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Fac/Perm/Co ID #	Date	Doc ID#
11-07	11/30/09	8966

November 24, 2009

Mr. Allen Gaither  
North Carolina Department of Environmental and Natural Resources  
Division of Waste Management  
Solid Waste Section  
2090 US Highway 70  
Swannanoa, North Carolina 28778

RECEIVED

Subject: Buncombe County Solid Waste Management Facility  
Buncombe County, North Carolina  
C&D Landfill Engineering Technical Review  
Permit to Construct Application – Phase 5  
Response to Comments

NOV 30 2009

SOLID WASTE SECTION  
ASHEVILLE REGIONAL OFFICE

Dear Mr. Gaither:

On behalf of Buncombe County, CDM is pleased to submit the response to review comments regarding the Engineering Technical Review for the Phase 5 Permit to Construct Application for the Buncombe County C&D Landfill. Buncombe County received review comments on July 10, 2009 (see Attachment 1). The following revisions are in response to that review letter and are provided for your review:

Engineering Plan

1. *Subgrade elevation contours are missing from drawing EP-3. Rule .0539(e)(2) requires Engineering drawings that illustrate grading plans including proposed limits of excavation, subgrade elevations, intermediate grading for partial construction.*

**Response:**

Subgrade elevation contours are not depicted because excavation will not be performed in Phase 5. The only construction activities will be clearing and grubbing of trees and shrubs, removal of the 6-inch topsoil layer, and proof-rolling for unsuitable areas.

2. *Drawing EP-6 only provides top elevations, surface water control features and seeding details. Rule .0539(e)(4) requires Engineering drawings that illustrate the cap system including base and top elevations, landfill gas devices, infiltration barrier, surface water removal, protective and vegetative cover, and details.*

**Response:**

Drawing EP-6 depicts the top elevations for the closure cap system. Detail A – Cover Cap on Drawing EP-9 shows the profile of the proposed cover cap and is in





Mr. Allen Gaither  
November 24, 2009  
Page 2

accordance with Rule .0543(c)(1). The base elevations for the cover cap were not shown to aid in clarity and will be 3 feet below the top elevations based on Detail A. Figure 2-2 – Vertical Gas Well in Part 8: Closure/Post-Closure Plan was provided and will be used as the primary gas venting device. The infiltration barrier is depicted in Detail A on Drawing EP-9 as the low permeability layer. Surface water control and conveyance details are also provided on Drawing EP-9. Vegetative cover information is provided in Section 5 – Vegetative Cover Materials, Appendix A CQA – Closure Cap, Part 8: Closure/Post-Closure Plan.

3. *There are no cross-sections in the Engineering drawings. Rule .0539(e)(6)(A) requires Engineering drawings that illustrate Cross-sections showing borings, which indicate existing ground surface elevations, base grades, seasonal high ground-water level, estimated long-term seasonal high ground-water and bedrock level.*

**Response:**

Drawings EP-6 and EP-10 are provided as Attachment 2.

4. *Base grade contours are not illustrated on Drawings EP-4 and EP-5. Rule .0539(e)(6)(B) requires Engineering drawings that include a map showing the existing ground surface elevation and base grades.*

**Response:**

Please see Response to Comment No. 1.

Construction Quality Assurance Plan

5. *Section 3.3 of Part 6: Construction Quality Assurance Plan states progress meetings will be held as deemed necessary with no mention made of the frequency of troubleshooting meetings. Rule .0541(b)(5) requires a plan for holding daily and monthly troubleshooting meetings.*

**Response:**

Revised Section 3 – Communication Between Involved Parties, Part 6: Construction Quality Assurance Plan is provided as Attachment 3.

Operations Plan

6. *Section 9 of Part 7: Operation Plan makes no mention of leachate containment or discharge of pollutants into waters of the United States. Rule .0542(l)(4) requires leachate to be contained*



Mr. Allen Gaither  
November 24, 2009  
Page 3

*onsite and Rule .0542(i)(5) requires C&DLF units not to cause a discharge of pollutants into waters of the United States.*

**Response:**

New Section 9.4 is provided as Attachment 4.

7. *Letter of Notice dated May 28, 2009 discusses revisions to the Operation Plan regarding methane monitoring. This document states future proposed methane monitoring wells M-5, -6, -7, -8, and -9 will be installed as subsequent phases of landfill development are completed. Please clarify if these wells will be installed prior to closure of each phase and, if not, please specify a time frame for installation after closure.*

**Response:**

Future proposed methane monitoring wells will be installed before disposal operations begin in subsequent phases of the landfill.

Also provide as Attachment 5 is revised Section 3.1.1 of the Operation Plan. This section was revised to include wet weather operations. Additionally, Sections 1 and 11 of the Operation Plan have been included as Attachments 6 and 7 and have been revised for your review.

The Subtitle D Landfill Operation Plan is presented as Attachment 8. The intent of providing this plan is to present a compiled version since there has been substantial revisions in the last few years. Appendices A and B, Waste Screening Plan and Methane Monitoring Plan, respectively, are also included for your review. Appendix C, Water Quality Monitoring Plan, has not been included since it has not been revised.

If you have any questions or need additional information, please do not hesitate to call me at (919) 787-5620.

Very truly yours,

Kenton J. Yang, P.E.  
Camp Dresser & McKee

xc: Ed Mussler, NCDENR SWS  
J. Creighton/J. Mears/K. Smith, BCGSD  
J. Wiseman/M. Colone/C. Gabel, CDM



Attachment 1  
NCDENR SWS  
Engineering Technical Review Letter  
Dated July 10, 2009



## North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Beverly Eaves Perdue, Governor  
Dee Freeman, Secretary

### SOLID WASTE SECTION

July 10, 2009

Mr. Jerry Mears  
Buncombe County Solid Waste Manager  
85 Panther Branch Road  
Alexander, North Carolina 28701

Subject: Engineering Technical Review – PTC Application  
Buncombe County C&D Landfill, Phase 5  
Buncombe County, Permit #11-07, Document ID No. 7955

Mr. Mears:

The Division of Waste Management, Solid Waste Section (Section) has completed the engineering technical review of the document titled *C&D Landfill Substantial Amendment and Phase 5 Permit to Construct Application, Buncombe County, North Carolina, Volumes 1 and 2*, September 2008. It has been determined the Section requires clarification or additional information in order to complete the technical review. Please provide a response for each of the following items:

#### Engineering Plan

1. Subgrade elevation contours are missing from drawing EP-3. Rule .0539(e)(2) requires Engineering drawings that illustrate grading plans including *proposed limits of excavation, subgrade elevations, intermediate grading for partial construction*.
2. Drawing EP-6 only provides top elevations, surface water control features and seeding details. Rule .0539(e)(4) requires Engineering drawings that illustrate the cap system including *base and top elevations, landfill gas devices, infiltration barrier, surface water removal, protective and vegetative cover, and details*.
3. There are no cross-sections in the Engineering drawings. Rule .0539(e)(6)(A) requires Engineering drawings that illustrate Cross-sections *showing borings, which indicate existing ground surface elevations, base grades, seasonal high ground-water level, estimated long-term seasonal high ground-water and bedrock level*.
4. Base grade contours are not illustrated on Drawings EP-4 and EP-5. Rule .0539(e)(6)(B) requires Engineering drawings that include *a map showing the existing ground surface elevation and base grades*.

#### Construction Quality Assurance Plan

5. Section 3.3 of Part 6: Construction Quality Assurance Plan states *progress meetings will be held as deemed necessary* with no mention made of the frequency of troubleshooting meetings. Rule .0541(b)(5) requires a plan for holding daily and monthly troubleshooting meetings.

Operations Plan

6. Section 9 of Part 7: Operation Plan makes no mention of leachate containment or discharge of pollutants into waters of the United States. Rule .0542(1)(4) requires leachate to be contained on-site and Rule .0542(i)(5) requires C&DLF units not to cause a discharge of pollutants into waters of the United States.
7. Letter of Notice dated May 28, 2009 discusses revisions to the Operation Plan regarding methane monitoring. This document states *future proposed methane monitoring wells M-5, -6, -7, -8, and -9 will be installed as subsequent phases of landfill development are completed*. Please clarify if these wells will be installed prior to closure of each phase and, if not, please specify a time frame for installation after closure.

If you should have any questions regarding this matter please contact me at (828) 296-4703, or by email at [allen.gaither@ncmail.net](mailto:allen.gaither@ncmail.net) .

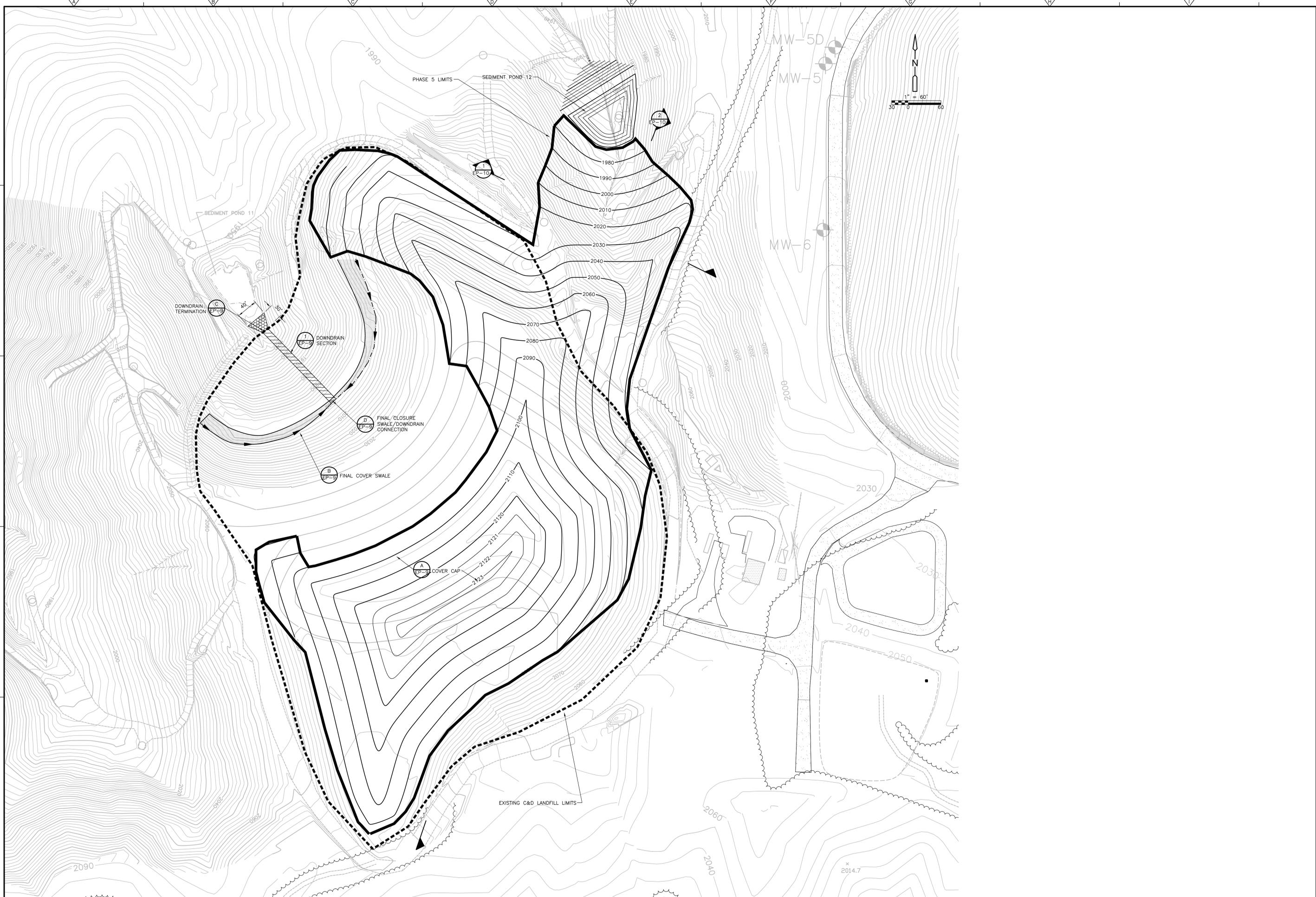
Sincerely,



Allen Gaither  
Environmental Engineer

Cc: Kristy Smith – Buncombe County  
Kenton Yang – CDM  
Zinith Barbee – SWS/RCO  
Andrea Keller – SWS/ARO

