleration is greater that the calculated peak average acceleration, a deformation analysis is performed". Should that be for cases in which peak average acceleration exceeds yield acceleration?*

An XSTABL analysis confirms that the liner system is in trouble (factor of safety = approximately 1) for the design acceleration of 0.11 g. The report states that, based on predictions of the Y-slip software, deformations should be small, < 0.1 ft. Since this important to the long-term performance of the OSDF, please provide some more details about the workings of this software, particularly its inputs, operating assumptions and outputs (note that the entire operations manual for the XSTABL program is presented several times in this report). In particular, please explain why this deformation will not damage the barrier components of the line system.

Response: With respect to the first portion of the comment, the indicated change will be implemented in Section 4.3 of the IDP calculations.

With respect to the second portion of the comment, the YSLIP-C (Yan, 1991) computer software is used to perform the formal Newmark seismic deformation analysis. The input parameters for each potential slip surface to be analyzed are: (i) the peak average acceleration-time history for the layer (calculated in the seismic site response analysis); (ii) the yield acceleration (calculated in the XSTABL slope stability analysis); and (iii) and the dynamic shear strength of the layer. For the formal Newmark analysis, the permanent seismic deformation is calculated by double-integration of the excursions of the earthquake average acceleration time history that are larger than the calculated yield acceleration. The output of interest for the program is the time period during the seismic event, the sliding acceleration, the sliding velocity, and the permanent deformation of the mass above the slip surface.
The maximum permanent seismic deformation calculated from all

analyses of the OSDF is less than 0.1 in. (3 mm). This calculated deformation is measured over the length of the potential slip surface used in the analysis. A mass movement of less than 0.1 in. (3 mm) over the length of the slip surface would result in only extremely small stresses and strains in the liner system components. In addition, the calculated permanent seismic deformation is far below the acceptable limit of deformation recommended by Seed and Bonaparte [1992] and Anderson and Kavazanjian [1995]. (Note: Complete references are given in the DCP.)

Action: Please see the revised narrative in Section 4.3 of the IDP calculations.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 6.1 Leachate Gen. Analysis Proc. *Pg. #: 1 of 7*
Original Comment # 40 *Line #* *Code:*
Comment: In the last paragraph on this page it states the leachate collection pipe will be buried in a gravel trench in the center of each cell. This statement is not consistent with the design presented in this Preliminary Design Package, which does not utilize a trench for the leachate collection pipe.

Response: The wording trench has been changed for the IDP to "drainage corridor".

Action: Please see the revised narrative in Section 7.1 of the IDP calculations.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 6.1 Leachate Gen. Analysis Proc. *Pg. #: 6 of 7* *Line #:*
Original Comment # 41 *Code: G*
Comment: In the paragraph "Waste Composition and Placement Procedures" the assumption that the waste will be at optimum water content and compacted to 85 to 90% maximum compaction has not been stated as it was in the settlement evaluation. This should be addressed in the generation of leachate, as this mass of compacted waste will dewater. Assuming that the compacted waste has a porosity of 0.40, is 30 feet

thick, and dewaters by 40% (decreasing from 80% to 40% water saturation) of saturation, this would account for over 1.5 million gallons per acre of generated leachate. Dewatering of the waste material should be addressed in the Leachate Generation Analysis.

Response: The water in the pores of the impacted soil placed in the OSDF is retained by capillary suction. This water is not mobile. However, some leachate may be generated by consolidation of the impacted soil. The potential for consolidation-generated leachate will be addressed in the IDP.

Action: Please see Section 7.1 of the IDP calculations where potential for consolidation-induced leachate generation is addressed.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 8.1 LDS, Calculated Proc. Pg. #: 5 of 13 *Line #: Code: G*
Original Comment # 42

Comment: In the section "Time of Travel in the LDS" the travel time for leak detection is calculated assuming the leachate flows down the slope of the cell and enters the leachate detection piping in the bottom of the cell. This assumption could be incorrect as the thickness of flow in the drainage layer, Tmax, was calculated at 0.0055 feet and the LDS pipe wall thickness is about 0.05 feet. The leachate would never enter the pipe, but instead flow down the 1% slope in the drainage layer in the center of the cell. For this reason, it would be appropriate to use equation 5 from this section, which is based on Darcy's equation instead of equation 6, which is based on Manning's equation to calculate the travel time along the center of the cell. Equation 5 gives a time of travel for flow along the centerline for a distance of 600 feet (700 ft less the topmost 100 ft in water flow from the top right corner, on page 6 of 12, LDS calculation results). Water flow along the 1% grade drainage layer. Assuming a porosity of 0.397 and hydraulic conductivity of 0.1 cm/sec (Values from page 1 of 5, LDS Data Verification) the travel time is calculated to be 84 days, instead of the 0.06 hr calculated using equation 6 for the travel time in the LDS pipe.

Response: DOE agrees with the main point of this comment. Calculations performed for the IDP consider flow in the drainage corridor gravel rather flow in the leak detection system pipe. In addition, the IDP OSDF Specifications (Section 02710) now require that this gravel have a minimum hydraulic conductivity of 10 cm/s, rather than 0.1 cm/s as specified in the PDP. The calculated time of travel for the IDP design is 15 days for active cell operating conditions and 16 days for the post-closure condition.

