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44-07	October 15, 2008	6013



October 3, 2008

Mr. Allen Gaither
Solid Waste Permitting Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
2090 U.S. Highway 70
Swannanoa, North Carolina 28778

RE: Response to Comments
Modifications to Operations Plan
White Oak MSW Landfill
Haywood County, North Carolina
Permit # 44-07

Dear Mr. Gaither:

Please find enclosed information related to our response to your comments in your June 20, 2008 letter regarding the modifications to the Operations Plan for the White Oak MSW Landfill in Haywood County. The following items were revised to address the concerns noted in your letter:

- Revised Demonstration Report for synthetic cover ADC;
- Removed request for mulch/soil ADC from this Operations Plan modification;
- Revised Composting Operations Plan, including proposed compost application rates and soil and compost test results;
- Revised Mulching and Grinding Treatment and Processing Plan to reflect the fact that the mulch/soil ADC will be utilized during a six-month demonstration period;

E n g i n e e r i n g • P l a n n i n g • F i n a n c e

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The following is our response to your comments in the June 20th letter (comments 1 and 2 did not require a response):

Comment 3) The Haywood County Synthetic Cover Operation Plan submitted in Appendix 2 appears to be complete. However, the Demonstration Report also submitted in Appendix 2 is not sufficient. As stated in the June 28, 2007 demonstration approval letter from Mr. Jim Patterson to Mr. Stephen King, the report must include documentation addressing the performance and effectiveness of the material, the number of times the ADC material was used, the quantities of the ADC material and other supportive information including photographs. Please revise the report to include more detail and cover all topics stated in the June 28, 2007 letter.

Response: The Demonstration Report has been modified to address the topics of the June 28, 2007 letter from Mr. Jim Patterson. A copy of the revised Demonstration Report is enclosed.

Comment 4) No new ADC will be approved without the satisfactory completion of a demonstration period. Similar to the tarp system, Haywood County will have to request approval of a demonstration material containing soil and mulch. Therefore, the soil and mulch ADC cannot be approved along with the other requested changes. I would like to point out the Solid Waste Section has made a decision not to approve any soil/mulch cover materials in excess of a 3:1 ratio.

Response: Haywood County will remove their request for using a mulch/soil material as an ADC at this time. The County has submitted a letter requesting a demonstration period for the mulch/soil ADC and has received tentative approval, dependent upon approval of this Operations Plan modification request. The Mulching and Grinding Treatment and Processing Facility Operation Plan will be modified to show that the County is requesting a demonstration period for the use of mulch/soil as an ADC. A copy of the revised Treatment and Processing Operations Plan is enclosed.

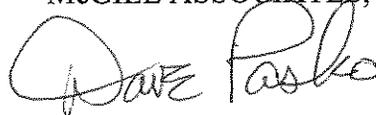
Comment 5) The Solid Waste Section is agreeable to the use of compost as a soil amendment to aid in the growth of vegetative cover. However, the compost may only be used at a rate beneficial to the growth of cover. I would like for you to submit additional information on realistic application rates, estimated nutrient values of the compost, an operation plan including method of application and plans for any material which may be unused for an extended period to time.

Response: Haywood County has conducted chemical analyses on the soils that will be used on temporary slopes at the White Oak Landfill and on the compost available to the County from the Johnson Packing House in Canton. With the assistance of North Carolina Regional Agronomist Bill Yarborough, application rates for compost that would be beneficial for growth of cover grasses have been established. Although the compost that

the County produces will be similar to that produced at the Johnson Packing House, it will be important for the County to regularly test the compost and soil materials in order to ensure that proper application rates and any additional soil amendments are calculated prior to use of the compost. See Appendix 1 of the Composting Operations Plan (Appendix 6), which includes the results for chemical analysis of cover soils and the compost from the Johnson Packing House as well as the calculations for the compost application rates. Included in the enclosed revised Composting Operations Plan is information pertaining to the application rates of compost, estimated nutrient values of the compost, and methods of application of the compost.

The County looks forward to receiving final approval for these revisions to the Operations Plan for the White Oak Landfill. This letter and the enclosed revised Operations Plans and supporting information is all provided to you via electronic copy. Please let us know if hard copies of this information are required. Figures 1 and 2 from the original submittal have not been revised and should be retained to be included along with the enclosed revised information. As always, don't hesitate to contact us if you have any questions regarding this submittal or if you require additional information.

Sincerely,
McGILL ASSOCIATES, P.A.



DAVE PASKO
Senior Engineering Technician

Enclosures via electronic mail

cc: Ed Mussler, NCDENR Solid Waste Section, w/enc
Deborah Aja, NCDENR Solid Waste Section, w/enc
Michael Scott, NCDENR-Composting and Land Applications Branch, w/enc
Stephen King, Haywood County Director of Solid Waste, w/enc
David Cotton, Haywood County Manager, w/o enc

**White Oak MSW Landfill
Haywood County, North Carolina**

Modifications to the Operations Plan

June 2008

Revised September 2008



**McGILL ASSOCIATES, P.A
55 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801**

OPERATIONS PLAN

**WHITE OAK MSW LANDFILL
HAYWOOD COUNTY, NORTH CAROLINA**



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**JUNE 2008
REVISED SEPTEMBER 2008**

07517



**HAYWOOD COUNTY
WHITE OAK LANDFILL
OPERATION PLAN**

Operations Plan
White Oak MSW Landfill

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INTRODUCTION

Haywood County Landfill will only accept Municipal Solid Wastes (MSW) generated in Haywood County. The White Oak MSW Landfill consists of 21.5 acres of lined landfill area and began receiving wastes in October of 1993. The most recently constructed cell was Phase 2, consisting of 10.26 acres, which was granted a Permit To Operate on November 7, 2001. The Phase 2 cell was constructed with 18 inches of cohesive soil (permeability of 1.0×10^{-5} cm/sec), a reinforced Geosynthetic Clay Liner, a 60-mil High Density Polyethylene liner (HDPE), double-bonded HDPE drainage net, 12 inches of select backfill protective soil cover over the liner and an additional 24" protective soil cover. A leachate collection system was installed on top of the 60-mil liner net, and leachate is collected and flows to a sump located within the Phase 2 cell, prior to flowing by gravity to the existing leachate lagoon. At the White Oak Landfill, the County also operates a Construction & Demolition Landfill (C&DLF) consisting of 4.0 acres and a Land Clearing and Inert Debris Landfill (LCID) consisting of 4.8 acres. Haywood County proposes the following revisions to their operating plan at the White Oak Landfill: 1) the addition of a Mulching and Grinding Treatment and Processing Facility, consisting of 2.0 acres; 2) the addition of a Small Type 2 Composting Facility, consisting of 1.5 acres; 3) the use of a polyethylene tarp as an Alternate Daily Cover (ADC); 4) a six-months demonstration period for the use of one and one-half inches of mulched material and four and one-half inches of soil as an ADC (this request is regulated by the Solid Waste Section-Compliance Branch); and 5) the use of compost from the Composting Operation as a soil amendment to assist the growth of vegetative cover on slopes. The Mulching and Grinding Treatment and Processing Operations Plan is included in Appendix 5. The Small Type 2 Composting Operations Plan is included in Appendix 6. The existing landfill cells and proposed Mulching and Composting Operation Areas are illustrated in Figures 1 and 2.

The perimeter of the MSW lined area is marked off by 3-inch or 2-inch PVC pipe at 100' intervals that are placed in the anchor trenches. Solid waste will not be placed within four (4) feet of this boundary to assure that it is being placed directly above the liner system so that no leachate can flow outside of this area. The lined area is divided by a berm that will segregate area for solid waste and where stormwater is to be diverted as runoff.

All stormwater that comes in contact with solid waste will be handled as leachate. The leachate is collected and held in the leachate lagoon. The leachate is gravity fed from the landfill to the leachate lagoon.

Leachate will be treated at the Waynesville Waste Water Treatment Plant. The leachate will have to be tested according to the pretreatment conditions outlined in the pre-treatment agreement. Tanker trucks will transport the leachate to the treatment plant. In the future there may be a force main constructed to pump the leachate to the treatment plant.

The leachate will be pumped out of the leachate lagoon into either tanker trucks or recirculated into the working face of the landfill. The pumping of leachate will be on an as needed basis. During wet weather, the pump and hauling may have to be done 24 hours a day for several days or until the leachate lagoon

levels have been reduced. On the other hand, during dry weather, leachate may not have to be hauled for several days at a time.

Leachate will be recirculated. See Appendix 4 for Haywood County's Recirculation Plan.

The leachate lagoon will be inspected on a monthly basis and a report generated and placed in the landfill records. The report will include the date the liner was inspected, the inspector, general observations since the last inspection, visible abrasions, possible stress cracks, or obvious punctures.

Stress cracks can occur in wrinkles that are generated from heat expansion or contraction due to freezing. Also, the HDPE liner may deteriorate due to ultra violet light and this can appear as an abrasion where material can be scraped away with a hard object. If any damage or possible weak spots due to ultra violet exposure has been detected, a qualified HDPE installation company shall be notified immediately so that a repair patch can be installed. The leachate level shall not be allowed to exceed the depth of the damaged liner until it has been repaired and tested by the liner installation company. Once this has been accomplished all testing documentation shall be placed in the operating records.

Daily cover will be the combination of soil, synthetic cover, and mulched material. Soil cover will be placed at least once a week. See Section 2b for the requirements of the Alternate Daily Cover tarp and mulched material.

The County has implemented a program at the landfill for detecting and preventing the disposal of hazardous and liquid wastes. The program consists of random inspection of incoming loads at a minimum of 1% of the weekly traffic. Landfill personnel have been trained to recognize hazardous and liquid wastes. Records will be kept on the training and the inspections. See Appendix 1 for a description of waste screening procedures.

The County of Haywood will monitor for explosive gases at landfill structures and the perimeter of the landfill. The concentration of methane gases generated by the landfill cannot exceed 25 percent of the lower explosive limit for methane in the structures, and it cannot exceed 100 percent of the lower explosive limit for methane of the landfill property boundary. See Appendix 3 for the Explosive Gas Control Plan. If methane gas is found to exceed the acceptable limits at either the property boundary or landfill structures, it is the County's responsibility to do the following:

1. Immediately take all necessary steps to ensure protection of human health, i.e. no smoking, temporarily abandon the structure and notify the Division of Solid Waste Management.
2. Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and
3. Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Division of Solid Waste management that the plan has been implemented. The plan will describe the nature and extent of the problem and the proposed remedy.

Off and on site erosion will be controlled through erosion control structures and devices. Provisions for a vegetative ground cover sufficient to restrain erosion will be accomplished within **21 calendar days** upon completion of any phase of landfill development.

The County of Haywood will record and retain at the landfill an operating record of the following information:

- (1) Inspection records, waste determination records, and training procedures;
- (2) Amounts by weight of solid waste received at the landfill;
- (3) Waste determination, Leachate sampling data, leachate levels, meteorological data;
- (4) Gas monitoring results and any remediation plans;
- (5) Any demonstration, certification, findings, monitoring, testing or analytical data required for surface and groundwater monitoring;
- (6) Any monitoring, testing or analytical data required for closure or post-closure;
- (7) Any cost estimates and financial assurance documentation.

All information contained in the operating record will be furnished upon request to the Division of Solid Waste Management or be made available at all reasonable times for inspection by the Division.

Ground and surface water will be sampled and analyzed according to Subtitle D Appendix I detection monitoring requirements. The monitoring frequency for all Appendix I detection monitoring constituents will be at least semi-annual during the life of the facility (including closure) and the post-closure period. A minimum of four independent samples from each well (background and downgradient) will be collected and analyzed for the Appendix I constituents during the first semi-annual sampling event. At least one sample from each well (background and downgradient) will be collected and analyzed during subsequent semiannual sampling events.

If the County of Haywood determines that there is a statistically significant increase over background for one or more of the constituents listed in Appendix I at any monitoring well at the relevant point of compliance, the County will, within 14 days of the finding, report to the Division of Solid Waste and place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels. The County will establish an assessment monitoring program within 90 days. The County may demonstrate that a source other than the landfill caused the contamination or that the statistically significant increase resulted from an error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting these demonstrations will be certified by a Licensed Geologist or Professional Engineer and approved by the Division of Solid Waste. A copy of this report will be placed in the operating record. If a successful demonstration is made, documented, and approved by the Division, the County may continue detection monitoring. If after 90 days, a successful demonstration is not made, the County will initiate an assessment monitoring program.

