Operations Manual

Halifax County Landfill Facility
Halifax County, North Carolina

Prepared for:

Halifax County Department of Public Utilities
Halifax, North Carolina

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Halifax County Landfill Facility

Operations Manual

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1.0 GENERAL FACILITY OPERATIONS

This Operations Manual was prepared for operations of the Halifax County Landfill facility (Permit No. 42-04) located near Littleton. This document discusses the operation of the following landfill units and other solid waste management activities:

- Area 1 C&D Landfill Unit (vertical expansion over closed unlined MSW unit);
- Area 2 C&D Landfill Unit (proposed);
- Ash Monofill (Cells 1 and 2 active; Cell 3 proposed);
- Transfer Station*;
- Animal Waste Disposal Area;
- Wood Waste Processing Area;
- White Goods Handling Area;
- Used Tire Storage Area; and
- Used Pesticide Container Storage Area.

*Note that the transfer station has a separate operations manual.

Refer to **Figure 1** for the location of existing and proposed landfill units and other solid waste management activities.

The information contained herein was prepared to provide facility personnel with a clear understanding of how the Design Engineer assumed that the completed facility would be operated and how regulatory operations criteria will be met. While deviations from the operations procedures outlined herein may be acceptable, they must be reviewed and approved by the NC DENR Division of Waste Management (DWM) prior to implementation. Additionally, the Design Engineer should be consulted regarding any changes which may affect the design of the facility. Please refer to the appropriate permit application for a detailed discussion and calculations for the individual components of each landfill unit, including phasing plans.

1.1 Contact Information

All correspondence and questions concerning the operation of the Halifax County Landfill should be directed to the appropriate County and State personnel listed below. For fire or police emergencies dial 911.

1.1.1 Halifax County

Halifax County Department of Public Utilities
26 N. King Street (Public Works Building)
P.O. Box 70
Halifax, NC 27839
Phone: (252) 583-1451
Fax: (252) 593-5014

Contact: Gwen Matthews, Director

Halifax County Landfill
921 Liles Road
Littleton, NC 27850
P.O. Box 70
Halifax, NC 27839
Phone: (252) 586-7516
Fax: (252) 586-2685

Contact: Larry Garriss, Solid Waste Manager

1.1.2 North Carolina Department of Environment and Natural Resources

North Carolina DENR - Raleigh Central Office (RCO)
217 W. Jones Street
Raleigh, NC 27603
1646 Mail Service Center
Raleigh, NC 27699-1646
Phone/Fax: (919) 707-8200

North Carolina DENR - Raleigh Regional Office (RRO)
3800 Barrett Drive
Raleigh, NC 27609
Phone: (919) 571-4700
Fax: (919) 571-4718

North Carolina DENR - Fayetteville Regional Office (FRO)
225 Green Street, Suite 714
Fayetteville, NC 28301
Phone: (910) 486-1541
Fax: (910) 486-0707

Division of Waste Management (DWM) - Solid Waste Section:

Field Operations Branch Head:	Mark Poindexter (RCO)
Eastern District Supervisor:	Dennis Shackelford (FRO)
Waste Management Specialist:	Mary Whaley (RCO)

Division of Land Resources - Land Quality Section:

Regional Engineer:	John Holley, P.E. (RRO)

1.2 Facility Operating Hours

Normal hours of operation will be 8:00 A.M. to 4:00 P.M. Monday through Friday. The facility will be closed on weekends and on holidays as designated by the County.

The County may elect to modify these hours from time to time.

1.3 Site Access

The site will be accessed by the existing main entrance on Liles Road. A Scale and a scale house are provided at this entrance. All waste will have been weighed prior to being placed in the landfill. A secondary entrance on Liles Road may also be utilized primarily for access to the ash monofill.

1.3.1 Physical Restraints

Limiting access to the landfill facility is important for the following reasons:

- Unauthorized and illegal dumping of waste materials is prevented.
- Trespassing, and injury resulting therefrom, is discouraged.
- The risk of vandalism is greatly reduced.

Access to active areas of the landfill will be controlled by a combination of fences and natural barriers, and strictly enforced operating hours. A landfill attendant will be on duty at all times when the facility is open for public use to enforce access restrictions (see also Section 1.2). Each entrance has a gate which will be securely locked during non-operating hours.

1.3.2 Security

Frequent inspections of gates and fences will be performed by landfill personnel. The County will arrange for a random security patrol of the landfill entrances to further discourage trespassing. Evidence of trespassing, vandalism, or illegal operation will be reported to the County Solid Waste Manager.

1.4 Signage

A prominent sign(s) containing the information required by the DWM will be placed at the main landfill entrance. This sign(s) will provide information on operating hours, operating procedures, and acceptable wastes. Additional signage will be provided as necessary within the landfill complex to distinctly distinguish the roadway to the active landfill unit(s). Service and maintenance roads for use by operations personnel will be clearly marked and barriers (e.g., traffic cones, barrels, etc.) will be provided as required.

1.4.1 Waste Limit Markers

During construction or closure of landfill units, waste limit markers will be used to identify the permitted limits of waste. The waste markers will be constructed of non-degradable material and will state "Waste Limits" or "Edge of Liner" in bold lettering. Offsets are acceptable such that all wording is clear to the DWM and operational staff. The waste markers will be maintained and replaced when damaged.

1.5 Communications

Two way radio communication will be maintained between the active landfill unit(s) and the landfill scale house and office. The scale house(s) and office have telephones in case of emergency and for the conduct of day-to-day business. Emergency telephone numbers are displayed in these locations.

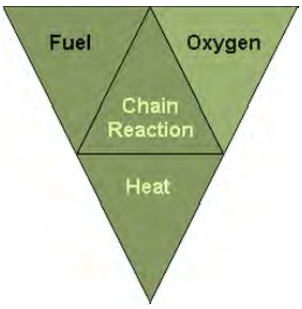
1.6 Fire Control

The possibility of fire within the landfill or a piece of equipment must be anticipated in the daily operation of the landfill. Potential fire hazards include both surface conditions and subsurface conditions. Surface conditions include equipment operations and newly placed waste. Subsurface conditions include existing waste previously landfilled.

1.6.1 Open Burning

With the exception of the controlled burning of land clearing debris generated on-site or from emergency clean-up operations, no opening burning is allowed at the facility. Controlled burning will occur only if permitted or approved by the DWM, the Division of Air Quality (DAQ), and the local fire department.

1.6.2 Fire Tetrahedron[1]



To better understand the properties of fire, the fundamental methods to extinguish it must be understood. The fire "tetrahedron" illustrates the rule that in order to ignite and burn, each component of the tetrahedron (fuel, oxygen, heat, and chemical chain reaction) represents a property of flaming fire. A fire is prevented or extinguished by "removing" any one of them. A fire naturally occurs when the elements are combined in the right mixture (e.g., more heat needed for igniting some fuels, unless there is concentrated oxygen). The fire tetrahedron is a more modern adaptation of the traditional fire "triangle"

[1] National Fire Protection Association (www.nfpa.org).

recognizing the chemical reactions that may occur as a component - "the uninhibited chain reaction". This chain reaction is the feedback of heat to the fuel to produce the gaseous fuel used in the flame. In other words, the chain reaction provides the heat necessary to maintain the fire. These principles are integral in the prevention and management of potential fire situations. *Please note this information is considered as a basis of understanding which may be superseded by the direction and skill of the local Fire Marshal.*

1.6.3 Equipment

A combination of factory installed fire suppression systems and/or portable fire extinguishers will be operational on all pieces of heavy equipment at all times. Potential fire hazards are created from the build-up of fine, dry dust particles on and around operational motors and control panels. The presence of these build-ups can cause overheating and potential fire if periodic equipment cleaning and maintenance are not practiced. Portable fire extinguishers should be maintained in a state of readiness on each piece of moving equipment and equipment should be cleaned periodically.

1.6.4 General Fire Management Strategies

Each fire situation is site specific; however, general strategies for active fire management include the following (in no particular order):

- Accelerated high temperature combustion (displacing fuel);
- Covering of the landfill burn area with soil (reduce oxygen);
- Covering of the burn area with foams (reduce oxygen);
- Flooding the burn area with water (reduce heat);
- Injecting an inert gas such as CO_2 (reduce oxygen);
- Excavating the burning material (displacing fuel) and then extinguishing it in small controlled areas; and
- Applying extinguishing agents that will interfere with and inhibit the combustion process at the molecular level (break the chemical reaction).

1.6.5 Fires Within Disposal Areas

Fires within the landfill disposal areas will be limited by the use of daily/periodic cover as a fire break and control of "hot" loads entering the landfill. Landfill personnel at the scale house will turn away all trucks containing waste that is suspected to be hot. If a hot load is placed on the working face, then the load will be spread as thin as possible and daily cover soil will be immediately placed on the waste to extinguish the fire.

In general, fires that break out close to the surface of the disposal area should be excavated and smothered with cover material. Deep fires should be smothered

out by placing moist soil on the surface and by constructing soil barriers around the fire. Where the smothering technique fails, the burning material must be excavated and smothered or quenched with water once the burning material is brought to the surface. Water is usually not effective unless it can be directly applied to the burning material.

For the lined ash monofill, in the event a fire occurs in the first lift of waste immediately above the protective cover layer, the possibility of damage to geosynthetics and collection piping exists. Once the fire is extinguished, the residue must be removed to allow limited inspection of the geosynthetics and piping. Damaged sections of geosynthetics, piping, etc. must be removed and replaced with new items of the same or equal material. The new materials must be placed in accordance with the technical specifications and construction quality assurance (CQA) documents prepared for this facility.