Attachment 2  
Engineering Drawings EP-6 and EP-10



REV. NO.	DATE	DRWN	CHKD	REMARKS

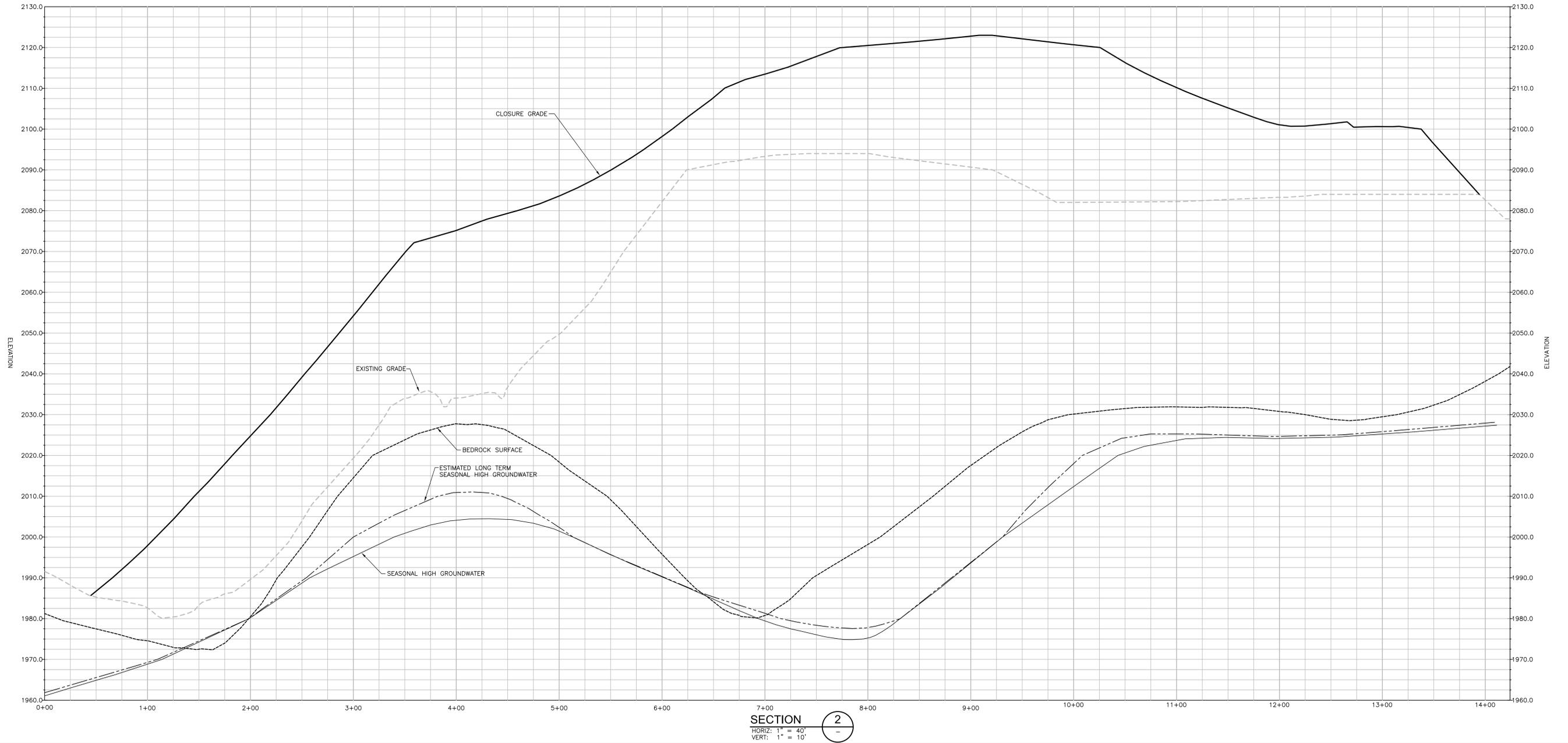
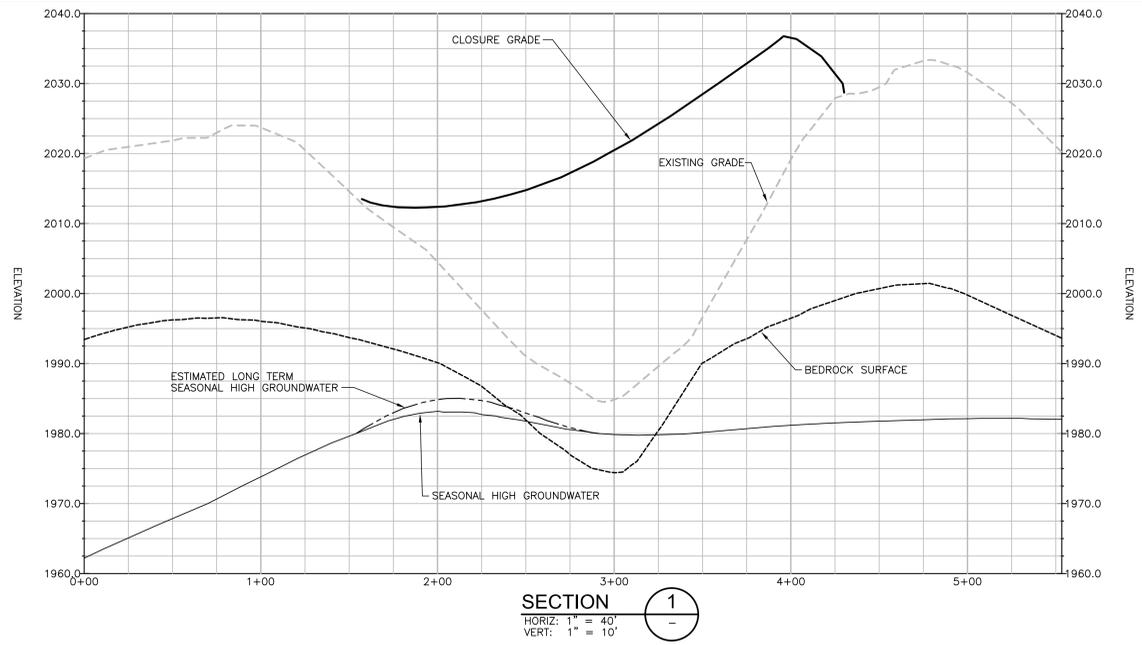
DESIGNED BY: K. YANG  
 DRAWN BY: J. KILLINGSWORTH  
 SHEET CHK'D BY: K. YANG  
 CROSS CHK'D BY: C. GABEL  
 APPROVED BY: K. YANG  
 DATE: APRIL 2008

**CDM**  
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 consulting • engineering • construction • operations

BUNCOMBE COUNTY  
 NORTH CAROLINA  
**BUNCOMBE COUNTY C&D LANDFILL  
 ENGINEERING PLAN**

**CLOSURE GRADING PLAN**

PROJECT NO. 6447-65973  
 FILE NAME: EP-6.DWG  
 SHEET NO.  
**EP-6**



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: K. YANG  
 DRAWN BY: J. KILLINGSWORTH  
 SHEET CHK'D BY: K. YANG  
 CROSS CHK'D BY: C. GABEL  
 APPROVED BY: K. YANG  
 DATE: APRIL 2008

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BUNCOMBE COUNTY  
 NORTH CAROLINA  
**BUNCOMBE COUNTY C&D LANDFILL  
 ENGINEERING PLAN**

**LANDFILL CROSS SECTIONS**

PROJECT NO. 6447-65973  
 FILE NAME: EP-10.DWG  
 SHEET NO.  
**EP-10**

Attachment 3  
Revised Section 3 of the  
Construction Quality Assurance Plan

## **Section 3**

### **Communication Between Involved Parties**

Communication is essential to achieve a high level of quality during construction and to assure the final product that meets all project requirements. This section discusses the necessary lines of communication.

#### **3.1 Lines of Communication**

All communication between parties shall go through the Engineer's Field Representative (EFR), who, in turn, will direct the communication through the proper channels.

#### **3.2 Pre-Construction Meeting**

A pre-construction meeting shall be held before construction activity begins. The meeting shall be conducted by the Engineer and attended by the Owner, EFR, Contractor, Contractor's Representative, and a Solid Waste Section representative.

Per Rule .0541(b)(1), the meeting will include a discussion of the construction management organization, the responsibilities and duties of each party during construction, and a discussion of the procedures for periodic reporting of testing results and construction activities.

#### **3.3 Progress and Troubleshooting Meetings**

Progress and troubleshooting meetings shall be conducted by the Engineer and attended by the Owner, EFR, and Contractor's Representative. Progress meetings shall be held as deemed necessary. These meetings shall discuss current progress, planned activities to be accomplished prior to the next progress meeting, issues requiring resolution, and any new business or revisions to the work. The EFR shall log any problems, decisions, or questions arising at this meeting in a weekly report. If any matter remains unresolved at the end of this meeting, the EFR will be responsible for obtaining a resolution of the matter and for forwarding communication of the decision to the appropriate parties. Troubleshooting meeting will be held daily and monthly when deemed necessary by the Owner and Engineer.

