Fac/Perm/Co ID #	Date	Doc ID#
44-07	6,25,14	21329

June 20, 2014

SANTEK
WasteServices

650 25th Street, N.W., Suite 100
Cleveland, Tennessee 37311
(423) 303-7101

Email: mail@santekenviro.com
Internet: www.santekenviro.com

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

RE: Updated Operations Plan
Haywood County (White Oak) Solid Waste Landfill
Haywood County, North Carolina
Permit Number: 44-07

Dear Mr. Gaither:

Santek Waste Services, Inc. (Santek) is submitting an updated Operations Plan for the Haywood County (White Oak) Landfill. Santek submitted an initial updated Operations Plan on May 9, 2014 in response to the Notice of Violation (NOV) letter dated April 9, 2014 from the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management – Solid Waste Section. The enclosed Operations Plan includes revisions to the cover page, table of contents, page 6, page 7, page 18 and page 19. A redline copy of the updated pages and an original copy of the updated Operations Plan are enclosed for your review.

If you have any questions or require additional information, please feel free to call me at (423) 303-7101.

Sincerely,

Ron E. Vail, P.E.
V.P. of Engineering

Enclosures

cc: Andrea Keller, Environmental Senior Specialist, NCDENR
Ervin Lane, Compliance Hydrogeologist, NCDENR
Ira Dove, Interim Manager, Haywood County
Stephen King, Solid Waste Director, Haywood, County (with enclosure)
Cheryl Dunson, Executive V.P. of Marketing, Santek
Robert D. Burnette, P.E., Executive V.P. of Engineering, Santek
Matt Dillard, Executive V.P. of Operations, Santek
John Preston, Landfill Manager, Santek (with enclosure)

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OPERATIONS PLAN
WHITE OAK MSW LANDFILL
PHASE 1-3
HAYWOOD COUNTY, NORTH CAROLINA

SANTEK WASTE SERVICES, INC.
650 25TH STREET N.W., SUITE 100
CLEVELAND, TN 37311

RON E. VAIL, P.E.

REVISED SEPTEMBER 2009
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REVISED MARCH 2012
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Note: 1. Original Operations Plan prepared by Municipal Engineering for development of Phase 2. Operational Plan has been modified to include Phase 3.
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h) Leachate Release Notification Requirements
i) Phase 1 Leachate Cleanout Monitoring

APPENDICES

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The Haywood County White Oak Landfill will accept Municipal Solid Wastes (MSW) generated in the following North Carolina Counties in addition to Haywood County: Avery County, Buncombe County, Burke County, Cherokee County, Clay County, Graham County, Henderson County, Jackson County, Macon County, Madison County, McDowell County, Mitchell County, Polk County, Rutherford County, Swain County, Transylvania County, and Yancey County. The White Oak MSW Landfill consists of Phases 1 and 2, which comprise 21.5 acres of lined MSW landfill area. Phase 1 began receiving wastes in October of 1993. Phase 2, consisting of 10.26 acres, was granted a Permit to Operate on November 7, 2001. MSW Phase 3, comprising approximately 8.8 acres, was issued a Permit to Operate on May 10, 2011. The Phase 3 airspace combined with the remaining available airspace in Phases 1 and 2 should provide the County with approximately 5 years of disposal airspace. Phase 3 was constructed with a geosynthetic clay liner system (GCL) consisting of 18 inches of cohesive soil (permeability less than 1.0×10^{-5} cm/sec) overlain with a GCL material with a demonstrated hydraulic conductivity of not more than 5×10^{-9} cm/sec under the anticipated confining pressure; a 60-mil High Density Polyethylene (HDPE) liner; a 16-ounce geotextile cushion; and 24 inches of washed stone leachate collection layer. A leachate collection piping system was installed on top of the 60-mil HDPE liner and 16-ounce geotextile and within the 24-inch washed stone layer. Leachate will flow to a sump area located near the northern margin of Phase 3. The sump includes two side-slope riser pumping stations that will pump leachate over the northern periphery berm to a gravity sewer system prior to discharge to the leachate storage lagoon. In conjunction with the development of MSW Phase 3, the leachate lagoon was expanded and an additional HDPE liner installed. Leachate is transported by truck from the storage lagoon to a discharge point at the Town of Waynesville and/or the Town of Maggie Valley's wastewater treatment system. The three existing sump areas within MSW Phases 1 and 2 will continue to operate during and after the construction of Phase 3. Leachate flows by gravity from these areas to the storage lagoon. Also in conjunction with the development of MSW Phase 3, a side slope riser pump station and dual contained force main were installed at the MSW Phase 1 (Cells 1-3) sump area. The gravity sump from MSW Phase 1 will continue to operate.

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The pumping of leachate will be on an as needed basis. During wet weather, the pump and hauling may have to be performed 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.

The recirculation of leachate within the landfill is a viable alternative to the present pump and haul leachate management operation and is considered a part of the overall Leachate Management Plan. Prior to actually beginning leachate recirculation, the County will prepare the appropriate plan for submission to and approval by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management.