1.6.6 Notification

The County will verbally notify the DWM (see **Section 1.1.2**) within 24 hours of discovery of a fire within any landfill disposal area. In addition, written documentation describing the fire, the actions carried out to extinguish the fire, and a strategy for preventing future occurrences will be provided to the DWM within 15 days following any such occurrence using the DWM's Fire Occurrence Notification Form (see **Appendix A**).

1.6.7 Coordination With Local Fire Department

A copy of this Operations Manual will be filed with the local fire department including all contact information for the facility.

1.7 Severe Weather Conditions

Unusual weather conditions can directly affect the operation of the landfill facility. Some of these weather conditions and recommended operational responses are as follows.

1.7.1 Ice Storms

An ice storm can make access to the landfill dangerous, prevent movement or placement of daily cover, and, thus, may require closure of the landfill until the ice is removed or has melted.

1.7.2 Heavy Rains

Exposed soil surfaces can create a muddy situation in some portions of the landfill during rainy periods. The control of drainage and use of crushed stone on unpaved roads should provide all-weather access for the site and promote

drainage away from critical areas. In areas where the aggregate surface is washed away or otherwise damaged, new aggregate should be used for repair.

Intense rains can affect newly constructed drainage structures such as swales, diversions, cover soils, and vegetation. After such a rain event, inspection by landfill personnel will be initiated and corrective measures taken to repair any damage found before the next rainfall.

1.7.3 Electrical Storms

The open area of a landfill is susceptible to the hazards of an electrical storm. If necessary, landfilling activities will be temporarily suspended during such an event. Refuge will be taken as necessary in the on-site buildings or in rubber-tired vehicles.

1.7.4 Windy Conditions

Landfill operations during a particularly windy period may require that the working face be temporarily shifted to a more sheltered area. When this is done, the previously exposed face will be immediately covered with daily cover.

1.7.5 Violent Storms

In the event of hurricane, tornado, or severe winter storm warning issued by the National Weather Service, landfill operations may be temporarily suspended until the warning is lifted. Daily cover will be placed on exposed waste and buildings and equipment will be properly secured.

1.8 Equipment Requirements

The County will maintain on-site equipment required to perform the necessary landfill activities. Periodic maintenance of all landfilling equipment and minor and major repair work will be performed at designated maintenance zones.

The anticipated equipment requirements for operation and maintenance of the site are listed in **Table 1** below. These may vary based upon volume coming into the landfill for disposal.

Table 1 Equipment Requirements

Description	Primary Function (Allocation)
1) Compactor (C&D)	Waste placement and compaction
2) Dozers (2) (C&D and Ash Monofill)	Stripping and grading of borrow areas, fine grading, slope work, and site cleanup
3) Excavator	Loading and placement of cover soils
4) Dump Truck	Loading and hauling of cover soils

1.9 Personnel Requirements

At least one member of the landfill supervisory staff will be certified as a Manager of Landfill Operations (MOLO) by the Solid Waste Association of North America (SWANA) (or other DWM-approved program) and landfill operations staff will go through appropriate training. At least one certified (SWANA Landfill Operations Specialist or other DWM-approved program) operator will be present on-site during times when the landfill is receiving or disposing of waste. As part of this training, personnel learn to recognize loads which may contain prohibited wastes.

1.10 Health and Safety

All aspects of the landfill facility operations were developed with the health and safety of the operating staff, customers, and neighbors in mind. Prior to commencement of operations of the facility, a member of the operating staff will be designated site safety officer. This individual, together with the facility's management will modify the site safety and emergency response program to remain consistent with SWANA and Occupational Safety and Health Administration (OSHA) guidance.

Safety equipment provided includes equipment rollover protective cabs, seat belts, audible reverse warning devices, hard hats, safety shoes, and first aid kits. Facility personnel will be encouraged to complete the American Red Cross Basic First Aid Course. Other safety requirements as designated by the County will also be implemented.

Facility employees will be routinely trained in health and safety by supervisory staff. All training will be documented. The following are some general recommendations for the health and safety of workers:

1.10.1 Personal Hygiene

The following items are recommended as a minimum of practice:

- Wash hands before eating, drinking, or smoking.
- Wear personal protective equipment as described in Section 1.10.2.
- Wash, disinfect, and bandage ANY cut, no matter how small it is. Any break in the skin can become a source of infection.

- Keep fingernails closely trimmed and clean (dirty nails can harbor pathogens).

1.10.2 Personal Protective Equipment

Personal Protective Equipment (PPE) must be evaluated as to the level of protection necessary for particular operating conditions and then made available to facility employees. The list below includes the PPE typically used and/or required in a solid waste management facility workplace.

- Safety shoes with steel toes.
- Noise reduction protection should be used in areas where extended exposure to continuous high decibel levels are expected.
- Disposable rubber latex or chemical resistant gloves for handling and/or sampling of waste materials.
- Dust filter masks.
- Hard hats (in designated areas).

Following use, PPE's should be disposed of or adequately cleaned, dried, or readied for reuse.

1.10.3 Mechanical Equipment Hazard Prevention

All equipment should be operated with care and caution. All safety equipment such as horns, backup alarms, and lights should be functional. A Lockout-Tagout program will be used to identify equipment in need or under repair and insure that operation is "off-limits" prior to maintenance or repair. All operators will be trained in the proper operation of equipment.

1.10.4 Employee Health and Safety

Some general safety rules are:

- Consider safety first when planning and conducting activities.
- Review the equipment O&M manual(s) prior to attempting repairs/changes.
- Remember the buddy system for repair of mechanical equipment.
- Post emergency contact phone numbers.
- Provide easy and visible access to the Right to Know materials.
- Provide easy and visible access to first aid kits and fire extinguishers.

1.10.5 Physical Exposure

Facility personnel may come in contact with the fluids, solids, and airborne constituents found at the facility. Routine training should be conducted

regarding the individual and collective materials used at the facility and their associated hazards. Training concerning safe work practices around these potential exposures should cover the use of equipment and proper disposal procedures.

1.10.6 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) will be made available for all chemicals stored on site for use at the facility. MSDS sheets will be stored in a location with all other Right to Know information for the site.

1.11 Utilities

Electrical power, water, telephone, and restrooms will be provided at the landfill scale house and/or office.

1.12 Record Keeping Program

The County will maintain the following records in an operating record at the landfill:

A. Current permit(s) (Permit to Construct, Permit to Operate, etc.);
B. Current operations manual/plan and engineering plan for each landfill unit;
C. Inspection reports;
D. Audit and compliance records;
E. Annual landfill reports (including survey and other documentation related to airspace usage);
F. Waste inspection records (see **Section 2.3.1**);
G. Daily tonnage records - including source of generation;
H. Waste determination records (if applicable);
I. Quantity, location of disposal, generator, and special handling procedures for all special wastes disposed of at the site;
J. List of generators and haulers that have attempted to dispose of restricted wastes;
K. Employee training procedures and records of training completed;
L. All ground water monitoring and surface water quality information (See the current **Water Quality Monitoring Plan**) including:
    1. Monitoring well construction records;
    2. Sampling dates and results;
    3. Statistical analyses (if applicable); and
    4. Results of inspections, repairs, etc.
M. LFG monitoring results and remedial measures as required (see the current **LFG Monitoring Plan**);
N. All closure and post-closure information, where applicable, including:
    1. Notification of intent to close;
    2. Testing;

3. Certification; and
4. Recording.

O. Cost estimates or financial assurance documentation;
P. A notation of the date of cover placement; and
Q. NPDES records (see **Section 3.1.4**).

The operating record will be kept up to date by the Solid Waste Manager or his designee. It will be presented upon request to the DWM for inspection. A copy of this Operations Manual will be kept at the landfill and will be available for use at all times.

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2.0 WASTE HANDLING OPERATIONS

This section describes the required waste handling operations for the Halifax County Landfill facility. In addition to the C&D and ash waste disposed of at this facility, the County also handles scrap tires, white goods and scrap metal, electronics, and used pesticide containers. These materials are stored at the landfill facility until there are sufficient quantities for pick up by various recycling contractors. The County also operates an animal waste disposal area and a wood waste processing area.

2.1 Acceptable Wastes

2.1.1 C&D Landfill Unit

Only the following wastes generated within the approved service area may be disposed of in the C&D landfill unit:

- Construction and Demolition (C&D) Solid Waste: as defined in 15A NCAC 13B.0532(8) means solid waste resulting solely from construction, remodeling, repair, or demolition operations on pavement and buildings or structures. C&D waste does not include municipal and industrial wastes that may be generated by the on-going operations at buildings or structures.
- Land Clearing and Inert Debris Landfill: as defined in 15A NCAC 13B.0101(22) means a facility for the disposal of land-clearing waste, concrete, brick, concrete block, uncontaminated soil, gravel and rock, untreated and unpainted wood, and yard trash.
- Land Clearing Waste: as defined in 15A NCAC 13B.0101(23) means solid waste which is generated solely from land-clearing activities, limited to stumps, trees, limbs, brush, grass, and other naturally occurring vegetative material.
- Asphalt: in accordance with NCGS 130A-294(m).
- Industrial solid waste that is generated by mobile or modular home manufacturers and asphalt shingle manufacturers in Halifax County. The waste must be separated at the manufacturing site to exclude municipal solid waste, hazardous waste, and other waste prohibited from disposal in a Construction and Demolition Landfill.
- Other Wastes as Approved by the Solid Waste Section of the Division of Waste Management.

In addition, the special wastes (asbestos only) described in **Section 2.4.4** and may also be disposed of in the C&D landfill units.

2.1.2 Ash Monofill

Only coal combustion by-products (residuals including fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) residue produced by coal fired electrical or steam generation units) generated within the approved service area may be disposed of in the ash monofill. Note that minor amounts of coal fines may also be included with wastes brought to the monofill for disposal.