Attachment 4  
New Section 9.4  
of the Operation Plan

# **Section 9**

## **Drainage Control and Water Protection Requirements**

### **9.1 Surface Water Diverted From Operational Area**

In accordance with Rule .0542(1)(1), surface water shall be diverted from the operational area. Excessive surface water at the working face creates difficulties for maneuvering equipment and prevents the operator from achieving maximum compaction of the waste. To divert surface runoff away from the working face, temporary diversion berms shall be installed on the current lift, up-gradient from the working face and in other locations as dictated by the direction of grade. The area between the temporary berm and the working face should be limited to one acre to prevent excessive ponding. The soil cover in the areas beyond the diversion berms shall be uniformly graded and compacted to prevent the formation of erosion channels. In the event that channels do form, the cover shall be promptly repaired. During the formation of the initial lift of each phase area additional measures shall be employed to divert surface water. Existing phases were graded with a high point located within each phase. The high point will separate each phase into two distinct areas from the perspective of stormwater control. Initial disposal operations for each phase will begin on only one side of the high point.

### **9.2 Surface Water Shall Not Be Impounded Over Waste**

Per Rule .0542(1)(2), surface water shall not be impounded over or in waste. Completed areas shall be adequately sloped at a minimum of 5% to allow surface water runoff in a controlled manner.

### **9.3 Waste Shall Not Be Disposed Of In Water**

In accordance with Rule .0542(1)(3), solid waste shall not be disposed of in water. The minimum four-foot separation between waste and the seasonal high groundwater table along with the drainage controls described in Section 8 will prevent waste from being disposed of in water.

### **9.4 Leachate Containment**

Operational cover is placed on the C&D landfill working face to minimize leachate generation. Any leachate generated is contained by existing and proposed stormwater control devices.

Attachment 5  
Revised Section 3.1.1  
of the Operation Plan

# Section 3

## Cover Material Requirements

### 3.1 Operational Cover

In accordance with Rule .0542(f), the County shall cover disposed C&D waste with six inches of earthen material (or alternative cover material (ACM) approved by the Solid Waste Section (SWS)) when the waste disposal area exceeds one-half acre and at least once weekly. Cover shall be placed at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging. A notation of the date and time of the cover placement must be recorded in the operating record.

In accordance with Rule .0542(f)(2), areas which will not have additional wastes placed on them for three months or more, but where final termination of disposal operations has not occurred, shall be covered and stabilized with vegetative ground cover or other stabilizing material.

#### 3.1.1 Wet Weather Operations

During wet weather, the County will develop a wet weather working face. The wet weather working face will be kept as small as possible. At the end of disposal operations, the County will cover in accordance with Section 3.1.

### 3.2 Alternative Cover Material

ACM methods are described in this section for Posi-Shell and soil/mulch mixture. Each ACM shall provide control for disease vectors, fires, odor, blowing litter, and scavenging. The ACM approval letter is included in Appendix B.

#### 3.2.1 Posi-Shell

The Posi-Shell Cover System is proposed as an ACM (see Appendix C for Manufacturer's Usage Guide) on waste disposed at the C&D landfill. Posi-Shell provides a thin cover that hardens over the covered waste surface.

##### 3.2.1.1 Properties of Posi-Shell

The properties of each component of Posi-Shell are presented in the Manufacturer's Usage Guide in Appendix C.

##### 3.2.1.2 Cover System Description

As described in the Manufacturer's Usage Guide, the application rate for short-term coverage (overnight cover for daily cover operations) is approximately 8 to 10 square feet per gallon. Assuming the working face is less than one acre (100 feet wide and 400 feet long), the desired load size would be approximately 4,000 gallons. At a minimum, the Posi-Shell material quantities for daily use should be the following:

- 3,200 gallons of liquid (water or leachate),
- 8 bags (15 lbs each) of Posi-Pak,

- 40 bags (50 lbs each) of PSM-200 setting agent, and
- 80 bags (94 lb each) of optional Portland cement.

Posi-Pak is a specially designed plastic fiber with a proprietary finish that provides the reinforcement matrix for the finished cover. PSM-200 setting agent is a blend of clay, polymers, and adhesives that provides thickening, lubrication, and adhesion. Portland cement can be used as a binder component which will help neutralize odors and enhances the durability of the cover system.

### 3.2.1.3 Cover System Application Procedures

#### Application Procedure

Application of the Posi-shell will generally follow the manufacturer's recommendation and will employ the following minimum procedures:

- The Posi-shell will be applied in two different directions to avoid spray shadow or wind dispersion;
- The Posi-shell will be applied at the end of each working day;
- The Posi-shell surface will be visually inspected on a daily basis for exposed waste and/or inadequate coverage. Inadequate coverage is generally defined as a thickness of less than 1/8 of an inch.

Areas of exposed waste and/or inadequate coverage will receive an additional application prior to operations ending for that day.

#### Maximum Daily Area Coverage

Based on the July 2008 Airspace Analysis Report:

- Annual 2007 waste disposal rate (C&D only) = 66,400 tons
- Operating days per year = 284 days
- Approximate daily waste disposal rate = 230 tons
- In-place density = 0.65 tons of C&D per cubic yard
- Daily cubic yards disposed = daily waste disposal rate / in-place density = 350 yd<sup>3</sup> or 9,500 ft<sup>3</sup>

The working face will be restricted to the smallest area feasible. The working lift is typically 4 feet high. Based on a working lift thickness of 4 feet, the working face area is 5,400 square feet (daily cubic yards disposed / working lift thickness), which is less than the daily coverage area.

Daily Depth and Quantity to be Applied

N/A

Average Monthly Volume of Daily Cover

N/A

List of Equipment

Equipment required for the Posi-Shell consists of a standard hydroseeding unit and a towing unit.

Material and Equipment Storage

The material components of Posi-Shell will be housed in the machine shop to minimize the risk of hydration. The spraying equipment will be parked in a County designated area which will not impede daily operations.

Wet Weather Operation

See Section 3.1.1 of this section.

Contingency Plans

If, for any reason, the County cannot use Posi-Shell as ACM material, soil or a soil/mulch mixture will be used.

Screening Criteria

N/A

### **3.2.2 Soil/Mulch Mixture**

A mulch (30% maximum by volume) and soil mixture is proposed as another ACM material. Mulch will be hauled from the on-site mulching operations and soil will be provided from the County's on-site borrow area. The soil/mulch mixture will be free of petroleum contaminated soils. The materials will be mixed at the borrow area or the working face.

#### **3.2.2.1 Properties of Soil/Mulch Mixture**

At the Buncombe County facility, waste segregation occurs at the scale house to prevent the mulch processing of any unacceptable material. Unacceptable material includes construction and demolition debris, potentially contaminated debris, etc. Since waste segregation occurs prior to the waste processing into mulch, the resulting mulch is considered inert.

#### **3.2.2.2 Cover System Application Procedures**

Application Procedure

Application of the soil/mulch mixture will employ the following minimum procedures:

- The mixture will be prepared by combining three (3) loads of mulch and seven (7) loads of soil;
- Mix soil and mulch load and visually verify that the mixture is adequately commingled, ensure that there are no large clumps (3 inches in diameter or larger) of either soil or mulch in the mixture;
- Load and haul soil/mulch mixture to active working face using an articulating truck; and
- Use dozer to cover working face with six inches of soil/mulch mixture.

The surface will be visually inspected on a daily basis for exposed waste and/or inadequate coverage. Areas of exposed waste and/or inadequate coverage will receive additional cover.

Maximum Daily Area Coverage

See Section 3.2.1.3.

Daily Depth and Quantity to be Applied

As stated above, **6 inches** of the soil/mulch mixture will be applied to the daily coverage area of 5,400 square feet. Therefore; the required daily quantity of soil/mulch mixture placed is approximately **100 yd<sup>3</sup>** (Assuming no other daily cover is used).

Average Monthly Volume of Daily Cover

As stated above, approximately 100 yd<sup>3</sup> per day of soil/mulch mixture will be used. Assuming 24 working days per month, the average monthly volume of daily cover required for normal operating conditions is **2,400 yd<sup>3</sup>**.

List of Equipment

An articulating truck and dozer will be used for the application process.

Material and Equipment Storage

Any soil/mulch mixture requiring storage will be stored at the borrow area. Mulch stock pile sizes shall not exceed 30 feet in width and 15 feet in height to avoid spontaneous combustion and to maintain a manageable pile size in the event of a fire. Landfill equipment used for ACM procedures will be stored at County designated areas.

Wet Weather Operation

See Section 3.1.1 of this section.

Contingency Plans

If, for any reason, the County cannot obtain mulch for the on-site processing area for use as ACM material, soil or Posi-shell will be used.

Screening Criteria

Each soil/mulch mixture load will be visually inspected prior to transport to the working face to determine if the material is adequately mixed. The load will not be placed if the mixture is not commingled adequately or if foreign material is observed.

Attachment 6  
Revised Section 1 of the Operation Plan

# Section 1

## Purpose

The purpose of this Operation Plan is to provide the Buncombe County C&D landfill staff with a manual that will serve as a guide for safe and efficient operation of the C&D landfill, including the current operating phase through the Phase 5 expansion that is proposed for construction. This Operation Plan has been prepared in accordance with the North Carolina Solid Waste Rule 15A NCAC 13B .0542, Operation Plan and Requirements for C&D Landfill Facilities, and therefore addresses the following issues.

- Waste Acceptance and Disposal Requirements
- Cover Material Requirements
- Spreading and Compacting Requirements
- Disease Vector Control
- Air Criteria and Fire Control
- Access and Safety Requirements
- Erosion and Sedimentation Control Requirements
- Drainage Control and Water Protection Requirements
- Survey for Compliance
- Operating Record and Recordkeeping Requirements

Additionally, Table 1 is provided to summarize all required documents or documentation (record keeping) which must be maintained by the County and retained at the facility. The operating record may be inserted into a 3-ring binder located at the scale house or main administration building. It is the intent that Table 1 is clearly and visually posted to ensure direction on record keeping.

### 1.1 Operation Drawings

In accordance with Rule .0542(b)(1), operation drawings have been prepared and are included in Appendix D.