Action: See Section 02710 of the IDP Specifications and Section 9.3 of the IDP calculations.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 8.1 Leachate Detection System Pg. #: Line #: Code: G
Original Comment # 43

Comment: The Travel Time calculations for the leak detection system are based on some thickness of flow values which are very small. The meaningfulness of these calculations should be questioned. Any subtle variations in slope, the texture of the geotextile cushion, or other variable will impede a flow that is less than 1/100 of a foot thick. In reality, the travel times would far exceed the calculated values. Is this leak detection system going to be adequate?

Response: The calculation procedure for time-of-travel assumes steady-state flow conditions and is performed using industry standard techniques recognized by USEPA. Actual time of travel will be longer than the calculated value for very low rates of leakage through the primary liner, as expected for normal geomembrane construction. Subtle variations in slope as envisioned in the comment will lead to subtle variations in liquid flow path, which is unimportant from the overall standpoint of LDS effectiveness.

Action: None.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 8 LDS, Data Verification *Pg. #: 1 of 5* *Line #:* *Code: E*
Original Comment # 44
Comment: *"Hydraulic gradient of LDS" should be "hydraulic conductivity of LDS".*

Response: The comment is noted.

Action: See Section 9.3 of the IDP calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 10.1 *Pg. #:* *Line #:* *Code: c*
Original Comment # 45
Comment: *Subsection 10.1, Liner System and Final Cover System Materials Evaluation - This section draws on data contained in the table of liner component strengths given in Subsection 3.2. Thus the concerns, expressed previously, about GCL shear angles apply to this section too. The table represents that the most vulnerable shear surfaces are the interfaces between layers, not the internal shear surfaces within layers (note that the lowest reported interface angle is 20 degrees, which is lower than that of the GCL material in any condition). However, a revision of shear angle value for the GCL (if necessary), might force a revision in the overall stability analysis.*

Response: See responses to OEPA Comments No. 29 and No. 34.

Action: See actions for OEPA Comment No. 29 and No. 34.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 11 Final Cover *Pg. #:* *Line #:* *Code: c*
Original Comment # 46
Comment: *The freeze/thaw analysis uses 60 days a year with average temperature < 32°F. Can that number be confirmed from meteorological records?*

Response: The frost penetration depth calculation for the IDP has been expanded to include data for Fairfield, Ohio, for the period 1936 to 1995. The

data were obtained from the National Climatic Data Center.

Action: See Section 11.3 of the IDP Calculation Package.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 13.1 *Pg. #: 1/12* *Line #:* *Code: c*
Original Comment # 47
Comment: Subsection 13.1, OSDF E&S Basin Sizing - Page 1/12 states that two basins will be used, while the executive summary implies that only one will be included. Please clarify.

Response: The preliminary design called for the use of two erosion and sediment (E&S) basins for each development stage of the OSDF (see PDP Drawings G-1, G-2, and G-3). The surface-water management system for the IDP has been revised to include three sediment basins during the first development stage and one sediment basin for each subsequent development stage.

Action: See IDP Drawings G-2, G-3, and G-4, and IDP Calculation Section 13.1.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 13.1 *Pg. #:2/8* *Line #:* *Code: c*
Original Comment # 48
Comment: Please give the applicability and appropriateness, for this site, of the 1800 cf/acre sediment term at the top of page 2/8.Also, it is not clear where the basins will be located and how the water will get to them.

Response: Calculations for the PDP were performed in accordance with USDA Soil Conservation Service (SCS) guidelines. For the IDP, the calculations have been revised to fully address OEPA requirements for sediment basins contained in OAC 3745-27-08(C)(6). Additional information on sediment basin locations and surface-water routing is given on the IDP Drawings.

Action: See IDP Drawings G-32 and G-33 for detailed information on Sediment Basins 1 and 4 (the two temporary sediment basins that are part of the OSDF design package). See Section 13.1 of the IDP Calculations for the detailed sediment basin calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 13.4 *Pg. #:* *Line #:* *Code: c*
Original Comment # 49
Comment: Subsection 13.4, Revegetation Design - section missing.

Response: A detailed Vegetation Design section has been added to the IDP.

Action: See Section 11.1 of IDP Calculation Package.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #:13.5 *Pg. #:* *Line #:* *Code: c*
Original Comment # 50
Comment: Subsection 13.5, Erosion of OSDF Final Cover - Figures 6 and 7 (pages 27/50 and 30/50) appear to have their captions reversed.

Response: Comment is noted.

Action: See Section 11.2 of the IDP Calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #:13.5 *Pg. #:36/50* *Line #:* *Code: c*
Original Comment #51
Comment: Page 36/50, Step 10, please check the statements about τe and τa. Doesn't $\tau e > \tau a$ mean that gullies may form?

Please compare the tables in Step 9, page 35/50 and in Step 10, page 36/50. The values for τe do not appear to agree for the first two soil groups.

Response: Comment is noted. $\tau_e > \tau_a$ indicates a potential for gully formation. Please note that all calculations for the erosional resistance of the OSDF final cover systems have been revised and checked for the IDP submittal.

Action: See Section 11.2 of the IDP Calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 14 *Pg. #:* *Line #:* *Code: c*
Original Comment # 52
Comment: Subsection 14.2, Construction Water Demand Estimation - What is the source for the estimate of dust control water volume?

Response: The source of the dust control estimate is given on page 1 of 2 of the data verification portion of the Section 14.2 of the PDP Calculations. The area, A, for dust control (10 acres) is an estimate of the active landfill working area and haul road area within the battery limit. The spray application rate assumed in the calculation is 0.04 gallon/per square foot. Experience has shown that this application rate will satisfactorily suppress dust in most cases. It was further assumed, based on experience, that dust control water will be applied five times per day. The discussion of the basis for the dust control water demand estimate has been expanded for the IDP submittal.