2.1.3 Wood Waste Processing Area

Clean untreated unpainted wood, including pallets, lumber scraps, land clearing debris (stumps and limbs), and yard waste is accepted for processing within the facility's wood waste processing area (see **Section 2.5**).

2.2 Prohibited Wastes

2.2.1 C&D Landfill Unit

Only wastes as defined in **Section 2.1.1** above may be accepted for disposal in the C&D landfill unit. Prohibited wastes include waste exclusions listed in 15A NCAC 13B 0.0542 as follows:

- Wastewater treatment sludge. Wastewater treatment sludge may be accepted, with the approval of the DWM, for utilization as a soil conditioner and incorporated into or applied onto the vegetative soil layer component of the final cover system. In this case, the sludge will be applied at no greater than agronomic rates and to a maximum depth of six inches.
- Containers such as tubes, drums, barrels, tanks, cans, and bottles unless they are empty and perforated to ensure that no liquid, hazardous, or municipal solid waste is contained therein;
- Garbage as defined in G.S. 130A-290(a)(7);
- Hazardous waste as defined in G.S. 130A-290(a)(8), to also include hazardous waste from conditionally exempt small quantity generators;
- Industrial solid waste unless a demonstration has been made and approved by the DWM that the landfill meets the requirements of Rule .0503(2)(d)(ii)(A);
- Liquid wastes;
- Medical waste as defined in G.S. 130A-290(a)(18);
- Municipal solid waste as defined in G.S. 130A-290(a)(18a);
- Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761;
- Radioactive waste as defined in G.S. 104E-5(14);
- Septage as defined in G.S. 130A-290(a)(32);
- Sludge as defined in G.S. 130A-290(a)(34);
- Special wastes as defined in G.S. 130A-290(a)(40);

- White goods as defined in G.S. 130A-290(a)(44); and
- Yard trash as defined in G.S. 130A-290(a)(45).

The following wastes cannot be received if separate from C&D waste:

- Lamps or bulbs including but not limited to halogen, incandescent, neon or fluorescent;
- Lighting ballast or fixtures;
- Thermostats and light switches;
- Batteries including but not limited to those from exit and emergency lights and smoke detectors;
- Lead pipes;
- Lead roof flashing;
- Transformers;
- Capacitors;
- Copper chrome arsenate (CCA) and creosote treated woods; and
- Pallets.

Waste accepted for disposal in the C&D landfill unit must be readily identifiable as C&D waste and must not have been shredded, pulverized, or processed to such an extent that the composition of the original waste cannot be readily ascertained except as specified as follows:

- C&D waste that has been shredded, pulverized, or otherwise processed may be accepted for disposal from a facility that has received a permit from an authorized regulatory authority which specifies such activities are inspected by the authority, and whose primary purpose is recycling and reuse of the C&D material. For this case, a waste screening plan and waste acceptance plan will be prepared and made available to the DWM upon request.

The County will not dispose of C&D waste that is known to be generated within the boundaries of a unit of local government that by ordinance:

(A) Prohibits generators or collectors of C&D waste from disposing that type or form of C&D waste.
(B) Requires generators or collectors of C&D waste to recycle that type or form of C&D waste.

2.2.2 Ash Monofill

Only wastes as defined in **Section 2.1.2** above may be accepted. Unacceptable wastes found in this area, if not otherwise prohibited, will be disposed of in the active C&D landfill unit or taken to the transfer station for transport to an approved MSW landfill.

2.2.3 Wood Waste Processing Area

Only clean wood waste as defined in Section **2.1.3** above may be accepted. Unacceptable wastes found in this area, if not otherwise prohibited, will be disposed of in the active C&D landfill unit or taken to the transfer station for transport to an approved MSW landfill.

2.3 Waste Screening Programs

In order to assure that prohibited wastes are not entering the landfill facility, screening programs have been implemented at the landfill. Waste received at both the scale house and waste taken to the working face is inspected by trained personnel. These individuals have been trained to spot indications of suspicious wastes, including: hazardous placarding or markings, liquids, powders or dusts, sludges, bright or unusual colors, drums or commercial size containers, and "chemical" odors. Screening programs for visual and olfactory characteristics of prohibited wastes are an ongoing part of the landfill operation.

Records of information gathered as part of the waste screening programs will be maintained at the landfill site during its active life and as long as required by the County and the DWM.

2.3.1 Waste Receiving and Inspection

All vehicles must stop at the scale house located near the entrance of the facility and visitors are required to sign-in. All waste transportation vehicles are weighed and the content of the load assessed. The scale attendant(s) requests from the driver of the vehicle a description of the waste it is carrying to ensure that unacceptable waste is not allowed into the landfill. The attendant(s) then visually checks the vehicle as it crosses the scale. Signs informing users of the acceptable and unacceptable types of waste are posted at the scale house. Once passing the scales, the vehicles are routed to the appropriate landfill unit or other area (transfer station, white goods handling area, etc.) as appropriate.

Vehicles are randomly selected for screening on a regular basis, depending on personnel available. At least one vehicle per week, but not less than 1% by weight of the waste stream entering the landfill (based on the previous week's total), will be randomly selected by inspection personnel. A random truck number and time will be selected (e.g., the tenth load after 10:00 a.m.) on the day of inspections. However, if something looks suspicious is spotted in any waste load, that load is inspected further.

Vehicles selected for inspection are directed to an area of intermediate cover adjacent to the working face where the vehicle will be unloaded. Waste is

carefully spread using suitable equipment. An attendant trained to identify wastes that are unacceptable at the landfill inspects the waste discharged at the screening site. If unacceptable waste is found, including wastes generated from outside of the service area, the load will be isolated and secured by berming off the area. For unacceptable wastes that are non-hazardous, the Solid Waste Manager will then notify officials of the DWM (see **Section 1.1.2**) within 24 hours of attempted disposal of any waste the landfill is not permitted to receive in order to determine the proper course of action. For unacceptable wastes that are hazardous, the Hazardous Waste Contingency Plan outlined in **Section 2.3.2** will be followed. The hauler is responsible for removing unacceptable waste from the landfill property.

If no unacceptable waste is found, the load will be pushed to the working face and incorporated into the daily waste cell. All random waste inspections will be documented by landfill staff using the waste screening form provided in **Appendix B**.

In addition to random waste screening described above, waste unloaded on the active face will be inspected by the equipment operators, trained to spot unacceptable wastes, before and during spreading and compaction. Any suspicious looking waste is reported immediately to the designated primary inspector for further evaluation.

2.3.2 Hazardous Waste Contingency Plan

In the event that identifiable hazardous waste or waste of questionable character is detected at the landfill, appropriate equipment, protective gear, personnel, and materials as necessary will be employed to isolate the wastes. The DWM will be notified immediately (see **Section 1.1.2**) that an attempt was made to dispose of hazardous waste at the landfill. If the vehicle attempting disposal of such waste is known, all attempts will be made to prevent that vehicle from leaving the site or, if the vehicle has left the site, immediate notice will be served on the owner of the vehicle that hazardous waste, for which they have responsibility, has been disposed of at the landfill.

The County will assist the DWM as necessary and appropriate in the removal and disposition of the hazardous waste and in the prosecution of responsible parties. If needed, the hazardous waste will be covered with either on-site soils or other tarping material until such time when an appropriate method can be implemented to properly handle the waste. The cost of the removal and disposing of the hazardous waste will be charged to the owner of the vehicle involved. Any vehicle owner or operator who knowingly dumps hazardous waste in the landfill may be barred from using the landfill.

Should an incident where hazardous waste is found at the landfill occur, the event will be documented by landfill staff using the waste screening form provided in **Appendix B**.

2.4 Waste Disposal

2.4.1 Access

Traffic will be clearly directed to the appropriate active access road. For the active lined ash monofill, all vehicles entering the unit will use the active ramp(s) to minimize the potential for damage the liner system. Traffic speed on the ramp should be less than 10 MPH.

The location of access roads during waste placement will be determined by operations personnel in order to reflect waste placement strategy. Additionally, access will be maintained for site monitoring locations.

2.4.2 General Procedures

For each active landfill unit, waste transportation vehicles will arrive at the working face at random intervals. There may be a number of vehicles unloading waste at the same time, while other vehicles are waiting. In order to maintain control over the unloading of waste, a certain number of vehicles will be allowed on the working face at a time. The actual number will be determined by the spotter (the spotter is typically the compactor or dozer operator). This procedure will be used in order to minimize the potential of unloading un-acceptable waste and to control disposal activity. Operations at the working face will be conducted in a manner which will encourage the efficient movement of transportation vehicles to and from the working face, and to expedite the unloading of waste.

The approach to the working face will be maintained such that two or more vehicles may safely unload side by side (A minimum separation distance of 10 feet is encouraged.). A vehicle turn-around area large enough to enable vehicles to arrive and turn around safely with reasonable speed will be provided adjacent to the unloading area. The vehicles will back to a vacant area near the working face to unload. Upon completion of the unloading operation, the transportation vehicles will immediately leave the working face area. Personnel will direct traffic as necessary to expedite safe movement of vehicles.

Waste unloading at the landfill will be controlled to prevent disposal in locations other than those specified by site management. Such control will also be used to confine the working face to a minimum width, yet allow safe and efficient operations. The width and length of the working face will be maintained as small as practical in order to maintain the appearance of the site, control windblown waste, and minimize the amount of cover required each day. Normally, only one

working face will be active on any given day, with all deposited waste in other areas covered by either daily/periodic, intermediate, or final cover, as appropriate.

The procedures for placement and compaction of C&D waste include: unloading of vehicles, spreading of waste into 2 foot lifts (thicker lifts may be necessary at the operators discretion depending on waste type and location of waste placement), and compaction on relatively flat slopes (i.e. 5H:1V max.) using a landfill compactor and a minimum number of three full passes. For the ash monofill, the ash is spread and tracked in with a bulldozer.