OPERATIONAL REQUIREMENTS

1. Waste Acceptance and Disposal Requirements

- a. The Municipal Solid Waste Landfill (MSWLF) will only accept those solid wastes which it is permitted to receive. Haywood County will notify the Division within 24 hours of attempted disposal of any waste the landfill is not permitted to receive. Signs are placed at the entrance to the Landfill stating that Hazardous and Liquid wastes are not accepted and that random waste screening is performed.
- b. The following wastes are prohibited from disposal at the MSWLF:
 - i. Hazardous waste as defined within 15A NCAC 13A, to also include hazardous waste from conditionally exempt small quantity generators.
 - ii. Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761.
 - iii. Bulk or non-containerized liquid waste will not be placed in the landfill unless:
 - (i) The waste is household waste other than septic waste and waste oil,
 - (ii) The waste is leachate or gas condensate derived from the landfill.
 - iv. White Goods, Yard Waste, Tires.
 - v. Containers holding liquid wastes will not be placed in the landfill unless:
 - (i) The container is a small container similar in size to that normally found in household waste;
 - (ii) The container is designed to hold liquids for use other than storage; or
 - (iii) The waste is household waste.
 - vi. For the purpose of this paragraph:
 - (i) Liquid waste means any waste material that is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), S. W. 846.
- c. Spoiled foods, animal carcasses, abattoir waste, hatchery waste, and other animal waste delivered to the disposal site will be covered immediately.
- d. Asbestos waste will be accepted. The waste will be put in a hole dug out of the existing waste and buried immediately. A 24 hour notice will be given to the Landfill before any asbestos arrives, records will be kept as to whom and type of asbestos buried.
- e. Wastewater treatment sludges may be accepted either as a soil conditioner incorporated into or applied onto vegetative growth layer but in no case greater than six inches in depth. Or wastewater treatment sludges may be co-disposed in the lined area.

- f. Haywood County will continue a program at the Landfill for detecting and preventing the disposal of hazardous and liquid wastes. (Section 5.3-Appendix I) This program will include, at a minimum:
 - i. Random inspections of incoming loads or other comparable procedures;
 - ii. Records of any inspections;
 - iii. Training of facility personnel to recognize hazardous and liquid wastes.
 - iv. Development of a contingency plan to properly manage any identified hazardous and liquid wastes. The plan must address identification, removal, storage and final deposition of the waste.
- g. Waste placement will be within the area limits of the base liner system and in a manner consistent with the effective permit.

2. Cover material requirements.

- a. Except as in Part (b), Haywood County must cover disposed solid waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors blowing litter, and scavenging.
- b. Haywood County proposes the addition of an Alternate Daily Cover (ADC) procedure to their operating plan: a synthetic tarp to be used as daily cover on the working face or until it is necessary to cover with earthen material. Also, the County will begin a six months demonstration period for the use of a mulch/soil mixture as an ADC. The mulch ADC will consist of one and one-half (1-1/2) inches of mulched material combined with four and one-half (4-1/2) inches of soil. At a minimum, soil cover will be used once a week.
 - i) A demonstration period for the ADC tarp was conducted from June 28, 2007 to December 28, 2007. See Appendix 2 for the demonstration report and operating plan for the ADC tarp. Also included in Appendix 2 is a copy of the ADC request for demonstration letter from Mr. Stephen King, Haywood County Solid Waste Director, a copy of the ADC demonstration authorization letter from Mr. James Patterson of NCDENR to Mr. King, and a photo of the ADC tarp applied to the White Oak Landfill during the demonstration period.
 - ii) The County will begin a six months demonstration period for the use of mulch/soil as an ADC. A request for the demonstration period has been submitted to the NCDENR-Solid Waste Section, Compliance Branch. The County proposes using one and one-half inches of mulched material along with four and one-half inches of soil as an ADC. The mulched material will primarily be used to help stabilize wet access areas of the landfill.
- c. Areas which will not have additional wastes placed on them for 12 months or more, but where final termination of disposal operations has not occurred, will be covered with a minimum of

one foot of intermediate cover. Compost from the Composting Operation may be used as a soil amendment when applying grass seed to any landfill area.

3. Disease vector control

- a. Haywood County will prevent or control on-site populations of disease vectors using techniques appropriate for protection of human health and the environment. At the end of every day, waste will be covered by approved daily cover. At a minimum soil will be used once a week. Any waste that requires immediate cover will be covered immediately with soil.
- b. "Disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

4. Explosive gases control

- a. Haywood County must ensure that:
 - i. The concentration of methane gas generated by the landfill does not exceed 25 percent of the lower explosive limit for methane in landfill structures (excluding gas control or recovery system components); and
 - ii. The concentration of methane gas does not exceed 100 percent of the lower explosive limit for methane at the landfill property boundary.
- b. Haywood County will implement a routine methane monitoring program to ensure that the standards of 4 (a) are met. See Appendix 3 for the Explosive Gas Control Plan for Haywood County White Oak Landfill.
 - i. The type and frequency of monitoring must be determined based on the following factors:
 - I. Soil conditions;
 - II. The hydrogeologic conditions surrounding the facility;
 - III. The hydraulic conditions surrounding the facility;
 - IV. The location of facility structures and property boundaries.
 - ii. The minimum frequency of monitoring will be quarterly.
- c. If methane gas levels exceeding the limits specified in 4 (a) are detected, the owner or operator will:

- i. Immediately take all necessary steps to ensure protection of human health, i.e. no smoking, temporarily abandon the structure and notify the Division of Solid Waste Management.
 - ii. Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and
 - iii. Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Division of Solid Waste Management that the plan has been implemented. The plan will describe the nature and extent of the problem and the proposed remedy.
- d. "Lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25° C and atmospheric pressure.

5. Air Criteria

- a. Haywood County will ensure that the landfill does not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the US. EPA Administrator pursuant to Section 110 of the Clean Air Act, as amended.
- b. Open burning of solid waste, except for the infrequent burning of land clearing debris generated on site or debris from emergency clean-up operations, is prohibited. Any such infrequent burning will be approved by the Division of Solid Waste Management.
- c. Earth moving equipment will be provided to control accidental fires and leachate tank trucks used for water or leachate that would be recirculated can also be used. Arrangements have been made with the local fire department to provide actual fire protection. This fire department has access at all times to the landfill to provide fire fighting services when needed. Landfill personnel can use soil to isolate the fire so it will not spread any further but actual fighting of the fire should be the responsibility of the trained fire department.
- d. Fires that occur at the landfill will be reported to the Division of Solid Waste Management within 24 hours and written notification will be submitted within 15 days.

6. Access and safety requirements

- a. The landfill will be adequately secured by means of gates, chains, beams, fences and other security measures approved by the Division of Solid Waste Management to prevent unauthorized entry.
- b. An attendant will be on duty at the site at all times while it is open for public use to ensure compliance with operational requirements.
- c. The access road to the site will be of all-weather construction and maintained in good condition.

- d. Dust control measures will be implemented when necessary. If dust problems should arise, the county will use any reasonable means necessary to reduce it. At a minimum the county will spray water on necessary areas.
- e. Signs providing information on tipping or disposal procedures, the hours during which the site is open for public use, the permit number and other pertinent information will be posted at the site entrance.
- f. Signs will be posted stating that no hazardous or liquid waste can be received.
- g. Traffic signs or markers will be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operating conditions.
- h. The removal of solid waste from the landfill will be prohibited unless the County approves and the removal is not performed on the working face.
- i. Barrels and drums will not be disposed of unless they are empty and perforated sufficiently to ensure that no liquid or hazardous waste is contained therein, except fiber drums containing asbestos.

7. Erosion and Sedimentation Control Requirements

- a. Adequate sediment control measures (structures or devices), will be utilized to prevent silt from leaving the landfill.
- b. Adequate sediment control measures (structures or devices), will be utilized to prevent excessive on-site erosion.
- c. Provisions for a vegetative ground cover sufficient to restrain erosion will be accomplished within **21 calendar days** upon completion of any phase of landfill development.

8. Drainage Control and Water Protection Requirements

- a. Surface water will be diverted from the operational area.
- b. Surface water shall not be impounded over or in waste.
- c. Solid waste shall not be disposed of in water.
- d. Leachate shall be contained on site and properly treated prior to discharge.
- e. The landfill will not:
 - (i) Cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the

National Pollutant Discharge Elimination System (NPDES) requirements pursuant to Section 402.

- (ii) Cause the discharge of a non-point source of pollution to waters of the United States, including wetlands, that violates any requirements of an area-wide or state-wide water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act, as amended.

9. Liquids Restriction

- a. Bulk or non-containerized liquid waste will not be placed in the landfill unless:
 - (i) The waste is household waste other than septic waste and waste oil,
 - (ii) The waste is leachate or gas condensate derived from the landfill.
- b. Containers holding liquid wastes will not be placed in the landfill unless:
 - (i) The container is a small container similar in size to that normally found in household waste;
 - (ii) The container is designed to hold liquids for use other than storage; or
 - (iii) The waste is household waste.
- c. For the purpose of this paragraph:
 - (i) Liquid waste means any waste material that is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), S. W. 846.
 - (ii) Gas Condensate means the liquid generated as a result of gas recovery processes at the MSWLF unit.
- d. Test for free liquids:

Sludges or other wastes may be tested for free liquids after previous screening tests have shown that the waste is not hazardous and does not contain PCB's. The specified test to determine whether or not a material is considered to be a liquid is the Paint Filter Test method 9095. The procedure for conducting this test is as follows:

- (i) Obtain standard 400-micron paint filter;
- (ii) Place a properly-sized, clean, dry funnel in a ring stand or similar device;
- (iii) Fold the filter and line the funnel with it;
- (iv) Place a 100 ml sample of waste into the funnel;

- (v) Place a clean, dry container under the funnel; and,
- (vi) Check in exactly 5 minutes to see if any liquid is in the container.
- (vii) If any liquid passes through the filter in 5 minutes or less, the waste is considered to be a liquid. The filtrate can be water, oil or any combination of any non-hazardous liquids.

10. Record keeping Requirements

- a. Haywood County MSWLF will record and retain at the facility, or an alternative location near the facility approved by the Division of Solid Waste Management, in an operating record the following information as it becomes available.
 - (i) Inspection records, waste determination records, and training procedures;
 - (ii) Amounts by weight of solid waste received at the landfill to include source of generation.
 - (iii) Waste determination, Leachate sampling data, leachate levels, meteorological data;
 - (iv) Gas monitoring results and any remediation plans;
 - (v) Any demonstration, certification, findings, monitoring, testing or analytical data required for surface and groundwater monitoring;
 - (vi) Any monitoring, testing or analytical data required for closure or post-closure; and,
 - (vii) Any cost estimates and financial assurance documentation.
- b. All information contained in the operating record will be furnished upon request to the Division of Solid Waste Management or be made available at all reasonable times for inspection by the Division.
- c. Haywood County will maintain a copy of the operation plan at the landfill.

11. Spreading and Compacting Requirements

- a. The landfill will restrict solid waste into the smallest area feasible, typically 60' x 75' area. The initial lift of solid waste will be placed over cell I that is bounded by the leachate collection ditch. This lift will be covered with six (6) inches of daily cover. This lift will absorb the rain water and allow some of it to evaporate prior to reaching the leachate collection system. When a heavy rain does occur, the impact on the leachate collection system will not be immediate. Prior to placement of solid waste over any leachate pipe, the geotextile fabric that is covering the stone will be folded back so that solid waste will be in direct contact with the stone. This

method will not allow biological growth to develop on the geotextile which could eventually clog the system.

- b. Solid waste will be compacted as densely as practical into cells. The compactor should run over an area of solid waste a minimum of 6 times. The initial lift of solid waste will be placed loosely at a depth of 4 feet. As this lift is being placed, a spotter should be placed in the landfill to assure that the compactor does not drive any long, sharp objects through the protective cover into the liner system. If an object were to penetrate the liner system, the protective cover must be removed and the penetration repaired. The subsequent lifts can be placed up to final grades or until the diversion berm needs to be moved to cell 2 which will allow for more horizontal space. Heavy landfill equipment including articulating dump trucks, and compactor will only be allowed on areas that have a minimum of 4' of solid waste. Only low pressure equipment such as a D6 LGP Caterpillar will be allowed on the protective cover.
- c. Appropriate methods such as fencing and diking will be provided within the area to confine solid waste subject to be blown by the wind. At the conclusion of each day of operation, all windblown material resulting from the operation will be collected and returned to the area.

12. Leachate Management Plan

- a. Haywood County will periodically maintain the leachate collection system.
- b. Haywood County will maintain records for the amount of leachate collected.
- c. Haywood County will quality sample their leachate bi-annually for Appendix I (Section 5.3) constituents, pH, BOD, COD, TDS, phosphate, nitrate, and sulfate. The sample will be obtained from the lagoon and sampled the same time as the monitoring wells.
- d. The leachate is being treated by the Town of Waynesville Waste Water Treatment Plant.
- e. Under extreme operational conditions Haywood County has the option of shutting down the flow of leachate to the lagoon by use of a shut off valve. The leachate will be temporarily stored within the MSWLF units until such a time the flow of leachate can continue to the lagoon. If any rain or other event requires storage of leachate or storm water in the cell, the Division of Solid Waste will be notified immediately followed by written communication. During wet weather, the pump and hauling may have to be done 24 hours a day for several days until the leachate lagoon levels have been reduced.
- f. Leachate will be recirculated upon approval of the NCDENR-Division of Waste Management. See Appendix 4 for Haywood County's Recirculation Plan.

