

# HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.

## CONSULTING ENGINEERS

484 MULBERRY STREET, SUITE 265 • POST OFFICE BOX 974  
MACON, GEORGIA 31201

H. LOWRY TRIBBLE, JR., PE  
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HAROLD L. NEWBERRY, PE  
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TELEPHONE (912) 743-7175  
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December 5, 1994

Mr. Ed Mussler, III  
Environmental Engineer  
P.O. Box 27687  
Raleigh, N.C. 27611

Fac/Perm/Co ID #	Date	Doc ID#
<i>08-031</i>	<i>7 11 5 1994</i>	<i>DIN 4386</i>

**Re: Technical Review  
East Carolina Regional Landfill  
Permit No. 08-03**

Dear Mr. Mussler:

We are currently completing a resubmittal of information on the referenced project, and it is our expectation that this information will be forwarded to you by December 15, 1994.

Should you have any question, please call.

Sincerely,

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**



William F. Hodges, P.E.  
Principal

WFH:tt

cc: Mr. John Murray, P.E.

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

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November 3, 1994

Mr. Ed Mussler, Environmental Engineer  
Solid Waste Division  
P.O. Box 27687  
Raleigh, N.C. 27611

**Re: East Carolina Landfill  
Bertie County, N.C.  
HHNT Project No. 1001-088-01**

Dear Mr. Mussler:

We have enclosed a revised Waste Screening Plan on the subject project to become part of the Transition Plan.

Should you have any questions, please call.

Sincerely,

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

  
William F. Hodges, P.E.  
Principal

cc: John Murray, P.E.  
Chuck Ketring, P.G.  
Greg Elkins  
H. Lowry Tribble, Jr., P.E.  
Harold L. Newberry

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

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November 10, 1994

Mr. Ed Mussler, Environmental Engineer  
Solid Waste Division  
401 Oberlin Road  
Raleigh, NC 27611

**Re: East Carolina Landfill  
Project No. 1001-109-01**

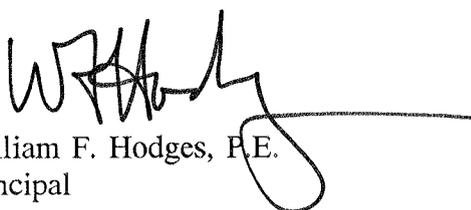
Dear Mr. Mussler:

We have enclosed several revised replacement pages for the Transition Plan under the heading of "D. Leachate Management".

Should you have any questions, please call.

Sincerely,

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

  
William F. Hodges, P.E.  
Principal

cc: John Murray, P.E.  
Chuck Ketring, P.  
Greg Elkins  
H. Lowry Tribble, Jr., P.E.  
Harold L. Newberry, P.E.

**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

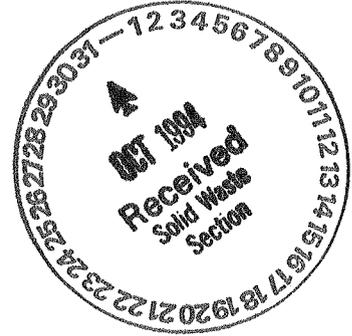
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HAROLD L. NEWBERRY, PE  
J. STEVEN HARBIN, PE

TELEPHONE (912) 743-7175  
FAX (912) 743-1703

October 28, 1994



Mr. Ed Mussler, Environmental Engineer  
Solid Waste Division  
401 Oberlin Road  
Raleigh, NC 27611

**Re: East Carolina Landfill  
Project No. 1001-109-01**

Dear Mr. Mussler:

We have enclosed several replacement pages for the Transition Plan under the heading of "D. Leachate Management".

Should you have any questions, please call.

Sincerely,

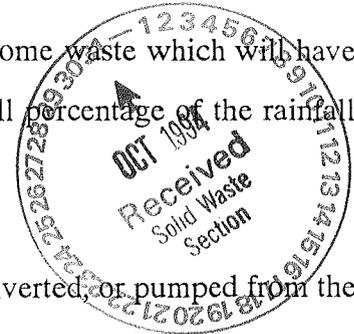
**HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.**

A handwritten signature in black ink, appearing to read "W. F. Hodges".

William F. Hodges, P.E.  
Principal

cc: John Murray, P.E.  
Chuck Ketring, P.  
Greg Elkins  
H. Lowry Tribble, Jr., P.E.  
Harold L. Newberry, P.E.

enter the system since practically, any cell will have some waste which will have some field capacity. Also, the sand will retain a small percentage of the rainfall event.



Stormwater above each of these dikes shall either be diverted, or pumped from the cell. Once this initial lift of waste is in place with an intermediate layer of soil, gravity drainage on top of the intermediate cover will be used.

The FML dikes shall be removed as the waste filling progresses to their location. In addition to their removal, the leachate collection pipe shall be connected to drain the leachate from that next portion of the cell. The FML dikes serve only the initial lift of the landfill.