Caution will be used in wet conditions such that no waste will be placed into ponded water. Likewise, surface water will not be allowed to be impounded over waste.

Wind screens and/or diking adjacent to the working face may be used as required to control windblown waste.

The use of portable signs with directional arrows and portable traffic barricades will facilitate the unloading of wastes to the designated disposal locations. These signs and barricades will be placed along the access route to the working face of the landfill or other designated areas which may be established.

The removal of solid waste from any landfill unit is prohibited unless an appropriate recycling plan has been approved by the DWM. Regardless, the general public is prohibited from any waste removal activities from any landfill unit.

2.4.3 Ash Monofill

The following items are unique to the ash monofill in that this unit includes a geomembrane liner and related geosynthetics.

2.4.3.1 Placement of Initial Lift

During ash placement operations, the landfill liner system is most vulnerable during the placement of the first lift of waste. The first lift should be a minimum of two (2) to four (4) feet thick and be carefully spread using a bulldozer. A spotter should be used during placement of the first lift of ash to ensure that no movement of the underlying protective cover is occurring which might indicate stretching or wrinkling of the liner system geosynthetics is occurring.

In the event that the landfill staff identifies any damage to any part of the landfill's liner system, they should immediately initiate its repair.

Additionally, they should document the damage and the repair as a part of the operating record.

2.4.3.2 Equipment Operations Within the Landfill

Both the facility's operational vehicles and waste transportation vehicles must be restricted as follows within the ash monofill:

- Equipment operation directly on the protective cover will be limited to rubber-tired vehicles having a maximum ground contact, i.e., tire pressure, of less than 32 psi.
- A minimum vertical separation of 3 feet will be maintained between the geomembrane liner and all waste transportation vehicles.
- A minimum vertical separation of 5 feet will be maintained between the geomembrane liner and waste compactors.

The operation of vehicles within those portions of the landfill not actively receiving waste should be restricted to activities associated with erosion and sedimentation control.

2.4.4 Special Waste Management

2.4.4.1 Asbestos Management (C&D Landfill Units)

The County may dispose of asbestos within the C&D landfill units. Asbestos will only be accepted if it has been processed and packaged in accordance with State and Federal (40 CFR 61) regulations. Asbestos will arrive at the site in vehicles that contain only the asbestos waste and only after advance notification by the generator.

Once the hauler brings the asbestos to the landfill, the hauler will be directed to the designated asbestos disposal area by operations personnel. The designated disposal area will be prepared by operations personnel by leveling a small area using a dozer or loader. Prior to disposal, the landfill operators will stockpile cover soil near the designated asbestos disposal area. The volume of soil stockpiled will be sufficient to cover the waste and to provide any berms, etc. to maintain temporary separation from other landfill traffic.

Once placed in the prepared area, the asbestos waste will be covered with a minimum of 18 inches of cover soil placed in a single lift. The surface of the cover soil will be compacted and graded using a tracked dozer or loader. The landfill compactor will be prohibited from operating over asbestos disposal areas until at least 18 inches of cover is in-place.

The landfill staff will record the approximate location and elevation of the asbestos waste once cover is in-place (typically using a GPS device). The Solid Waste Manager will then review pertinent disposal and location information to assure compliance with regulatory requirements and enter the information into the Operating Record.

Once disposal and recording for asbestos waste is completed, the disposal area may be covered with waste. No excavation into designated asbestos disposal areas will be permitted.

2.4.4.2 Animal Carcasses (Animal Waste Disposal Area)

The disposal of animal carcasses within the animal waste disposal area will be handled as follows:

- The generator of the carcass(es) must call in advance to the landfill, and a determination will be made as to whether or not the carcass(es) will be accepted.
- If approved, the generator will present the carcass(es) at a predetermined time.
- An area for disposal will already have been prepared and the waste will be covered immediately with three (3) feet of soil.

2.4.5 Periodic Cover

2.4.5.1 C&D Landfill Unit

At the completion of waste placement each week, or sooner if the area of exposed waste exceeds one-half acre in size, a 6-inch layer of earthen material or other material as approved by the DWM will be placed over the exposed waste. Cover will be placed at more frequent intervals, if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.

2.4.5.2 Ash Monofill

Due to the nature of the waste placed in this landfill unit, no periodic soil cover is required.

2.4.6 Intermediate Cover

2.4.6.1 C&D Landfill Units

A 12-inch thick layer of soil cover should be placed on all waste surfaces that have not received waste in 30 days but are below final elevation. This intermediate cover should be seeded immediately and graded such that all precipitation run-off is channeled to the surface water systems.

2.4.6.2 Ash Monofill

Upon reaching final grades on outer slopes, a 12-inch thick layer of soil cover will be placed over the ash. This intermediate cover should be seeded immediately and graded such that all precipitation run-off is channeled to the surface water systems.

2.4.7 Height Monitoring

Periodically, the landfill staff will monitor landfill top and side slope elevations with a level. When such elevations approach design grades, the final top-of-waste grades will be staked to limit over-placement of waste.

2.5 Wood Waste Processing Area Operations

A wood waste processing are is located to the east of the existing Area 1 C&D landfill unit (see **Figure 1**). The operation of the wood waste processing area is as follows:

- Acceptable wood and yard wastes are stockpiled in windrows with a maximum height of 15 feet and width of 50 feet. Sufficient space is provided between windrows to allow equipment access in case of fire and the windrows are kept a minimum of 50 feet from the property line.
- Once sufficient material is accumulated at the site, a contractor is brought in to grind the waste. This typically occurs 2 times per year.
- Once the waste is ground and becomes mulch, it is either hauled off-site (for use as boiler fuel), used around the site (primarily for surface stabilization), or placed in windrows (with similar maximum dimensions to pre-processed materials) to be used in the future at the site. Typically, approximately 4,000 tons of material is ground each year.

Unacceptable wastes found in this area, if not otherwise prohibited, will be routed to either the C&D landfill unit or transfer station as appropriate.

Should the County decide to provide ground wood/yard waste to the public, the County will follow the requirements for a Small Type 1 Compost facility (under 15A NCAC

13B.1402 (g)(3)) including notification of the DWM (see **Section 1.1.2**) and operation in accordance with requirements of 15A NCAC 13B.1406.

2.6 White Goods Handling Area

A white goods handling area is located to the east of the existing Area 1 C&D landfill unit (see **Figure 1**). The operation of the white goods handling area is as follows:

- County personnel segregate materials suspected of containing chloroflourocarbon (CFC) refrigerants (i.e. refrigerators, freezers, and air conditioners containing Freon), and set aside to minimize the potential for damage prior to CFC removal.
- Other white goods and scrap metal are stockpiled up to about 10 feet high over an approximate 100 foot by 100 foot area.
- Once the stockpile reaches capacity (typically every 2 to 3 months), a recycler removes any CFC refrigerants (from applicable previously segregated materials) and hauls the white goods and scrap metal off-site to be recycled.

2.7 Used Tire Storage Area

Used tires are collected at an area near the landfill scale house (see **Figure 1**) and placed in up to three tire trailers. Once one or more trailers are full, the trailer(s) are picked up by a recycling contractor.

2.8 Used Pesticide Container Storage Area

A sheltered storage area is located near the landfill office/maintenance building (see **Figure 1**) for used pesticide containers from local agricultural sources. Once approximately 5,000 containers have been collected, a recycling contractor grinds the containers, bags the ground plastic, and transports the plastic for recycling.

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3.0 ENVIRONMENTAL MANAGEMENT

This section reviews the overall environmental management tasks required for the successful operation of the landfill facility.

3.1 Surface Water Control

As used herein, the definition of "surface water" is water which results from precipitation or site run-on that has not contacted the waste.

Proper control of surface water at the landfill will accomplish the following goals:

- Minimize the potential for the discharge of pollutants to waters of the United States, including wetlands (point or non-point sources);
- Prevent the run-on of surface water into the landfill unit(s) or the active face(s);
- Prevent the run-off of surface water that has come into contact with the waste (i.e. leachate);
- Limit the erosion caused by surface waters;
- Limit sediments carried off-site by surface waters; and
- Maximize the SEPARATION of SURFACE water from LEACHATE.

Separate erosion and sedimentation control plans have been provided for the various landfill units. These plans describe both short and long term engineered features and practices for preventing erosion and controlling sedimentation at this site. The following is a brief discussion of some of these features and practices, focusing more on the landfill units.

3.1.1 Surface Water Run-On Control

The perimeter berms and/or perimeter channels around the landfill unit(s) are designed to prevent the run-on of surface water from adjacent land into the landfill. Additional structures such as diversion berms, channels, down pipes, etc. carry surface water away from the landfill units.

3.1.2 Erosion Control

The serviceability of the landfill relies heavily on soil berms, barrier layers, and agricultural layers that are readily eroded by flowing water. Erosion control provisions incorporated in the landfill include the following:

- The slope of the working face must be no steeper than 5H:1V where practical to limit erosion of the periodic cover.
- Intermediate cover that has been exposed for more than 30 days must be seeded immediately and repaired when erosion features are identified.
- Drainage breaks (diversion berms, rain gutters, etc.) are provided on the

final cover to limit the flow length of run-off.

- Water collected by each drainage break is routed to stormwater drainage channels or down pipes so that the run-off volume does not accumulate going down the slope.
- The vegetative soil layer placed over the final cover must be seeded immediately.

Additional erosion control measures have been taken within the drainage channels and at points of stormwater discharge. All final cover should be inspected regularly for erosion damage and promptly repaired. Revegetation should be performed in accordance with the requirements of the applicable erosion and sedimentation control plan and/or the NC Erosion and Sedimentation Control Planning and Design Manual[2].