Action: See Section 14.4 of the IDP Calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 16 *Pg. #:* *Line #:* *Code: c*
Original Comment #53
Comment: Section 16. Prepared Surfaces - missing

Response: Comment noted. Required calculations are included in the IDP.

Action: See Section 14 of the IDP Calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 17 *Pg. #:* *Line #:* *Code: c*
Original Comment # 54
Comment: Section 17. Utility Requirements - missing

Response: Comment noted. Required calculations are included in the IDP.

Action: See Section 14 of the IDP Calculations.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #:02225 *Pg. #:2,4,5* *Line #:* *Code: c*
Original Comment # 55
Comment: Section 02225, page 2 - Liquid limit and plasticity index missing. Page 4 - clod size missing. Page 5 - paragraph J, several words on soil conditioning missing.

Response: The OSDF Specifications in the PDP are "*Library Masters*" and were only partially modified for the PDP submittal. Shaded or blank areas of these specifications indicate additional information is required. The requested information will be provided in the IDP.

Action: See Section 02225 of the IDP Specifications for the information mentioned in the comment.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02225 Comp. Clay Liner & Cap *Pg.#: 02225-5 Line #:3.02J3.*
Original Comment # 56 *Code: G*
Comment: A maximum moisture content should not be exceeded, and this should be explicitly stated. Excessive moisture results in a compacted dry density below the acceptable value.

Response: See response to OEPA Comment No. 55.

Action: See Section 02225, Paragraph 3.02, of the IDP Specifications for explicit

language on minimum and maximum acceptable moisture contents for compaction of clay liner and cap components of the OSDF.

Commenting Organization: OEPA — *Commentor: GeoTrans, Inc.*
Section #: 02225 Comp. Clay Liner & Cap — *Pg.#: 02225-7 Line #:3.04B*
Original Comment # 57 — *Code: G*

Comment: This section should indicate the location of the top of the compacted clay liner and cap should be located and a drawing submitted before the geotextile clay liner, not the geomembrane, is installed.

Response: See response to OEPA Comment No. 55.

Action: See Section 02225, Paragraph 3.05, of the IDP Specifications.

Commenting Organization: OEPA — *Commentor: GeoTrans, Inc.*
Section #: 02225 Comp. Clay Liner & Cap — *Pg.#:02225-8 Line #:3.06C*
Original Comment # 58 — *Code: G*

Comment: Will surface hydration repair extensive desiccation cracking? The engineer should have the option of requiring replacement in lieu of repair of areas affected by desiccation cracking. There should be a specification relating the depth of cracking to the allowable repair or replacement method.

Response: Guidelines for replacement versus repair of desiccated portions of compacted clay liner and cap will be addressed in Section 02225 of the IDP Specifications. The assessment for replacement versus repair will be based on a number of factors, including the depth of desiccation cracking.

Action: See Section 02225, Paragraph 3.07, of the IDP Specifications for the guidelines.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02240 Prot. & Contour Layers *Pg.#:02240-2 Line #:2.01A*
Original Comment # 59 *Code: G*

Comment: *The note on drawing 90X-6000-00024 states impacted material used for the protective and contour layers should be free draining and references this specification. A more quantitative criteria for the suitability of this material should be identified in this section.*

Response: The note on Drawing 90X-6000-00024 indicates that protective layer material need only be free draining at a few specific locations. This note and the specifications will be clarified for the IDP. Requirements for this free draining material will be specified.

Action: See Section 02240, Paragraph 2.01, of the IDP Specifications for material requirements for the free-draining material to be used as the protective layer.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02240 Prot. & Contour Layers Pg. #: 02240-3 Line #: 3.02 G. Code: G
Original Comment # 60

Comment: *Referenced Section 2210 does not exist. This reference is probably to Section 2200, Earthwork.*

Response: See response to OEPA Comment No. 55.

Action: See Section 02240, Paragraph 3.02, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: DSW/WQ*
Section #: 02270 E&S Control *Pg. #:* *Line #:* *Code: c*
Original Comment # 61

Comment: *Section 1.04 C references the (Ohio) Water Management and Sediment Control for Urbanized Areas Technical Standards and Specifications. The actual name of this reference is Water Management and Sediment Control for Urbanizing Areas. There is a 1995 edition that has undergone a name change to Rainwater and Land Development which*

should be used. It is available from the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Fountain Square Court, Columbus, Ohio 43224, (614) 265-6610.

The installation description of silt fencing (Section 3.02) is incomplete. This section does not comply with the reference standards. There should be eight inches of cloth below the ground surface in a six inch trench, not four inches as specified.

Response: See response to Comment No. 55.

Action: See Section 02270, Paragraph 1.04, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: DSW/WQ*
Section #: 02270 E&S Control *Pg. #:* *Line #:* *Code: c*
Original Comment # 62

Comment: Section 3.03 A references a Pollution Prevention Plan for construction activities. Please submit a copy for review to Ohio EPA and add this to the list of deliverables cited in section 1.6 of the design Criteria Package. It is Ohio EPA's expectation that this plan will include a monitoring provision.

Response: DOE does not believe it is necessary to develop a stormwater pollution prevention plan specific to the OSDF activities because the basic elements of such a plan are already included in the design, specifications, and plans for the OSDF activities. Support plans will be submitted with the Draft OSDF RAWP. The Draft OSDF RAWP will be submitted in accordance with the submittal schedule previously established in Table 6-1 of the USEPA-approved OU2 RDWP.