An as-built drawing showing FML stormwater separation dikes shall be made when installation is complete. The design engineer will develop a detailed operation sequence based on this.

As a rule, any water that directly contacts waste shall be deemed leachate. Any water that is diverted away from the waste, and does not contact any waste, shall be deemed stormwater. Leachate shall be managed in the leachate management system and stormwater shall be directed to a stormwater management pond.

**D. Leachate Management**

Leachate is the liquid waste generated as stormwater passes through the landfill waste mass. In the East Carolina Landfill, this leachate is collected by a system of perforated pipes and sand media on top of the base liner system. The leachate

flows by gravity through this system to a penetration assembly in the liner system.

At the penetration assembly, the leachate leaves the lined landfill via solid leachate gravity transport lines. These lines, like the base liner system, is designed at grades which will cause gravity transport through the underground lines to a leachate pump station. This wet well mounted station will pump the leachate to the leachate holding tank. Leachate will be stored in this tank until it is periodically transported via a tanker truck to a POTW for treatment. The leachate storage tank is a glass lined steel tank capable of holding sixty days volume of leachate. For this site, a 250,000 gallon tank is provided. This tank has secondary containment capable of holding 110% of tank volume. This secondary containment is a system of concrete walls fused to a 60 mil HDPE floor. This is a sealed containment so it will be the operators responsibility to pump off uncontaminated stormwater at the conclusion of each rainfall event.

The leachate will either be handled at a private wastewater treatment facility such as the Marpol Facility in Virginia, or a local POTW (Windsor, Ahoski or another nearby facility). The leachate will be hauled by tanker truck to the selected facility.

Bertie County is planning to expand the Town's sewage collection system beyond the Town Limits into the unincorporated county. This expansion will bring collection lines to within six miles of the landfill facility. It is anticipated, that at that time, a force main may be constructed from the landfill facility to the expanded sewage collection system.

The leachate management system is sized based on the "Hydraulic Evaluation of Landfill Performance Model" (HELP Model), developed by the U.S. Army for the Environmental Protection Agency. The HELP Model cases, runs, and results are included in the appendix to this Operational Plan. Based on these runs, a case exists where the landfill will generate 190,480 cubic feet of leachate in one year.

Specifically, the Town of Windsor requires that the leachate storage be capable of holding 60 days generation of leachate. Therefore,  $(190,480 \text{ cu. ft.} \times 7.48 \text{ gallon/cubic foot}) / (12 \text{ months/year}) \times 2 \text{ months storage}$  equals 237,465 gallons of storage.) Since 60 days storage accounts for adequate factors of safety, a 250,000 gallon tank is satisfactory. Also, the Town has indicated the following for leachate treatment:

1. The leachate is pretreatment to the level required by the Town. This will in general terms, mean that the wastewater be no stronger than typical domestic wastes in terms of conventional pollutants, such as BOD<sub>5</sub>, ammonia nitrogen, and suspended solids. Non-conventional pollutants, such as metals and complex organic compounds must be present in concentrations not greater than the Water Quality Standards established for those pollutants by the State of North Carolina unless other levels are explicitly authorized by the Town. The required pretreatment system can therefore be expected to eventually contain not only biological treatment components, but also chemical precipitation and carbon absorption units.

2. During the period when pump and haul disposal is used, provision will be made to use rate-of-flow controllers on tanker trucks, with discharge bled into the Town's plant at a slow rate (8-24 hours). Provision will also be made for a system of identifying tanker trucks and drivers and preventing any non-leachate wastes from reaching the Town system.
  
3. East Carolina Environmental, Inc. will pay normal sewer user charges, plus normal surcharges where applicable, for all wastewater. In addition, East Carolina Environmental, Inc. will directly reimburse the Town for all expenses it incurs as a consequence of, or arising out of the Town's acceptance of the leachate. Such expenses could be expected to include but not be limited to: (1) engineering costs the Town incurs in reviewing various plans and submittals; (2) additional NPDES monitoring requirements imposed by the State because of the presence of the leachate; (3) sampling and testing costs incurred by the Town in verifying compliance with pretreatment standards.
  
4. The pump station and force main eventually built for transport of the leachate will be constructed to the Town's standards by and at the expense of the landfill. The design will include provision for odor and corrosion control, and all costs of operating the pump station, force main and odor and corrosion control system will be borne by the landfill.

5. The landfill permit application should include, or be amended to include, allowance for the acceptance for co-disposal of dewatered, stabilized sludge from the Windsor municipal system [Note: Recent State regulatory changes allow for such co-disposal for lined landfills. The Town does not presently dewater its sludge, but wishes to preserve dewatering and landfilling of sludge as a future disposal option]. East Carolina Environmental must agree to accept dewatered sludge from the Town of Windsor, subject of course, to the sludge's meeting all State regulatory requirements for co-disposal.