3.1.3 Sedimentation Control

Stormwater run-off from the landfill unit(s) is conveyed to one of the on site sediment basins and/or traps. These basins and/or traps should be inspected regularly for sediment build-up or erosion damage. The basins and/or traps should be cleaned out when sediment fills the lower half of the basin.

3.1.4 NPDES Requirements

The County will follow the requirements of applicable National Pollutant Discharge Elimination System (NPDES) permit requirements for the site. Requirements include periodic inspections, qualitative monitoring, and sampling of stormwater discharge points. The County will keep records of all inspections, monitoring, and sampling activities (including any test results) in the operating record.

3.2 Water Quality Monitoring

The monitoring program and procedures outlined in the current water quality monitoring plan(s) will be followed for the monitoring of site groundwater monitoring wells and surface water monitoring locations. Documentation of the water quality monitoring program will be placed in the facility operating record as described in Section 1.12.

[2] NC Division of Land Resources (Current Update), North Carolina Erosion and Sediment Control Planning and Design Manual, NCDENR - Division of Land Resources - Land Quality Section, Raleigh, NC.

3.3 Landfill Gas (LFG) Management

Landfill gas (LFG) generated from the closed MSW landfill unit and the C&D landfill units will be vented using passive vents placed at the time of closure. Refer to the appropriate permit application for details of these vents.

3.4 Landfill Gas (LFG) Monitoring Plan

The County will implement a routine landfill gas (LFG) monitoring program to ensure that methane concentrations do not exceed 25 percent of the lower explosive limit (LEL) (1.25% methane (CH_4)) in facility structures, or 100 percent of the LEL (5% CH_4) at property boundaries. LFG monitoring activities and remedial actions for concentrations exceeding these requirements will be in accordance with the site's current landfill gas monitoring plan(s).

3.4.1 Record Keeping

Results of LFG monitoring and description of any remedial measures will be placed in the facility operating record as described in Section 1.12.

3.5 Vector Control

Due to the nature of the waste disposed at this facility, vector control is not anticipated to be of concern. Note that the use of periodic cover in the C&D landfill units will discourage animals from nesting in the waste.

3.6 Litter Control

The vegetative trees/bushes act as a barrier to keep litter contained within the site and a litter control crew will pick up litter around the site and on access roads daily as necessary. Wind screens adjacent to active areas will be used as required to control windblown waste. Additionally, landfill staff will make operational changes as practical based on wind conditions that may spread litter.

3.7 Odor Control

Due to the nature of the waste disposed at this facility, odor control is not anticipated to be of concern. However, if odor control becomes a problem, additional measures (such as additional cover over wastes such as drywall) will be taken to ensure odor control.

3.8 Dust Control

Dust related to waste hauler traffic on the access roads will be minimized by using a water truck to limit dust on the gravel portions of site roads. Dust generated by

excavation of cover soil will be limited by watering the cut soil areas if accessible to the water truck. The source of water is from the County's water line and/or from one of the site sediment basins.

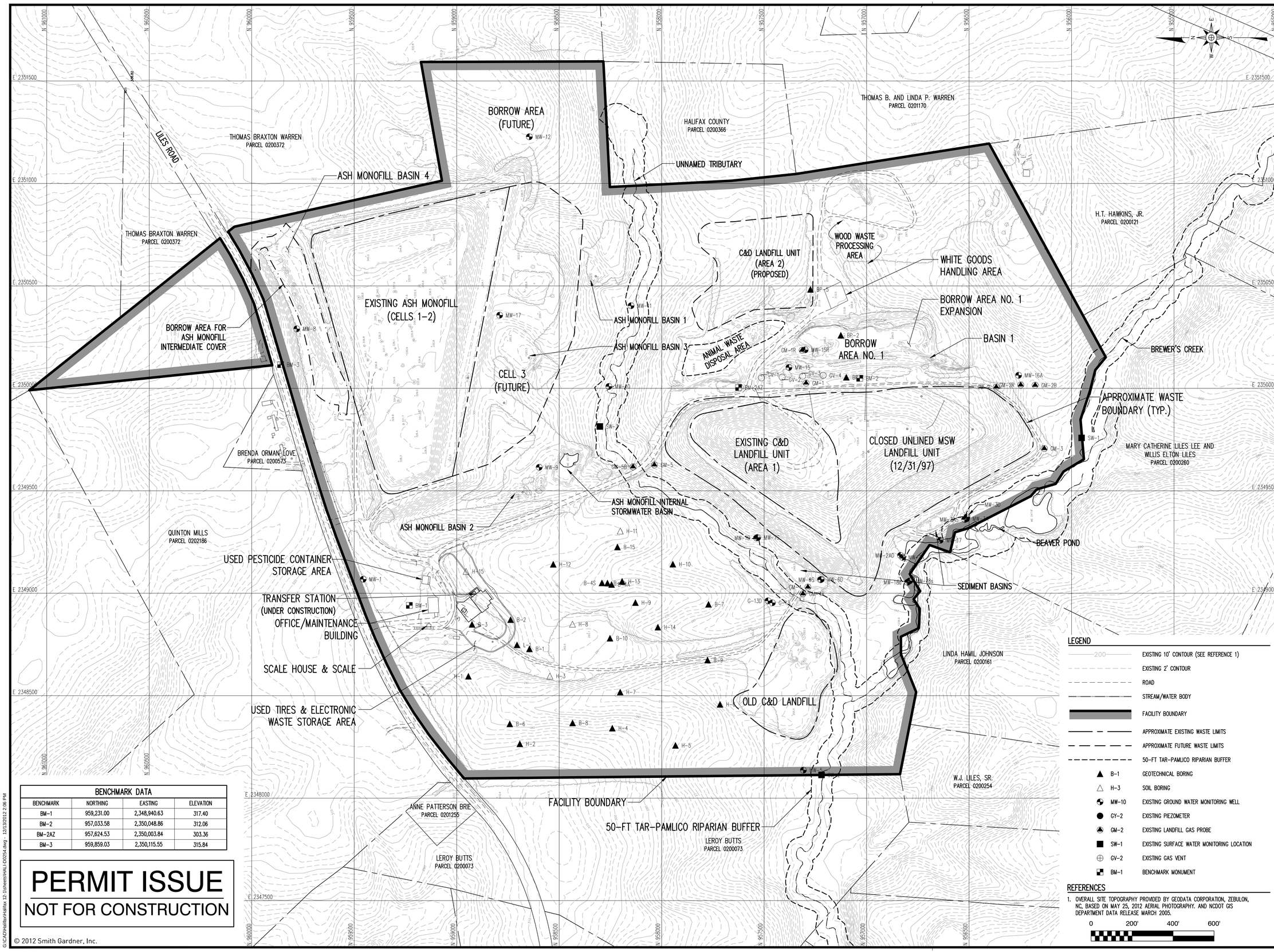
3.9 Air Quality

The County will follow all air quality requirements which are applicable to the landfill facility. This includes applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the U.S. EPA Administrator pursuant to Section 110 of the Clean Air Act.

3.10 Leachate Seeps

Leachate seeps can occur due to a variety of circumstances. The goal in dealing with leachate seeps is to prevent seepage from leaving the limits of waste disposal areas and to minimize the potential for reoccurrence. If evidence of leachate seeps is observed, the County will take the following actions. Depending on the circumstances, various combinations of actions may be appropriate.

1. If leachate is observed outside of the limits of waste disposal areas, notify the DWM (see Section 1.1.2).
2. Contain the flow of leachate using soil berms and/or excavation.
3. Excavate the area of seepage to attempt to allow flow into the underlying waste (i.e. break-up soil layers that may be causing the seep.).
4. For contained leachate that will not flow into underlying waste, a pump may be required to route the leachate to an existing leachate collection system cleanout pipe (ash monofill) or to a tanker truck.
5. For the lined ash monofill, french drains may be utilized for routing the seepage to the leachate collection system (via cleanout pipes).
6. The use of soil (particularly clay) to plug the seepage may also be successful in the case where flows are minor.
7. Remove and dispose of impacted cover soils accordingly.
8. Repair landfill cover as necessary.



BENCHMARK DATA			
BENCHMARK	NORTHING	EASTING	ELEVATION
BM-1	959,231.00	2,348,940.63	317.40
BM-2	957,033.58	2,350,048.86	312.06
BM-2AZ	957,624.53	2,350,003.84	303.36
BM-3	959,859.03	2,350,115.55	315.84

PERMIT ISSUE
NOT FOR CONSTRUCTION

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LEGEND

- EXISTING 10' CONTOUR (SEE REFERENCE 1)
- EXISTING 2' CONTOUR
- ROAD
- STREAM/WATER BODY
- FACILITY BOUNDARY
- APPROXIMATE EXISTING WASTE LIMITS
- APPROXIMATE FUTURE WASTE LIMITS
- 50-FT TAR-PAMLICO RIPARIAN BUFFER
- B-1 GEOTECHNICAL BORING
- H-3 SOIL BORING
- MW-10 EXISTING GROUND WATER MONITORING WELL
- GY-2 EXISTING PIEZOMETER
- GM-2 EXISTING LANDFILL GAS PROBE
- SW-1 EXISTING SURFACE WATER MONITORING LOCATION
- GV-2 EXISTING GAS VENT
- BM-1 BENCHMARK MONUMENT

REFERENCES

1. OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, ZEBULON, NC, BASED ON MAY 25, 2012 AERIAL PHOTOGRAPHY. AND NCDOT GIS DEPARTMENT DATA RELEASE MARCH 2005.