Furthermore, a sitewide stormwater pollution prevention plan (SWPPP) for the FEMP is being developed as a condition of the recently renewed NPDES permit (1IO00004*ED) for the FEMP, effective November 1, 1995, which requires preparation of a SWPPP within six months of the permit's effective date (i.e., May 1, 1996). The sitewide SWPPP will address specific inspection and monitoring requirements for all industrial

and construction related stormwater discharges from the FEMP. That sitewide SWPPP will be in place by the required date.

Action: None.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02280 Biointrusion Barrier Pg. #: 02280-4 Line #: 3.01 C & F. Code: G
Original Comment # 63
Comment: Referenced Section 2710 should be Section 2714, Geotextile Filter and Cushion.

Response: See response to OEPA Comment No. 55.

Action: For the IDP, the geotextile filter has been removed from between the biointrusion barrier and drainage layer components of the OSDF final cover system. The reference mentioned in the comment no longer exists. No action needed.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 02605 Pg. #:2 Line #: Code: c
Original Comment # 64
Comment: Section 02605, page 2 - ASTM D 2122 is entitled "Method for Determining Dimensions of Thermoplastics Pipe and Fittings".

Response: Comment noted.

Action: See Section 02605, Paragraph 1.04, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02605 HDPE Manhole Pg. #: 02605-7 Line#: 3.04 D Code: G
Original Comment # 65
Comment: A gravity head testing procedure for the HDPE manholes is inadequate. A pressure test of each manhole would be a more conservative method. Any breach of these manholes will mean a release to the environment.

Response: All manholes (including LDS and LCS manholes) except the permanent lift station manhole, are designed to be secondary containment dry wells, not wet wells. For these dry manholes, gravity testing is adequate and appropriate. The permanent lift station is a double-walled system consisting of an inner manhole and a secondary casing. The inner manhole of the permanent lift station will be pressure tested. The pump suction vessel for the temporary lift station will also be pressure tested.

Action: See Section 02605, Paragraph 3.04, of the IDP Specifications for the manhole field testing requirements.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02610 HDPE Pipe etc. Pg. #: 02610-4 *Line#:2.02 B Code: G*
Original Comment # 66

Comment: All design calculations were based on an SDR of 11 piping in the LCS, LDS, and LTS. Changing to SDR 17 piping as specified here, will change the maximum gravity flow of the LDS, LCS, and LTS. The design calculations need to be redone if this change is made.

Response: Comment noted. See the response to OEPA Comment No. 55.

Action: See Section 02610, Paragraph 2.02, of the IDP Specifications for the revised wording to require use of for SDR 11 HDPE pipe.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02610 HDPE Pipe etc. Pg. #: 02610-9 *Line#:3.05 A. Code: G*
Original Comment # 67

Comment: The specifications call for pressure testing of the force main only. The gravity drain systems (LDS, LCS, and LTS) are not mentioned. The gravity drain systems should also be pressure tested, including both the containment and transmission piping. Testing of the gravity flow piping should also include tests for deflections or deformations of the pipe to verify the pipe bedding design and installation.

Response: Typically, LDS and LCS pipes are not pressure tested because they are

perforated. It is also not customary to test gravity pipes. To be conservative, the LTS gravity line pipe, and solid wall portions of the LCS and LDS pipes (including carrier and containment pipes) will be pressure tested.

Action: See the additional pipe pressure testing requirements called for in Section 02610, Paragraph 3.05, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02721 Corrugated Metal Pipe Pg. #: Line #: Code: G
Original Comment # 68
Comment: This sections references nonexistent sections and incorrectly references existing sections. It appears that this sections was taken from another design package without modification.

Response: See response to OEPA Comment No. 55.

Action: See the revised Section 02721 of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #:02770 Geomembrane Cover & Liner Pg. #: 02770-7 Line #: 3.02 Code: G
Original Comment # 69
Comment: This section implies that the geomembrane will be placed directly on the compacted clay liner (soil). In fact, the drawings call for geomembrane to be placed over the geomembrane clay liner (GCL). This surface inspection by the Installer must take place before the GCL in placed, and/or be performed by the Installer of the GCL.

Response: See response to OEPA Comment No. 55.

Action: See Section 02770, Paragraph 3.02, of the IDP Specifications for a discussion of placement of the geomembrane liner on the GCL.

Commenting Organization: OEPA *Commentor: DERR/CO*

Section #: 02721 *Pg. #:* *Line #:* *Code: c*
Original Comment #70
Comment: *Section 02721, Numerous details of this section on corrugated metal piping are missing.*

Response: See response to OEPA Comment No. 55.

Action: See Section 02721 of the IDP Specifications.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 02772 *Pg. #:3* *Line #:* *Code: c*
Original Comment # 71
Comment: *Section 02772, page 3 - The GCL conductivity of 2E-09 cm/sec at a confining pressure of only 5 psi appears to be lower than usually reported in vendor literature. Has a supplier who can consistently deliver GCL's with such low conductivity properties been identified? Also, the cohesive strength specification for the GCL's is unclear. Does this value include reinforcement?*

Response: See response to OEPA Comment No. 55. The GCL required hydraulic conductivity specified in Section 02772 of the IDP Specifications is 3 x 10^{-9} cm/s. Several suppliers can provide GCL material that will consistently satisfy this hydraulic conductivity criterion.

