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**OEPA COMMENTS ON THE DRAFT-FINAL SOIL-GEOSYNTHETIC INTERFAC  
DIRECT SHEAR TESTING REPORT**

11/29/96

OEPA

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COMMENTS



State of Ohio Environmental Protection Agency

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George V. Voinovich  
Governor

November 29, 1996

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

**Subject: OEPA Comments on the Draft-Final Soil-Geosynthetic Interface Direct Shear Testing Report**

Dear Mr. Reising:

The Ohio EPA has reviewed the Draft-Final Soil-Geosynthetic Interface Direct Shear Testing Report which was received in our office on October 31, 1996. Based upon this review, attached to this cover letter are our comments.

Should you have any questions, please feel free to contact Tim Hull or me.

Sincerely,

Thomas A. Schneider <sup>for</sup>  
Fernald Project Manager  
Office of Federal Facilities Oversight

cc: Jim Saric, USEPA V  
Terry Hagen, FDF  
Sharon McLellan  
Ray Beaumier, TPSS/DERR, CO

(John G.)  
As final  
action  
response  
to file - 0103-97  
(10138)

1.) Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.  
 Section#: General Pg#: Line#: Code: C

Original Comment#:

Comment: Information on GCL performance relative to the first exposure of actual hydrating liquids should be included. What types of leachate or site groundwater is expected to hydrate the GCL and how will this effect performance? What would be the effect on the shear strength results if the test specimens were soaked in representative leachate (rather than water) prior to testing?

2.) Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.  
 Section#: Appendix A Pg#: 410 Line#: Note 7 Code: C

Original Comment#:

Comment: The frictional characteristics of some geosynthetics are dependent on the shear direction. What analyses were conducted to determine if a direction bias exists?

3.) Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.  
 Section#: General Pg#: Line#: Code: C

Original Comment#:

Comment: The conclusions section states that "an assessment of the laboratory testing conditions that form an appropriate basis for design" was conducted. However, it remains unclear what field values the test variables are being compared to. The text should more clearly state what steps were taken to insure that the conditions reproduced in the laboratory are consistent with expected field conditions, specifically the modes of failure expected in the field.

4.) Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.  
 Section#: General Pg#: Line#: Code: C

Original Comment#:

Comment: Please explain the QA/QC procedures for retesting or eliminating test outliers. For example, if one or more of the tests conducted at different normal compressive stresses were inconsistent with previous results.

5.) Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.  
 Section #: 3.2 Geosynthetic and Soils Materials Pg. #: 3.1 Line # Code: C

Original Comment #

Comment: It is our understanding that shear tests are very material specific. In performing the tests only on the materials listed in this section, DOE has significantly narrowed the potential list of liner materials to be used in the landfill. Are these all of the materials in consideration, or will tests be performed on the final design after all vendors and materials have been selected?

6.) Commenting Organization: Ohio EPA                      Commentor: GeoTrans, Inc.  
 Section #: 3.2 Geosynthetic and Soils Materials      Pg. #: 3.1 Line #      Code: C

Original Comment #

Comment: Only two HDPE geosynthetics, both GSE materials, were retained for testing in this study. Are these the same two GSE materials that were tested in the compatibility study? The names given for the materials are not the same as in the compatibility test document.

7.) Commenting Organization: Ohio EPA                      Commentor: GeoTrans, Inc.  
 Section #: 3.3 Soil Characterization Tests Pg. #: 3-4 Line #      Code: C

Original Comment #

Comment: In describing soil sample selection, clay soil samples to be used for this study were screened so the Plasticity Index exceeded 17 for clay soil and exceeded 30 for supplemental clay soil. Where did these guidelines for Plasticity Index come from?

8.) Commenting Organization: Ohio EPA                      Commentor: GeoTrans, Inc.  
 Section #: 3.4.2 Testing Procedures Pg. #: 3-19 Line #      Code: C

Original Comment #

Comment: In Test Series Numbers 7, 8, and 12 through 22B, the procedure for placing the clay soil or supplemental clay soil is given as compaction by hand tamping to the reported dry unit weight for each normal stress condition. How will the level of compaction be verified? The level of compaction will affect the results of the test, and there must be some way of monitoring this before the testing is performed.

9.) Commenting Organization: Ohio EPA      Commentor: GeoTrans, Inc.  
 Section#: Section 5                      Pg#: 5-1      Line#: NA      Code: C

Original Comment#:

Comment: The sensitivity analyses performed relative to shear rates includes an evaluation of rates that are ten times faster, but does not include rates that are slower (i.e., less than 0.1 mm/min). The sensitivity analysis should include an evaluation of rates on either side of the selected value.

Are the shear tests performed at the slower 0.1 mm/min rate considered drained or undrained tests? How does this effect the test results?

10.) Commenting Organization: Ohio EPA                      Commentor: GeoTrans, Inc.  
 Section #: 5.2 Effect of Shear Displacement Rate      Pg. #: 5-1 Line #      Code: C

Original Comment #

Comment: The conclusion reached about the summary of the shear displacement rate tests is that the slower rate tends to have a higher shear strength. However, the results on Table 5-1 indicate this is true for two of the three interfaces tested. Is it possible

that this trend is material specific? Can we safely draw the conclusions about this trend based on testing of three material interfaces?

11.) Commenting Organization: Ohio EPA      Commentor: GeoTrans, Inc.  
Section #: 5.2 Effect of Shear Displacement Rate    Pg. #: 5-1 and 5-2 Line #    Code: C  
Original Comment #

Comment:    In the conclusion to this section, the slower shear rate is chosen as the design basis; however, this gives the highest shear strength of the two rates tested. It would be more conservative to use the lower of the two shear strengths, or the higher of the two shear rates.

12.) Commenting Organization: Ohio EPA      Commentor: GeoTrans, Inc.  
Section#: Section 5.4      Pg#: 5-6      Line#: NA      Code: C  
Original Comment#:

Comment:    Sensitivity analyses were conducted for shear displacement rate, clay compaction conditions, and clay plasticity. The cumulative effect of varying these parameters was not considered. What would be the cumulative effect under the worst case scenario for each variable? Note that summing the individual results with no re-testing will likely not give the same result as an actual test.

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