The leachate lagoon will be visually 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.~~ The exposed leachate lagoon liner above the leachate level will be visually inspected for abrasions, possible stress cracks, or obvious punctures. The inspection report will include the date the liner was inspected, the inspector, general observations since the last inspection and a summary of the current inspection.

Stress cracks may 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 are 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. A second textured 60-mil HDPE liner was installed over the existing HDPE liner at the storage lagoon during the MSW Phase 3 construction.

Daily cover may be the combination of soil, synthetic covers (i.e., tarp), or soil/mulch material. Soil cover will be placed at least once a week. See Section 2b for the requirements of the Alternate Daily Cover tarp and soil/mulch 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 operating personnel have been trained to recognize

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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. Heavy landfill equipment including articulating dump trucks, and compactors will only be allowed on areas that have a minimum of 4' of solid waste. Only low pressure equipment (i.e., LGP tracked equipment) will be allowed on the protective cover.

c. Appropriate methods such as fencing and diking may be provided within the waste disposal area to help confine solid waste subject to being 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.

13. Leachate Management Plan

a. Leachate flows by gravity from three locations within existing MSW Phases 1 and 2. In conjunction with the MSW Phase 3 project, a side slope riser pumping station and dual-contained force main were constructed in MSW Phase 1, Cells 1-3 in the vicinity of the sump area. For leachate generated within the MSW Phases 3, two side-slope riser pumping stations located within the Phase 3 sump area will pump leachate to the gravity collection system prior to discharge into the leachate storage lagoon. The leachate pumps contain a high-water level alarm, which will alert the landfill operator when high leachate levels are encountered. The leachate pipes can be cleaned with a jet cleaner with access through the cleanouts and leachate test wells. The County will video inspect on a yearly basis up to 2,000 l.f. of leachate lines, until two years of clean lines are observed for an individual line. Jet cleaning will be performed on leachate lines that video inspections show the need for cleaning. The side-slope riser pumps shall be pulled and inspected ~~annually~~as needed. Any worn or damaged parts will be replaced. The pump stations will be visually inspected for proper operation and run-time hours will be documented weekly. ~~Landfill operating personnel shall maintain records of all inspections, cleaning, and repairs made on the leachate collection system.~~Documentation of the visible inspection is not required.

b. Haywood County will maintain records for the amount of leachate collected and transported to the wastewater treatment facility.

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 at the same time as the monitoring wells.

d. The leachate is being treated by the Town of Maggie Valley and/or the Town of Waynesville Wastewater Treatment Plant.

e. Under extreme operational conditions Haywood County has the option of shutting down the flow of leachate from portions of Phase 1 to the lagoon by use of shut off valves. 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 Waste Management will be notified verbally and immediately followed by written communication. During wet weather, the pump and hauling may have to be performed 24 hours a day for several days until the leachate lagoon levels have been reduced.

In the early phases of waste fill operations in MSW Phase 3, the discharge from the stormwater removal pump can be diverted to the leachate gravity system, if necessary during extreme conditions.

f. The recirculation of leachate within the landfill is a viable alternative to the present pump and haul leachate management operation and is considered a part of the overall Leachate Management Plan. Prior to actually beginning leachate recirculation, the County will prepare the appropriate leachate recirculation plan for submission to and approval by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management.

g. Leachate Release Response/Contingency Plan: In the event of a leachate release outside the lined disposal area or leachate collection and storage system, Haywood County or Santek will immediately utilize all available resources to contain and minimize the leachate release. Soil berms, ditches and landfill equipment may be used to contain the leachate and repair the affected area.

h. Leachate Release Notification Requirements: In the event of a leachate release outside the lined disposal area or leachate collection and storage system, ~~Haywood County or~~ Santek will notify the NCDENR, Division of Waste Management within 24 hours of becoming aware of the leachate release.

i. Haywood County installed a leachate cleanout in the northeast portion of Phase I to assist leachate flow through the leachate collection system. Haywood County or Santek will monitor this cleanout for the presence of leachate. If leachate is detected in the cleanout, Haywood County or Santek will pump out the leachate and transport it to the leachate storage lagoon.

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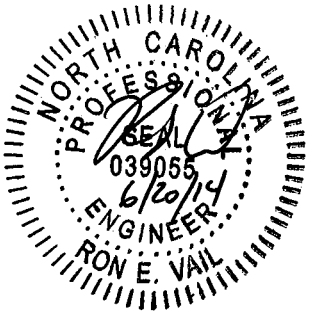
OPERATIONS PLAN
WHITE OAK MSW LANDFILL
PHASE 1-3
HAYWOOD COUNTY, NORTH CAROLINA

SANTEK
WasteServices

SANTEK WASTE SERVICES, INC.
650 25TH STREET N.W., SUITE 100
CLEVELAND, TN 37311

RON E. VAIL, P.E.



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INTRODUCTION

Haywood County entered into a landfill management agreement with Santek Environmental of North Carolina, LLC, effective October 3, 2011. Haywood County will remain as Owner and Santek will be the Operator.