APPENDIX 1

Waste Screening Procedures

Appendix 1

WASTE SCREENING PROCEDURES

A. INTRODUCTION

The municipal solid waste stream is made up of wastes from all sectors of society. The waste is often categorized by its source or its characteristics. Terms used include commercial, industrial, residential, biomedical, hazardous, household, solid, liquid, demolition/construction, sludge, etc. Regardless of how one classifies wastes, the bottom line is that wastes are delivered to the landfill and a management decision must be made to either reject or accept them. This responsibility rests with the manager of the landfill. Wastes which are not authorized to be accepted at the landfill create a number of potential problems including: (1) liability due to future releases of contaminants; (2) bad publicity if media learns of unacceptable waste entering the landfill; (3) potential for worker injury; (4) exposure to civil or criminal penalties; (5) damage to landfill environmental control systems.

B. HAZARDOUS WASTE REGULATIONS AND MANAGEMENT

In the United States, hazardous waste is regulated under RCRA, Subtitle C. A waste is hazardous if it is listed as a hazardous waste by the Administrator of the Environmental Protection Agency (EPA) in the Code of Federal Regulations, Title 40, Part 261, or if it meets one or more of the hazardous waste criteria as defined by EPA. These criteria are:

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

1. Ignitability

Ignitable waste is a waste that burns readily, causes a fire by friction under normal circumstances, or is an oxidizer. Any waste having a flash point of <140F falls in this category. Flash point is that temperature at which a liquid gives off vapors that will ignite when an open flame is applied. Under Department of Transportation (DOT) definitions, a flammable liquid has a flash point of >100 F. A combustible liquid has a flash point between 100 and 200 F. Therefore, a flammable liquid is always hazardous while a combustible liquid may or may not be hazardous depending upon its flash point.

2. Corrosivity

A corrosive waste is one having a very high or a very low pH. The pH of a liquid is a measure of how acidic or basic (alkaline) the material is. The pH scale ranges from 0 to 14. High numbers are basic and low numbers are acidic. A substance having a pH ≤ 2.0 or ≥ 12.5 is defined as hazardous under RCRA.

3. Reactivity

A waste is reactive if it is normally unstable; reacts violently with water; forms an explosive mixture with water; contains quantities of cyanide or sulfur that could be released to the air; or can easily be detonated or exploded. These wastes may fall into any one of several DOT categories.

4. Toxicity Characteristic Leaching Procedure (TCLP)

A waste is TCLP toxic if the concentration of any constituent in Table 1 exceeds the standard assigned to that substance. The TCLP is a methodology which attempts to simulate the conditions within a landfill. An acidic solution is passed through a sample of waste and the resultant "leachate" is analyzed for contaminants. The TCLP is designed to detect heavy metals, pesticides and a few other organic and inorganic compounds. The purpose of the test is to prevent groundwater contamination by highly toxic materials. TCLP tests the mobility of 40 different elements and compounds.

Except in certain specified circumstances, regulated quantities of hazardous waste must be disposed of at a permitted hazardous waste disposal facility. In accordance with 40 CFR Part 26 1.3, **any material contaminated by a hazardous waste is also deemed to be a hazardous waste and must be managed as such.** Hazardous waste from conditionally exempt small quantity generators are to be disposed of in a Hazardous waste disposal facility. RCRA permits are also required to store, transport, and treat hazardous waste.

C. POLYCHLORINATED BIPHENYL'S (PCBs)

1. Introduction

PCBs are nonflammable and conduct heat without conducting electricity. These compounds were most frequently used as an additive to oil or other liquids in situations where heat was involved. The PCBs enhance the heat conducting properties of the liquid and thereby increase the heat dissipation or cooling effect obtained. They have also been used in lubricants and paint. In the United States one of the most common applications was in electric transformers. The only effective method for destroying PCBs is high Temperature incineration which is relatively expensive due to a shortage of PCB incineration capacity.

TABLE 1

T.C.I.P CONSTITUENTS & REGULATORY LEVELS (mg/L)			
CONSTITUENT	REG LEVEL	CONSTITUENT	REG LEVEL
Arsenic	5.0	Hexachlorobenzene	0.13
Barium	100	Hexachloro-1,3-butadiene	0.5
Benzene	0.5	Hexachloroethane	3.0
Cadmium	1.0	Lead	5.0
Carbon Tetrachloride	0.5	Lindane	0.4
Chlordane	0.03	Mercury	0.2
Chlorobenzene	100	Methoxychlor	10.
Chloroform	6.0	Methyl ethyl ketone	200
Chromium	5.0	Nitrobenzene	2.0
m-Cresol	200	Pentachlorophenol	100
o-Cresol	200	Pyridine	5.0
p-Cresol	200	Selenium	1.0
Cresol	200	Silver	5.0
1,4-Dichlorobenzene	10.0	Tetrachloroethylene	0.7
1,2-Dichloroethane	0.7	Toxaphene	0.5
1,1-Dichloroethylene	0.5	Trichloroethylene	0.5
2,4-Dichlorophenoxyacetic acid	0.7	2,4,5-Trichlorophenol	400
2,4-Dinitrotoluene	0.13	2,4,6-Trichlorophenol	2.0
Endrin	0.02	2,4,5-TP (Silvex)	1.0
Heptachlor (and its hydroxide)	0.008	Vinyl Chloride	0.2

By law PCB's are no longer used as dielectrics in transformers and capacitors manufactured after 1979. There are many millions of pounds of PCBs still in use or in storage. One example is the ballasts used in fluorescent light fixtures. It has been estimated that there are between 0.5 million and 1.5 billion ballasts currently in use in this country. Due to the long life of these units, about half of these may be of pre-1979 manufacture and contain PCBs. Since each ballast contains about one ounce of nearly pure PCB fluid, there are about **20 to 30 million pounds** of PCBs in existing lighting fixtures. These items are not subject to RCRA Subtitle D Waste Screening!

Commercial or industrial sources of PCB wastes that should be addressed by the program include:

- Mineral oil and dielectric fluids containing PCBs;
- Contaminated soil, dredged material, sewage sludge, rags, and other debris from a release of PCBs;
- Transformers and other electrical equipment containing dielectric fluids; and
- Hydraulic machines

2. PCB Regulatory Requirements

As contrasted to hazardous wastes, the Toxic Substance Control Act regulates PCBs based on the concentration of PCBs in the waste rather than the source or characteristic of the waste. The regulations concerning PCB disposal are spelled out in 40 CFR Part 761. Subtitle D of RCRA merely requires that PCB waste not be disposed in a MSW landfill. PCB management requirements include:

Waste containing more than 500 ppm of PCBs must be incinerated. Waste containing from 50 to 500 ppm must be disposed of by incineration, approved burning, or in chemical waste landfill permitted to receive such wastes. The regulations are silent concerning wastes containing less than 50 ppm of PCBs; however, the regulations cannot be circumvented by diluting stronger wastes.

D. FUNDAMENTALS OF WASTE SCREENING

1. Know Your Generators and Haulers

Since the level of sophistication of your waste screening program will be a reflection of the likelihood of hazardous waste and PCB waste being in your incoming waste, **knowledge of the commercial industrial base of your service area is critical.** Some examples are the automotive industry, which generates solvents, paint wastes, lead acid batteries, grease and oil; the dry cleaning industry, which may generate filters containing dry cleaning solvents; metal platers which generate heavy metal wastes; and other industries which generate a variety of undesirable wastes; e.g. chemical and related products, petroleum refining, primary metals, electrical and electronic machinery, etc.

Landfill managers should also know the haulers and trucks serving the businesses in their community which are likely to carry unacceptable wastes.

Some local governments and solid waste management agencies have enacted legislation requiring haulers to provide a manifest showing the customers whose wastes make up that particular load. Such a manifest is an extremely useful tool when a load is found to contain prohibited wastes. It is unwise to accept wastes from unknown, unlicensed, or otherwise questionable haulers.

2. Inspections

An inspection is typically a visual observation of the incoming waste loads by an individual who is trained to identify regulated hazardous or PCB wastes that would not be acceptable for disposal at the MSWLF unit. The training of landfill personnel will be conducted by a local EMS official or a SWANA certification. An inspection is considered satisfactory if the inspector knows the nature of all materials received in the load and is able to discern whether the materials are potentially regulated hazardous wastes or PCB wastes.

Ideally, all loads should be screened; however, it is generally not practical to inspect in detail all incoming loads. Random inspections, therefore, can be used to provide a reasonable means to adequately control the receipt of inappropriate wastes. Random inspections are simply inspections made on less than every load. At a minimum the inspection frequency will not be less than one percent of the waste stream.

The frequency of random inspections may be based on the type and quantity of wastes received daily, and the accuracy and confidence desired in conclusions drawn from inspection observations. Because statistical parameters are not provided in the regulation, a reasoned, knowledge-based approach may be taken. A random inspection program may take many forms such as inspecting every incoming load one day out of every month or inspecting one or more loads from transporters of wastes of unidentifiable nature each day. If these inspections indicate that unauthorized wastes are being brought to the MSWLF site, the random inspection program should be modified to increase the frequency of inspections.

Inspection priority also can be given to haulers with unknown service areas, to loads brought to the facility in vehicles not typically used for disposal of municipal solid waste, and to loads transported by previous would-be offenders. For wastes of unidentifiable nature received from sources other than households (e.g., industrial or commercial establishments), the inspector should question the transporter about the source/composition of the materials.

Loads will be inspected on the tipping floor at the baler facility prior to actual disposal of the waste at the working face of the landfill unit to provide the County the opportunity to refuse or accept the wastes.

An inspection flow chart to identify, accept, or refuse solid waste is provided as Figure 1.

Inspections of materials may be accomplished by discharging the vehicle load in an area designed to contain potentially hazardous wastes that may arrive at the facility. The waste should be carefully spread for observation using a front end loader or other piece of equipment. The Division of Solid Waste recommends that waste should be hand raked to spread the load. Personnel should be trained to identify suspicious wastes. Some indications of suspicious wastes are:

- Hazardous placards or markings;
- Liquids;
- Powders or dusts;
- Sludges;
- Bright or unusual colors;
- Drums or commercial size containers; or
- Chemical odors.

Haywood County will follow these procedures when suspicious wastes are discovered.

- Segregate the wastes;
- Question the driver;
- Review the manifest (if applicable);
- Contact possible source;
- Call the State Solid Waste Management Department;
- Use appropriate protective equipment;
- Contact laboratory support if required; and
- Notify the local Hazardous Material Response Team.

Containers with contents that are not easily identifiable, such as unmarked 55-gallon drums, should be opened only by properly trained personnel. Because these drums could contain hazardous waste, they should be refused whenever possible. Upon verifying that the solid waste is acceptable, it may then be transferred to the working face for disposal.

Testing typically would include the Toxicity Characteristic Leaching Procedure (TCLP) and other tests for characteristics of hazardous wastes including corrosivity, ignitability, and reactivity. Wastes that are suspected of being hazardous should be handled and stored as a hazardous waste until a determination is made.

If the wastes temporarily stored at the site are determined to be hazardous, Haywood County is responsible for the management of the waste. If the wastes are to be transported from the facility, the waste must be: (1) stored at the MSWLF facility in accordance with requirements of a hazardous waste generator, (2) manifested, (3) transported by a licensed Treatment, Storage, or Disposal (TSD) facility for disposal.

E. RECORD KEEPING AND NOTIFICATION REQUIREMENTS

Records must be kept pursuant to an incident where regulated hazardous waste or prohibited waste is found at the landfill. It is also recommended that records be kept of all screening activities and incidents, whether or not, regulated or prohibited wastes are found. This will help prove that the landfill owner/operator has acted in a prudent and reasonable manner.

The best way to prove compliance with this requirement is to document each inspection including:

- Date and time of waste detection
- Hauler name (company and driver)
- Waste(s) detected
- Waste generator(s) if able to identify
- Action(s) taken to manage or return material(s)
- Efforts taken if extreme toxicity or hazard was discovered
- Landfill employee in responsible charge

40 CFR Part 258 requires that records should be maintained at or near the landfill site during its active life and as long after as may be required by the appropriate state or local regulations.