Table 1  
Buncombe County C&D Landfill  
Operating Record Requirements

Required Record Keeping	Rule	Reference in Ops Plan	Action
<b>INCOMING WASTE</b>			
Attempted disposal of any prohibited wastes	.0542	2.5	Report to NCDENR within 24 hrs
Attempted disposal of any waste from outside the permitted service area	.0542	2.5	Report to NCDENR within 24 hrs
Records of random waste inspections	.0544	11.1	Note date and result
Amounts by weight of solid waste received at the C&D landfill, include county of generation	--	11.1	--
<b>DISPOSAL OPERATIONS</b>			
Placement of cover material at a minimum per 3.1	.0542	3.1	Note date and time and include in Operating Record
Open burning requests	.0542	6.2	Note date of approval and approving DWM personnel and include in Operating Record
Fire and explosion notification	.0542	6.4	Report to NCDENR verbally within 24 hrs and written by 15 days and keep notification on file
<b>METHANE (LFG) MONITORING</b>			
Methane (LFG) monitoring reports	.0544	11.2.1	Quarterly
Exceedance in methane levels - required action within 7 days following detection	.0544	11.2.1	Include in Operating Record detected levels and description of steps to protect human health
Exceedance in methane levels - required action within 60 days following detection	.0544	11.2.1	Include in Operating Record a remediation plan for gas releases
<b>GROUNDWATER AND SURFACE WATER MONITORING</b>			
Groundwater and surface water monitoring reports	.0544	App. A	Semi-annual
<b>TRAINING</b>			
Certifications of training	.0544	11.1	--

Training procedures	.0544	11.1	--
<b>MISCELLANEOUS</b>			
Audit records, compliance records and inspection reports	.0542	11.1	--
<b>CLOSURE/POST-CLOSURE (NOT APPLICABLE AS OF OCTOBER 2008)</b>			
Any closure or post-closure monitoring, testing, or analytical data	.0543	11.1	Note date and result and include in Operating Record
<b>REQUIRED APPROVED DOCUMENTS TO BE INCLUDED IN THE OPERATING RECORD</b>			
Current Operations Plan and Monitoring Plan in accordance with Rules .0542 & .0544			
Current Permit to Construct and Permit to Operate			
Current cost estimates and financial assurance documentation			

Attachment 7  
Revised Section 11 of the Operation Plan

# Section 11

## Operating Record and Record Keeping Requirements

### 11.1 Regulatory Requirements

In accordance with Rule .0542(n)(1), the county shall record and retain at the facility the following information as it becomes available:

- Records of random waste inspections, monitoring results, certifications of training, and training procedures required by Rule .0544;
- Amounts by weight of solid waste received at the C&D landfill;
- Any demonstration, certification, finding, monitoring, testing, or analytical data required by Rules .0544 through .0545;
- Any closure or post-closure monitoring, testing, or analytical data as required by Rule .0543;
- Any cost estimates and financial assurance documentation required by Rule .0546;
- Notation of date and time of placement of cover material; and
- All audit records, compliance records and inspection reports.

### 11.2 Operating Record

Per Rule .0542(n)(2), all information contained in the operating record must be furnished to the Division according to the permit or upon request, or be made available for inspection by the Division.

The operating record must also include:

- (A) A copy of the approved operation plan required by this Rule and the engineering plan required by Rule .0539;
- (B) A copy of the current Permit to Construct and Permit to Operate; and
- (C) The Monitoring Plan, in accordance with Rule .0544 of this Section, included as appendices to the Operation Plan.

#### 11.2.1 Monitoring Plan

In accordance with Rule .0542(n)(3)(C), a monitoring plan per Rule .0544 shall be included as appendices to the Operation Plan.

The groundwater and surface water monitoring plan was prepared per Rules .0544(b) and (c) and is included as Appendix A.

Rule .0544(d) requires a gas control plan and is included as Appendix B.

Rule .0544(e) requires a waste acceptability program. Currently, this program is in place with the MSW landfill and was approved in the aforementioned Permit submittal. Since both landfills are integral parts of the solid waste management facility, the previously approved waste acceptability plan covers the C&D landfill as well.

Attachment 8  
Subtitle D Landfill Operation Plan

# Buncombe County, North Carolina

## Buncombe County Solid Waste Management Facility

### Subtitle D Landfill Operation Plan

November 2009



# Contents – Operation Plan

## Subtitle D Landfill

<b>Section 1</b>	<b>Purpose</b>	
1.1	Operation Drawings.....	1-1
<b>Section 2</b>	<b>Waste Acceptance and Disposal Requirements</b>	
2.1	Waste Definitions.....	2-1
2.2	Acceptable Waste.....	2-3
2.3	Acceptable Waste Requiring Special Handling.....	2-4
2.4	Prohibited Wastes.....	2-5
2.5	Receiving Prohibited Waste.....	2-5
2.6	Waste Screening Program.....	2-6
<b>Section 3</b>	<b>Cover Material Requirements</b>	
3.1	Daily Cover.....	3-1
3.1.1	Wet Weather Operations.....	3-1
3.2	Intermediate Cover.....	3-1
3.3	Alternative Daily Cover.....	3-1
3.3.1	Posi-shell.....	3-1
3.3.1.1	Properties of Posi-shell.....	3-2
3.3.1.2	Cover System Description.....	3-2
3.3.1.3	Cover System Application Procedures.....	3-2
3.3.2	Soil/Mulch Mixture.....	3-4
3.3.2.1	Properties of Soil/Mulch Mixture.....	3-4
3.3.2.2	Cover System Application Procedures.....	3-4
3.3.3	Tarps.....	3-5
3.3.3.1	Properties of Tarps.....	3-5
3.3.3.2	Cover System Application Procedures.....	3-5
<b>Section 4</b>	<b>Disease Vector Control</b>	
<b>Section 5</b>	<b>Explosive Gas Control</b>	
<b>Section 6</b>	<b>Air Criteria</b>	
6.1	State Implementation Plan.....	6-1
6.2	Open Burning of Waste.....	6-1
6.3	Fire Protection Equipment.....	6-1
6.4	Notification of Fire.....	6-1
<b>Section 7</b>	<b>Access and Safety Requirements</b>	

7.1	Landfill Access and Security .....	7-1
7.2	Attendant .....	7-1
7.3	Access Road .....	7-1
7.4	Dust Control .....	7-1
7.5	Signs.....	7-1
7.6	Waste Removal Scavenging Policy .....	7-2
7.7	Barrel and Drum Disposal.....	7-2
<b>Section 8</b>	<b>Erosion and Sediment Control Requirements</b>	
8.1	Control of Sediment .....	8-1
8.2	On-Site Erosion Control.....	8-1
8.3	Vegetative Cover .....	8-2
<b>Section 9</b>	<b>Drainage Control and Water Protection Requirements</b>	
9.1	Surface Water Diverted from Operational Area .....	9-1
9.2	Surface Water Shall Not Be Impounded Over Waste.....	9-1
9.3	Waste Shall Not Be Disposed of in Water .....	9-1
9.4	Leachate Collection and Disposal .....	9-1
9.5	Leachate Discharge.....	9-2
<b>Section 10</b>	<b>Liquid Restrictions</b>	
10.1	Bulk or Non Containerized Liquid Waste .....	10-1
10.2	Containerized Liquid Waste .....	10-1
10.3	Paint Filter Test .....	10-1
<b>Section 11</b>	<b>Recordkeeping Requirements</b>	
11.1	Regulatory Requirements.....	11-1
11.2	Permit File.....	11-1
<b>Section 12</b>	<b>Spreading and Compacting of Waste</b>	
12.1	Solid Waste Working Area .....	12-1
12.2	Solid Waste Compaction .....	12-1
12.3	Controlling Wind Blown Material .....	12-1
<b>Section 13</b>	<b>Leachate Management Plan</b>	
13.1	Maintenance and Inspection of the Leachate Storage Pond and Collection System .....	13-1
13.1.1	System Design.....	13-1
13.1.2	Leachate Storage Pond.....	13-1
13.1.3	Leachate Collection System .....	13-2
13.2	Leachate Monitoring .....	13-2
13.2.1	Quantitative Monitoring .....	13-2
13.2.2	Qualitative Monitoring.....	13-2
13.3.3	Recordkeeping .....	13-3

13.3	Leachate Disposal Approval .....	13-3
13.4	Leachate Management Contingency Plan.....	13-3
13.4.1	Leachate Sump Pump Station.....	13-3
13.4.2	Leachate Storage .....	13-3
13.4.3	Leachate Breakout .....	13-4

**Appendices**

<i>Appendix A</i>	Waste Screening Plan
<i>Appendix B</i>	Methane Monitoring Plan
<i>Appendix C</i>	Water Quality Monitoring Plan

# Section 1

## Purpose

The purpose of this Operations Plan is to provide the Buncombe County Subtitle D Landfill staff with a manual that will serve as a guide for safe and efficient operation of the Subtitle D landfill. This Operations Plan has been prepared in accordance with the North Carolina Solid Waste Rule 15A NCAC 13B .1626, Operational Requirements for MSWLF Facilities, and therefore addresses the following issues.

- Waste Acceptance and Disposal Requirements
- Cover Material Requirements
- Disease Vector Control
- Explosive Gases Control
- Air Criteria
- Access and Safety Requirements
- Erosion and Sediment Control
- Drainage Control and Water Protection Requirements
- Liquids Restrictions
- Recordkeeping Requirements
- Spreading and Compacting Requirements
- Leachate Management Plan

Additionally, Table 1 is provided to summarize all required documents or documentation (record keeping) which must be maintained by the County and retained at the facility. The operating record may be inserted into a 3-ring binder located at the scale house or main administration building. It is the intent that Table 1 is clearly and visually posted to ensure direction on record keeping.

### 1.1 Operation Drawings

In accordance with Rule .1625(b)(1), operation drawings have been prepared and were included in the December 2004 Phase III Permit to Construction Application.

Table 1  
Buncombe County Subtitle D Landfill  
Operating Record Requirements

Required Recordkeeping	Rule	Reference in Ops Plan	Action
<b>INCOMING WASTE</b>			
Attempted disposal of any prohibited wastes	.1626(1)(a)	2.5	Report to NCDENR within 24 hrs
Attempted disposal of any waste from outside the permitted service area	.1626(1)(a)	2.5	Report to NCDENR within 24 hrs
Records of random waste inspections	.1626(10)(a)(i)	11.1	Complete form
Waste determination records	.1626(10)(a)(i)	11.1	--
Amounts by weight of solid waste received at the Subtitle D landfill	.1626(10)(a)(ii)	11.1	--
<b>DISPOSAL OPERATIONS</b>			
Open burning requests	.1626(5)(b)	6.2	--
Fire and explosion notification	.1626(5)(d)	6.4	Report to NCDENR verbally within 24 hrs and written by 15 days
<b>LEACHATE MANAGEMENT MAINTENANCE AND MONITORING</b>			
Inspect leachate pond	.1626(12)(a)	13.1.2	Annually
Jet clean leachate collection pipes	SB1492 130A-295.6.(h)(3) and Leachate Spill Corrective Action	13.1.3	Annual, note in Operating Record
Remote camera inspection	SB1492 130A-295.6.(h)(3) and Leachate Spill Corrective Action	13.1.3	Once every 5 years
Inspect pump station and audio and visual alarms	Leachate Spill Corrective Action	13.1.3	Weekly
Inspect landfill sideslopes and LCS	Leachate Spill Corrective Action	13.1.3	Weekly or following rainfall events equal to or exceeding ½ inch
Leachate generation	.1626(12)(b)	13.2.1	Weekly

records			
Leachate quality sampling	.1626(12)(c)	13.2.2	Semi-annual
<b>METHANE MONITORING</b>			
Methane monitoring reports	.1626(10)(a)(iii) .1626(4)(b)	11.1	Quarterly
Exceedance in methane levels - required action within 7 days following detection	.1626(10)(a)(iii) .1626(4)(c)(ii)	11.1	Include in Operating Record detected levels and description of steps to protect human health
Exceedance in methane levels - required action within 60 days following detection	.1626(10)(a)(iii) .1626(4)(c)(iii)	11.1	Include in Operating Record a remediation plan for gas releases and notify NCDENR that plan has been implemented
<b>GROUNDWATER AND SURFACE WATER MONITORING</b>			
Groundwater and surface water monitoring reports	.1626(10)(a)(iv)	App. C	Semi-annual
<b>TRAINING</b>			
Certificates of training	.1626(10)(a)(i)	11.1	--
Training procedures	.1626(10)(a)(i)	11.1	--
<b>CLOSURE/POST-CLOSURE (NOT APPLICABLE)</b>			
Any closure or post-closure monitoring, testing, or analytical data	.1626(10)(a)(v)	11.1	--
<b>REQUIRED APPROVED DOCUMENTS TO BE INCLUDED IN THE OPERATING RECORD</b>			
Current Operation Plan in accordance with Rule .1626(10)(c)			
Current Water Quality Monitoring Plan in accordance with Rule .1630			
Current Permit to Construct and Permit to Operate			
Current cost estimates and financial assurance documentation in accordance with Rules .1626(10)(a)(vi) and .1628			

# Section 2

## Waste Acceptance and Disposal Requirements

### 2.1 Waste Definitions

Agricultural Waste - waste material produced from raising of plants and animals, including animal manures, bedding plant stalks, hulls, and vegetative matter.