Contact for Haywood County:
Mr. Stephen King
Solid Waste Director
Haywood County Solid Waste
278 Recycle Road
Clyde, NC 28721
828-627-8042

Additional Contact for Haywood County:
Mr. Marty Stamey
County Manager
215 North Main Street
Waynesville, NC 28786
828-452-6625

Contact for Santek Environmental of North Carolina, LLC:
Mr. John Preston
Landfill Superintendent
650 25th Street NW Suite 100
Cleveland, Tennessee 37311
423-650-3095

Additional Contact for Santek Environmental of North Carolina, LLC:
Mr. Matt Dillard
Vice President of Operations
650 25th Street NW Suite 100
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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 operating 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.

Haywood County will ensure that explosive gases are monitored for at all 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 at 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, the landfill operator will notify the County and 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 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 Waste Management that the plan has been implemented. The plan will describe the nature and extent of the problem and the proposed remedy.

Erosion is controlled through erosion control structures and devices. Provisions for a vegetative ground cover sufficient to restrain erosion will be accomplished within **15 calendar days** upon completion of any phase of landfill development.

Haywood County 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, and 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 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) were 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. In conjunction with the development of MSW Phase 3, the "Environmental Monitoring Plan, Proposed Phase 3 & 4 MSW Cell Areas" was prepared by BLE, Inc.

If Haywood County 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 Waste Management 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 Waste Management. 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 White Oak Landfill stating that Hazardous and Liquid wastes are not accepted and that random waste screening is performed. The White Oak Landfill will receive wastes from the County's Solid Waste Processing Facility, located on Recycle Road in Clyde and the Citizen's Convenience Centers strategically located throughout the County. In addition to Haywood County, the White Oak Landfill may also receive waste from the following North Carolina Counties: Avery County, Buncombe County, Burke County, Cherokee County, Clay County, Graham County, Henderson County, Jackson County, Macon County, Madison County, McDowell County, Mitchell County, Polk County, Rutherford County, Swain County, Transylvania County, and Yancey County.

b. Typically the landfill is open Monday through Saturday from 7:30 a.m. to 3:30 p.m. However, the landfill may accept waste 24 hours a day, 7 days per week.

c. 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.

d. Spoiled foods, animal carcasses, abattoir waste, hatchery waste, and other animal waste delivered to the disposal site will be covered immediately.

e. Asbestos waste will be accepted. The wastes are taken to a designated area of the landfill for disposal. The landfill operator will immediately cover the asbestos wastes with a minimum of six inches of soil. A 24 hour notice will be given to the Landfill before any asbestos arrives, and records will be kept as to whom and what type of asbestos was buried.

f. Wastewater treatment sludges may be accepted for disposal within the lined disposal area of Phases 1-3.

g. Haywood County will continue a program at the Landfill for detecting and preventing the disposal of hazardous and liquid wastes. This program includes, at a minimum:

   i. Random inspections of incoming loads or other comparable procedures;

   ii. Records of any inspections;

   iii. Training of facility operating 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.

h. Waste placement will be within the area limits of the base liner system and in a manner consistent with the effective permit. The County may dispose of baled wastes or loose wastes. Baled wastes are handled, placed, and covered in similar fashion as loose wastes. Wastes are transported to the landfill where they are placed on the floor of the cell as close to the working face as possible. Landfill operators either stack bales or push loose wastes and construct a working face in 8' to 10' lifts. Wastes are covered with approved daily cover materials.

2. Waste Filling Practices

a. Proposed fill grades for Phases 1-3 have been developed as a part of the permit drawings to assist the landfill operation's staff with the placement of waste within the disposal unit. These proposed grades represent the top of final cover for those exterior slopes not anticipated to receive further waste as a part of future expansions. For those interior slopes anticipated to receive further waste as a part of future expansions, the proposed grades represent the top of the intermediate cover.

b. As a part of waste placement activities a certain degree of waste settlement is expected and anticipated over time. To compensate for anticipated settlement the initial placement of waste may exceed the fill grades for the top of waste by up to five feet (5') on the outer slopes and top of fill surfaces. The amount of anticipated overfill is contingent upon the location within the disposal unit, type of waste being received and operator experience. Elevations will be checked

periodically to track progress and ensure general conformance with proposed final fill grades in addition to monitoring the extent of the anticipated settlement.

c. Prior to beginning final closure construction activities, the surface grades of the area to be closed will be surveyed and compared to the proposed final grades. Surface grades that present a uniform slope within reasonable conformance with the permitted final slope and allow the placement of the final cap grades to be within an average of +/- 2 feet of the permitted grades will be deemed in accordance with the permit drawings. Minor imperfections in the subgrade surface (i.e., areas of settlement and/or overfill) that are outside the allowable tolerances will be corrected prior to placing the final closure cap system.

3. Cover material requirements.

a. Except as noted 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 is currently permitted to use a synthetic tarp system and/or a soil/mulch mixture as an alternate daily cover (ADC) in lieu of six-inches (6") of soil material. The use of these ADC's was approved on May 5, 2009. Appendix 2 provides a general operating plan for the use of the synthetic tarp system. When using the synthetic tarp system, soil cover material will be used at the end of the week's operation or more frequently as needed to control blowing waste, vectors or other conditions not suitable for the use of a tarp system. The soil/mulch ADC will generally consist of twenty-five percent (25%) mulched material combined with seventy-five percent (75%) soil for a total combined thickness of six-inches (6").