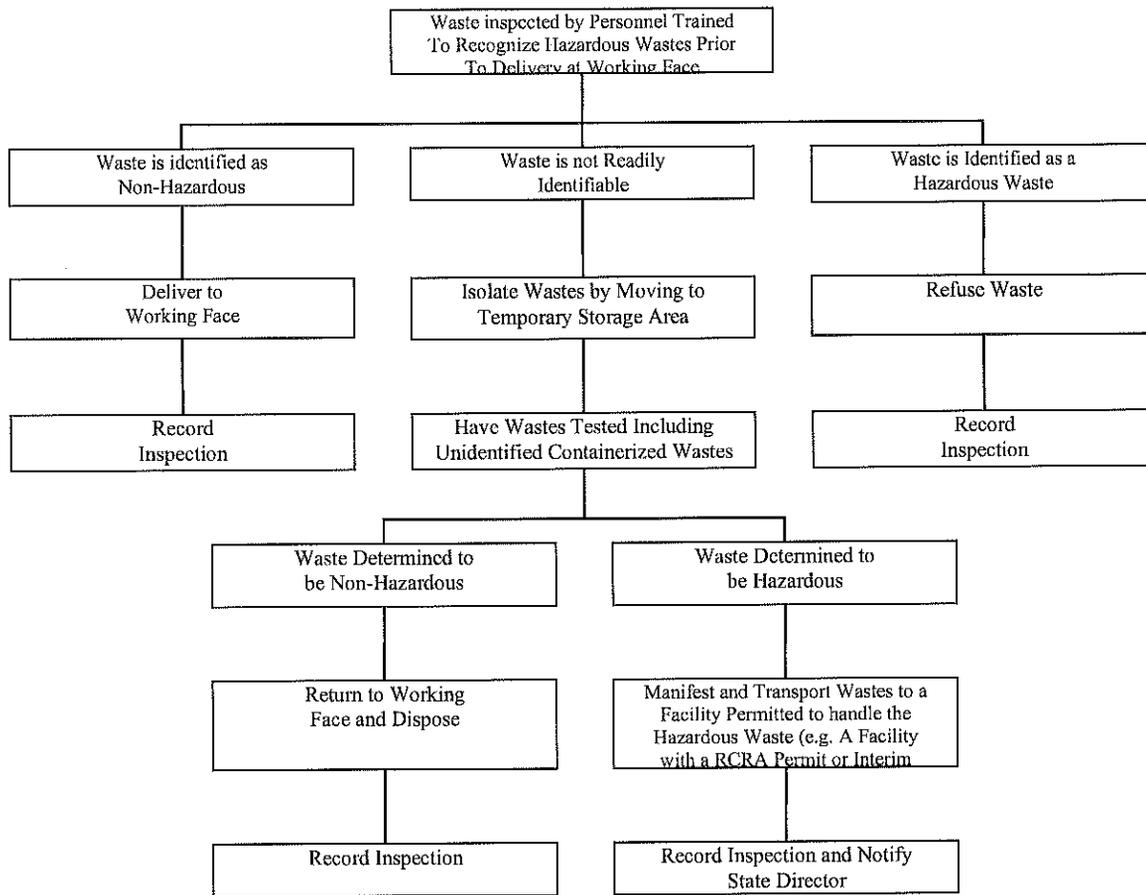


FIGURE 1
 Hazardous Waste Inspection Decision Tree
 Inspection Prior to Working Face

WASTE SCREENING CHECK LIST

CONTAINERS	YES	NO
FULL.....	_____	_____
PARTIALLY FULL	_____	_____
CRUSHED.....	_____	_____
PUNCTURED.....	_____	_____
 POWDERS/DUSTS		
IDENTIFIED	_____	_____
UNKNOWN	_____	_____
 SATURATION		
LABEL/HAZARDOUS.....	_____	_____
 ODOR/FUMES		
STRONG.....	_____	_____
FAINT.....	_____	_____
 HEAT.....		
 ITEMS FOUND		
BATTERIES	_____	_____
 OIL.....		
BIOMEDICAL	_____	_____
RADIOACTIVE	_____	_____
ASHES/RESIDUE.....	_____	_____
SOD/SOIL.....	_____	_____
LIQUID.....	_____	_____
HAZARDOUS.....	_____	_____
PCB'S	_____	_____

CHECK ALL THAT APPLY

DETAILED SCREENING REPORT

WASTE SOURCE _____
ADDRESS _____

PROBABLE [] SUSPECTED [] CONFIRMED []

WASTE HAULER _____
ADDRESS _____

DRIVER'S NAME _____
DETAIL _____

NOTIFIED:

WASTE SOURCE [] HAULING MANAGEMENT [] SITE MANAGEMENT []

STATE [] FEDERAL []

NAME _____
WITNESS (IF ANY) _____
DATE _____ TIME _____ AM PM

ACTION REQUIRED

APPENDIX 2

Haywood County Synthetic Cover Demonstration Report

Appendix 2

HAYWOOD COUNTY WHITE OAK LANDFILL SYNTHETIC COVER DEMONSTRATION REPORT

Demonstration Period Overview

Upon authorization from the North Carolina Department of Environment and Natural Resources, a demonstration period for the use of an ADC tarp at the White Oak Landfill was conducted from June 28, 2007 to December 28, 2007. The County wanted to use the tarp on the working face of the landfill at the end of the work day in order to allow for a cohesive progression of landfill filling from one day to the next. The use of the tarp would also increase airspace of the landfill because less cover soils would be required. The County chose to use three Landfill Tarp Systems tarps during the demonstration period. The tarps were pulled over the working face at the end of the day as described in the Operations section below.

ADC Materials Used

Alternate Daily Cover: Landfill Tarp System:
Landpac Cover by PacTec Inc.
6-oz. Coated Woven Polypropylene

<u>Properties</u>	<u>Test Method</u>	<u>Value</u>
Coating		1.5-Mil, one side
Weight		7.5-oz/yd ² coated
Thickness		20-Mil
Color		White
Warp Grab	ASTM D 5034-90	370-lbs.
Weft Grab	ASTM D 5034-90	380-lbs.
Warp Tear	ASTM D 2261-83	170-lbs.
Weft Tear	ASTM D 2261-83	160-lbs.
Mullen Burst	ASTM D 3786-87	800 psi
Puncture	ASTM D 4833	106-lbs.
Accelerated UV Weathering	ASTM G53	>70% @ 1200 hrs.

Synthetic Cover Operations

1. By the end of each day of operations, the horizontal or lateral expansion of the working face was covered with at least six (6) inches of earthen material. The working face was maintained at a minimum of a 4:1 slope (3:1 in locations of temporary slopes) and compacted to reach maximum waste density possible to minimize the size of the working face; preserve landfill space; and deter wind-blown litter. An ADC synthetic cover was used in place of soil at the discretion of the landfill

operator. At the end of the operating day, a 50' x 50', 7.5 oz/sq.ft. tarp was pulled over the slope of the working face. The tarp covered all exposed portions of the working face, and the corners and sides of the tarp were weighted with dirt and/or small stones to prevent the wind from exposing any waste. At the beginning of the next operating day, the tarp was walked off of the working face and stored in an adjacent area to the working face.

2. The ADC consisted of three (3) Landfill Tarp systems. Each tarp was approximately 50' x 50' in size, and 6.5-8.5 oz/sq.ft. The tarp was constructed of a woven polypropylene that is puncture, tear and U.V. resistant. The synthetic cover was shipped to the landfill site with panels folded accordion-type, and rolled up. The cover was unrolled along the working face (depending upon operations), and the leading edge of the unrolled panel was attached to existing landfill equipment with ropes (i.e., to the top of the blade) and unrolled.
3. The tarp panels were pulled across the compacted trash by attaching the two leading corners of the tarp to landfill equipment (loader, dozer) via rope tied to the integrated D-ring clips. The synthetic cover was pulled from any direction, which varied from day to day. The leading edge between the two machines (or in some cases, by people) was kept as high as possible to eliminate drag.
4. Blocks are attached at the corners and the edges of synthetic cover were anchored every 20 feet with blocks, tires (with rims intact or filled with concrete), rocks, or sandbags to hold the synthetic cover in place. In windy conditions, more anchoring was required.
5. On the next day of operations, the blocks, tires, rocks, and/or sandbags were removed. The synthetic cover was pulled across itself (to reduce drag) and off the refuse to an area that is inactive. The leading edges of the tarp were anchored to prevent wind from lifting the tarp. At the end of the day, the synthetic cover was pulled back across the refuse by repeating steps 3 and 4 until a new panel was needed.
6. Care was taken to avoid driving on the tarps, which would cause punctures and tears.
7. The fill area was maintained so that the ADC completely covered the entire working face each day. The area that was covered was kept as close to a square shape as possible in order to accommodate the installation of the tarp. Any additional areas of uncovered waste (horizontal progression or side slopes) were covered each day with 6 inches of soil. On rare occasions, such as the beginning or end of a landfill lift, it was necessary to maintain a larger working face. Under such circumstances, the second tarp was taken to the landfill for additional temporary coverage. The second tarp was placed so that a maximum overlapping of the tarps was maintained

Results

1. The tarps were used approximately 35 times during the six-month demonstration period, or about 25% of the time.

2. In the initial days of the demonstration period, a tarp was partially displaced by high winds. Since that time, additional weights were added to the edges of the tarp and no recurrences of the problem took place.
3. After using the tarps once near a temporary 3:1 side slope, landfill Staff determined that this procedure interfered with construction of the temporary slope and thus would be avoided in the future.
4. The use of the tarps during periods of wet weather created challenges as the tarps became heavy with the extra weight of water and caused one tarp to tear. This tarp was removed from the ADC operations. The use of the tarps during wet weather was discontinued by landfill Staff.
5. The tarps were relatively easy to install over the working face. The tarps could be walked off by hand or with the use of landfill equipment. Which method to use was determined by the distance that the tarp was transported to ensure that the stowed tarp was out of the way of filling activities.
6. The use of the tarps allowed for a seamless transition from one day to the next. The tarp allowed landfill staff a quick method to finish covering waste at the end of the day and easy integration of the next day's filling operation.
7. Six inches of soil cover was used at least once per week.

Conclusions

Haywood County would like to continue to use the synthetic cover as an ADC and include this option as a permanent addition to the Operations Plan for the White Oak Landfill. Not only did this procedure allow for easier coverage, it allows for better management of the working face and saves time at the end of the working day. The County would like to increase the frequency of use of the tarps as landfill staff becomes more familiar with this operation. Variables affecting the use of the tarps include the location within the landfill (i.e. proximity to temporary and permanent slopes) and wet weather conditions. The tarps were not used when the working face was near the permanent or temporary slopes because soil cover was used in these areas. Additionally, the tarps were not used during wet weather due to the fact that extra water weight could cause tearing of the tarps. The use of the tarps allowed for a seamless integration from one day to the next and the County will continue to use these tarps as a method of daily cover.

Haywood County will continue to use the plastic panel cover that is currently approved to cover the working face of stacked bales.

**Haywood County Department of Solid Waste
Management**

278 Recycle Road, Clyde, North Carolina 28734, Ph.:(828)627-8042, Fax:(828)627-8137

June 26, 2007

Mr. Jim Patterson, Waste Management Specialist
NCDENR
Division of Solid Waste Management
Asheville Regional Office
2090 US Highway 70
Swannanoa, North Carolina 28778

**Re: Request for Demonstration and Approval of Alternate Daily Cover
Haywood County MSW Landfill; Permit # 44-07**

Dear Mr. Patterson:

The Haywood County Department of Solid Waste Management (Department) is formally requesting the use of an Alternate Daily Cover (ADC) at the Haywood County MSW Landfill. The Department proposes a 180 day demonstration period, during which Field Specialists with the Solid Waste Section will be able to verify the ADC's effectiveness in meeting the requirements of Rule .1626(2)(a).

The proposed ADC will consist of (3) Landfill Tarp systems. Each tarp will be approximately 50'x50' in size, and 6.5-8.5 oz/sq ft. The tarp is constructed of a woven polypropylene that is puncture, tear and U.V. resistant. Actual material specifications are attached and will be available for inspection at the time of implementation of the tarp system.

Haywood County currently has approved as an ADC a 2 mil polyethylene film designed to drape over the vertical face of the bale fill. As we try to achieve maximum density we will continue to utilize the 2 mil plastic on the vertical face of the bales. The tarp, therefore, would be utilized in conjunction with the film allowing us to compact between the bales and cover daily with tarps.

Haywood County would like to begin the demonstration period for approval of the ADC as soon as possible. The tarp will be put into use once we receive permission to proceed with the demonstration. An amended operating plan detailing the tarping system operational procedures will be submitted to your office upon successful completion of the demonstration period and final approval of the tarp as an ADC. Use of the tarp will follow the general operations listed below, and will be designed to ensure protection of public and environmental health and all requirements of Rule .1626(2)(a).

Operations Plan: ADC; Polypropylene Tarp.

By the end of each day of operations, the horizontal or lateral expansion of the working face will be covered with at least six (6) inches of earthen material. The working face will be maintained at a minimum of a 4:1 slope and compacted to reach maximum waste density possible to minimize the size of the working face; preserve landfill space; and deter wind-blown litter. At the end of each operating day, a 50'x50', 6.5 oz/sq ft tarp will be pulled over the slope of the working face. The tarp will cover all exposed portions of the working face, and the corners and sides of the tarp will be weighted with

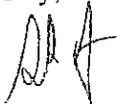
**Haywood County Department of Solid Waste
Management**

278 Recycle Road, Clyde, North Carolina 28734, Ph.:(828)627-8042, Fax:(828)627-8137

dirt and/or small stones to prevent the wind from exposing any waste. At the beginning of the next operating day, the tarp will be walked off of the working face and stored in an adjacent area to the working face.

Thank you for your time and consideration of this request. Please contact me at your convenience should you need any additional information or have any additional requirements of this department with regards to the request. I look forward to your response.

