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North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor  
William G. Ross Jr., Secretary

August 5, 2004

Mr. Thomas Yanoschak, P.E.  
and Mr. Timothy Grant, L.G.  
Camp Dresser & McKee  
5400 Glenwood Avenue, Suite 300  
Raleigh, North Carolina 27612

RE: Black Bear Disposal, LLC,  
a subsidiary of Waste Industries, USA, Inc.  
Site Study, March 2004  
Camden County, North Carolina

Dear Mr. Yanoschak and Mr. Grant,

The above referenced Site Study for the proposed Black Bear Disposal Facility has been reviewed for hydrogeologic concerns by the Solid Waste Section. There appears to be a number of items in the Report that require clarification, revision, or additional information. Please respond to the following questions and comments:

Section 2 - Regional Characterization Study:

- 2.2 There is no USGS Topographic Map as required by Rule .1618(c)(1)(A).
- 2.3 The Report states: "The properties with private wells are noted on Figure 2-1". However these properties and wells do not appear to be noted on Figure 2-1.
- 2.4 Likewise, the residential properties do not appear to be designated on Figure 2-1, as stated in the Report.
- 2.5 I assume, though it is not stated in the Report, nor is it shown on Figure 2-3, that the primary waste transportation route is via U.S. Hwy. 17.

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Section 3 - Local Characterization Study:

- 3.2 There is no map showing existing topography, surface water drainage patterns, etc., as required by Rule .1618(c)(2)(G).
- 3.10 The Report states: "there are no 100-year floodplains within the 2000-foot perimeter", however Figure 3-1B shows a 100-year flood area at the northeast corner of the 2000-foot perimeter. The FEMA maps referenced should also be included in the Report.

Section 4 - Site Hydrogeologic Investigation:

- The review comments for the Site Hydrogeologic Investigation Report appear after the Site Study review, since it was submitted as a separate report.

Section 5 - Location Restrictions:

- 5.6 The USGS is constantly updating and revising the Seismic Hazard Maps. Have more recent maps been checked for the proposed landfill area? Do the maps indicate an increasing or decreasing level of concern regarding seismic hazards for this location?
- 5.7 Considering the height of proposed waste fill and the associated loading, and considering the saturated soils and low Standard Penetration Resistance blow count values recorded in most of the Boring Logs, it appears that soil liquefaction is a potential concern. While it is not likely that this would make the site totally unsuitable, this could greatly affect the amount of waste disposal at the site. Please provide at least some preliminary evaluation of the potential for soil liquefaction.
- 5.9 The Report states: "The Great Dismal Swamp is approximately 7,000 feet west of the proposed facility boundary along the west side of US 17". In the Attachment 5-5 Figure, the distance appears to be only about half that stated in the Report.

Attachment 5-2 In the Attachment for Wetlands Information, there is mention of fairly extensive and deep mining operations in the vicinity of the proposed landfill. Any existing or proposed mining or borrow activities, on-site or off-site, in the vicinity of the proposed facility that would have any potential to affect hydrology within the proposed facility needs to be clearly identified in the Report. The location, size, depth, water pumping activities, duration, post-closure use, etc. for any mines or borrow pits needs to be clearly identified.

#### Section 7 - Facility Plan:

7.1 What is the exact acreage for the proposed facility?

Drawing SD-2, Site Development, shows the majority of the required minimum 300 foot buffer taken up with an Access Road and Borrow Pit/Stormwater Pond. One of the main purposes of the buffer is to provide an area for ground-water monitoring, and should there be a contaminant release, an area for attenuation, water quality assessment, and possible corrective action. Generally borrow pits are not permitted in the buffer area or within 300 feet of the waste disposal unit. While sedimentation basins constructed at least 2 feet above the seasonal high water table are sometimes allowed in the buffer area, there must remain sufficient room for ground-water monitoring and possible assessment and remediation.

#### Section 8 - Preliminary Geotechnical Evaluation:

8.1 The facility acreage, landfill acreage, and landfill height are all inconsistent with values stated in Section 7 and other parts of the Report.

8.5.2 A layer of "fill" is described below the top soil. How and when could a "fill" layer of 0 to 8 feet of soil be placed below the top soil?

Table 8-1 For Boring B-1, the Strata Thickness do not add up to the Total Drilling Depth. It appears that the Sand, Sand with shell fragments, and Sand (total) values are incorrect. After finding errors in the table for B-1, I did not check the other borings. Please check the data in Table 8-1 for accuracy and make revisions as necessary.

Table 8-2 For Boring B-1, according to the Boring Log the sample interval from 33 to 35 feet is sample S-10, a fine silty sand. This differs from the information on the table. After finding apparent errors in the table for B-1, I did not check the other values. Please check the data in Table 8-2 for accuracy and make revisions as necessary.

Table 8-3 The Grain Size Analysis data for the two B-7 samples appears to be reversed. I was not able to locate the support documentation in Appendix B for some of the values in the table. After finding some errors in my initial evaluation of the B-7 samples, I did not check the other values. Please check the data in Table 8-3 for accuracy and make revisions as necessary.