Landfill Staff may utilize one of two methods for producing the mulch/soil ADC mixture. One procedure will be to place in a line two (2) loads of dirt, one (1) load of mulch, and another load of dirt (all equal volume) in the area of the landfill to receive cover. The four piles will be walked into the surface by landfill equipment to create the desired cover depth. The landfill operator will work the loads to ensure an even distribution of mulch throughout the cover area. The second method is to pile three loads of dirt and one load of mulch (all equal volume) out of the way of landfill operations in an area of the landfill that can be utilized for a temporary stockpile. The four loads will be thoroughly mixed using landfill equipment to achieve an even distribution of the mulched material. The stockpiled ADC will be utilized as needed.

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. The County is permitted (May 5, 2009) to utilize compost from the Composting Operation as a soil amendment when applying grass seed to any landfill area. See Appendix 5 for the requirements of the use of compost on landfill slopes.

4. 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 at the end of the week's operation. Any waste that requires immediate cover will be covered immediately with soil. In conjunction with the overall development of the White Oak Landfill, the County installed a chain-link "bear" fence.

b. "Disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

5. 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 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 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.

6. 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 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. The fire department has access at all times to the landfill to provide fire fighting services when needed. Landfill operating personnel may use soil to isolate the fire so it will not spread any further; however, 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 Waste Management within 24 hours and written notification will be submitted within 15 days.

e. Although the County does not have nor is required to operate a methane collection and combustion system, provisions for a methane extraction and collection system were included in the MSW Phase 3 Permit To Construct. Any future gas collection system will connect to a planned methane collection and combustion system associated with MSW Phases 1 and 2.

7. Access and safety requirements

a. The landfill will be adequately secured by means of gates, chains, beams, fences, natural barriers and other security measures approved by the Division of 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 operator 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 approved by the County.

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.

8. Erosion and Sedimentation Control Requirements

a. Adequate sediment control measures (structures or devices), are 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 **15 calendar days** upon completion of any phase of landfill development.

9. 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.

10. 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.

11. 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 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, and 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 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.

12. Spreading and Compacting Requirements

a. The landfill will restrict the daily disposal of solid waste into the smallest area feasible. Waste will be covered with six (6) inches of soil daily cover and/or one of the approved ADC's.

b. Solid waste will be compacted as densely as practical. 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. Heavy landfill equipment including articulating dump trucks, and compactors will only be allowed on areas that have a minimum of 4' of solid waste. Only low pressure equipment (i.e., LGP tracked equipment) will be allowed on the protective cover.

c. Appropriate methods such as fencing and diking may be provided within the waste disposal area to help confine solid waste subject to being 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.

13. Leachate Management Plan

a. Leachate flows by gravity from three locations within existing MSW Phases 1 and 2. In conjunction with the MSW Phase 3 project, a side slope riser pumping station and dual-contained force main were constructed in MSW Phase 1, Cells 1-3 in the vicinity of the sump area. For leachate generated within the MSW Phases 3, two side-slope riser pumping stations located within the Phase 3 sump area will pump leachate to the gravity collection system prior to discharge into the leachate storage lagoon. The leachate pumps contain a high-water level alarm, which will alert the landfill operator when high leachate levels are encountered. The leachate pipes can be cleaned with a jet cleaner with access through the cleanouts and leachate test wells. The County will video inspect on a yearly basis up to 2,000 l.f. of leachate lines, until two years of clean lines are observed for an individual line. Jet cleaning will be performed on leachate lines that video inspections show the need for cleaning. The side-slope riser pumps shall be pulled and inspected as needed. Any worn or damaged parts will be replaced. The pump stations will be visually inspected for proper operation and run-time hours will be documented weekly. Documentation of the visible inspection is not required.

b. Haywood County will maintain records for the amount of leachate collected and transported to the wastewater treatment facility.

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 at the same time as the monitoring wells.

d. The leachate is being treated by the Town of Maggie Valley and/or the Town of Waynesville Wastewater Treatment Plant.

e. Under extreme operational conditions Haywood County has the option of shutting down the flow of leachate from portions of Phase 1 to the lagoon by use of shut off valves. 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 Waste Management will be notified verbally and immediately followed

by written communication. During wet weather, the pump and hauling may have to be performed 24 hours a day for several days until the leachate lagoon levels have been reduced.