Action: See Section 02772, Paragraph 2.01, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02772-5 Geotextile Clay Liner Pg. #: 02772-5 Line #: 3.03 Code: G
Original Comment # 72
Comment: *This section seems redundant with Section 02225. This section implies that the responsibility of the condition of the surface of the compacted clay liner surface is borne by the GCL installer. Is this correct?*

Response: No, the condition of the surface of the compacted clay liner is the responsibility of the OSDF Construction Contractor.

Action: See Section 02772, Paragraph 3.03, of the IDP Specifications for clarified requirements on subgrade preparation and acceptance.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02772-5 Geotextile Clay Liner Pg. #: 02772-5 Line #: 3.04 Code: G
Original Comment # 73
Comment: Detail 7 on Sheet G-25 shows the GCL, the geomembrane, and the geotextile cushion anchors being buried as a unit. This is not what is indicated in this section of text. Please clarify.

Response: The geomembrane, geotextile cushion, and GCL will be anchored as a unit. Additional language has been added to the IDP Specifications, for clarity.

Action: See Section 07227, Paragraph 3.05, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #: 02930 Pg. #:3 Line #: Code: c
Original Comment 74
Comment: Section 02930, page 3 - Grass seed details omitted.

Response: See response to OEPA Comment No. 55.

Action: Please see Paragraph 2.01 of Section 02930 of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02930 Vegetation Pg. #: Line #: Code: G
Original Comment # 75
Comment: Calculations in Section 13.5 of the Preliminary Design Calculation Package indicate the grass cover quality must be 95% of the ground, or 80% of the ground with a gravelly topsoil and classify in at least vegetal retardance class "C" or "E" for clayey gravel top soil. This must be included in the specifications to insure the performance of the cover.

Response: Comment noted. IDP calculations for final cover system have been

revised, resulting in revised topsoil and vegetation requirements.

Action: See Section 11.2 of the IDP Calculations and Sections 02920 and 02930 of the IDP Specifications.

Commenting Organization: OEPA *Commentor: DERR/CO*
Section #:03310 *Pg. #:* *Line #:* *Code: c*
Original Comment # 76
Comment: Section 03310 - Basic concrete properties, such as strengths, are missing.

Response: See response to OEPA Comment No. 55.

Action: See Section 03310 of the IDP Specifications for cast-in-place concrete requirements.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 13010 Impacted Material Placement *Pg. #:* *Line #:* *Code: G*
Original Comment # 77
Comment: A specification for the degree of compaction and other pertinent geotechnical properties should be included in this section. Assumptions about the moisture content and degree of compaction were made in estimation of the cap settlement.

These assumptions need to be carried through as specifications.

Response: The requested information is contained in the OSDF Impacted Material Placement (IMP) Plan. This plan will be a Contract Document; the OSDF Construction Contractor will be required to fully comply with this plan. The IMP Plan is incorporated by reference in Section 13010 of the OSDF IDP Specifications.

Action: See Section 13010 of the IDP Specifications and Sections 6, 7, and 8 of the February 1996 IMP Plan (Revision C).

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02220 Earth Work *Pg. #: 02220-6* *Line#:3.03 B* *Code: E*
Original Comment # 78
Comment: *A reference is made to section 02290, which does not exist. Section 02270 is the correct reference.*

Response: Comment noted. See response to OEPA Comment No. 55.

Action: Please see Section 02220, Paragraph 3.03, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02220 Earth Work *Pg. #: 02220-6* *Line#:3.03 E* *Code: E*
Original Comment # 79
Comment: *This section might reference Sheet X-5, the Existing Site Utility Map.*

Response: Please recognize that construction specifications do not typically cross-reference construction drawings. Also, note that the Contractor is responsible for locating all structures, even those not shown on the drawings.

Action: None.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #:02225 Compacted Clay Liner & Cap *Pg. #:02225-4* *Line#:3.02C* *Code:E*
Original Comment # 80
Comment: *The word fee should be replaced with free.*

Response: Comment noted.

Action: Please see Section 02225, Paragraph 3.03, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02250 Vegetative Soil Layer Pg. #: 02250-2 Line #: 2.01 A. Code: E
Original Comment # 81
Comment: Referenced Section 1.04 D should be 1.04 C.

Response: Comment noted.

Action: See Section 02250, Paragraph 2.01, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02605 HDPE Manhole Pg. #: 02605-4 Line#:2.03 E Code: E
Original Comment # 82
Comment: In the last sentence, the word stack should be replaced with stock.

Response: Comment noted.

Action: See Section 02605, Paragraph 2.03, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02610 HDPE Pipe etc. Pg. #: 02610-5 Line#:2.04 A Code: E
Original Comment # 83
Comment: Section 02200 does not contain specification for pipe bedding material.

Response: Paragraph 2.04 now specifies that "pipe bedding material shall be gravel conforming to the requirements of Section 02215 of these Specifications."

Action: See Section 02610, Paragraph 2.04, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02770 Geomembrane Cover & Liner Pg. #:02770-6 Line#:2.02 Code:E
Original Comment # 84
Comment: Table referenced should be 02770-1 or 02770-2. The reference is to Table 02771-1.

Response: Comment noted.

Action: See Section 02770, Paragraph 2.02, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02770 Geomembrane Cover & Liner Pg. #: 02770-7 Line#:2.03B.9 Code:E
Original Comment # 85
Comment: A frequency should be specified for the tests listed in this section.