#### Section 4 - Site Hydrogeologic Report:

- Rule .1603(b)(2)(A) requires "The text of the application shall: Be submitted in a three ring binder".
- 1.2 Since the ditches and borrow areas largely control surface water flow and shallow ground-water flow, it is very important to understand the surface water flow patterns and present this information in detail in the Report. What are the flow patterns in the various ditches? Where are existing and proposed borrow pits located? What are the proposed depths of borrow pits? How long are the borrow pits to be in operation? What are the pumping rates and volumes and how is the pumped water dispersed? A thorough understanding of these things is necessary in order to understand the hydrologic regime of the upper portion of the surficial aquifer.
- 1.3 Please clarify the discrepancies within the Report regarding the amount of total acreage in the proposed facility and the acreage to be used for landfilling.

Table 1 For those Boring Logs that include TOC Elevation values, the TOC Elevations in Table 1 do not match those on the Boring Logs. There is no TOC Elevation data provided on the Boring Logs for GP-1 through GP-34 and B-35 through B-44. What is the source of TOC Elevations for these borings. Likewise, there is a lack of Ground Elevation data for many of the borings on the Boring Logs.

Table 1 The Screen Interval values for Borings B-1 and B-7 differ with those on the Boring Logs. For many of the borings, the Sand Filter Interval values and Bentonite Seal values differ from those on the Boring Logs.

Table 2 It is not clear how the USCS Soil Classification was established for B-26, since there are no Atterberg Limits. I was not able to find documentation for the Porosity data? What is the source of the Estimated Effective Porosity values? Based on the soil analyses and the Soil Classification Triangle, I calculated different Effective Porosity values from those in Table 2.

Table 3 Refer to previous comments regarding TOC Elevations.

1.7 The data is insufficient for providing "Tabulations of stabilized water table elevations over time in order to develop an understanding of seasonal fluctuations in the water table", as required by Rule .1623(a)(7)(B). There is no "estimation of the long-term seasonal high water table" as required by Rule .1623(a)(7)(C). There is no "discussion of any natural or man-made activities that have the potential for causing water table fluctuations", as required by Rule .1623(a)(7)(D). As referenced earlier in this letter, this information is especially critical for understanding the hydrology for this site.

1.8.1.2 I was not able to calculate the same Screen Midpoint Separation values that appear in the chart. This may be due to the discrepancies noted in Table 1. Was just the saturated portion of the shallow well screens used?

Table 6 It is not clear how the Hydraulic Conductivity values were determined. Appendix D has raw data and graphs, but I was not able to find any actual Hydraulic Conductivity calculations or values.

Table 7 What is the source of the Horizontal Gradient values, Effective Porosity values, and Permeability values?

Drawings:

- The facility boundaries are not indicated on Sheets 1 or 2.
- The Ground Elevation for Boring GP-33 is incorrect on Sheet 1.

- For Sheet 2, the Ground-water Contours appear inaccurate in some locations. Examples: in the vicinity of B-2 Shallow, B-27, GP-29. At other locations it appears the contours are not best proportioned based on the data available. Where is the ground-water divide and south-easterly element of ground-water flow that is referenced in the Report?
- Sheet 3: What is the basis for defining the different hydrogeologic units for many of the borings that do not have Boring Log data provided. In some random spot checks, I was not able to match Ground Elevations and soil profiles for some of the borings.

Appendix A - Boring Logs and Well Construction Diagrams:

- Several of the deep borings were drilled significantly deeper than where the well screens were placed. How were the bottoms of these holes plugged?
- Note previous comments regarding discrepancies in TOC elevations between the Boring Logs and the tables.
- Many of the borings have no boring log information, ground surface elevations, or TOC elevations.

Appendix D - Slug Test Data:

- Note previous comment regarding apparent lack of hydraulic conductivity calculations and values.

The proposed Black Bear Disposal Facility in Camden County is a somewhat unique site in that the hydrology of the shallow portion of the uppermost aquifer is largely controlled by man-made features, such as ditches, borrow pits, sedimentation basins, and the landfill itself. Therefore it is critical that the effect of all these features be clearly understood regarding how they shape the ground and surface water flow regime. While there does not appear to be any thing that would preclude landfill development, these issues could dramatically affect the design of the landfill and its associated appurtenances, such as the erosion and sedimentation control features. It will be critical to design the landfill facility in such a way so as to allow adequate buffer for effective ground and surface water monitoring. The buffer must also be sufficient to allow for possible water quality assessment and corrective action, if this should ever become necessary.

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Please respond to the questions and comments raised above, and provide additional information and revisions as necessary. If you have any questions or would like to arrange for a meeting to discuss these issues, you may contact me at (919) 733-0692, extension 258.

Sincerely,

*Bobby Lutfy*

Bobby Lutfy  
Hydrogeologist  
Solid Waste Section

cc: Jim Barber Solid Waste Section  
~~Chuck Boyette~~ Solid Waste Section  
Chuck Boyette SWS - Washington