In the early phases of waste fill operations in MSW Phase 3, the discharge from the stormwater removal pump can be diverted to the leachate gravity system, if necessary during extreme conditions.

f. The recirculation of leachate within the landfill is a viable alternative to the present pump and haul leachate management operation and is considered a part of the overall Leachate Management Plan. Prior to actually beginning leachate recirculation, the County will prepare the appropriate leachate recirculation plan for submission to and approval by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management.

g. Leachate Release Response/Contingency Plan: In the event of a leachate release outside the lined disposal area or leachate collection and storage system, Haywood County or Santek will immediately utilize all available resources to contain and minimize the leachate release. Soil berms, ditches and landfill equipment may be used to contain the leachate and repair the affected area.

h. Leachate Release Notification Requirements: In the event of a leachate release outside the lined disposal area or leachate collection and storage system, Santek will notify the NCDENR, Division of Waste Management within 24 hours of becoming aware of the leachate release.

i. Haywood County installed a leachate cleanout in the northeast portion of Phase I to assist leachate flow through the leachate collection system. Haywood County or Santek will monitor this cleanout for the presence of leachate. If leachate is detected in the cleanout, Haywood County or Santek will pump out the leachate and transport it to the leachate storage lagoon.

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/operator 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 <140 deg F 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 deg F. Therefore, a flammable liquid is always hazardous while a combustible liquid mayor 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 $\leq$ 2.0 or $\geq$ 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 anyone 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 CONSITIUENTS & 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 Pan 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/operators 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 may be inspected on the tipping floor at the Processing 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 Waste Management 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

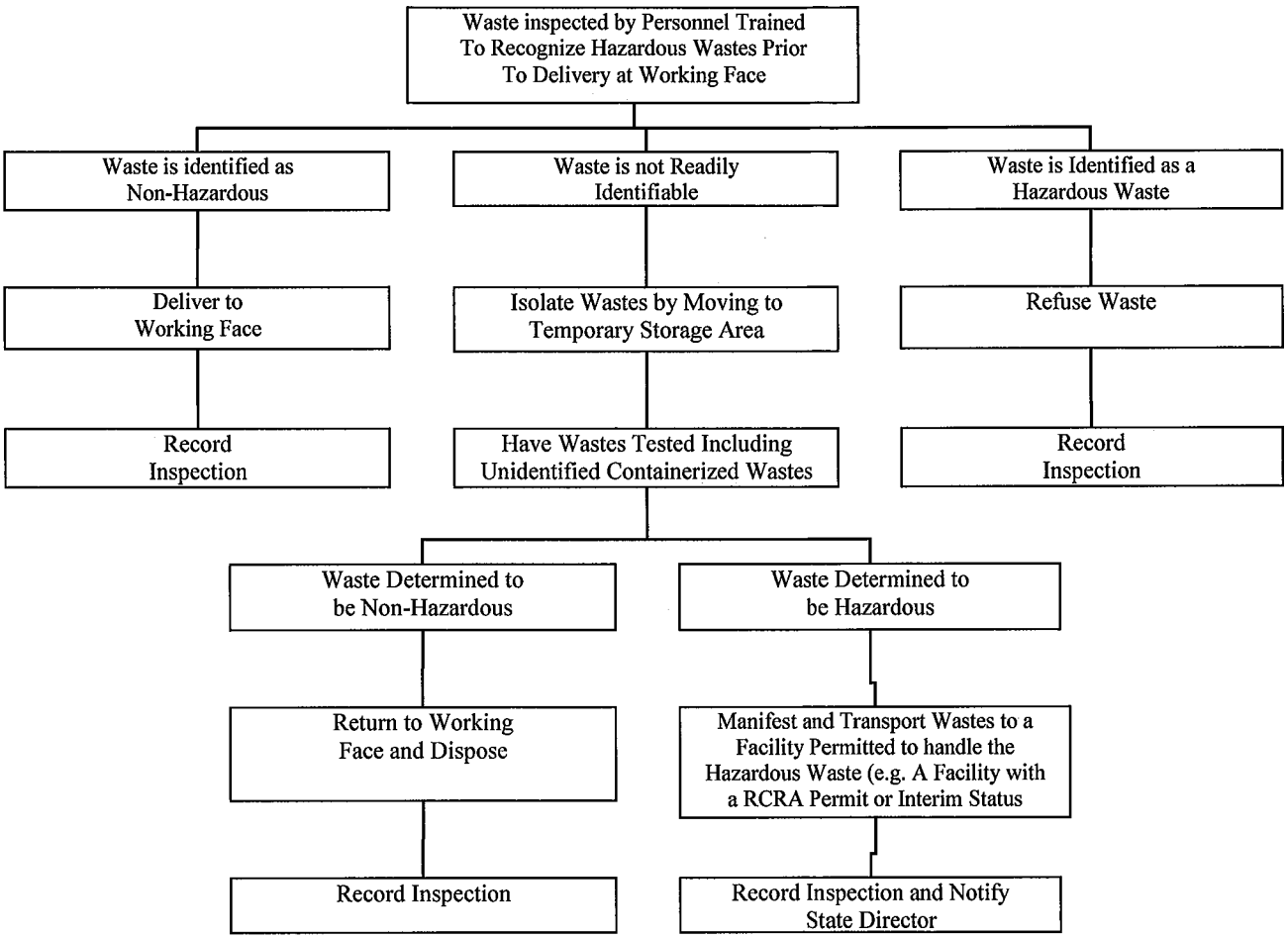
Records must be kept pursuant to an incident where regulated hazardous waste or prohibited waste is found at the landfill. It is also recommended that records be kept of all screening activities and incidents, whether or not, regulated or prohibited wastes are found. This will help prove that the landfill 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 identity
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 OPERATION PLAN

Overview

Haywood County has been approved to use Landfill/Synthetic Tarp Systems as Alternate Daily Cover (ADC) in lieu of six-inches (6") of soil cover. The tarps are pulled over the working face at the end of the day as described in the Operations section below. Variables affecting the use of the tarps include the location within the landfill and weather conditions (i.e., wet conditions, wind, etc.). The tarps are not generally used when the working face is near the permanent or temporary slopes because soil cover is used in these areas. The use of the tarps allow for a seamless integration from one day to the next.