Response: Standard industry practice is not to require frequencies for these performance tests. However, for the IDP Specifications, the following narrative requirement has been added: "The following tests need not be run at the 1 per 40,000 ft^2 frequency, however, the Geomembrane Manufacturer shall certify that these tests have been performed on a sample geomembrane that is identical to the geomembrane to be used on this project. The Contractor shall provide test result documentation."

Action: See Section 02770, Paragraph 2.03B, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02770 Geomembrane Cover & Liner Pg. #:02770-7 Line#:2.03B.9. Code:E
Original Comment # 86
Comment: A frequency be specified for the tests listed in this section.

Response: Comment is a repeat of Comment No. 85.

Action: None.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02770 Geomembrane Cover & Liner Pg. #:02770-10 Line#:3.03 E Code:E
Original Comment # 87
Comment: Table referenced should be 02770-1 or 02770-2. The reference is to Table 02771-1.

Response: Comment noted.

Action: See Section 02770, Paragraph 2.06, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02770 Geomembrane Cover&Liner *Pg. #: 270-16*
Original Comment # 88 *Line#:3.05J.3&4. Code:E*
Comment: Table referenced should be 02770-1 or 02770-2. The reference is to Table 02771-1.

Response: Comment noted.

Action: See Section 02770, Paragraph 3.04, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02930 Vegetation *Pg. #: 02930-1* *Line #: 1.02* *Code: E*
Original Comment # 89
Comment: All of the related sections listed in this section are nonexistent or misnumbered.

Response: See response to OEPA Comment No. 55.

Action: See Section 02930 of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 02930 Vegetation *Pg. #: 02930-5* *Line#:3.02 and 3.03 Code:E*
Original Comment # 90
Comment: These sections discuss placement of topsoil, which is covered in Specification 02920.

Response: Comment noted.

Action: See Section 02920 of the IDP Specifications for the topsoil placement requirements. Duplicative requirements in Section 02930 have been eliminated.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 03310 Cast-In-Place Concrete Pg. #: 03310-1 Line#:1.02 Code: E
Original Comment # 91
Comment: *All of the related sections listed in this section are nonexistent or misnumbered.*

Response: See response to OEPA Comment No. 55.

Action: See Section 03310 of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: 13040 Control of Fugitive Dust Pg. #: 13040-2 Line #:1.04 C. Code: E
Original Comment # 92
Comment: *The statement should be changed to read "The Contractor shall submit a dust control plan to the Engineer for approval."*

Response: Comment noted.

Action: See Section 13040, Paragraph 1.04, of the IDP Specifications.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet X-4* *Line#:Note 8. Code: G*
Original Comment # 93
Comment: *Because the underlying tills will be relied upon for the future leachate containment in the landfill, a more specific well abandonment plan should be referenced. Some of these well bores are conduits directly to the water table aquifer.*

Response: DOE will submit the Well Plugging and Abandonment procedure to the OEPA prior to the submittal of the interim design review package.

Action: Submit Well Plugging and Abandonment Procedure to OEPA for concurrence.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-24* *Line #: Detail 4* *Code: G*
Original Comment # 94
Comment: *The geomembrane in the liner and the geomembrane in the cap should meet and be seamed together to encapsulate the waste.*

Response: It is unnecessary to seam the liner system and final cover system geomembranes together. The OSDF is designed so that this area of the liner system will not be subjected to leachate. The current design has the benefit of extending the final cover system over the entire anchor trench and clay plug area. The current design also has the benefit of providing protection to the primary geomembrane liner as soon as it is installed. If an attempt were made to seam the final cove system geomembrane to the primary geomembrane liner, a significant potential would exist for damaging the primary geomembrane liner (at a point in time when repair to the geomembrane would be very difficult due to the fact that the OSDF cell will already contain impacted material).

Action: See Detail 23 on IDP Drawing G-26 for the liner system and final cover system tie-in detail.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-24* *Line #: Detail 4* *Code: G*
Original Comment # 95
Comment: *The anchor trench should have 3 feet of compacted clay liner beneath it.*

Response: The anchor trench in the PDP has 3 ft of clay beneath it. Note, however, that there is no ARAR or OAC requirement for 3 ft; the 3 ft thickness of clay was originally included as a conservative design measure.

Action: See Detail 9 on IDP Drawing G-22 for the anchor trench detail.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-25* *Line #: Section A Code:*
Original Comment # 96
Comment: *In Section A, the drainage layer is shown as terminating at the toe of the cap. A design criteria given on page 2-59 of the Design Criteria Package states the drainage layer should be designed to rapidly convey infiltrating liquid off of the OSDF final cover system. It is not clear to us how the seepage will discharge out of the toe of the cap.*

Response: As shown in the referenced section, the cover drainage layer will free discharge into the biointrusion barrier. It is noted that this section has been revised for the IDP to have the cover drainage layer continuous to the perimeter drainage channel (which will result in free discharge).

Action: See Details 32, 34, 35, and 36 on IDP Drawing G-30 for updated details of the final cover system drainage layer termination at the OSDF perimeter.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-26* *Line #:* *Detail 13* *Code: G*
Original Comment # 97
Comment: *Will the cover drainage layer discharge into the geotextile cushion then into the selected impacted material? A sacrificial geomembrane layer extended from the end of the cover geomembrane down the slope of the seasonal cover would prevent this.*

Response: The direction of flow in the cover drainage layer is normal to the plane of the cross section. Cross-gradient flow as envisioned by the comment should not occur to an appreciable extent.