East Carolina Environmental agrees with the conditions posed by the Town of Windsor and will proceed with execution of a contract with the Town if that facility is utilized.

East Carolina Environmental understands that as leachate strength increases over time, the need for a pretreatment facility will occur. It is expected that this need will arise in year three or four of the operations. The operator will monitor the leachate strength and work with the treatment facility on meeting this requirement. The capacity and treatment methodology will be developed when leachate characteristics are known. It is anticipated that a batch type on-site pretreatment facility will be developed to meet this requirement.

The operations of the leachate storage and treatment plan should include the following:

- A. The tank filling is handled by automatic level controls on the leachate pump station.
- B. When the tank is filled to 10%, removal of leachate shall begin.
- C. Should the tank filling exceed 25% during normal operations, the operator shall utilize additional tank trucks to expedite removal of the leachate.
- D. Unless other provisions are made, all leachate shall be transported to a treatment facility.
- E. On a monthly basis, the leachate in the storage tank shall be sampled for those constituents identified by the <sup>or as required by the treatment facility.</sup> (Town of Windsor.)  
OR TREATMENT FACILITY.
- F. On a daily basis, inspect the secondary containment system and the tank for any leaks. If none present, record inspection and pump off stormwater.
- G. Records shall be maintained by the landfill operator of the following:
  - 1. Daily volume of leachate generated
  - 2. Daily volume of leachate transported to the <sup>treatment facility</sup> (Town of Windsor.)  
(include manifests)
  - 3. Monthly analytical records of leachate quality
  - 4. Records of days when stormwater is pumped from the secondary containment system
  - 5. Weekly inspections of the leachate tank
  - 6. Daily inspections of the leachate pump station

7. Records of any equipment breakdowns
8. Volume of leachate in the tank
9. Yearly inspections of the tank
10. Maintenance records
11. Accident records
12. Pump off of stormwater buildup in the secondary containment system.

In accordance with the various agreements between the landfill operator and treatment facilities, no initial pretreatment is required. However, if the leachate quality indicates the need for pretreatment, this shall be added by the Landfill Operator.

Special attention shall be given to managing rainfall events to reduce, as much as possible, the surge volumes caused by rainfall events. A major part of this leachate management is discussed in item C – Cell Filling/Stormwater Management. In this item C discussion, it is recognized that it is possible that a 25 year frequency rainfall event could create a surge of up to 185,000 gallons of stormwater (initial lift only) that would require treatment as leachate. This stormwater could be handled by all components of the leachate management system including the storage tank.

Operations require the normal level of the tank to be below 10% full or 25,000 gallons. And in addition, the operations require expedited removal of leachate anytime the tank approaches a 25% full condition. The 10% full tank would have a remaining volume of 225,000 gallons, and the 25% full tank would have a remaining volume of 187,000 gallons. In both cases, this would be adequate to hold the surge volumes caused by the storm event.

Should this storm surge occur when the filling was being done in the initial lift of the landfill, it would produce a very low strength or very dilute leachate. As a contingency, East Carolina Environmental will initiate discussions with other POTW facilities in Northeast North Carolina to accept this potential surge volume of dilute leachate.

East Carolina Environmental will negotiate contracts with commercial handlers of industrial wastewater for the treatment of any surge volumes. Areas of special attention by the landfill operator include:

1. Maintain the cell internal FML dikes to assure segregation of stormwater from the leachate. The operator should use reasonable measures to minimize leachate generation.
2. Maintain cross slope and surface drainage on the landfill to promote runoff of stormwater. Any stormwater that can be drained from the surface above the waste will not contribute to the leachate generation.
3. Immediately pump off stormwater in the cell that is segregated from contact with the waste fill area.
4. Each day, inspect the storage tank and the secondary containment system. Maintain daily removal of leachate from the tank and pump off stormwater from the secondary containment system.

With aggressive leachate management activities by the operations personnel, stormwater surges caused by rainfall events as great as the 25 year rainfall event can be handled by

the system. Contingency for events that potentially exceed this event include:

1. Establish a contingency policy to allow greater daily leachate disposal.
2. Establish relationships with other POTW's in Northeast North Carolina to handle potential surge volumes of leachate.
3. Establish a relationship with a commercial wastewater handler for potential surge volumes of leachate.
4. Maintain a registry of tank trucks that can be accessed within 24 hours to assist with leachate hauling.

A written protocol, which follows this discussion, shall be posted in the landfill office. This discussion shall provide a step-by-step method for the landfill operator in the event of a surge event. This posted document shall be titled "Contingency Plan for Leachate Management".

Should this contingency plan ever be activated, records should be kept documenting all activities related to the event. These shall be maintained in the operating record of the site.

**E. Random Inspection Program**

The landfill is permitted as a municipal solid waste landfill and as such must not receive regulated hazardous or nuclear wastes. It is important that such wastes not