Operations

1. At 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 and/or soil/mulch 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. An ADC synthetic cover may be used in place of soil at the discretion of the landfill operator. At the end of the operating day, 50' x 50', 6.5 oz/sq.ft. tarps 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 dirt, small stones, sandbags, tires with rims or other measures to prevent the wind from exposing any waste. At the beginning of the next operating day, the tarp will be carefully removed from the working face and stored in an adjacent area to the working face.

2. The proposed ADC will consist of at least three (3) Landfill Tarp systems. Each tarp will be approximately 50' x 50' 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. The synthetic cover is shipped to the landfill site with panels folded accordion-type, and rolled up. Unroll the cover along the working face (depending upon operations), and attach the leading edge of the unrolled panel to existing landfill equipment with ropes (i.e., to the top of the blade).

3. Pull the sewn panels of cover across the compacted trash. The synthetic cover maybe pulled from any direction, which may vary from day to day. Keep the leading edge between the two machines (or people) as high as possible to eliminate drag.

4. Anchor the edges of synthetic cover at least every 20 feet with dirt, small stones, tires (with rims intact or filled with concrete), sandbags or other measures to hold the synthetic cover in place. If it is windy, more anchoring may be required.

5. On the next day of operations, remove the anchor system. Simply pull the synthetic cover across itself (to reduce drag) and off the refuse to an area that is inactive. Anchor the edges again to prevent wind from lifting the blanket. At the end of the day, pull the synthetic cover back across the refuse by repeating steps 3 and 4 until a new panel is needed.

The Synthetic Cover is designed to be used as landfill daily cover on a working face. For best results, it is recommended that the area to be covered be kept as close to a square shape as possible. Not only does 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.

Should the need arise, Haywood County will continue to use the plastic panel cover that is currently approved to cover the working face of stacked bales. At the end of the working day, the plastic panel will be secured in place similar to the proposed 6.5-oz. Synthetic Cover.

The working face is operated in this manner, brought to an intermediate grade and then covered with the required soil. The process will continue until a lift is completed. The process is then started over on the next lift until the landfill is filled to final grade and a section is closed. At a minimum six (6) inches of soil cover will be used once a week at the end of the week's operation.

TIPS TO REMEMBER

1. Always pull the fabric across itself during installation and removal to make each panel last as long as possible.

2. Avoid driving on the panel(s) as this may cause punctures and tears.

3. Tie the panel(s) to the top of the dozer blade and raise the blade to minimize dragging on refuse.

4. Use tires (tires must be filled with concrete or include rims), sandbags, dirt, small stones or other measures to hold the panel(s) down overnight.

5. Minimize stress between dozer/compactors while pulling on the panel(s).

Appendix 3

EXPLOSIVE GAS CONTROL PLAN FOR - HAYWOOD COUNTY

Quarterly the Haywood County landfill will monitor for methane and other explosive landfill gases within the landfill structures and at the landfill gas monitoring wells, as shown on attached Figure 1. The permanent landfill gas monitoring wells (monitoring well) will consist of a plastic stand pipe similar to a piezometer used for groundwater detection. A typical permanent landfill gas monitoring well is detailed in the attached Figure 2. The permanent probe will be constructed at a minimum depth of six (6) feet. A minimum 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 (I) inch PVC cap, one quarter (1/4) inch NPT hose barb, and 1" tubing, plugged or capped to prevent contamination. A minimum four inch (4") diameter schedule 40 PVC sleeve or aluminum/steel prefabricated well cover will be placed over the one inch (1") pipe and filled with clean masonry sand to within four inches (4") of the one inch (1") schedule 40 PVC cap. The top of the PVC pipe sleeve or prefabricated well cover will be secured with a removable water tight cap. Where necessary, a marker post will be placed in close proximity to the landfill gas monitoring well. A permanent well I.D. will be placed/painted on the marker post or the well cover. The County is also required to perform quarterly monitoring at all existing and future on-site structures. Currently, the on-site structures include the Maintenance Building and the Scale House.

The location and spacing of the landfill gas monitoring wells are strategically located in accordance with the approved Permit To Operate, White Oak Municipal Solid Waste Landfill and the Permit To Construct, Municipal Solid Waste Landfill Phase 3, Permit No. 44-07, dated October 7, 2009, Document I.D. 8720.