Sincerely,



Stephen King
Director of Solid Waste Management, Haywood County

CC: David Cotton, County Manager
Rick Honeycutt, Assistant County Manager
Jeff Bishop, McGill & Associates
Jim Coffey, Regional Engineer, NC DENR



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management
Solid Waste Section

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

June 28, 2007

Mr. Stephen King, Director
Haywood County Solid Waste Management
278 Recycle Drive
Clyde, NC 28734

Re: Alternate Daily Cover Demonstration Authorization Letter, Polypropylene Tarp,
Haywood County Municipal Solid Waste Landfill, Permit Number 44-07

Dear Mr. King:

This letter is in response to your request for approval to demonstrate the capability of an alternate daily cover (ADC) at the referenced landfill. This Authorization Letter conditionally approves the Demonstration Project as described in your letter dated June 26, 2007, for a period of six (6) months. This period of time provides the operator with time to perform the Demonstration Project, and to compile and submit the certified Demonstration Report to the Solid Waste Section for review.

After six (6) months of using the conditionally approved ADC, the facility operator may then either:

- (1) provide a written report demonstrating the feasibility and request approval for the use of the ADC material on a full-time basis, or
- (2) cease use of the ADC material, properly dispose of any remaining ADC material, and provide a written report detailing the findings of the use of the material during the approval period and what actions were taken to dispose of the material.

If the operator decides to request approval for the use of the ADC material on a full-time basis, a Demonstration Report and revised facility Operation Plan that incorporates the ADC operation, both certified by a professional engineer licensed in North Carolina, shall be submitted to the Solid Waste Section for review and approval.

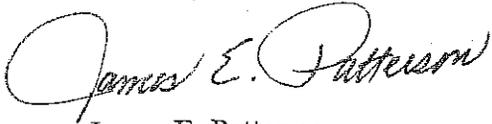
The certified Demonstration Report would include documentation addressing the performance and effectiveness of the material, the number of times the ADC material was used, the quantities of the ADC material, and other supportive information, including photographs.

Following satisfactory demonstration of the ADC material and application, the Solid Waste Section would issue a modified permit for the facility that includes the ADC operation.

Mr. Stephen King
ADC Demonstration Authorization Letter
June 28, 2007
Page 2

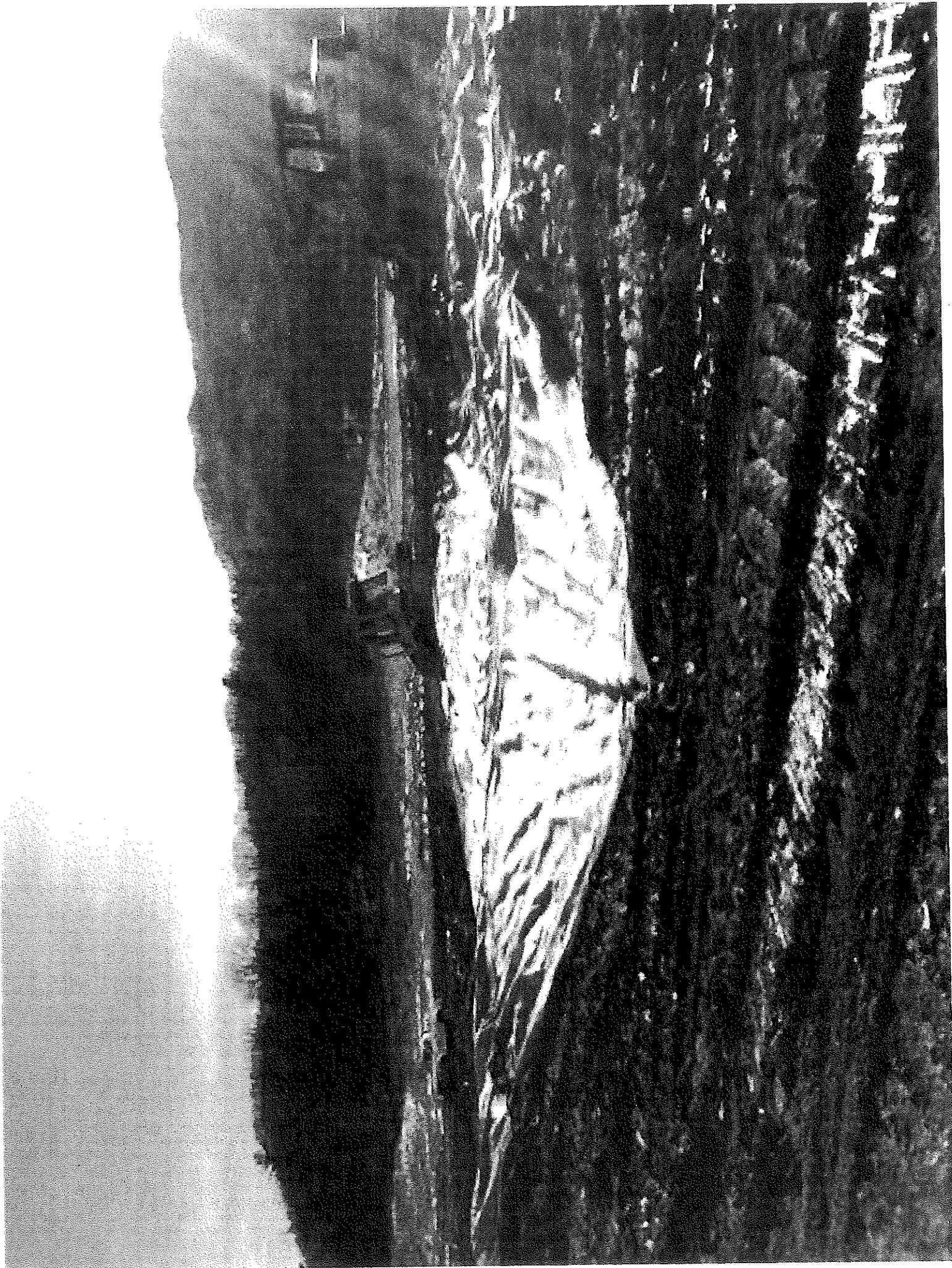
If you have any questions, please call me, phone number 828-296-4700 at the Asheville Regional Office.

Sincerely,

A handwritten signature in cursive script that reads "James E. Patterson". The signature is written in black ink and is positioned above the typed name.

James E. Patterson
Environmental Senior Specialist
Solid Waste Section

cc. Deb Aja
Mark Poindexter



APPENDIX 3

Explosive Gas Control Plan For Haywood County White Oak Landfill

Appendix 3

EXPLOSIVE GAS CONTROL PLAN FOR - HAYWOOD COUNTY

Quarterly the Haywood County landfill will monitor the explosive gas at the landfill structures and at or near the landfill boundary. The permanent probes will consist of a plastic stand pipe similar to a piezometer used for groundwater detection. A typical permanent methane probe is detailed in the operation drawings. The permanent probe will be constructed at a depth of six (6) feet. A 6" diameter hole will contain a one (1) inch slotted PVC pipe. The bottom two (2) feet will be backfilled with non-carbonate pea gravel with a bentonite seal one (1) foot thick above it. The remaining three (3) feet will be backfilled with *in situ* soils. The one (1) inch PVC pipe will be approximately three (3) feet above the existing grade. The PVC pipe will be capped with a one (1) inch PVC cap, one quarter (1/4) inch NPT hose barb, and 1" tubing, plugged or capped.

The location and spacing of the methane monitoring probes is somewhat arbitrary. The locations were determined by the relationship of solid waste with property lines and landfill structures. The spacing of the monitoring probes is between 200 and 400 feet. The migration of methane gas is induced by pressure gradients. The methane will move from areas of high pressure to those of low pressure following the path of least resistance. The methane will migrate vertically until it reaches the landfill cap, where it will begin to flow horizontally. This occurs until it finds a pathway out, either by the installed methane collection trenches or migration through the permeable *in situ* soils. Since methane is lighter than air, it wants to escape into the atmosphere. It has been our experience that whenever gas is migrating no matter what the spacing or depth of the monitoring probes, the gas will fill the void created by the monitoring point and an explosive meter will monitor the level. The six foot depth of the monitoring probes is to ensure a stable monitoring point. The only time a shallow monitoring point has not worked is in a very heavy, impermeable clay layer that acts as a seal to the migration of the gas. If a clay layer is encountered during the construction of the monitoring points, it will either be moved beyond the clay or excavated to a depth that is in the conductive zone below the clay.

The permanent probes will surround Phase 2. Haywood County's landfill is designed with a base liner system and cap system, there should be no migration of methane in the permeable *in situ* soils.

The gas can be detected by use of an instrument that reports the percent of lower explosive limit. The instrument being used is the Gas Tech GP 204.

Quarterly, a County employee will visit each monitoring point either the temporary or permanent. The monitoring points consist of all methane probes and leachate collection system cleanouts. Using the detection instrument, he will determine if methane gas has filled the probes. If the probe is near the property line and methane gas is detected at or beyond the lower explosive limit (100% LEL), it must then be determined if the gas is migrating across the landfill boundary. If the probe is on the boundary or methane gas has migrated beyond the boundary, a remediation plan must be completed by Haywood County.

Other points of monitoring will be the landfill structures. Each structure will be monitored, for methane using the following methods:

1. All crawl spaces will be monitored;
2. All corners in the structure will be monitored;
3. Any holes, cracks and pipes through the foundation will be monitored

If methane gas is detected beyond 25% of its lower explosive limit in any structure, check the calibration of the monitor and resample. If the reading is still above 25%, evacuate the building and try to find the source of gas. If the source is found try to remove the source. If this fails a remediation plan is stated in the operational requirements.

Appendix 4

HAYWOOD COUNTY'S RECIRCULATION PLAN

Haywood County does intend to utilize recirculation as a means of disposal of their leachate. The intention is to utilize recirculation as a method by which some relief can be given to the pumping and hauling. This relief will come in the form of evaporation and retention of water within the solid waste. The remaining leachate will be hauled to the Waynesville Waste Water Treatment Plant for disposal. Haywood County must obtain a permit from the Division of Solid Waste before leachate recirculation can begin.

No water that comes in contact with the present surface of solid waste runs off any where other than the leachate collection system.

The County will spread the leachate over the surface of the solid waste, that is at a minimum five feet (5') deep, within the landfill. The spreading will be accomplished by one of two methods. The first method is by simply backing their leachate hauling truck into the landfill. A spreader hose will then be attached to the leachate tank and Haywood County personnel will manually discharge the leachate over the solid waste. The second method will utilize the tank truck except the leachate will be used to wet down solid waste that is piled up from being dumped from a truck or trucks. Once this pile is wet, it will be spread around the working face by the trash compactor.

At a later date, a pump system may be incorporated into the system. The pump system will pump directly from the leachate lagoon and the leachate spread in a manner as it was from the tank truck.

Monthly monitoring will be performed to measure the leachate head at the leachate head detection well and analyze the leachate for BOD, COD, temperature and pH.

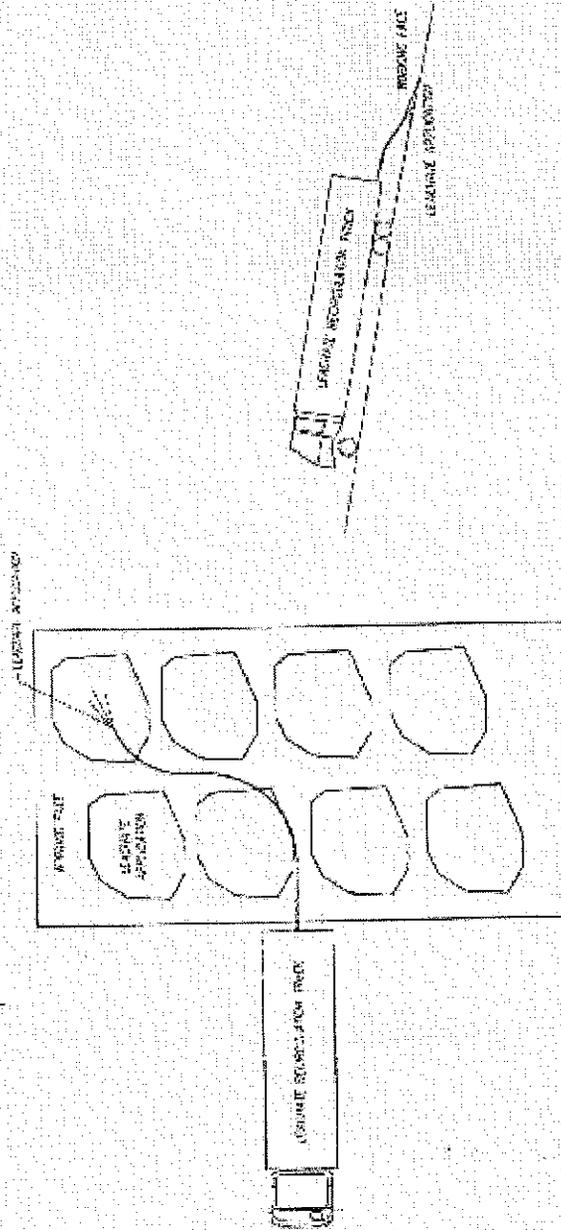
The following conditions will be met by Haywood County:

- A rain gauge and thermometer will be placed on site
- A base line sampling of leachate has been performed (See Attachment 1)
- A brief description of the equipment and its associated specifications is submitted (see Attachment 2)
- Weekly record of leachate head measurements (see Attachment 3)
- Weekly record of leachate recirculated and leachate disposed (see Attachment 4)
- Weekly record of visual monitoring log (see Attachment 5)
- Weekly record of rainfall and lagoon depth (see Attachment 6)
- Records will be kept on a weekly basis
- No leachate will be applied on less than one foot (8 feet) of waste
- No leachate will be recirculated when it is raining, or when the waste is too wet
- No run off or side seepage will be allowed
- Odors will be controlled
- Leachate depth will be monitored in the leachate head detection well to ensure that the head on the liner does not exceed one foot for more than 24 hours.
- The application system will be properly maintained and documented

- Leachate will be tested every 30 days and a progress report will be submitted annually
ATTACHMENT 1

BASELINE DATA

TO BE ADDED IN THE FUTURE



ATTACHMENT 2

APPENDIX 4

Haywood County's Recirculation Plan

Appendix 4

HAYWOOD COUNTY'S RECIRCULATION PLAN

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The County will spread the leachate over the surface of the solid waste. that is at a minimum five feet (5') deep, within the landfill. The spreading will be accomplished by one of two methods. The first method is by simply backing their leachate hauling truck into the landfill. A spreader hose will then be attached to the leachate tank and Haywood County personnel will manually discharge the leachate over the solid waste. The second method will utilize the tank truck except the leachate will be used to wet down solid waste that is piled up from being dumped from a truck or trucks. Once this pile is wet. it will be spread around the working face by the trash compactor.