Action: See Detail 24 on IDP Drawing G-26 for the final cover system to seasonal closure tie-in.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-27* *Line #: Details 14, 15, and 18* *Code: G*
Original Comment # 98
Comment: *Will the geocomposite layer tend to clog if directly overlain by the vegetative soil layer?*

Response: The geocomposite drainage layer (which was a component of the interim closure detail for the PDP) is fabricated with a needlepunched nonwoven geotextile bonded to its upper surface to mitigate the potential for clogging by the overlying soil layer. It is noted that the interim closure details have been removed from the IDP; therefore, there is no geocomposite drainage layer in the IDP OSDF design.

Action: None.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-29* *Line #: Detail 23* *Code: G*
Original Comment # 99
Comment: *The redundant LCS containment pipe is not shown, only the redundant LCS collection pipe.*

Response: The containment pipe for the redundant LCS pipe has been added to the cell layout grading plans for the IDP.

Action: See the cell outlet grading plans on IDP Drawing C-9.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-30* *Line #: Section A G-30* *Code: G*
Original Comment # 100
Comment: *The LDS transmission pipe is shown about 0.38 ft above the bottom of the LDS drainage layer. However in Section A G29, the pipe is shown as resting directly on the bottom of the LCS drainage layer. A similar situation exists for the LCS transmission pipe. It would be advantageous to have these transmission pipes rest on the bottom of the drainage layer, as this would minimize ponding on the bottom of the drainage layers.*

Response: The LDS and LCS are designed to rest directly on the underlying liners. The drawings for the IDP have been revised to better reflect this condition.

Action: See the LCS and LDS details on IDP Drawing G-24.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: Pg. #:Sheet G-30 Line #:Sections A G29, A G30, B G30, C G30 Code:G
Original Comment # 101

Comment: What is the purpose of the concrete pads in the LDS and LCS drainage layers near the penetrations? Will the rigidity of these cause problems with differential settlement, since the pads may resist the settlement that occurs around them? How will casting in place directly on the GCL affect the integrity of this material?

Response: The concrete pads were included in the PDP as part of the design of the liner system pipe penetrations. They were intended to fill a depression needed to allow welding of a geomembrane boot to each pipe. The liner system penetration details have been revised and improved for the IDP. As part of the revisions and improvements, the concrete pads were eliminated from the design.

Action: See IDP Drawings G-24 and G-25 for the liner system penetration details.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: Pg. #: Sheet G-30 Line #:Sections A,B, and C G30 Code: G
Original Comment # 102

Comment: How will the clay liner be compacted around the Containment pipes at the penetrations of the compacted clay liner? How will the integrity of the seal at the penetrations be verified?

Response: The clay material around the liner system pipe penetrations will be placed in lifts in accordance with the OSDF Specifications and compacted to the required dry density and moisture content using hand-

held compactors. The integrity of the seals for the pipe penetrations will be air pressure tested in the field as indicated on Drawing G-25 of the IDP.

Action: See Section 02225, Paragraph 3.04, of the IDP Specifications for the requirements for compaction of clay liner material around LCS and LDS containment pipes, and IDP Drawing G-25, Note 3, for the testing requirements for the pipe penetration seal.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-30* *Line #:Sections A,B, and C G30* *Code: G*
Original Comment # 103
Comment: How will the rigidity of the HDPE flat stock at the transmission and containment pipe penetrations cause problems with differential settlement, since this is a large bearing surface fixed rigidly to the pipe? Should the edges of the flat stock be beveled so the liner won't rest against a square edge? Should the GCL lap underneath the HDPE flat stock, not butt up against it?

Response: The liner system penetration details have been revised and improved for the IDP. As part of the revisions, the HDPE flat stock was eliminated from the design.

Action: See IDP Drawings G-24 and G-25 for details on the revised and improved liner penetration details.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet G-32* *Line #:* *Code: G*
Original Comment # 104
Comment: Why aren't there level alarms in the secondary containment (i.e., manholes and containment pipes). Leaks within the secondary containment system cannot be detected without entering the manholes.

Response: The design of the OSDF LTS essentially meets the goal expressed in the comment. The IDP drawings show a liquid level sensor in each LCS

manhole (which provides secondary containment) and in the primary containment vessel of each LDS manhole. With respect to the LDS manholes, should there be a leak in the LDS manhole primary containment vessel, and were liquid to flow into the vessel, and then leak through the vessel and into the manhole, the liquid level in the manhole and vessel would be the same due to the hydraulic connection between the two. Thus, if there was enough leakage to raise the liquid level in the manhole, it would also raise the liquid level in the primary containment vessel, causing the liquid level sensor in the vessel to be activated.

Action: See IDP Drawings M-2 and M-3 for the LTS instrumentation diagrams showing the locations of the liquid level sensors.

Commenting Organization: OEPA *Commentor: GeoTrans, Inc.*
Section #: *Pg. #: Sheet X-3* *Line #:* *Code: E*
Original Comment # 105
Comment: The wind rose indicates about 2% of the frequency distribution in the 17-21 knot range. This is not indicated in the legend.

Response: DOE has reviewed the wind rose and legend shown at Drawing X-3 for correctness of the wind rose and the information presented in the legend. DOE also has checked the wind rose and legend shown at drawing X-3 against the source document cited, namely Figure 3-1 from the Operable Unit 2 Remedial Investigation Report. As a result of that review, DOE concludes that both the wind rose and legend presented in Drawing X-3 have been reproduced from the cited reference document without error.

Action: None.