The migration of methane and other explosive landfill gases (landfill gas) is induced by pressure gradients. The landfill gases will move from areas of high pressure to those of low pressure following the path of least resistance. Landfill gas will generally migrate vertically until it reaches the landfill surface where it may begin to flow horizontally until it finds a pathway out through the permeable in situ soils or a landfill gas venting/extraction system. Given that Haywood County's landfill is designed with a synthetic membrane base liner system there should be no landfill gas migration into or through the subsurface permeable *in situ* soils. The final cap system, once designed and installed, will also contain a synthetic membrane liner system with a landfill gas venting/extraction system. This type of cap system will also prevent the migration of landfill gas into or through the surrounding permeable *in situ* soils.

Since methane, a component of landfill gas, is lighter than air, it wants to escape into the atmosphere. Experience has shown 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 well and an explosive gas detection meter will monitor the level of concentration. The six foot depth of the monitoring wells is to ensure a stable monitoring point. The only time a shallow monitoring well 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 a monitoring well, it will either be moved beyond the clay or excavated to a depth that is in the conductive zone below the clay.

The landfill gas can be detected by use of an instrument that reports the percent of lower explosive limit (% LEL) and the methane gas concentration (% CH_4). The instrument being used is the LandGEM 2000. Observations for the landfill gas monitoring wells will be recorded on the attached form titled "Landfill Gas Measurements Field Worksheet, White Oak MSW Landfill, Haywood County, North Carolina". Observations for the on-site structures will also be recorded on the attached form.

Quarterly, a County employee or contractor for the County will visit each landfill gas monitoring well. . Using the detection instrument, he/she will determine if landfill gas is present in the monitoring well. Observations will be recorded on the aforementioned "Haywood County Landfill Gas Monitoring, White Oak MSW Landfill" form. If landfill gas is present and the level is detected at or above the lower explosive limit (100% LEL), it must then be determined if the landfill gas is migrating or has migrated beyond that particular monitoring well. If it is determined that explosive landfill gas has or may have migrated beyond the particular monitoring well then additional steps may be implemented to delineate the extent of any suspected landfill gas migration. If it is determined that explosive landfill gas has or may have migrated across the landfill boundary then the facility will immediately take all necessary steps to ensure protection of human health. The North Carolina Department of Environment and Natural Resources (NCDENR) will be notified. Within seven (7) days of detection, the methane gas levels detected and a description of the steps taken to protect human health will be placed in the operating record. Within 60 days of the detection of suspected landfill gas migration at or beyond the landfill boundary, the County will prepare and implement a remediation plan for the suspected landfill gas releases. A copy of the remediation plan will be placed in the operating record and the NCDENR will be notified that the plan has been implemented. Resampling of the affected landfill gas monitoring wells will be performed as necessary to evaluate the effectiveness of the approved remediation plan.

Other quarterly monitoring locations will be the on-site structures located within the landfill's Facility Boundary. Each structure will be monitored for explosive landfill gas using the following general protocol:

1. All crawl spaces, if applicable, will be monitored;
2. All corners in the structure, if accessible, will be monitored;
3. Any observed holes, cracks and/or pipe penetrations through the foundation will be monitored;

Observations will be recorded on the aforementioned "Landfill Gas Measurements Field Worksheet, White Oak MSW Landfill, Haywood County, North Carolina" form. If methane gas is detected above 25% of its lower explosive limit (25% LEL) in any structure, excluding gas control or gas recovery system components, the detection instrument will be recalibrated in accordance with the manufacturer's instructions and the structure resampled. If the reading is still above 25% LEL, evacuate the building and take all steps necessary to protect human health. The North Carolina Department of Environment and Natural Resources (NCDENR) will be notified as well as the Haywood County Solid Waste Director. Within seven (7) days of initial detection, the methane gas levels detected and a description of the steps taken to protect human health will be placed in the operating record. Upon taking the necessary safety precautions, attempt to determine the source of the explosive gas. If the source is found, initiate repairs to prevent re-infiltration of the landfill gas or remove the source. If the source of the landfill gas infiltration cannot be easily determined and/or promptly corrected then the structure must be closed and marked to prevent further occupancy. The County will then prepare and implement a remediation plan for the suspected landfill gas releases within sixty (60) days of initial detection. A

copy of the remediation plan will be placed in the operating record and the NCDENR will be notified that the plan has been implemented. The structure will remain closed for occupancy until such time as the repairs and/or remediation plan have been implemented and the structure retested for the presence of landfill gas concentrations. The structure will be reopened for occupancy once the landfill gas concentrations are below the 25% LEL concentration.

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

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

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 and Natural Resources (DENR), Division of 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.

C. Service Area

The Mulching and Grinding Treatment and Processing Facility will provide service for all of the approved service area.

II. SITING REQUIREMENTS

Siting requirements are described as follows:

1) The proposed Treatment and Processing Facilities are not located in the 100-year floodplain.
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 was provided to the NCDENR-DWM.
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. Mulched material will be used as a part of the soil/mulch Alternate Daily Cover material approved on May 5, 2009. The soil/mulch ADC will be used on the MSW Landfill and in wet areas of gravel access roads. The soil/mulch ADC will be mixed with soil at a 3:1 soil/mulch ratio. A description of the procedures used for creating the soil/mulch ADC are included in Section 2(b) of the White Oak MSW Landfill Operations Plan. 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 will be in accordance with the Facility operating hours.