0 200' 400' 600'

PREPARED FOR:

HALIFAX COUNTY NORTH CAROLINA DEPARTMENT OF PUBLIC UTILITIES

PREPARED BY:

NC LIC. NO. C-0828 (ENGINEERING)
SMITH+ GARDNER
ENGINEERS
14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

SEAL

SEAL

REV.	DATE	DESCRIPTION
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PROJECT TITLE:

HALIFAX COUNTY C&D LANDFILL AREA 2 PERMIT TO CONSTRUCT DRAWINGS

DRAWING TITLE:

EXISTING AND PROPOSED LANDFILL UNITS AND SOLID WASTE MANAGEMENT ACTIVITIES

DESIGNED: P.K.S.	PROJECT NO: HALIFAX-12-1
DRAWN: C.T.J.	SCALE: AS SHOWN
APPROVED:	DATE: DEC. 2012
FILENAME: HALI-D0254	
SHEET NUMBER:	DRAWING NUMBER: FIG.1

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Appendix A

Fire Occurrence Notification Form

Operations Manual
Halifax County Landfill Facility
Halifax County, North Carolina

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SOLID WASTE MANAGEMENT FACILITY
FIRE OCCURRENCE NOTIFICATION
NC DENR Division of Waste Management
Solid Waste Section

Notify the Section verbally within 24 hours and submit written notification within 15 days of the occurrence.
(If additional space is needed, use back of this form.)

NAME OF FACILITY: _____ PERMIT # _____

DATE AND TIME OF FIRE: _____ @ _____

HOW WAS THE FIRE REPORTED AND BY WHOM:

LIST ACTIONS TAKEN:

WHAT WAS THE CAUSE OF THE FIRE:

DESCRIBE AREA, TYPE, AND AMOUNT OF WASTE INVOLVED:

WHAT COULD HAVE BEEN DONE TO PREVENT THIS FIRE:

DESCRIBE PLAN OF ACTIONS TO PREVENT FUTURE INCIDENTS:

NAME: _____ TITLE: _____ DATE: _____

****

THIS SECTION TO BE COMPLETED BY SOLID WASTE SECTION REGIONAL STAFF

DATE RECEIVED _____

List any factors not listed that might have contributed to the fire or that might prevent occurrence of future fires:

_____

FOLLOW-UP REQUIRED:

☐ NO ☐ PHONE CALL ☐ SUBMITTAL ☐ MEETING ☐ RETURN VISIT BY:_____ (DATE)

ACTIONS TAKEN OR REQUIRED:

Revised 6/8/09

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Appendix B

Waste Screening Form

Operations Manual
Halifax County Landfill Facility
Halifax County, North Carolina

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Halifax County Landfill Facility
Permit No. 42-04
(252) 586-7516

WASTE SCREENING FORM

Day / Date: _____ Time Weighed in: _____
Truck Owner: _____ Driver Name: _____
Truck Type: _____ Vehicle ID / Tag No: _____
Weight _____ Tare: _____
Waste Generator / Source: _____

Reason Load Inspected: Random Inspection _____ Staff Initials _____
Detained at Scales _____ Staff Initials _____
Detained by Operating Staff _____ Staff Initials _____

Inspection Location: _____

Approved Waste Determination Form Present? Yes _____ No _____ N/A _____

Description of Load: _____
_____
_____

Load Accepted (signature) _____ Date _____
Load Not Accepted (signature) _____ Date _____

Reason Load Not Accepted (complete only if load not accepted)

Description of Suspicious Contents: Color _____ Haz. Waste Markings _____
Texture _____ _____
Drums Present _____ Smell _____
Est. Cu. Yds. Present in Load _____
Est. Tons Present in Load _____

Halifax County Emergency Management Contacted? Yes _____ No _____

Company or Authority Contacted? _____
Hazardous Materials Present: _____
_____

Hauler Notified (if waste not accepted) Phone: Time Contacted:
Other Observations: _____
_____

Final Disposition
Signed _____ Date _____
Waste Screening Inspector or Solid Waste Director

Attach related correspondence to this form.
File completed form in Operating Record.

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ENGINEERS

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September 16, 2013

Mr. Larry Frost, P.E.
Environmental Engineer
NCDENR - Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646

RE: Halifax County C&D Landfill (Permit No. 4204-MSWLF-2013)
Determination of Completeness, Technical Review and Financial Assurance Cost Estimates
Response to Review Comments

Dear Mr. Frost:

On behalf of Halifax County, Smith Gardner, Inc. (S+G) would like to respond to the comments in your letter dated April 30, 2013 and received by S+G via mail on May 2, 2013 (see **attached**). Your comments are repeated below in *italics* followed by our response in **bold**.

1. *On April 19, 2013 Ms. Christine Ritter, Section Hydrogeologist, issued her technical review regarding these issues in an email entitled; Halifax County C&D Landfill - Area 2 Permit No. 42-04. Addressed to Smith Gardner, Inc. April 2013. DIN 18830.*

   S+G responded to Ms. Ritter's comments and submitted revisions in a letter dated May 8, 2013. Subsequently, in a letter dated July 22nd 2013, Ms. Ritter approved the Design Hydrogeologic report and the Water Quality and Landfill Gas Monitoring Plans.

2. *Section 1.0 General Facility Operations; remove the disclaimer paragraph from the Plan. The Plan cannot be approved with the paragraph included. Once the Plan is approved all changes to the "Approved Plan" will require prior approval of the Section.*

   The referenced paragraph in Section 1.0 has been modified to reflect approval by the Division of Waste Management.

3. *Section 1.6.1 Open Burning; replace the second sentence of the statement with, "Burning of land-clearing debris generated on site as a result of construction activities requires approval by the Section prior to initiating the burn. In addition, the Division of Air Quality and local fire department must approve the activity prior to burning".*

   This sentence has been modified as follows:

   "Controlled burning will occur only if permitted or approved by the DWM, the Division of Air Quality (DAQ), and the local fire department."

Additionally, two additional changes have been made in Section 1.6 as the result of other reviews. These changes are as follows:

- The last sentence of Section 1.6.2 (Fire Tetrahedron) has been modified as follows:

  "Please note this information is considered as a basis of understanding which may be superseded by the direction and skill of the local Fire Marshal."

- The last bullet of Section 1.6.4 (General Fire Management Strategies) has been modified as follows:

  "Applying extinguishing agents that will interfere with and inhibit the combustion process at the molecular level (break the chemical reaction)."

Please refer to the attached revised Operations Manual.

4. *Section 2.1.1 C&D Landfill Unit; Bullet point 5, provide background for this activity and define "ABC County".*

At several other facilities, this statement has been included to allow segregated wastes from certain manufacturers. While there is not a manufacturer identified at this time for Halifax County, the intent is to allow this flexibility as has been approved elsewhere in the State (example - Davidson County). Also, "ABC" has been changed to "Halifax" in the attached revised Operations Manual.

5. *Section 2.1.3 Wood Waste Processing Area; I am convinced by the description of the County's Wood Waste Processing Area that the County not only needs this area but it also needs a Small Type I Compost Area for the proper handling of yard trash. I have attached a guidance regarding Yard Waste Management in North Carolina.*
   a. *The Wood Waste Processing Area should be renamed the Wood Grinding Area and should accept; Clean untreated unpainted wood, including pallets, lumber scraps, and land clearing debris (stumps and limbs).*
   b. *A Small Type I Compost Area should be established on site for the proper handling of Yard Trash and Yard Waste (woody debris mixed with yard trash that cannot be separated).*

      Note: Please contact me and/or Ms. Mary Whaley (919) 693-5023/ mary.whaley@ncdenr.gov. for more information.

Per our discussion with Ms. Mary Whaley, we understand that the suggested compost requirements above are required only if material is provided to the public. The County does not intend to provide material to the public at the present time. Thus, Section 2.1.3 has been changed as follows:

"Clean untreated unpainted wood, including pallets, lumber scraps, land clearing debris (stumps and limbs), and yard waste is accepted for processing within the facility's wood waste processing area (see Section 2.5)."

See also the response to Comment 7 below.

6. *Section 2.4.5.1 C&D Landfill Unit; Incorporate the following language regarding Cover found in 15A NCAC 13B .0542 (f). "All C&DLF units must cover the solid waste with six inches of earthen material when the waste disposal area exceeds one-half acre and at least once weekly. Cover must be placed at more frequent intervals if necessary to control disease vectors, fires, odors, blowing litter, and scavenging."*

   Section 2.4.5.1 has been modified as follows:

   "At the completion of waste placement each week, or sooner if the area of exposed waste exceeds one-half acre in size, a 6-inch layer of earthen material or other material as approved by the DWM will be placed over the exposed waste. Cover will be placed at more frequent intervals, if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging."

7. *Section 2.5 Wood Waste Processing Area Operations; See item number 5 above. Review this Section with the regards to the information provided.*

   Based on our response to Comment 5 above, Section 2.5 has been changed to read as follows:

   "A wood waste processing are is located to the east of the existing Area 1 C&D landfill unit (see Figure 1). The operation of the wood waste processing area is as follows:

   - Acceptable wood and yard wastes are stockpiled in windrows with a maximum height of 15 feet and width of 50 feet. Sufficient space is provided between windrows to allow equipment access in case of fire and the windrows are kept a minimum of 50 feet from the property line.
   - Once sufficient material is accumulated at the site, a contractor is brought in to grind the waste. This typically occurs 2 times per year.
   - Once the waste is ground and becomes mulch, it is either hauled off-site (for use as boiler fuel), used around the site (primarily for surface stabilization), or placed in windrows (with similar maximum dimensions to pre-processed materials) to be used in the future at the site. Typically, approximately 4,000 tons of material is ground each year.

   Unacceptable wastes found in this area, if not otherwise prohibited, will be routed to either the C&D landfill unit or transfer station as appropriate.

Should the County decide to provide ground wood/yard waste to the public, the County will follow the requirements for a Small Type 1 Compost facility (under 15A NCAC 13B.1402 (g)(3)) including notification of the DWM (see Section 1.1.2) and operation in accordance with requirements of 15A NCAC 13B.1406."