Asbestos Waste - any waste material that is determined to contain asbestos.

Blood Product - all bulk blood and blood products.

Commercial Solid Waste - all types of solid waste generated by retail stores, offices, restaurants, warehouses, and other non manufacturing activities, excluding residential waste.

Construction/Demolition Waste - solid waste resulting solely from construction, remodeling, repairs or demolition of buildings, structures, or pavement but does not include inert, land-clearing or yard waste.

Hazardous Waste - any solid waste that is defined as hazardous in 15A NCAC 13A 261.3 and that is not excluded from regulation as a hazardous waste from conditionally exempt small quantity generators as defined within 15A NCAC 13A 261.5.

Hot Load - when a waste hauling vehicle is transporting solid waste that is burning or smoldering, it is referred to as a hot load.

Household Waste - any solid waste derived from households including hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas.

Industrial Solid Waste - solid waste generated by manufacturing processes that is not a hazardous waste regulated under Subtitle C of RCRA. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

Inert Debris - any solid waste which consists solely of material that is virtually inert, such as brick, concrete, rock, and uncontaminated soil.

Infectious Waste - any solid waste capable of producing an infectious disease. These types of waste include microbiological waste, pathological waste, blood products, and sharps.

Land Clearing Debris - solid waste which is generated solely from land clearing activities such as stumps, trees, limbs, brush, grass, and other naturally occurring vegetative material.

Liquid Hydrocarbons - As defined under Article 21A of Chapter 143 of the North Carolina General Statutes: except that any such oils or other liquid hydrocarbons that meet the criteria for hazardous waste under the Federal Resource Conservation and Recovery Act (P.L. 94-580) as amended.

Liquid Waste - any waste material that is determined to contain free liquid by Method 9095 (Paint Filter Test).

Microbiological Waste - includes cultures and stocks of etiologic agents. The term includes cultures of specimens from medical, pathological, pharmaceutical, research, commercial, and industrial laboratories.

Oils - As defined under Article 21A of Chapter 143 of the North Carolina General Statutes: except that any such oils that meet the criteria for hazardous waste under the Federal Resource Conservation and Recovery Act (P.L. 94-580) as amended.

Pathological Waste - includes: human tissue, organs, body parts, secretions, and excretions, blood, and body fluids that are removed during surgery and autopsies; the carcasses and body parts of all animals that were exposed to pathogens in research, were used in the production of biological or in the in-vitro testing of pharmaceuticals, or that died of known or suspected infectious disease.

Polychlorinated Biphenyls (PCB) - defined as any of several compounds that are produced by replacing hydrogen atoms in biphenyl with chlorine. PCB's were most frequently used as an additive to oil or other liquid in situations where heat is involved. PCB's have been used in paints and lubricants, however the most common application was in electric transformers.

Radioactive Waste - any waste that contains radioactivity as defined by the North Carolina Radiation Protection Act, G.S. 104E-1 through 104E-23. Radioactivity is defined as the property possessed by some elements of spontaneously emitting alpha or beta rays and sometimes gamma rays by the disintegration of the nuclei of atoms.

Sharps - includes needles, syringes with attached needles, capillary tubes, slides and cover slips, and scalpel blades.

Spoiled Food - any food which has been removed from sale by the United States Department of Agriculture, North Carolina Department of Agriculture, Food and Drug Administration, or any other regulatory agency having jurisdiction in determining that food is unfit for consumption.

Treatment or Processing Waste - any waste that is a residual solid from a wastewater treatment or pretreatment facility.

Tires - rubber tires from vehicles.

White Goods - any inoperative and discarded refrigerators, freezers, ranges, washers, dryers, water heaters, and other large domestic commercial appliances.

Yard Trash - solid waste resulting from landscaping and yard maintenance such as brush, grass, tree limbs, and similar vegetative material.

## **2.2 Acceptable Waste**

In accordance with 15A NCAC 13B .1626, a Municipal Solid Waste Landfill Facility (MSWLF) shall only accept those solid wastes which it is permitted to dispose of. In accordance with the North Carolina Solid Waste Management Rules, except where noted, the Buncombe County Sanitary Landfill is permitted to dispose of the following using normal operating procedures:

Agricultural Waste - This waste is acceptable with the exception of animal manures.

Bulk or Non-Containerized Liquid Waste - The waste is acceptable if the waste is a household waste other than septic waste and waste oil or the waste is leachate or gas condensate derived from the MSWLF unit.

Commercial Solid Waste

Containerized Liquid Waste - This waste is acceptable only if the liquid waste is in small containers similar in size to that normally found in household waste, and if the small containers are designed to hold liquids for use other than storage, and the waste is household waste.

Household Waste

Industrial Solid Waste

Animal Carcasses - Dog and cat carcasses will be accepted at the landfill, however, poultry and cattle carcasses will not be accepted. In accordance with .1626.(1)(c), all animal (dog and cat) carcasses delivered to the landfill shall be covered immediately.

## 2.3 Acceptable Waste Requiring Special Handling

Several components of the acceptable waste stream will require special handling procedures. The waste stream components requiring special handling include, but are not limited to the following:

Asbestos Waste - The County can accept asbestos waste, and is permitted to dispose of it in a designated portion of the C&D landfill, however, in order to maintain an accurate record of asbestos disposal quantities and locations, landfill staff will identify specific locations in each cell that will contain these wastes.

In accordance with .1626.(1)(d), the waste shall be covered immediately with a soil in a manner that will not cause airborne conditions and must be disposed of separate and apart from other solid wastes at the bottom of the working face or in an area not contiguous with other disposal areas. Separate areas shall be clearly designated so that asbestos is not exposed by future land disturbing activities.

Barrels and Drums - Barrels and drums may be disposed of if they are empty and perforated sufficiently to ensure that no liquid or hazardous waste is contained in them.

Construction/Demolition Waste - This waste is to be disposed in accordance with state and federal regulations in the approved location on site.

Hot Loads - Hot loads arriving at the site should be dumped immediately in the designated primary hot load area located near the working face. The designated area must be located only on areas containing compacted refuse covered by at least 6 inches of cover material. The location of the primary hot load area will change along with the landfill development so as to always be near the working face. Hot loads should be extinguished immediately after being dumped by applying water to the burning refuse and by covering the refuse with soil from the stockpile area. If problems are encountered, the local fire department should be called. Once extinguished, the hot load should be observed until it is certain that the fire is out. The remaining refuse should then be compacted and buried at the working face.

Land Clearing Debris/Yard Trash - This waste will be handled at the tub grinder and used as the mulch portion for the mulch/soil alternate daily cover mixture.

Sharps - Sharps shall be accepted for disposal in the lined portion of the lined landfill only if the sharps are within a puncture proof container or if the sharps have been incinerated.

Spoiled Food - Spoiled food shall be placed at the bottom of the working face and covered immediately.

Tires - Tires will be accepted, placed immediately in an on-site trailer and removed periodically.

Treatment or Processing Waste - per .1626 (1) (e)

White Goods - All chlorofluorocarbon will be removed and the remainder will be sold for scrap metal.

## 2.4 Prohibited Wastes

The following wastes are prohibited from disposal at the Buncombe County Subtitle D Landfill.

Containerized Liquid Waste - Containerized Liquid Waste may not be placed in the landfill unless the container is a small container similar in size to that normally found in household waste. In addition, Containerized Liquid Waste may not be placed in the landfill unless the container is a small container that is designed to hold liquids for use other than storage.

Hazardous Waste - per .1626 (1) (b) (i). Hazardous waste as defined in 15A NCAC 13A 261.3, that is not excluded from regulation as a hazardous waste from conditionally exempt small quantity generators as defined within 15A NCAC 13A 261.5 shall not be accepted at the Buncombe County Subtitle D Landfill.

Inert Debris

Infectious Waste

Liquid Waste per .1626 (1) (b) (iii)

Microbiological Waste

Pathological Waste

Polychlorinated Biphenyls (PCB) per .1626 (1) (b) (ii)

Radioactive Waste

Sharps - Sharps not within a puncture proof container or sharps that have not been incinerated shall not be disposed in the Buncombe County Subtitle D Landfill.

## 2.5 Receiving Prohibited Waste

The Buncombe County Subtitle D Landfill shall only accept those solid wastes that it is permitted to receive. The County will notify the North Carolina Department of Environment and Nature Resources Division of Waste Management (NCDENR

DWM) within 24 hours of attempted disposal of any waste the C&D and Subtitle D landfills are not permitted to receive.

A report shall be prepared of any attempted delivery of waste of which the landfill is not permitted to receive, including waste from outside the permitted landfill service area. The report will be forwarded to:

Department of Environment and Natural Resources  
Division of Waste Management  
Solid Waste Section  
1646 Mail Service Center  
Raleigh, North Carolina 27699-1646

## 2.6 Waste Screening Program

The Rule .1626(1)(f) require all MSWLFs implement a program at the facility for detecting and preventing the disposal of hazardous and liquid waste. This program must include, at a minimum:

- Random inspection of incoming loads or other comparable procedures
- Records of inspection
- Training of facility personnel to recognize hazardous and liquid waste.
- Development of a contingency plan to properly manage any identified hazardous and liquid waste addressing identification, removal, storage, and final disposition of the waste.

A copy of the waste screening plan for the Buncombe County Subtitle D Landfill is included in Appendix A to this Operation Plan.