B. Personnel

The facility is owned by Haywood County and operated by Santek Environmental of North Carolina, LLC. Santek will provide the employees 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 and processed at the facility and/or disposed of in a landfill, reused, recycled, 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) Those items specified as "yard trash" as defined in Section .0101(55) of the Solid Waste Rules may not be included in the Mulching operation. Yard trash includes those materials resulting from landscaping and yard maintenance, such as brush, grass, tree limbs, and similar vegetative material.
3) Mulched materials will be removed from the site several times a week.
4) Sludges may not be included in mulched materials.
5) Neither hazardous waste nor asbestos containing waste shall be accepted at the mulching facility.
6) Household hazardous waste shall not be accepted at the mulching facility.
7) The Mulching and Grinding Treatment and Processing Facility shall not allow uncontrolled public access.
8) Alternate daily coverage materials will include only those materials specified as suitable for mulching, as described in C 1-6 herein.
9) Only clean, unpainted masonry, concrete, and asphalt may be ground for use as road base and ditch lining material.
10) Open burning of solid waste is prohibited.
11) Arrangements with the local fire protection agency to immediately provide fire-fighting services when needed is required (see Section F below).

12) Personnel training shall be provided to insure that all employees are trained in site specific safety, remedial, and corrective action procedures.
13) Signs providing information on waste that can be received, dumping procedures, the hours during which the site is open for public use, the permit number and other pertinent information shall be posted at the site entrance.
14) The County uses a multi-level waste screening procedure, as outlined in Appendix 1 of the White Oak MSW Landfill Operations Plan. Waste haulers are directed by the scale attendant to the appropriate disposal location. Also on site is the appropriate signage directing haulers to the correct disposal drop-off points, with information pertaining the types of allowable materials for each unit of the White Oak MSWLF. Additionally, landfill personnel are on-site to further inspect waste loads. In the event that inappropriate materials are disposed at the Mulching and Grinding Treatment and Processing Facility, these materials shall be segregated from the appropriate mulching materials and then disposed in the correct landfill unit.

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 verbally notified within 24 hours and written notification will be submitted within 15 days.

G. Storm Water Management and Erosion Control

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 5

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

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, and Natural Resources (DENR), Division of 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 the approved service area.

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. Siting requirements are described as follows:

1) The proposed Composting Facility is not located in the 100-year floodplain.
2) A 200-foot buffer is maintained between the composting facility and all residences.
3) A 100-foot buffer is maintained between the compositing 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) The depth from the composting pad to the seasonal high water table shall be maintained at least 24 inches.
12) Portions of the site used for waste receipt and storage, active composting, and curing shall have a soil texture finer than loamy sand, soils which are in abundance at the White Oak Landfill.
13) Access to the composting facility is controlled by properly trained employees.
14) The site will have diversion berms and ditches leading to two sediment control structures. Both the ditches and the sediment control structures can be utilized to control runoff from a potential fire.
15) 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 may use culls from pre-consumer agricultural activities as a material source for the composting operation. Additionally, there may be clean wood materials available at the landfill for composting as a result of the grinding operation. However, these materials will be typically mulched and used elsewhere rather than become available for composting. The County has been approved to use the compost as a soil amendment to facilitate the establishment of vegetative cover. The rate of compost used will be determined as the compost is developed and the chemical constituency of the material is known.
Haywood County will use existing landfill equipment to manage and turn windrows of composting material.

Normal working hours for the Composting Site will be in accordance with the Facility operating hours.

B. Personnel

The facility is owned by Haywood County and operated by Santek Environmental of North Carolina, LLC. Santek will provide the employees 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 and processed at the facility and/or disposed of in a landfill, recycled or reused. 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 104 degrees Fahrenheit for 14 days or longer and the average temperature for that time shall be higher than 113 degrees Fahrenheit. The temperature of all compost produced shall be monitored sufficiently to ensure that the pathogen reduction criteria is met. The data shall be recorded on the form included in the Appendices.
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.
11) Open burning of solid waste is prohibited.
12) Arrangements with the local fire protection agency to immediately provide fire-fighting services when needed is required (see Section F below).

13) Personnel training shall be provided to insure that all employees are trained in site specific safety, remedial, and corrective action procedures.
14) Signs providing information on waste that can be received, dumping procedures, the hours during which the site is open for public use, the permit number and other pertinent information shall be posted at the site entrance.

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. Traffic signs/markers shall be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operation conditions.

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

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 trap.

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 Data Log

Windrow Date of Formation_____
(if more than one windrow is formed on the same date, add A,B,C designator. Note location of windrows for future identification. Add weight of materials if known.)

Materials used and source_____

_____

Date	Temperature Noted	Date	Temperature Noted
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Observations:_____

_____

Windrow Date of Formation_____
(if more than one windrow is formed on the same date, add A,B,C designator. Note location of windrows for future identification. Add weight of materials if known.)

Materials used and source_____

_____

Date	Temperature Noted	Date	Temperature Noted
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Observations:_____

_____