8. *Section 2.6 White Goods Handling Area; Bullet Point 1, infers that white goods containing CFC's are intermingled with other white goods and scrap metal. Add to the Plan language that white goods containing CFC's must be segregated and protected until the CFC's are removed. Once the CFC's are removed the units may be marked and added to regular scrap metal storage.*

   Section 2.6 has been modified to state that County personnel segregate materials suspected of containing chloroflourocarbon (CFC) refrigerants and set aside to minimize the potential for damage prior to CFC removal.

Please contact me at your earliest convenience if you should have any questions or comments on this submittal.

Sincerely,
SMITH GARDNER, INC.

NORTH CAROLINA PROFESSIONAL SEAL 021666 ENGINEER PIETER K. SCHEER
9/16/13

Pieter K. Scheer, P.E.
Vice President, Senior Engineer
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Joan A. Smyth, P.G.
Senior Hydrogeologist
joan@smithgardnerinc.com

Attachments: DWM Comment Letter (April 30, 2013)
Revised Operations Manual

cc: Larry Garriss, Halifax County

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Pat McCrory
Governor
Dexter R. Matthews
Director
John E. Skvarla, III
Secretary
SOLID WASTE SECTION

April 30, 2013

RECEIVED MAY - 2 2013

Ms. Gwen Matthews, Director
Halifax County Department of Public Utilities
Post Office Box 70
Halifax, North Carolina 27839

Subject: Determination of Completeness, Technical Review and Financial Assurance Cost Estimates
Halifax County C&D Landfill, Permit No. 4204-CDLF-2013
Halifax County, DIN 18850

Dear Ms. Matthews:

Determination of Completeness

On February 4, 2013 the Division of Waste Management, Solid Waste Section (Section) received your permit amendment, permit to construct application, entitled;

Permit to Construct Application, Halifax County C&D Landfill – Area 2, Halifax County, North Carolina, December 2012. Prepared for Halifax County. Prepared by Smith Gardner, Inc. February 2013. DIN 18385.

The Section has performed a review of the Facility's application for a determination of completeness and determined the application is complete, in accordance North Carolina General Statute NCGS 130A-295.8(e). A determination of completeness means the application contains the required components in accordance with North Carolina Administrative Code 15A NCAC 13B .0500.

Technical Review

Design Hydrogeologic Report, Water Quality Monitoring Plan, and Landfill Gas Monitoring Plan

1. On April 19, 2013 Ms. Christine Ritter, Section Hydrogeologist, issued her technical review regarding these issues in an email entitled;
   Halifax County C&D Landfill – Area 2 Permit No. 42-04. Addressed to Smith Gardner, Inc. April 2013. DIN 18830.

Operations Plan

2. Section 1.0 General Facility Operations; remove the disclaimer paragraph from the Plan. The Plan cannot be approved with the paragraph included. Once the Plan is approved all changes to the "Approved Plan" will require prior approval of the Section.
3. Section 1.6.1 Open Burning; replace the second sentence of the statement with, "*Burning of land-clearing debris generated on site as a result of construction activities requires approval by the Section prior to initiating the burn. In addition, the Division of Air Quality and local fire department must approve the activity prior to burning*".

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4. Section 2.1.1 C&D Landfill Unit; Bullet point 5, provide background for this activity and define "ABC County".
5. Section 2.1.3 Wood Waste Processing Area; I am convinced by the description of the County's Wood Waste Processing Area that the County not only needs this area but it also needs a Small Type I Compost Area for the proper handling of yard trash. I have attached a guidance regarding **Yard Waste Management in North Carolina**.
    a. The Wood Waste Processing Area should be renamed the Wood Grinding Area and should accept; Clean untreated unpainted wood, including pallets, lumber scraps, and land clearing debris (stumps and limbs).
    b. A Small Type I Compost Area should be established on site for the proper handling of Yard Trash and Yard Waste (woody debris mixed with yard trash that cannot be separated).
    Note: Please contact me and/or Ms. Mary Whaley (919) 693-5023/mary.whaley@ncdenr.gov. for more information.
6. Section 2.4.5.1 C&D Landfill Unit; Incorporate the following language regarding Cover found in 15A NCAC 13B .0542 (f). "*All C&DLF units must cover the solid waste with six inches of earthen material when the waste disposal area exceeds one-half acre and at least once weekly. Cover must be placed at more frequent intervals if necessary to control disease vectors, fires, odors, blowing litter, and scavenging.*"
7. Section 2.5 Wood Waste Processing Area Operations; See item number 5 above. Review this Section with the regards to the information provided.
8. Section 2.6 White Goods Handling Area; Bullet Point 1, infers that white goods containing CFC's are intermingled with other white goods and scrap metal. Add to the Plan language that white goods containing CFC's must be segregated and protected until the CFC's are removed. Once the CFC's are removed the units may be marked and added to regular scrap metal storage.

Financial Assurance
The following Financial Assurance Cost Estimates have been presented;

Landfill Activity	Costs	Total
C&D Landfill - Area 1	Estimate of Closure Costs	$303,280
C&D Landfill - Area 2	Estimate of Closure Costs	$291,503
C&D Landfill - Area 1 & 2	Estimate of Post-Closure (30 Year) Costs	$627,000
Ash Monofill - Cells 1 & 2	Estimate of Closure Costs	$2,115,086
Ash Monofill - Cells 1 & 2	Estimate of Post-Closure (30 Year) Costs	$1,257,300
	Total of the Costs Presented	$4,594,169

This letter approves the cost estimates presented for Closure Costs and Post-Closure Care Costs, totaling; four million, five hundred and ninety four thousand, one hundred and sixty nine dollars ($4,594,169). The total Financial Assurance Mechanism for the Facility will be based on the now approved Closure and Post-Closure cost total plus, a "to be determined" approved Potential Assessment and Corrective Action Cost Estimate. The Company must contact Ms. Christine Ritter (919) 707-8254/christine.ritter@ncdenr.gov and/or Ms. Elizabeth Werner (919) 707-8257/elizabeth.werner@ncdenr.gov, in order to establish the Potential Assessment and Corrective Action Cost Estimate.

All concerns contained in this letter must be resolved prior to issuance of the Permit to Operate for Area 2. All documents referenced in this letter may be accessed and downloaded from the Section's website at http://portal.ncdenr.org/web/wm/sw. Should you have any questions regarding this matter contact me at (828) 296-4704 or larry.frost@ncdenr.gov.

Sincerely,

Larry Frost
Environmental Engineer

Attachments

cc: Pieter Scheer. Smith Gardner, Inc.
ec: Mary Whaley – SWS/CO
Christine Ritter – SWS/CO
Elizabeth Werner – SWS/CO
Sarah Rice – SWS/CO

Yard Waste Management in North Carolina

NCDENR Composting and Land Application Branch

History: Yard Waste management in North Carolina became a larger issue in 1993 when the material was banned from NC landfills. Yard waste disposal bans and new markets for this type of material after it has been processed, has made the handling of yard waste a more prominent issue in the solid waste arena.

The following is provided to clarify issues pertaining to solid waste management facilities that accept yard waste. This document should be utilized for solid waste compost facilities (SWC), yard waste notification sites (YWN), solid waste compost demonstration approvals (SWCD), fully permitted facilities that include composting in the operation plan (or RAL), land clearing and inert debris (LCID) facilities, treatment and processing facilities (T&P) and treatment and processing notified sites (T&PN).

The following definitions will apply in this document (regulatory definitions include citation of Rule):
"Active Composting"- Method of composting that involves increased levels of management in order to produce a finished product within a short duration (14 days to 6 months).
"Composting" 15A NCAC 13B .0101(8) means the controlled decomposition of organic waste by naturally occurring bacteria, yielding a stable, humus like, pathogen free final product resulting in volume reduction of 30-75 percent.
"C:N ratio"- The ratio of the weight of organic carbon (C) to that of total nitrogen (N) in an organic material. While C:N ratio is not a term contained in Rules, it is a factor that should be considered when determining the appropriate method of yard waste management.
"Feedstock"- Raw material for the compost process.
"High C:N ratio Yard Trash"- means solid waste resulting from landscaping and yard maintenance such as brush, tree limbs, and similar vegetative materials that has a C:N ratio higher than 75.
"Land Clearing Debris" 130A-290(a)(15)- means solid waste which is generated solely from land-clearing activities.
"Land Clearing Waste" 15A NCAC 13B .0101(23) means solid waste which is generated solely from land clearing activities such as stumps, trees, limbs, brush, grass, and other naturally occurring vegetative material.
"Low C:N ratio Yard Trash"- means solid waste resulting from landscaping and yard maintenance such as grass clippings, bush trimmings, and similar vegetative materials that has a C:N ratio less than or equal to 75.
"Passive Composting"- Method of composting in which there is little management and manipulation of the materials after they are mixed and piled. Turning occurs infrequently (On-Farm Composting Handbook). Duration can be from 6 months to 2 years.
"Themophilic temperatures"- Temperatures above 105 degrees F.
"Untreated and unpainted wood waste"- means solid waste wood material that has not been glued, treated with preservatives, painted, stained, or varnished.

"Yard Trash" 130A-290(a)(45)- means solid waste consisting solely of vegetative matter resulting from landscaping maintenance.
"Yard Waste" 15A NCAC 13B .0101(56)- Yard Waste means "Yard Trash" and "Land Clearing Debris" as defined in GS 130A-290, including stumps, limbs, leaves, grass and untreated wood.