# Section 3

## Cover Material Requirements

### 3.1 Daily Cover

In accordance with 15A NCAC 13B .1626 (2), the operator of MSWLF units must cover disposed solid waste with six inches of earthen material (or alternative daily cover (ADC) approved by the Solid Waste Section (SWS)) at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging. The daily cover must:

- be capable of covering solid waste after it is placed without change in its properties and without regard to weather;
- be noncombustible; and,
- not include rock fragments that are greater than six inches in diameter.

#### 3.1.1 Wet Weather Operations

During wet weather, the County may develop a wet weather working face. The wet weather working face will be kept as small as possible. At the end of disposal operations, the County will cover in accordance with Section 3.1.

### 3.2 Intermediate Cover

In accordance with 15A NCAC 13B .1626 (2), the owner or operator of all MSWLF units must place 12-inches of intermediate cover on all areas which will not have additional waste placed on them for 12 months or more, but where final termination of disposal operations has not occurred. The composition standards of intermediate cover shall be the same as for daily cover in addition to being capable of supporting the germination and propagation of vegetative cover.

### 3.3 Alternative Daily Cover

Three ADCs are described in this section; Posi-Shell, soil/mulch mixture, and tarps. Each ADC shall provide control for disease vectors, fires, odor, blowing litter, and scavenging. Through SWS required demonstration periods from February 5, 2008 to June 5, 2008 and from August 9, 2008 to November 7, 2008, each ADC has been determined to provide equal or better element control as soil.

ADC shall not be used more than five (5) consecutive days. If ADC is used on four consecutive days, soil cover will be used on the following day.

#### 3.3.1 Posi-Shell

The Posi-Shell Cover System will be used as an ADC on waste disposed at the Subtitle D landfill. Posi-Shell provides a thin cover that hardens over the covered waste surface.

### 3.3.1.1 Properties of Posi-Shell

The properties of each component of Posi-Shell are available in the Manufacturer's Usage Guide.

### 3.3.1.2 Cover System Description

As described in the Manufacturer's Usage Guide, the application rate for short-term coverage (overnight cover for daily cover operations) is approximately 8 to 10 square feet per gallon. Assuming the working face is less than one acre (100 feet wide and 400 feet long), the desired load size would be approximately 4,000 gallons. Posi-shell manufacturers may change recipes and County may use newer or better products as they become available. Currently, at a minimum, the Posi-Shell material quantities for daily use should be the following:

- 3,200 gallons of liquid (water or leachate),
- 8 bags (15 lbs each) of Posi-Pak,
- 40 bags (50 lbs each) of PSM-200 setting agent, and
- 80 bags (94 lb each) of optional Portland cement.

Posi-Pak is a specially designed plastic fiber with a proprietary finish that provides the reinforcement matrix for the finished cover. PSM-200 setting agent is a blend of clay, polymers, and adhesives that provides thickening, lubrication, and adhesion. Portland cement can be used as a binder component which will help neutralize odors and enhances the durability of the cover system.

### 3.3.1.3 Cover System Application Procedures

#### Application Procedure

Application of the Posi-shell will generally follow the manufacturer's recommendation and will employ the following minimum procedures:

- The Posi-shell will be applied in two different directions to avoid spray shadow or wind dispersion;
- The Posi-shell will be applied at the end of each working day;
- The Posi-shell surface will be visually inspected on a daily basis for exposed waste and/or inadequate coverage. Inadequate coverage is generally defined as a thickness of less than 1/8 of an inch.

Areas of exposed waste and/or inadequate coverage will receive an additional application prior to operations ending for that day.

#### Maximum Daily Area Coverage

Based on the May 2007 Airspace Analysis Report:

- Annual 2007 waste disposal rate (MSW only) = 125,000 tons
- Operating days per year = 284 days
- Approximate daily waste disposal rate = 440 tons
- In-place density = 0.50 tons of MSW per cubic yard
- Daily cubic yards disposed = daily waste disposal rate / in-place density = 880 yd<sup>3</sup> or 23,800 ft<sup>3</sup>

The working face will be restricted to the smallest area feasible. The working lift is typically 4 feet high. Based on a working lift thickness of 4 feet, the working face area is 5,400 square feet (daily cubic yards disposed / working lift thickness), which is equal to the daily coverage area.

Daily Depth and Quantity to be Applied

N/A

Average Monthly Volume of Daily Cover

N/A

List of Equipment

Equipment required for the Posi-Shell consists of a standard hydroseeding unit and a towing unit.

Material and Equipment Storage

The material components of Posi-Shell will be housed in the machine shop to minimize the risk of hydration. The spraying equipment will be parked in a County designated area which will not impede daily operations.

Wet Weather Operation

The application of Posi-shell during heavy rain events will be minimized. If Posi-shell is applied during periods of heavy rain, the surface will be visually inspected following the rain event for exposed waste or inadequate coverage.

Contingency Plans

If, for any reason, the County cannot use Posi-Shell as ADC material, soil, a soil/mulch mixture, or tarps will be used.

Screening Criteria

N/A

### 3.3.2 Soil/Mulch Mixture

A mulch (30% maximum by volume) and soil mixture is used as another ADC material. Mulch will be hauled from the on-site mulching operations and soil will be provided from the County's on-site borrow area. The soil/mulch mixture will be free of petroleum contaminated soils. The materials will be mixed at the borrow area or the working face.

#### 3.3.2.1 Properties of Soil/Mulch Mixture

At the Buncombe County facility, waste segregation occurs at the scale house to prevent the mulch processing of any unacceptable material, additionally the mulch processing operator segregates waste by placing unacceptable material into a dumpster located near the mulching area. Unacceptable material includes construction and demolition debris, potentially contaminated debris, etc. Since waste segregation occurs prior to the waste processing into mulch, the resulting mulch is considered inert.

#### 3.3.2.2 Cover System Application Procedures

##### Application Procedure

Application of the soil/mulch mixture will employ the following minimum procedures:

- The mixture will be prepared by combining three (3) loads of mulch and seven (7) loads of soil;
- Mix soil and mulch load and visually verify that the mixture is adequately commingled, ensure that there are no large clumps (3 inches in diameter or larger) of either soil or mulch in the mixture;
- Load and haul soil/mulch mixture to active working face using an articulating truck; and
- Use dozer to cover working face with six inches of soil/mulch mixture.

The surface will be visually inspected on a daily basis for exposed waste and/or inadequate coverage. Areas of exposed waste and/or inadequate coverage will receive additional cover.

##### Maximum Daily Area Coverage

See Section 3.3.1.3.

##### Daily Depth and Quantity to be Applied

As stated above, **6 inches** of the soil/mulch mixture will be applied to the daily coverage area of 5,400 square feet. Therefore; the required daily quantity of soil/mulch mixture placed is approximately **100 yd<sup>3</sup>** (Assuming no other daily cover

is used).

#### Average Monthly Volume of Daily Cover

As stated above, approximately 100 yd<sup>3</sup> per day of soil/mulch mixture will be used. Assuming 24 working days per month, the average monthly volume of daily cover required for normal operating conditions is **2,400 yd<sup>3</sup>**.

#### List of Equipment

An articulating truck and dozer will be used for the application process.

#### Material and Equipment Storage

Any soil/mulch mixture requiring storage will be stored at the borrow area. Mulch stock pile sizes shall not exceed 30 feet in width and 15 feet in height to avoid spontaneous combustion and to maintain a manageable pile size in the event of a fire. Landfill equipment used for ADC procedures will be stored at County designated areas.

#### Wet Weather Operation

The soil/mulch mixture wet weather operation will be similar to the operation the County currently follows when using soil as daily cover during wet weather.

#### Contingency Plans

If, for any reason, the County cannot obtain mulch for the on-site processing area for use as ADC material, soil, Posi-shell, or tarps will be used.

#### Screening Criteria

Each soil/mulch mixture load will be visually inspected prior to transport to the working face to determine if the material is adequately mixed. The load will not be placed if the mixture is not commingled adequately or if foreign material is observed.

### **3.3.3 Tarps**

Tarps will be used as another ADC. The tarps will be placed either manually or by using an automatic tarping machine which uses a spreader bar to lay and roll up the tarps.

#### **3.3.3.1 Properties of Tarps**

N/A

#### **3.3.3.2 Cover System Application Procedures**

##### Application Procedure for Manual Placement

Application of the tarp will employ the following minimum procedures:

- Visually inspect working face to ensure that no sharp objects are protruding from the compacted waste which may tear the tarp;

- If necessary, run compacter over any protruding objections;
- Manually roll out tarp and place over working face, the side cables within the tarp and the metal bars on the short ends shall be heavy enough to weigh down the tarp; and
- Place additional tarps as needed to adequately cover working face.

The tarps will be visually inspected following placement to ensure that uplift will not occur. Additional metals bars will be placed if necessary. Soil will be placed over any areas of exposed waste and/or inadequate coverage.

Application Procedure for Equipment Placement

Application of the tarp will employ the following minimum manufacturer's recommended procedures:

- Visually inspect working face to ensure that no sharp objects are protruding from the compacted waste which may tear the tarp;
- If necessary, run compacter over any protruding objections;
- Using an automatic tarping machine, install tarp directly on working face, the side cables within the tarp and the metal bars on the short ends shall be heavy enough to weigh down the tarp; and
- Lay additional tarps as needed to adequately cover working face.

The tarps will be visually inspected following placement to ensure that uplift will not occur. Additional metals bars will be placed if necessary. Soil will be placed over any areas of exposed waste and/or inadequate coverage.

Maximum Daily Area Coverage

See Section 3.3.1.3.

Daily Depth and Quantity to be Applied

N/A

Average Monthly Volume of Daily Cover

N/A

List of Equipment

An automatic tarping machine and/or dozer will be used for the tarp installation.

Material and Equipment Storage

The automatic tarping machine and tarp will be stored in a County designated area

that will not conflict with daily haul and disposal operations.

Wet Weather Operation

The tarping wet weather operation will be similar to the operation the County currently follows when using soil as daily cover during wet weather.

Contingency Plans

If, for any reason, the County cannot use tarps as ADC, soil, Posi-shell, or a soil/mulch mixture will be used.

Screening Criteria

N/A

## Section 4

# Disease Vector Control

In accordance with 15A NCAC 13B .1626 (3), owners or operators of all MSWLF units must prevent or control on-site population of disease vectors using techniques appropriate for the protection of human health and the environment. Disease vectors are defined as any rodent, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

Effective vector control measures shall be applied when necessary. Control of vectors will be maintained by application of cover material over the compacted solid waste. This will protect against migration of vectors into and from the landfill. Stagnant ponding water should be prevented to control mosquito breeding. Filling in low spots should be performed regularly, and if necessary, County mosquito control or a licensed exterminator shall be employed to control vectors.