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- Weekly record of visual monitoring log (see Attachment 5)
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- Odors will be controlled
- Leachate depth will be monitored in the leachate head detection well to ensure that the head on the liner does not exceed one foot for more than 24 hours.
- The application system will be properly maintained and documented

- Leachate will be tested every 30 days and a progress report will be submitted annually

ATTACHMENT 1

BASELINE DATA

TO BE ADDED IN THE FUTURE

APPENDIX 5

Mulching and Grinding Treatment and Processing Operations Plan

Appendix 5

OPERATIONS PLAN

**MULCHING AND GRINDING
TREATMENT AND PROCESSING FACILITY**

**WHITE OAK MSW LANDFILL
HAYWOOD COUNTY, NORTH CAROLINA**

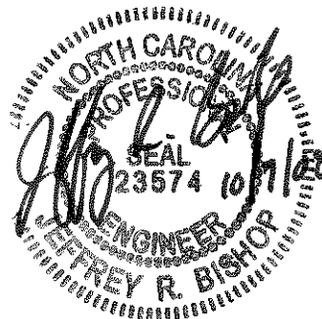


JEFFREY R. BISHOP, P.E.

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SEPTEMBER 2008

07517



OPERATIONS PLAN
MULCHING AND GRINDING
TREATMENT AND PROCESSING

WHITE OAK MSW LANDFILL
HAYWOOD COUNTY, NORTH CAROLINA

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**OPERATIONS PLAN
MULCHING AND GRINDING TREATMENT AND PROCESSING
WHITE OAK LANDFILL
HAYWOOD COUNTY, NORTH CAROLINA
September 2008**

I. INTRODUCTION

A. Purpose of Plan

This operations plan has been developed for the proposed Mulching and Grinding Treatment and Processing Facility located at the White Oak Landfill in Haywood County, North Carolina. This plan has been prepared in accordance with the requirements of the North Carolina Department of Environment, Health, and Natural Resources (DENR), Division of Solid Waste Management, Solid Waste Rules (15A NCAC 13B).

The purpose of this plan is to provide the owner and operator with a reference manual that includes necessary information, procedures, and applicable rules for properly operating the Treatment & Processing Facility. All personnel involved with the management or supervision of operations at the facility will be required to review the Operations Plan and to maintain the facility in conformance with applicable requirements. A copy of the Operations Plan will be kept in the vicinity of the Mulching and Grinding Treatment and Processing Facility at all times.

B. Facility Location

The Mulching and Grinding Treatment and Processing Facility is located at the White Oak Landfill at 3898 Fines Creek Road, Waynesville, North Carolina 28785 and is operated by Haywood County. The Treatment and Processing Facility is located south of the Phase 2 MSW Landfill and east of the Phase 1 Construction/Demolition Landfill. Figure 1 illustrates the Overall Site Plan for the White Oak Landfill and Figure 2 shows the Mulching and Grinding Treatment and Processing Facility.

C. Service Area

This Mulching and Grinding Treatment and Processing Facility will provide service for all of Haywood County.

II. SITING REQUIREMENTS

Siting requirements are shown on Figure 2 as well as described as follows:

- 1) The proposed Treatment and Processing Facilities are not located in the 100-year flood plain.
- 2) A 50-foot buffer between all property lines and the treatment and processing areas is maintained.
- 3) A 25-foot buffer shall be maintained between material stockpiles and berms and swales to allow for access of fire-fighting equipment.
- 4) A 200-foot buffer is maintained between treatment and processing facilities and residences.
- 5) A 100-foot buffer is maintained between treatment and processing facilities and water supply wells.
- 6) Haywood County has no zoning requirements for the treatment and processing site property.
- 7) Diversion berms and drainage ditches are designed to ensure that there will be no standing water in the treatment and processing area and there will be no off-site drainage problems and also to divert runoff from processing areas to sediment basins.
- 8) An all-weather gravel access road to the site will be kept passable at all times.
- 9) An erosion control permit submittal for the site is pending and will be provided to the NCDENR-DWM prior to commencement of treatment and processing operations.
- 10) Site screening of the treatment and processing site is not required.
- 11) Access to the treatment and processing facility is controlled by properly trained employees.
- 12) The area has diversion berms leading to a sediment basin. Both the ditches and the sediment basin can be utilized to control runoff from a potential fire.
- 13) An aerial photo illustrating the area within one-fourth mile of the site was submitted to NCDENR in the "White Oak Landfill MSWLF Site Study", dated November 4, 1998.

III. OPERATIONS PROCEDURES

A. Overview

The Mulching and Grinding Treatment and Processing Facility will consist of approximately 2.0 acres. The location of the facility is shown on Figures 1 & 2. For the twelve-month period from July 1, 2006 through June 30, 2007, the White Oak Landfill averaged 100 tons per month of wood mulch, brush, and yard waste. Mulched material will be used as an Alternate Daily Cover material during a six-month demonstration period at the Landfill and in wet areas of gravel access roads. The mulch ADC will be mixed with

soil at a 3:1 soil/mulch ratio. A portion of the mulched material may be used as a bulking agent in the adjacent composting facility.

Normal working hours for the Mulching and Grinding Treatment and Processing Facility are 8:00 a.m. to 4:30 p.m., Monday through Friday and 8:00 a.m. to 12:00 p.m. on Saturday. The facility is closed on Sunday and the following holidays: New Year's Day, Independence Day, Thanksgiving Day, and Christmas Day.

B. Personnel

The facility is owned and operated by Haywood County. A minimum of two part-time staff employees is required for the daily operation of the Mulching and Grinding Treatment and Processing Facility. These employees are properly trained in safety procedures and the inspection of incoming wastes. Training material published by the Solid Waste Association of North America (SWANA) is utilized for initial training of on-site personnel and for continuing education. The employees also direct and coordinate the movement of collection vehicles into and out of the Mulching and Grinding Treatment and Processing Facility.

C. Technical Operational Requirements

On or before August 1st of each year, the owner or operator shall report to the North Carolina Solid Waste Section, for the previous year beginning July 1st and ending June 30th, the amount by weight of the solid waste that was received at the facility and disposed of in a landfill, incinerated, or converted to fuel. To the maximum extent practicable, such reports shall indicate by weight the county of origin of all solid waste. The owner or operator shall transmit a copy of the report to the county in which the facility is located and to each county from which waste originated.

The following operational criteria shall be met at the Mulching and Grinding Treatment and Processing Facility:

- 1) Only clean unpainted untreated wood and brush will be used in the mulching process, including pallets.
- 2) Mulched materials will be removed from the site several times a week.
- 3) Sludges may not be included in mulched materials.
- 4) Neither hazardous waste nor asbestos containing waste shall be accepted at the mulching facility.
- 5) Household hazardous waste shall not be accepted at the mulching facility.
- 6) The Mulching and Grinding Treatment and Processing Facility shall not allow uncontrolled public access.

- 7) Alternate daily coverage materials will include only clean unpainted wood waste.
- 8) Only clean, unpainted masonry, concrete, and asphalt may be ground for use as road base and ditch lining material.

D. Traffic Control

Access to the Mulching and Grinding Treatment and Processing Facility is controlled by properly trained employees who are located at the entrance of the facility. As vehicles arrive at the Mulching and Grinding Treatment and Processing Facility, site personnel will direct the driver to position the vehicle at the correct unloading location. When the contents of the vehicle are emptied, the driver is instructed to move the vehicle away from the Treatment and Processing area.

E. Housekeeping, Litter, and Vector Control

Incoming wastes will be transported to the Mulching and Grinding Treatment and Processing Facility in covered or enclosed vehicles. Outgoing transfer trailers will also be covered or enclosed. Throughout the day and at the end of each working day, facility personnel will police the area for litter. Mosquitoes and rodents shall be controlled so as to protect the public health and welfare.

F. Fire Control

In the event that a fire occurs, the local authorities will be notified immediately. The telephone numbers of local fire, police, ambulance and hospital facilities are posted in and around the facility at all times. Additionally, the White Oak Landfill facility keeps a water tank truck on site at all times. In the event of a fire at the facility the DENR will be notified within 24 hours and written notification will be submitted within 15 days.

G. Storm Water Management and Erosion Control

An erosion control permit submittal for the Mulching and Grinding Treatment and Processing Facility is pending and will be provided to the NCDENR-DWM upon receipt. Standard erosion control practices, such as a sediment basin, silt fencing, vegetating slopes, and diversion ditches will

be utilized at the site. Runoff from the processing area will be diverted through ditches to a sediment basin prior to discharge off the property.

H. Zoning

Haywood County has no zoning requirements for the Treatment and Processing Site property. A detailed discussion of the zoning requirements for Haywood County is included in the "White Oak Landfill, MSWLF Site Study", dated November 4, 1998.

APPENDIX 6

Composting Operations Plan

Appendix 6

OPERATIONS PLAN
SMALL TYPE 2 COMPOSTING FACILITY
WHITE OAK MSW LANDFILL
HAYWOOD COUNTY, NORTH CAROLINA

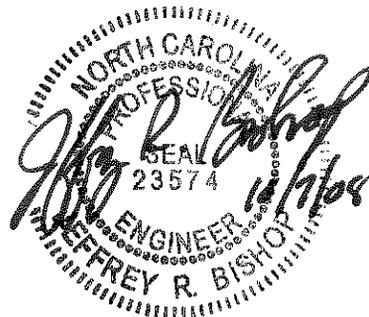


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SEPTEMBER 2008

07517



**OPERATIONS PLAN
SMALL TYPE 2 COMPOSTING FACILITY
WHITE OAK LANDFILL
HAYWOOD COUNTY, NORTH CAROLINA
September 2008**

I. INTRODUCTION

A. Purpose of Plan

This operations plan has been developed for the proposed Small Type 2 Composting Facility located at the White Oak Landfill in Haywood County, North Carolina. This plan has been prepared in accordance with the requirements of the North Carolina Department of Environment, Health, and Natural Resources (DENR), Division of Solid Waste Management, Solid Waste Rules (15A NCAC 13B).

The purpose of this plan is to provide the owner and operator with a reference manual that includes necessary information, procedures, and applicable rules for properly operating the Composting Facility. All personnel involved with the management or supervision of operations at the facility will be required to review the Operations Plan and to maintain the facility in conformance with applicable requirements. A copy of the Operations Plan will be kept in the vicinity of the Composting Site at all times.

B. Facility Location

The Small Type 2 Composting Facility is located at the White Oak Landfill at 3898 Fines Creek Road, Waynesville, North Carolina 28785 and is operated by Haywood County.

C. Service Area

The Composting Facility will provide service for all of Haywood County.

II. SITING REQUIREMENTS

The proposed composting facility site is located south of the Phase 2 MSW cell and east of the Phase 1 Construction & Demolition cell. The location of the composting facility is illustrated on Figures 1 and 2 of the plans. Siting requirements are shown on the plans as well as described as follows:

- 1) The proposed Composting Facility is not located in the 100-year flood plain.
- 2) A 200-foot buffer is maintained between the composting facility and all residences.
- 3) A 100-foot buffer is maintained between the composting facility and water supply wells.
- 4) A 50-foot buffer is maintained between all property lines and the composting facility.
- 5) A 25-foot minimum distance between compost areas and swales or berms will be maintained in order to allow for adequate access of fire-fighting equipment.
- 6) Haywood County has no zoning requirements for the composting site property.
- 7) Diversion berms and drainage ditches are designed to ensure that there will be no standing water in the composting area and there will be no off-site drainage problems and also to divert runoff from composting areas to sediment basins.
- 8) A 50-foot minimum buffer between perennial streams and the compost area will be maintained.
- 9) An all-weather gravel access road to the site will be kept passable at all times.
- 10) An erosion control permit submittal for the site is pending and a copy of the permit will be sent to NCDENR-DWM prior to commencing grading of the site.
- 11) Site screening of the composting site is not required.
- 12) Access to the composting facility is controlled by properly trained employees.
- 13) The site has diversion berms leading to a sediment basin. Both the ditches and the sediment basin can be utilized to control runoff from a potential fire.
- 14) An aerial photo illustrating the area within one-fourth mile of the site was submitted to NCDENR-DWM in the "White Oak Landfill MSWLF Site Study", dated November 4, 1998.

