N00129.AR.000476
NSB NEW LONDON
5090.3a

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

January 16, 1997

Mark Evans, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: Revised Design Analysis Report Area A Landfill - Interim Remedial Design for the Naval Submarine Base - New London, in Groton, Connecticut

Dear Mr. Evans:

This letter provides EPA's comments to the interim remedial design for the Area A Landfill performed by Brown & Root Environmental. Following our review of the "Revised Design Analysis Report," dated December 1996, EPA concurs with the methods and assumptions made in the revised design with the following exception:

Based on the proposed design, the thickness of the final cover will expose the geocomposite liner ("GCL") to freeze-thaw cycles. Final cover for the plateau area consists of a 21-inch thick composite pavement/drainage layer overlying the composite geomenbrane/GCL low permeability barrier system. The report indicates the GCL is below the depth of frost penetration. According to Groton City Engineers, depth of frost penetration in the area of the site is 42 inches. This places the GCL well within the frost zone, thus exposing the material to freeze-thaw cycles.

On side slopes, the GCL will be replaced with a 6-inch thick cohesive backfill material consisting of silty sand or clayey sand. I assume the material will be used as an infiltration layer with a permeability of not more than 1×10^{-5} centimeters per second ("cm\sec"). To achieve this permeability, a minimum compacted thickness of at least 18 inches is necessary. To support this recommendation, the report states the GCL for the plateau area is a direct substitution for a 2-foot thick infiltration layer (permeability less than 1×10^{-5} cm/sec).

The factor of safety against sliding was determined using interface friction angles chosen from literature and available data. EPA recommends that these assumed interface strength parameters, especially the geomembrane interface strength parameters, be verified using strength parameters determined from actual site soil materials and geosynthetics specified in the design. This would verify the critical interfaces assumed for the plateau and side slope areas.

PRINTED ON RECYCLED PAPER

The report indicates "the low shear strength and interface characteristics of a reinforced GCL render the material undesirable for steep side slope applications." The apparent concern is the creep effects relative to long-term performance, as indicated in Reference 19 of the report. Additional concerns include, the effects of swelling, and the need for more refined shear test methods for defining shear strength parameters. The use of GCLs on slopes is currently in a state of debate for the reasons indicated above. In recent years, designers have used GCLs on side slopes as steep as 3 horizontal to 1 vertical with no reported failures. However, when considering their use, I recommend that actual test parameters be used in the design, in addition to conducting a cost versus risk evaluation.

I look forward to working with you on the construction of the cap. Please do not hesitate to contact me at (617) 573-5777 should you have any questions.

Sincerely,

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Mark Lewis, CTDEP, Hartford, CT
Andy Stackpole, NSBNL, Groton, CT
Yoon-Jean Choi, USEPA, Boston, MA
Dale Weiss, TRC Environmental, Lowell, MA
Jennifer Hayes, Gannett Fleming, Harrisburg, PA
Matthew Cochran, Brown & Root, Pittsburgh, PA