Commenting Organization: OEPA *Commentor: Ohio Department of Health*
Section #: 2.4.7 *Pg. #:2-36* *Line #:* *Code: G*
Original Comment #106
Comment: The Geomembrane Compatibility Study to be conducted mentions chemical and physical tests as an indicator of durability after

installation. Mixed microbial populations inherent in soils and solid waste may also potentially impact the geomembrane system by their metabolic activities. This would be more pronounced during the initial period when more leachate is expected to be generated. Is there any consideration or contingency for how long (or if) this may impact meeting the ARAR for functional longevity of at least 200 to 1000 years? Also of concern is the effect of ultraviolet light on the geomembrane if it remains exposed for an extended period during installation.

Response: The potential for microbial activity to affect the HDPE geomembrane to be used in the OSDF liner system was addressed as part of preparation of the OSDF Leachate/Liner Compatibility Study Work Plan which was provided to OEPA in February 1996. The following information is provided on page 4-3 of Revision C of the aforementioned document:

> "The majority of the impacted materials at the OSDF will be soil (> 80% by volume), consisting of a significant proportion (approximately 45% by volume) of carbonate minerals (Table 3-2). Since the soils will be essentially inorganic (and therefore polar) and HDPE geomembranes are organic (and therefore nonpolar), the soils and HDPE geomembrane are not expected to interact [Wrigley, 1987; Wrigley, 1989]. In addition, Schwope et al. [1985] reported that HDPE geomembranes are resistant to carbonates. Moreover, even when exposed to soils that are rich in organic materials, such as fungi and bacteria, HDPE materials do not degrade [Albertsson, 1978]."

With respect to ultraviolet light, page 2-8 of the aforementioned document states, "during manufacture, a small percentage of carbon black (usually about 2.5 percent by weight) is added to the polyethylene resin. The carbon black is an ultra-violet (UV) light absorber and an oxidation inhibitor." With the carbon black additive, which will be required by the OSDF Specifications, an HDPE geomembrane can be exposed to sunlight for many years without significant degradation in properties. Nonetheless, the OSDF HDPE geomembranes will only be exposed to sunlight for much shorter periods of time, likely for several weeks to a few months.

Action: None.

Commenting Organization: OEPA *Commentor: Ohio Department of Health*
Section #: *Pg. #:* *Line #:* *Code: G*
Original Comment #107

Comment: There was no estimate of the amount of municipal (putrescible) material which may be placed in the OSDF. It is suggested that this be kept to a minimum to preclude the added expense of installing a gas venting system.

Response: DOE agrees that the amount of what is usually thought of as municipal (petruscible) waste to be placed into the OSDF should be limited in order to preclude the added expense of installing a gas venting system.

With this concern in mind, along with compressibility and settlement concerns, focused efforts on investigating the major known source of potential municipal-like waste — the Solid Waste Landfill within Operable Unit 2 — were undertaken during the Operable Unit 2 remedial investigation (RI). That effort was known as the Sanitary Landfill Soil Trenching Study. Its findings were identified in the Operable Unit 2 RI Report and again in the Operable Unit 2 FS Report. Pertinent points are summarized as follows: approximately 20-25 percent of the volume of the OU2 Solid Waste Landfill could be considered "burnable" or "possibly burnable"; burnable could be construed to be petruscible; the volume of excavated materials from that landfill is estimated at 24,200 cubic yards; collectively, this equates to approximately 6,050 cubic yards (bank/unbulked) out of an estimated 2,500,000 cubic yards (also bank/unbulked) of materials within the OSDF, or 0.0024 percent by volume.

Given these quantities, the DCP under A. Design Criteria within Section 2.11.2.5, Impacted Material Placement, includes a design criteria such that "municipal solid waste" be spread in thin lifts with soil cover in order to minimize the potential for generation of landfill gas from anaerobic decomposition, as well as to minimize the potential for differential settlement. Specifics for management of impacted materials are presented in the forthcoming Impacted Materials Placement Plan.

Action: None.

Commenting Organization: OEPA *Commentor: Ohio Department of Health*
Section #:3.2.6.2 *Pg. #: 3-7* *Line #:* *Code: G*
Original Comment #108

Comment: The Impacted Materials Placement Plan is a critical document which should detail how incoming wastes will be screened to meet the WACs In addition, data obtained from the DOE and AIP air monitoring efforts should be closely coordinated with excavation and placement activities in order to minimize fugitive emissions and keep worker and public exposures ALARA. The details of how these tasks will be accomplished require clarification.

Response: DOE agrees that the details of how impacted materials are assured to meet the WAC is critical. As will be stated in the forthcoming Remedial Action Work Plan for the On-site Disposal Facility (OSDF), the documentation of whether FEMP remediation project impacted materials (soil or debris) meet the WACs established for the OSDF will be the responsibility of the remediation project which will generate the material. Forthcoming FEMP remediation project work plans (e.g., soil excavation work plans) — to be approved by the agencies — will be the documents to discuss how the WACs will be met, as well as when and to what degree the necessary sampling and analysis *or* field screening will occur.

DOE also agrees that the excavation and placement activities for impacted materials need to be managed to adequately control dust and fugitive emissions in order to protect worker and public health. Numerous forthcoming documents will focus on this concern — OSDF Remedial Action Work Plan, Impacted Materials Placement Plan, Operations and Maintenance Plan, Borrow Area Management and Restoration Plan, and appropriate specifications, will identify dust and fugitive emission control requirements; the Air Monitoring Plan will identify the air monitoring requirements.

Action: None.