# Section 5

## Explosive Gas Control

In accordance with 15A NCAC 13B .1626 (4) ,the owners or operators of all MSWLF units must ensure that:

- the concentration of methane gas generated by the facility shall not exceed 25 percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and,
- the concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary.

Owners or operators of all MSWLF units must implement a routine methane monitoring program to ensure that the above standards are met. A Methane Monitoring Plan prepared in accordance with this rule is located in Appendix B of this Operations Plan.

# Section 6

## Air Criteria

### 6.1 State Implementation Plan

In accordance with 15A NCAC 13B .1626 (5), the owner or operator of all MSWLFs must ensure that units do not violate any 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, as amended.

All of the SIP requirements are listed in the current Title V Operating Permit for the Subtitle D landfill. The County is in compliance with the Title V Operating Permit thusly are not in violation of any SIP requirements.

### 6.2 Open Burning of Waste

In accordance with 15A NCAC 13B .1626 (5) (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 at all MSWLF units. Any such infrequent burning must be approved by the Division of Solid Waste Management.

### 6.3 Fire Protection Equipment

In accordance with 15A NCAC 13B .1626 (5) (c), equipment shall be provided to control accidental fires or arrangements shall be made with the local fire protection agency to immediately provide fire fighting services when needed. Fires that break out close to the surface of the fill area should be dug out 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.

### 6.4 Notification of Fire

In accordance with 15A NCAC 13B .1626 (5) (d), fires that occur at the MSWLF require verbal notice to the Division of Solid Waste Management within 24 hours and written notification shall be submitted within 15 days. Verbal and written notification shall be submitted to:

Department of Environment and Natural Resources  
Division of Waste Management  
Solid Waste Section  
1646 Mail Service Center  
Raleigh, North Carolina 27699-1646  
(919) 508-8400

# **Section 7**

## **Access and Safety Requirements**

### **7.1 Landfill Access and Security**

In accordance with 15A NCAC 13B .1626 (6) (a), the Buncombe County Subtitle D Landfill must be adequately secured by means of gates, chains, berms, fences and other security measures approved by the Division of Solid Waste Management to prevent unauthorized entry.

All vehicles disposing of waste at the facility will enter and leave through the access control gate. All waste entering the landfill must be weighed in at the scalehouse where a full-time Scale Operator verifies compliance with operation requirements. Unauthorized vehicle access to the site is prevented around the remaining portion of the landfill property by woods, wetlands, and storm water ditches.

### **7.2 Attendant**

In accordance with 15A NCAC 13B .1626 (6) (b), an attendant shall be on duty at the site at all times while the facility is open for public use to ensure compliance with operational requirements.

A full-time Scale Operator will be located in the scale house during operating hours. The Scale Operator will verify compliance with operation requirements. In addition, a Facility Supervisor will be present on-site at all times during operation.

### **7.3 Access Road**

In accordance with 15A NCAC 13B .1626 (6) (c), the access road to the site shall be of all weather construction and maintained in good condition. Potholes, ruts, and debris on the roads will receive immediate attention in order to avoid damage to vehicles. Access roads will be regraded as necessary to maintain positive slope for adequate drainage.

### **7.4 Dust Control**

In accordance with 15A NCAC 13B .1626 (6) (d), dust control measures shall be implemented when necessary. Minimum dust control will include a water truck for wetting of dusty roads. Petroleum products shall not be used for dust control.

### **7.5 Signs**

In accordance with 15A NCAC 13B .1626 (6) (e), a sign providing information on disposal procedures, operation hours, tipping fee, permit number, and other pertinent information shall be clearly posted at the site entrance.

In accordance with 15A NCAC 13B .1626 (6) (f), signs shall be clearly posted stating that no hazardous or liquid waste can be received.

In accordance with 15A NCAC 13B .1626 (6) (g), traffic signs or markers shall be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operating conditions.

## **7.6 Waste Removal Scavenging Policy**

In accordance with 15A NCAC 13B .1626 (6) (h), the removal of solid waste from the landfill will be prohibited unless the County approves and the removal is not on the working face.

## **7.7 Barrel and Drum Disposal**

In accordance with 15A NCAC 13B .1626 (6) (i), barrels and drums shall not be disposed of unless they are empty and perforated sufficiently to ensure that no liquid or hazardous waste is contained therein.

# Section 8

## Erosion and Sediment Control Requirements

### 8.1 Control of Sediment

In accordance with 15A NCAC 13B .1626 (7) (a), adequate sediment control measures shall be utilized to capture and control sediment in order to prevent sediment from impacting wetlands and off-site properties.

Surface water runoff passing through the landfill site shall be diverted to the sediment ponds by the use of ditches, berms, and pipes as shown on the Operation Drawings. Stormwater sedimentation ponds shall be constructed in accordance with the approved Sediment and Erosion Control Plan for control of on site stormwater run off and sediment transport from landfill operation.

The sedimentation ponds have been designed in such a manner that releases will not overload downstream drainage features or damage adjacent property. Sediment accumulated in the ponds shall be removed as specified in the approved Erosion Control permit. Silt gages shall be installed in all ponds as shown on the Detail Sheets in the Engineering Plan. Ditches require frequent inspection for sediment buildup. At a minimum, the sediment buildup should be assessed after all significant rain events.

### 8.2 On-Site Erosion Control

In accordance with 15A NCAC 13B .1626 (7) (b), adequate erosion control measures, shall be utilized to prevent excessive on-site erosion of slopes and roadways.

Erosion control measures shall include:

- A. Disturbing as little area as practical at any one time for landfilling operations.
- B. Seeding/mulching of all disturbed areas commencing as soon as practically possible. Employing erosion netting or sod on steep slopes and other erosion prone areas.
- C. Use of earthen berms, hay bales, silt fences, riprap or equivalent devices down-gradient of disturbed areas, stockpiles, around drainage pipes inlets and outlets and at intervals along grassed waterways, until such time as permanent vegetation is established.
- D. Placement of riprap at the inlets and outlets of storm water piping.

### 8.3 Vegetative Cover

In accordance with 15A NCAC 13B .1626 (7) (c), vegetative ground cover sufficient to restrain erosion must be established within 30 working days or 120 calendar days upon completion of any phase of landfill development.

Riprap, haybales, or other acceptable temporary methods of erosion control may be required until permanent cover is established. Areas where final grade has been reached can be stabilized by mulching until a vegetative cover is established. Soil mulching can be achieved using wood chips, straw, hay, asphalt emulsion, jute matting, and synthetic fibers. Mulches allow for greater water retention; reduce the amount of runoff; retain seeds, fertilizer, and lime in place; and, improve soil moisture and temperature conditions.

Temporary seeding shall be applied in accordance with the NC Erosion and Sediment Control Planning and Design Manual, June 2006.

# **Section 9**

## **Drainage Control and Water Protection Requirements**

### **9.1 Surface Water Diverted From Operational Area**

In accordance with 15A NCAC 13B .1626 (8) (a), surface water shall be diverted from the operational area. Excessive surface water at the working face creates difficulties for maneuvering equipment and prevents the operator from achieving maximum compaction of the waste. To divert surface runoff away from the working face, temporary diversion berms shall be installed on the current lift, up-gradient from the working face and in other locations as dictated by the direction of grade. The area between the temporary berm and the working face should be limited to one acre to prevent excessive ponding. The soil cover in the areas beyond the diversion berms shall be uniformly graded and compacted to prevent the formation of erosion channels. In the event that channels do form, the cover shall be promptly repaired. During the formation of the initial lift of each disposal unit additional measures shall be employed to divert surface water. For portions of the disposal unit that have not yet received waste, surface water can be better diverted by temporarily plugging the leachate collection line at the location where the temporary berm intersects the line. Since the surface water that will pond at the plugged location is uncontaminated, it can be pumped from the disposal unit to the storm water management system. Temporary diversion berms and plugs that are no longer needed shall be promptly removed and the area regraded to promote uniform runoff of surface water.

### **9.2 Surface Water Shall Not Be Impounded Over Waste**

In accordance with 15A NCAC 13B .1626 (8) (b), surface water shall not be impounded over or in waste. Completed areas shall be adequately sloped at a minimum of 4% to allow surface water runoff in a controlled manner.

### **9.3 Waste Shall Not Be Disposed Of In Water**

In accordance with 15A NCAC 13B .1626 (8) (c), solid waste shall not be disposed of in water. Based on design, the minimum four foot separation from the seasonal high groundwater table to the bottom of the liner system will be maintained at all times.

### **9.4 Leachate Collection and Disposal**

In accordance with 15A NCAC 13B .1626 (8) (d), leachate shall be contained on-site or properly treated prior to discharge. An NPDES permit is required for surface discharge prior to discharge of leachate to surface waters.

Leachate generated will be collected and disposed in accordance with the leachate management plan provided in Section 13.

## **9.5 Leachate Discharge**

In accordance with 15A NCAC 13B .1626 (8) (e) (i), MSWLF units shall not cause a discharge of pollutants into waters of the United States, including wetlands, that violate any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to Section 402.

In accordance with 15A NCAC 13B .1626 (8) (e) (ii), MSWLF units shall not cause a discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirement 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.

Leachate generated is contained on-site. The management system is discussed in Section 13.

# Section 10

## Liquid Restrictions

Liquid waste is defined as any waste material that is determined to contain "free liquid" as defined by Method 9095 (Paint Filter Liquids Test). A description of how to conduct a paint filter test is included in Section 10.3.

### 10.1 Bulk or Non-Containerized Liquid Waste

In accordance with 15A NCAC 13B .1626 (9) (a), bulk or non-containerized liquid waste may not be placed in a MSWLF unit unless:

- The waste is liquid household waste other than septic waste and waste oil.
- The waste is leachate or gas condensate from gas recovery derived from the MSWLF unit, whether it is a new or existing MSWLF unit or lateral expansion, is designed with a composite liner and leachate collection system per North Carolina Solid Waste Management Rules (Rule .1624).

### 10.2 Containerized Liquid Waste

In accordance with 15A NCAC 13B .1626 (9) (b), containers holding liquid wastes may not be placed in MSWLF units unless:

- The container is small and similar in size to that normally found in household waste containing liquid waste,
- The container is designed to hold liquids for use other than storage; and,
- The waste is household waste.