III. OPERATIONS PROCEDURES

A. Overview

The Small Type 2 Composting Site will consist of an area of approximately 1.5 acres where composting will take place. The County intends to use culls from pre-consumer agricultural activities as a primary material source for the composting operation. Approximately 230 tons of agricultural culls per quarter will be available to the County for composting. Additionally, there are additional clean wood materials available at the landfill for composting as a result of the grinding operation, but these materials are typically

mulched and used prior to them becoming available for composting. For the twelve-month period from July 2006 through June 2007, the White Oak Landfill averaged 100 tons per month of wood and yard waste. Composted material will be utilized on site as a soil amendment for newly grassed areas. The rate of compost use will be determined as the compost is developed and the chemical constituency of the material is known. An analysis of compost taken from the Johnson Tomato Packing House in Canton was conducted. The Johnson Packing House compost will be similar in nature to compost produced at the White Oak Landfill. Additionally, analysis was conducted on the soils at the White Oak Landfill that will be used on intermediate slopes where compost will be used to establish vegetative cover. The results of the analyses and proposed compost application rates are included in Appendix 1. A rate of as high as 100 tons of compost per acre will have no undesired effects on the site, according to Bill Yarborough, Regional Agronomist with the North Carolina Department of Agriculture and Community Service. A copy of a letter from Mr. Yarborough is attached in Appendix 1 of this plan.

Normal working hours for the Composting Site are 8:00 a.m. to 4:30 p.m., Monday through Friday and 8:00 a.m. to 12:00 p.m. on Saturday. The facility is closed on Sunday and the following holidays: New Year's Day, Independence Day, Thanksgiving Day, and Christmas Day.

B. Personnel

The facility is owned and operated by Haywood County. A minimum of two part-time staff employees is required for the daily operation of the Composting Site. These employees are properly trained in safety procedures and the inspection of incoming wastes. Training material published by the Solid Waste Association of North America (SWANA) is utilized for initial training of on-site personnel and for continuing education. The employees also direct and coordinate the movement of collection vehicles into and out of the Composting Site.

C. Technical Operational Requirements

On or before August 1st of each year, the owner or operator shall report to the North Carolina Solid Waste Section, for the previous year beginning July 1st and ending June 30th, the amount by weight of the solid waste that was received at the facility and disposed of in a landfill, incinerated, or converted to fuel. To the maximum extent practicable, such reports shall indicate by weight the county of origin of all solid waste. The owner or operator shall transmit a copy of the report to the county in which the facility is located and to each county from which waste originated.

The following operational criteria shall be met at the Composting Site:

- 1) Small Type 2 Composting Facilities shall process or store less than 1,000 cubic yards of material for composting per quarter, and occupy less than two acres of land.
- 2) Type 2 composting facilities may receive pre-consumer meat-free food processing waste, vegetative agricultural waste, source separated paper or other source separated specialty wastes, which are low in pathogens and physical contaminants
- 3) Waste acceptable for a Type 1 facility may be composted at a Type 2 facility. Type 1 wastes include yard and garden waste, silvicultural waste, untreated and unpainted wood waste or any combination thereof.
- 4) Sludges may not be included in a Type 2 Composting Facility.
- 5) Neither hazardous waste nor asbestos containing waste shall be accepted at the composting facility.
- 6) Household hazardous waste shall not be accepted at the composting facility.
- 7) The composting site shall not allow uncontrolled public access.
- 8) Compost shall be maintained at or above 131 degrees Fahrenheit for 3 days. The temperature of all compost produced shall be monitored sufficiently to ensure that the pathogen reduction criteria is met.
- 9) Nitrogen bearing wastes shall be incorporated as necessary to minimize odor and the migration of nutrients.
- 10) The finished compost shall meet the classification and distribution requirements outlined in Rule 15A NCAC 13B.1407 of the Solid Waste Regulations.

D. Traffic Control

Access to the Composting Site is controlled by properly trained employees who are located at the entrance of the landfill. As vehicles arrive at the Composting Site, site personnel will direct the driver to position the vehicle at the correct unloading location. When the contents of the vehicle are emptied, the driver is instructed to move the vehicle away from the Composting Site.

E. Housekeeping, Litter, and Vector Control

Incoming wastes will be transported to the Composting Site in covered or enclosed vehicles. Outgoing transfer trailers will also be covered or enclosed. Throughout the day and at the end of each working day, facility personnel will police the area for litter. Mosquitoes and rodents shall be controlled so as to protect the public health and welfare.

F. Fire Control

In the event that a fire occurs, the local authorities will be notified immediately. The telephone numbers of local fire, police, ambulance and hospital facilities are posted in and around the facility at all times. Additionally, the White Oak Landfill facility keeps a water tank truck on site at all times. In the event of a fire at the facility the NCDENR will be notified within 24 hours and written notification will be submitted within 15 days.

G. Storm Water Management and Erosion Control

An erosion control permit submittal is pending and a copy of the erosion control permit will be provided to the NCDENR-DWM upon receipt. Standard erosion control practices, such as a sediment basin, silt fencing, vegetating slopes, and diversion ditches will be utilized at the site. Runoff from the composting areas will be diverted to an existing sediment basin and a proposed sediment traps.

H. Zoning

Haywood County has no zoning requirements for the Scrap Tire Collection Site property. A detailed discussion of the zoning requirements for Haywood County is included in the "White Oak Landfill, MSWLF Site Study", dated November 4, 1998.

Composting Operations Plan
APPENDIX 1

- **Letter from Bill Yarborough, Regional Agronomist with the North Carolina Department of Agriculture and Community Service.**
- **Results of Compost Analysis of Johnson Tomato Packing House**
- **Results of Soil Analysis of White Oak Landfill Soils**
- **Calculated Compost Application Rates**
- **Compost Application Recommendations**

Mr. Steven King, Manager
Haywood Co Solid Waste
278 Recycle Road
Clyde, NC 28721

Subject: Compost use for soil remediation at the White Oak Sanitary Landfill

Mr. King,

Recently I took compost samples produced from produce waste and wood chips by the JW Johnson Tomato Company facility. The compost is located at the Jim Francis site and was composted according to a demonstration permit issued last summer by DENR- Div of Solid Waste. I found the material in excellent condition for use as a soil amendment to improve the condition of saprolite soil material currently being used on the slopes of the landfill. The use of this organic material will greatly improve water holding ability, cation exchange capacity, and general soil quality. Soil stabilization with vegetation will be vastly improved through the addition of this material.

The compost contained less than one colony of e.coli. The nutrient content was very low. Nitrogen was about two pounds per ton and phosphorus about 1.6 lbs per ton. Both of these conditions are good from an environmental standpoint. I see no concerns from the use of this compost for its intended use.

Based on the low fertility content, I feel confident that a broadcast and incorporated rate as high as 100 tons of compost per acre will have no undesired effects on the site. The soil material present on the site will tightly hold the available phosphorus and not allow leaching. The available nitrogen at that rate will be readily utilized by the planted vegetation and this also will allow little to no leaching. I have used similar compost and similar rates on graded areas with great success. I expect the results in this situation to be comparable.

From an environmental and from an agronomic standpoint, I applaud your interest in improving this site. The addition of organic material from compost is considered by all disciplines involved as a best management practice for soil remediation. Erosion and subsequent sedimentation should be drastically reduced. Land applied composted vegetable waste is also considered a best management practice as well as a recommended practice.

Please let me know if additional information is required or requested.

Bill Yarborough
Regional Agronomist
NCDA&CS
Waynesville, NC 28786

King, Stephen
278 Recycle Rd
Clyde, NC 28721

Copies Yarbrough, Bill



Soil Test

9/18/2008 SERVING N.C. RESIDENTS FOR

Haywood County

Agronomist

C - 12, \$

Field	Applied		Recommendations													
	Mo	Yr	Crop or Year	Lime	N	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note		
Sample HARDR			1st	1.3T	50-70	140-160	50-70	0	0	\$	\$	.0	0	12	
			2nd	0	120-200	140-160	90-110	0	0	\$	\$	.0	0	12	

Test Results

Soil	HM%	W/V	CEC	BS%	Ac	pH	P-J	K-J	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO ₃ -	NH ₄ -	Na
MIN	0.04	0.95	2.7	48.0	1.4	4.9	0	21	25.0	18.0	273	173	173	3	3	15	250				0.0

Field	Applied		Recommendations													
	Mo	Yr	Crop or Year	Lime	N	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note		
Sample NEWCE			1st	1.7T	50-70	30-50	0	0	0	\$	\$	.0	0	12	
			2nd	0	120-200	10-30	20-40	0	0	\$	\$	.0	0	12	

Test Results

Soil	HM%	W/V	CEC	BS%	Ac	pH	P-J	K-J	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO ₃ -	NH ₄ -	Na
MIN	0.04	1.06	6.4	72.0	1.8	4.9	51	61	36.0	31.0	138	92	92	8	8	25	582				0.1

Field	Applied		Recommendations													
	Mo	Yr	Crop or Year	Lime	N	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note		
Sample LEACH			1st	1.8T	50-70	140-160	80-100	0	0	0	\$	.0	0	12	
			2nd	0	120-200	140-160	110-130	0	0	0	\$	.0	0	12	

Test Results

Soil	HM%	W/V	CEC	BS%	Ac	pH	P-J	K-J	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO ₃ -	NH ₄ -	Na
MIN	0.04	0.94	3.8	50.0	1.9	5.1	0	10	31.0	17.0	143	95	95	8	8	30	200				0.2

Field	Applied		Recommendations													
	Mo	Yr	Crop or Year	Lime	N	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note		
Sample ENTRA			1st	.5T	50-70	100-120	0-20	0	0	0	0	.0	0	12		
			2nd	0	120-200	90-110	40-60	0	0	0	0	.0	0	12		

Test Results

Soil	HM%	W/V	CEC	BS%	Ac	pH	P-J	K-J	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO ₃ -	NH ₄ -	Na
MIN	0.04	0.99	7.5	92.0	0.6	5.9	16	44	58.0	32.0	316	199	199	30	30	50	1051				0.1

Grower: **Johnson, J. W.**
 c/o J. W. Johnson Packing House
 7762 Cruso Rd
 Canton, NC 28716

Copies To: Yarborough, Bill
 Johnson, J. W.

Waste Analysis Report



7/17/2008

Haywood County

Laboratory Results (parts per million unless otherwise noted)

Sample ID:	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	C
1	6743	1530	2915	4952	1077	510	315	90.7	62.5	85.0	1.69			148348
Waste Code:														
FCV	-NH4													
	-NO3													
Description:														
Composted Veg. Residue	OR-N	606	7.25	5.21	43.3				7.04	80	22.00	37.88		
	Urea													

Application Method	Nutrients Available for First Crop											Other Elements								
	N	P2O5	K2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	Na	Ni	Cd	Pb	Al	Se	Li
Broadcast	2.0	1.6	2.1	2.2	0.49	0.23	0.14	0.04	0.03	0.04	T			0.46	0.01	T	0.05			
Soil Incorp	2.6	2.0	2.4	2.8	0.61	0.29	0.18	0.05	0.04	0.05	T			0.46	0.01	T	0.05			

The waste product has an ideal C:N ratio of 20-30 for optimum composting. No additional blending is necessary.

Soluble salt level is high. The roots of plants growing directly in the compost may be damaged particularly under dry soil conditions. The compost should be blended at least 50:50 with another material of lower salt level. High soluble salts likely indicate high nutrient availability. Take a matching soil sample to further evaluate pH and nutrient availability.

Compost pH is higher than ideal for plant production. If the compost will be used as a landscape or potting soil, blend other materials or add elemental sulfur to decrease pH to the desired range. As a general rule, add 0.25 lb. of elemental sulfur per cu. yd. of soil to lower pH 0.5-1.0 unit. One month after treatment, take a soil sample to determine if pH is within the desired range.

Completed: 3/17/2008



Understanding the Soil Test Report

www.ncagr.com/agronomi/uyrst.htm

Steve Troxler, Commissioner of Agriculture



This cover sheet briefly explains the measurements, abbreviations and units found on NCDA&CS soil test reports. For more details, visit www.ncagr.com/agronomi/uyrst.htm. Along with the report and this cover sheet, you probably also received one or more trifold *Notes* that address nutrient issues relevant to the crop(s) specified on your information sheet(s).