The term yard waste includes several types of waste as stated within the definition. The types of waste and their respective management options depend on several factors:

1) Nitrogen content of the waste
2) Spontaneous combustion risk
3) Potential for pathogens
4) Herbicide/pesticide content
5) Criteria set forth in the rules
6) Needs of facility
7) Desired end product

Management Options

Composting:

Composting has been utilized in most states as an effective process to manage yard waste. Composting has been recognized within North Carolina since 1888 as a method of handling waste ("Compost Formulas, Analysis, and Value" Bulletin Number 61 NC Agricultural Experiment Station). Composting is a controlled process that reduces the potential pathogen load, herbicide/pesticide content of the waste and potential for spontaneous combustion by managing low carbon to nitrogen ratio waste (Table 1 includes C:N ratios for several feedstocks). Composting also provides a volume reduction in the amount of waste that was introduced into the process (30-75% reduction) while also producing a marketable product. Specific parameters for optimizing active composting have been listed in Table 2.

Boiler Fuel:

The production of boiler fuel is an additional outlet for the disposal of yard waste. Ground material that is not distributed to the public and is used as a fuel source may contain all components of yard waste including yard trash. However, large volumes of low C:N ratio material in the waste stream may not be suitable for use as a boiler fuel. It is important to note that this material is often stockpiled prior to grinding. Stockpiling should not create excessive temperatures (>110 F), attract vectors, or produce objectionable odors.

Mulch:

High C:N ratio yard trash and land clearing waste can be ground and utilized as mulch. The potential for spontaneous combustion, pathogens and pesticide / herbicide residue prevents other yard trash materials like grass clippings and bush trimmings from being used directly as mulch. It is important to note that all yard waste components may be ground into a "mulch like" product prior to placing in compost windrows. Several municipalities stockpile yard waste prior to hiring a contract grinder to process the material for windrow composting.

Passive Composting:

An additional process that is utilized by several facilities in NC is passive composting. Passive composting involves a lower level of management compared to conventional composting. In this process, feedstocks are allowed to compost on their own with or without being mixed with other feedstocks. Turning of the material occurs on an infrequent basis but monitoring of the material is still required to assure that moisture levels are appropriate and temperatures do not indicate the potential for spontaneous combustion. Leaves are an example of a material that is often passively composted. Leaves compost without being blended with low C:N ratio feedstocks like grass clippings. The process takes from six months to two years depending on the level of management. Numerous facilities have a customer base that prefers a "leaf compost" rather than a mixed yard waste compost. In result, passive composting is utilized to meet this demand while also allowing facilities to handle large volumes of leaves with less management. Regular monitoring of the passive compost piles is required to document elevated thermophilic temperatures to achieve pathogen reduction (131 degrees F for 3 days) and to monitor the material for excessive temperatures (>160 degrees F) that could lead to spontaneous combustion. Infrequent turning events can produce pockets of anaerobic conditions within the material. The anaerobic pockets can release odors when the material is turned.

Note: Rule .1406(10) requires that all Type I composting facilities, whether they utilize active or passive composting management options, must maintain the compost process at or above 131 degrees F and are aerated to maintain elevated temperatures.

Passive and active composting achieve the same end result: a finished product that may be distributed in accordance with the requirements of 15A NCAC 13B .1407.

Management Options for Specific Feedstocks

Leaves: Yard Waste Notifications (YWN) require that leaf piles be managed to include at the very minimum annual turning (passive composting). In order for any compost facility to produce leaf compost with a passive compost process, clean loads of leaves (source separated) must be delivered to the facility without contaminants. In most instances, a leaf collection program will have to be implemented by the municipality to keep other yard trash out of the waste stream. Acceptance of leaves from the general public may be limited because of the increased risk for contaminants. Leaf compost piles shall be monitored for pathogen reduction (3 days at or above 131 degrees F) and to prevent excessive temperatures (>160 degrees F). Temperature monitoring after pathogen reduction is recommended at least monthly or more often as dictated by observation. The leaves should be turned as needed to break up areas of anaerobic activity and additional moisture may have to be added to the leaf piles to assure that the moisture content is sufficient for passive composting. Leaf windrow dimensions are dependent on the turning equipment available but a height of 12' and width of 20' should not be exceeded unless other dimensions have been approved (minimum dimensions of 6' in height and 9' in width). Leaves that are passively composted should stay at the site for a minimum of six to twelve months for sufficient decomposition prior to distribution as leaf compost. Leaves may also be managed within an active composting process.

Grass clippings, bush trimmings, other vegetative matter resulting from landscaping maintenance: These specific yard trash components must be actively composted at elevated thermophilic temperatures. Active composting is required to minimize the development of anaerobic conditions and potential for spontaneous combustion based on the types of feedstocks utilized (primarily grass clippings). At Type 1 facilities the requirement (.1406(10)) is that the compost process shall be maintained at or above 131 degrees F for 3 days and aerated to maintain elevated temperatures. The composting process with elevated temperatures also provides a reduction in pathogen levels and some degradation of pesticides and herbicides.

Stumps, trees, limbs, untreated and unpainted wood waste: This material may be ground and used directly as mulch or utilized as a carbon source for the composting process. The material can also be utilized as boiler fuel.

Questions related to yard waste management

Are leaves yard trash? Leaves are not specifically included in the definition of yard trash, but the Section considers them as yard trash. Management options as noted above include active composting with other yard trash, less intensive measures to include passive composting and use as boiler fuel.

Do leaves contain pathogens, herbicides/pesticides? Leaves are not expected to contain high levels of pathogens, herbicides or pesticides compared to other yard trash components (grass clippings, bush trimmings).

What types of solid waste facilities can manage leaves? Leaves should only be managed at solid waste compost facilities (SWC), yard waste notifications (YWN), solid waste compost demonstration approvals (SWCD), facilities that have composting written into their operation plan, treatment and processing facilities that only distribute the leaves as boiler fuel (T&P, T&PN) and land clearing and inert debris (LCID) facilities.

Is yard trash subject to spontaneous combustion? This is a primary concern with this particular waste stream. Low C:N ratio yard trash has the potential to generate heat if not managed appropriately. Grass clippings do have the potential to cause spontaneous combustion where pile moisture levels drop below 40% and temperatures reach 450 degrees F. Piles should be turned or divided when temperatures reach 160 degrees F. Under most circumstances leaves are not expected to spontaneously combust because of their higher C:N ratio but the potential is there. Observations may be made that indicate that heat is being generated. The facility shall investigate (i.e. temperature monitoring) to assure that excessive temperatures are not being generated and that appropriate measures including dividing the pile are utilized to prevent excessive heat buildup.

How is the C:N ratio determined? The C:N ratio cannot be determined in the field but can be determined by laboratory analysis (NCDA waste analysis). This test is recommended to all facilities to ensure a balanced C:N ratio for composting (20:1 – 30:1) but is not required. Table 1 provides C:N ratios for various yard waste materials. Some judgment has to be utilized

during site visits to determine if materials that appear to have low C:N ratios are being managed properly.

What are the considerations for stockpiling yard waste? Grass clippings are one feedstock that should not be stockpiled for more than a week prior to incorporation into the windrows. Odors and vector attraction problems are the main issues with extended storage frequencies for grass clippings. Stockpile areas should allow vehicle access and sizes should be limited to the volume and dimensional requirements within the operation plan. If there is not an operation plan that lists dimensions for stockpile areas sizes should be limited to 30' in height, 50' in width and no limitation on length as long as buffer and operation plan requirements are met. There are no specific limitations on stockpile storage timeframes unless listed in the permit or operation plan. Numerous facilities will contract grind on a semi annual or quarterly basis.

Additional Questions?
Please contact Michael Scott, Composting and Land Application Branch Head, at 919-508-8508 or Michael.Scott@ncdenr.gov

The regulatory underpinning to this guidance is:

15A NCAC 13B .1401 REQUIREMENT FOR PERMIT

(a) All persons whose purpose is or includes the production of compost from solid waste or solid waste co-composted with other wastes shall not construct, operate, expand or modify a facility until a currently valid permit for a solid waste compost facility is issued by the Division. This provision also applies to facilities that accept, store, or produce compost or mulch from yard waste or from residues from agricultural products and processing. General Provisions, Siting, design, application, operational, distribution, and reporting requirements shall be in accordance with Rules .1402, .1403, .1404, .1405, .1406, .1407, and .1408 of this Section.

15A NCAC 13B .1406 OPERATIONAL REQUIREMENTS FOR SOILD WASTE COMPOST FACILITIES

(10) Compost process at Type 1 facilities shall be maintained at or above 131 degrees F for 3 days and aerated to maintain elevated temperatures.

References

Rynk, Robert. "On-Farm Composting Handbook" NRAES– 54. Ithaca, New York: Northeast Regional Agricultural Engineering Service. 1992.

"Compost Formulas, Analysis, and Value" Bulletin Number 61 Agricultural Experiment Station (NC) 1888.

FEEDSTOCK CHARACTERISTICS
Table 1

Material	% N (DM)*	C:N ratio	Moisture %	Bulk Density (lbs/cu yd)
Grass Clippings	2.0-6.0	9.0-25.0	82	300-800
Leaves	0.5-1.3	40.0-80.0	38	100-500
Shrub trimmings	1	53	15	429
Tree Trimmings	3.1	16	70	1296
Sawdust	.06-.08	200-750	19-65	350-450
Sewage Sludge	2-6.9	5.0-16.0	72-84	1075-1750

*Source: On-Farm Composting Handbook
*DM- Dry matter basis

CONDITIONS FOR ACTIVE COMPOSTING
Table 2

Condition	Reasonable Range	Preferred Range
C:N ratio	20:1-40:1	25:1-30:1
Moisture Content	40-65%	50-60%
Oxygen Concentration	> 5%	> 5%
Particle size	1/8 - 1/2"	1/8 - 1/2"
pH	5.5 - 9.0	6.5 - 8.0
Temperature (deg F)	110 - 150	130 - 140

*Source: On-Farm Composting Handbook

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