The "Test Results" section of the report lists values for *up to* 21 factors. The first seven [soil class, HM%, W/V, CEC, BS%, Ac and pH] describe the soil and its degree of acidity. The other 14 [P-I, K-I, Ca%, Mg%, Mn-I, Mn-AI (1), Mn-AI (2), Zn-I, Zn-AI, Cu-I, S-I, SS-I, NO₃-N, Na] indicate levels of plant nutrients or other fertility measurements.

If testing indicates that soil pH is too low for the crop(s) you indicated, there will be a *lime recommendation* on your report. The recommendation is given in units of either M (lb/1000 ft²) or T (ton/acre). For best results, mix the lime into the top 6 to 8 inches of soil several months before planting. For no-till or established plantings where this is not possible, apply no more than 50M (or 1 to 1.5T) at one time, even if your report recommends more. You can apply the rest in similar increments every six months until the full rate is applied.

Fertilizer recommendations for small areas, such as home lawns/gardens, appear in parentheses after the lime recommendation and are listed in units of lb/1000 ft². If you cannot find the exact fertilizer recommended, visit www.ncagr.com/agronomi/obpart4.htm#fs to find information that may help you choose an alternate grade. Refer also to *A Homeowner's Guide to Fertilizer*, available at www.ncagr.com/agronomi/pdf/files/sfn8.pdf.

Fertilizer recommendations for field crops or other large areas are listed separately for each nutrient to be added (in units of lb/acre unless otherwise specified). NCDA&CS soil reports provide a recommendation for N (and sometimes for B) that is based on research/field studies for the crop being grown, not on soil test results. K-I and P-I values are based on test results and should be ≥ 50 . If they are not, follow the fertilizer recommendations given. NO₃-N is analyzed by request only. SS-I levels appear only on reports for greenhouse soil or problem samples.

Farmers and other commercial producers should pay special attention to *micronutrient levels*. If \$, pHs, \$pH, C or Z notations appear on the soil report, refer to \$*Note: Secondary Nutrients and Micronutrients* (enclosed with your report) or visit [www.ncagr.com/agronomi/pdf/files/st\\$note.pdf](http://www.ncagr.com/agronomi/pdf/files/st$note.pdf). In general, homeowners do not need to be concerned about micronutrients.

Report Abbreviations

Ac	exchangeable acidity
B	boron
BS%	% CEC occupied by basic cations
Ca%	% CEC occupied by calcium
CEC	cation exchange capacity
Cu-I	copper index
HM%	percent humic matter
K-I	potassium index
K ₂ O	potash
M	pounds per 1000 square feet
Mg%	% CEC occupied by magnesium
MIN	mineral soil class
Mn-AI	manganese availability index
Mn-I	manganese index
M-O	mineral-organic soil class
N	nitrogen
Na	sodium
NO ₃ -N	nitrate nitrogen
ORG	organic soil class
pH	current soil pH
P-I	phosphorus index
P ₂ O ₅	phosphate
ppm	parts per million
S-I	sulfur index
SS-I	soluble salt index
T	tons per acre
W/V	weight per volume (g/cm ³)
Zn-AI	zinc availability index
Zn-I	zinc index



— Soil Fertility Note 12 — Fertilizing with Organic Nutrients

March 1999

NCDA&CS Agronomic Division

Web site: www.ncagr.com/agronomi

Phone: 919-733-2655

Serving North Carolina growers since 1940

Some growers prefer to use organic sources of nutrients (Table 1) instead of chemical fertilizers to grow plants. Organic sources do have the advantages of containing slow-release nutrients, posing little risk of soluble salt injury, and contributing considerable amounts of organic matter to the soil. Some of the beneficial response that organic growers see may actually be coming from the increased organic matter they are adding to the soil.

Animal Manures

Animal manures are an excellent source of organic nutrients. Fresh manure may be available directly from livestock operations. Commercial, packaged manures generally contain composted material. Since manures are highly variable in nutrient content, it is advisable to purchase an analyzed manure or have an analysis done to determine nutrient content. The Waste Analysis Section of the NCDA&CS Agronomic Division can conduct tests to determine exact nutrient concentrations in either fresh manure or noncommercial, composted manure.

Composted manures have several advantages over fresh manures. They are less likely to have a strong odor, attract undesirable insects, or burn plants if applied directly. Also, since they contain lower levels of moisture and higher concentrations of nutrients than fresh manures, smaller quantities are needed to supply a given amount of nutrients. In addition, composted manures usually have labels that specify the exact nutrient concentrations they contain.

Compost

Many materials from yard waste to sawdust to industrial by-products can be composted. Compost is generally ready to mix into the soil when you can no longer identify what the material originally consisted of. It usually has a dark brown appearance, is granular in size, and has a musty smell.

Uncomposted waste, such as leaves and grass clippings, is useful as mulch but not as a nutrient source. When uncomposted organic matter is mixed into the soil, plants may become nitrogen deficient. This situation is due to the build up of microorganisms that break down organic matter and tie up nitrogen, making it unavailable to plants.

Cover Crops

Legumes, such as clover or vetch, make excellent cover crops. When killed or mixed back into the soil prior to planting, they can supply up to 100 lb of nitrogen per acre. For small gardens, this would be about 2 lb of nitrogen per 1000 ft². Mixing a cover crop into the soil also adds organic matter to the soil, making clay soils easier to work and sandy soils more able to retain nutrients.

Lime

Lime is a naturally occurring material produced by crushing rock containing high amounts of calcium and magnesium carbonates. Because it is not chemically altered, it can be used by organic growers. Lime is also the primary source of calcium and magnesium.

Management Considerations

Never fertilize without knowing the nutrient status of your soil and of the organic source you intend to apply. The NCDA&CS Agronomic Division can perform these tests for you. A soil test report is good for at least two years and contains recommendations for lime and fertilizer applications, including micronutrients.

For lawns and gardens, the fertilizer rate suggested on the soil report can be applied more than one time per growing season. For field crop situations, however, the suggested rate is for the entire growing season and should not be exceeded. The total amount of fertilizer applied during the growing season will depend on soil type, crop, and weather conditions. You can use the suggested fertilizer rate for several years until a subsequent soil test gives a new recommendation.

Soil pH. As a rule, plants grow well at a pH of 6.0 although vegetable gardens do better at a pH of 6.5. In North Carolina, soil pH is usually less than optimum. Rainfall and fertilization, even with some organic sources, tend to lower soil pH over time.

The chief purpose of applying lime is to raise the pH to a more desirable level. When the pH is too low, levels of aluminum and hydrogen in the soil are toxic to the root systems of plants. If the pH is too high, micronutrients may be bound in forms unavailable for plant uptake.

The amount of lime recommended on a soil test report is based on the existing pH, exchangeable acidity in the soil, and the crop you want to grow. Although you can apply it at any time, lime requires weeks to months to neutralize excess acidity. Therefore, it is wise to apply lime well in advance of planting and to mix it into the soil whenever practical.

Nutrient availability. Nutrients from most organic sources are slowly available over time. Therefore, it is wise to apply organic fertilizers well before planting so that adequate amounts of nutrients will be released before plants need them. When a deficiency does occur, it is not easy to get quick corrective action from organic sources.

Soil moisture, temperature, and pH all affect nutrient availability. Very wet, dry, or cool soil can prevent nutrient release. Phosphate availability is limited in soils with pH values below 6.0, even when materials rich in phosphate (e.g., rock phosphate) are applied.

Rates of application. A typical organic fertilization strategy might be to apply a poultry litter product (3-2-3 or 3-2-2) at the rate of 20–35 lb per 1000 ft² prior to planting. Later in the season, application of a liquid fish emulsion and seaweed product (~4-1-1) or a blended mixture of cottonseed and bonemeal can supply additional nitrogen.

Most soils contain adequate levels of micronutrients so outside sources are usually unnecessary.

Using a current NCDA&CS soil test report, you can calculate the application rate for any chemical or organic fertilizer you choose. First, look on the product packaging to find the percentage of nutrients contained in the material. If you are using a nonpackaged source, use the results listed in the waste analysis report or the appropriate value from in Table 1. Then, divide this number into the pounds of actual nutrient recommended on the soil test report.

For example, if the soil test report recommends 1 lb of nitrogen per 1000 ft² and you intend to apply bloodmeal (12% N), then divide the nitrogen recommendation (1 lb) by the percentage of nitrogen in the bloodmeal (0.12). The results of this calculation indicate that 8.3 lb of bloodmeal per 1000 ft² will supply the recommended nitrogen.

If you want to supply 1 lb of nitrogen per 1000 ft² with fish meal (8-4-0.5), follow the same process. Divide the nitrogen recommendation (1 lb) by the percentage of nitrogen in the fish meal (0.08). You find that you need to apply 12.5 lb of meal per 1000 ft² to meet the nitrogen requirement. In addition, you will be applying 0.5 lb P₂O₅ [0.04 x 12.5] and 0.06 lb K₂O [0.005 x 12.5] per 1000 ft².

J. Kent Messick

Table 1. Approximate nutrient content and availability of organic materials

Material	%Nitrogen (N)	% Phosphate (P ₂ O ₅)	% Potash (K ₂ O)	Availability
bloodmeal	12.0	1.5	0.57	medium–fast
bone meal (steamed)	0.7–4.0	18.0–34.0	0	slow–medium
compost	1.5–3.5	0.5–1.0	1.0–2.0	slow
cottonseed meal	6.0	2.0	1.0	slow
cow manure	0.25–2.0	0.15–0.9	0.25–1.5	medium
fish meal	8.0	4.0	0.5	
greensand*	0	0	6.0	very slow
horse manure	0.3–2.5	0.15–2.5	0.5–3.0	medium
poultry manure	1.1–2.8	0.5–2.8	0.5–1.5	medium–fast
rock phosphate	0	28.0	0	very slow
seaweed	0	0	4.0–13.0	
soybean meal	7.0	0.0	1.0	
swine manure	0.3	0.3	0.3	medium
tankage*	9.0	10.0	0	
wood ashes	0	1.0–2.0	3.0–7.0	rapid

*Greensand is a hydrated salt of iron and potassium silicate. Tankage is a mixture of dried, ground-up by-products from animal slaughter.

Questions or comments should be directed to the Soil Testing Section of the NCDA&CS Agronomic Division. Additional information on soil testing, nematode assay and plant/waste/solution analysis is available from the NCDA&CS Agronomic Division.

Compost Requirements for White Oak Landfill

Existing Soils at the White Oak Landfill

Per the Soil Test Report (see attached), the following quantities of N-P-K are required for the soils obtained from the borrow area (sample: NewCell) at the landfill to establish a stand of grass:

- 70 lbs N per acre
- 50 lbs P₂O₅ per acre
- 40 lbs K₂O per acre (looking at second crop)

Existing Compost at Johnson Tomato Company

Per the Waste Analysis Report and the letter by State Agronomist, Bill Yarborough (see attached), the compost for the Johnson Tomato Company consists of approximately:

- 2.0 lbs N/ton of compost
- 1.6 lbs P₂O₅/ton of compost
- 2.1 lbs K₂O/ton of compost

Application Rates of Compost Similar to Johnson Tomato Company

N required: $\frac{70 \text{ lbs N required/acre}}{2.0 \text{ lbs N provided/ton of compost}} = 35 \text{ tons of compost/acre}$

P₂O₅ required: $\frac{50 \text{ lbs P required/acre}}{1.6 \text{ lbs P provided/ton of compost}} = 32 \text{ tons of compost/acre}$

K₂O required: $\frac{40 \text{ lbs P required/acre}}{2.1 \text{ lbs P provided/ton of compost}} = 19 \text{ tons of compost/acre}$

Therefore, use **35 tons of compost per acre**. Additionally, 1.7 tons of lime per acre is recommended.

Application Recommendations

Assuming that the compost has a density of 1,000 lbs/cy (0.5 tons/cy), the following volume of compost is required per acre:

$$(35 \text{ tons/acre})(1 \text{ cy}/0.5 \text{ tons}) = 70 \text{ cy/acre, or } 1,890 \text{ cf/acre}$$

To calculate the depth of compost:

$$(1,890 \text{ cf/acre})(1 \text{ acre}/43,560 \text{ sf}) = 0.04339 \text{ ft, or approximately } \mathbf{1/2 \text{ inch}}$$

Compost shall be applied per the requirements of the hydroseeder equipment used by the County. Landfill Staff can utilize the scales at the landfill to measure the amount of compost required for a given area. The required tonnages can be weighed for each seeding application, to obtain the rate of 35 tons/acre. Another option is to weigh three truckloads of compost for the first seeding undertaken with the compost. Average the weight of the three truckloads and use this average to project compost requirements for future applications. Records of the weight of compost loads should be kept at the landfill office and referred to during subsequent seeding applications. In the event that an insufficient quantity of compost is available, landfill Staff may supplement compost with commercially obtained fertilizer. The County should consult with the North Carolina Department of Agriculture & Consumer Services, Agronomic Division at 919/733-2665 in Raleigh or 828/456-3943 in Haywood County to obtain recommendations for compost/fertilizer application rates. The County should test soils and compost once per year before planting season to verify application requirements. The records of the testing should be kept at the landfill office.