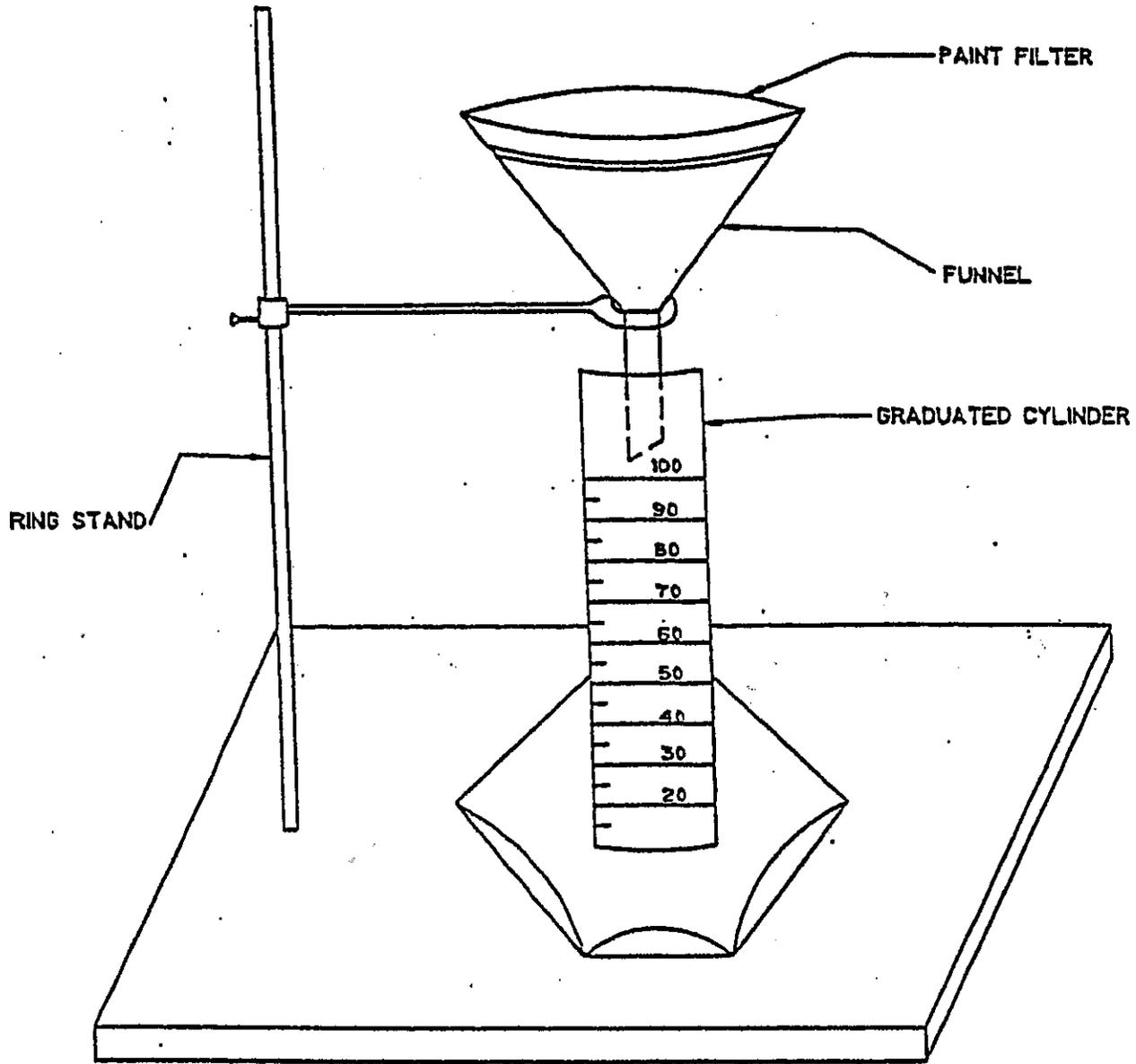
### 10.3 Paint Filter Test

According to 40 CFR 264.314 and 265.314, the placement of any liquid which is not a hazardous waste in a landfill is prohibited unless the owner or operator of such landfill demonstrates to the Regional Administrator, or the Regional Administrator determines that:

- The only reasonably available alternative to the placement in such landfill is placement in a landfill or unlined surface impoundment, whether or not permitted or operating under interim status, which contains, or may reasonably be anticipated to contain, hazardous waste.
- Placement in such landfill will not present a risk of contamination of any underground source of drinking water.

To demonstrate the absence or presence of free liquids in either a containerized or bulk waste, the following test must be used: Method 9095 (Paint Filter Test). This method is used to determine compliance with 40 CFR 264.314 and 265.314.

To conduct the Paint Filter Tests, a pre-determined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-minute test period, the material is deemed to contain free liquids. The test apparatus and materials are presented in Figure 10-1. The paint filter is required to be a conical paint filter mesh number 60 (fine meshed size). If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 inch of the filter mesh to protrude should be used to support the filter. The funnel is to be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.



**CDM**  
environmental engineers, scientists,  
planners, & management consultants

### PAINT FILTER LIQUIDS TEST

Figure 10-1

# Section 11

## Recordkeeping Requirements

### 11.1 Regulatory Requirements

In accordance with 15A NCAC 13B .1626 (10), the owner or operator of a MSWLF unit must record and retain at the facility, or an alternative location near the facility approved by the Division, the following information as it becomes available:

- Inspection records, waste determination records, and training procedures;
- Amount by weight of solid waste received at the facility to include source of generation;
- Gas monitoring (methane monitoring) results and any remediation plans;
- Any demonstration, certification, findings, monitoring, testing, or analytical data required for groundwater monitoring requirements, groundwater monitoring systems, groundwater sampling and analysis requirements, detection monitoring, assessment monitoring, assessment of corrective measures, selection of remedy, and implementation of corrective action program;
- Any monitoring, testing, or analytical data required for Closure and Post-Closure Plans;
- Any cost estimates and financial assurance documentation required by financial assurance requirements;

All information contained in the operating record must be furnished upon request to the Division or be made available at all reasonable times for inspection by the Division. The owner or operator must maintain a copy of the operation plan required by Rule .1625 at the facility.

The County will keep all required documentation either at the scale house or administration building at the facility entrance.

### 11.2 Permit File

A file containing all appropriate permits should be kept on site. The file shall include the following permits at the minimum:

- Current solid waste permits (Permit to Construct and Permit to Operate);
- Sediment and Erosion Control Permits;
- Applicable NPDES Stormwater Permits; and
- Applicable leachate disposal permit

# **Section 12**

## **Spreading and Compacting of Waste**

### **12.1 Solid Waste Working Area**

In accordance with 15A NCAC 13B .1626 (11) (a), operators shall restrict solid waste within MSWLF units to the smallest area feasible. The working face is defined as where waste is unloaded, inspected, spread, compacted, and ultimately covered with cover material. The working face shall be wide enough to prevent a backlog of vehicles waiting to unload and to allow adequate working space for landfill equipment. At a maximum, the width of the working face shall not exceed 100 feet.

### **12.2 Solid Waste Compaction**

In accordance with 15A NCAC 13B .1626 (11) (b), solid waste shall be compacted as densely as practical into cells. After solid waste is discharged from vehicles, it shall be inspected for unacceptable items and subsequently spread on the working face not steeper than four feet horizontal to one foot vertical in layers not to exceed 2 feet in thickness. All areas of each layer shall be compacted by at least four passes of a compactor in order to achieve a minimum waste density of approximately 1,000 pounds per cubic yard.

### **12.3 Controlling Wind Blown Material**

In accordance with 15A NCAC 13B .1626 (11) (c), appropriate methods such as fencing and diking shall be provided as needed within the landfill area to confine solid waste subject to be blown by the wind.

Portable litter screens shall be placed downwind of the working face as needed. The screens shall be kept as close to the working area as possible without unduly interfering with landfill operations. The screens shall be moved promptly when required by change in wind direction or progress of the fill. Additional screens or alternative measures may be required to prevent blowing litter from escaping the working area.

At the conclusion of each day of operation, windblown material at the landfill site shall be collected and returned to the working face.

# Section 13

## Leachate Management Plan

This plan has been prepared in accordance with Rule .1626 (12) and the Leachate Spill Corrective Action/Permit to Operate dated July 2008.

### 13.1 Maintenance and Inspection of the Leachate Storage Pond and Collection System

The maintenance plan has been prepared in accordance with Rule .1626 (12) (a).

#### 13.1.1 System Design

The leachate collection pipes within the municipal solid waste landfill (MSWLF) cells will convey collected leachate by gravity to a sump area, where a submersible pump will pump leachate to the leachate storage pond located south of the landfill.

Cleanouts are located at the upstream ends of the collection pipes, and at the sump area low point. A submersible pump at the storage pond can pump leachate through a flow metering vault, to a truck loading station, where tank trucks can be filled to haul leachate to the Metropolitan Sewerage District (MSD) wastewater treatment plant. The pond will serve as an equalization basin to absorb peak flows coming from the submersible pumps in each cell.

Each leachate pump station is provided with numerical identification at the leachate pump control panel. One pump control panel is provided for each submersible leachate pump station and is provided in a common enclosure. The control panel is programmed to respond to the liquid level sensor to automatically start and stop pumps in response to changes in liquid levels and to allow manual control of the sump when needed. Each control panel is equipped with visual and audible high level alarms programmed to activate when the leachate levels exceed one foot of head.

#### 13.1.2 Leachate Storage Pond

Inspection of the leachate storage pond constructed, visible surfaces will be made on an annual basis by County staff. Any stored leachate and sediment in the pond must be removed so that the pond bottom is visible. The inspector should perform a thorough walkover of the pond bottom, surveying the protective layer for any signs of damage, such as cracks, tears, gouges, uplift, or soft spots. Observations should be recorded and photographs should be taken of the areas of concern and also placed in the operating record.

If damage or potential problems are discovered, they should be reported to the facility supervisor so that repairs may be made as soon as possible. All repair activities should be recorded. The pond should be put back on-line as soon as possible, to minimize leachate storage time within the sump areas in the cells.

### **13.1.3 Leachate Collection System**

The perforated leachate collection piping will be pressure cleaned and flushed annually to remove any accumulation of debris, sediment, or organic growth, which will be achieved by inserting a self-propelled, high pressure jetting system into the collection pipes by way of the clean-out ports. Remote camera inspections of the leachate collection lines shall also occur, following initial cleaning, and at least once every five years thereafter.

The sump control panels will be visually inspected during weekly leachate quantity data collection to ensure proper audio and visual alarm operations, reset functions and normal operations performance. Any components not properly functioning shall be promptly repaired or replaced.

Flow meter operation will be validated by comparing the recorded flows at each individual sump. Flow meters not properly operating will be removed and replaced.

The operator shall also, on a weekly basis, visually observe the landfill sideslopes for leachate breakouts and the perimeter berm for staining, which would indicate a potential pipe failure. All exposed leachate piping shall also be monitored for leaks.

In addition to weekly observations, the operator shall, after substantial rainfall events equal to or exceeding ½ inch, observe the landfill sideslopes for leachate breakouts, leaks or pipe failures.

## **13.2 Leachate Monitoring**

### **13.2.1 Quantitative Monitoring**

Per Rule .1626 (12) (b), the County maintains leachate generation records. Each sump pump station is designed with a flow meter to measure the leachate generated from each cell. The operator shall read and register the leachate flows on a weekly basis at each of the sump pump stations.

The information to be collected shall include the date, time, leachate quantity (in gallons), pump run time, leachate levels, and the name of the person taking measurements. Weekly measurements recorded at each sump pump station will be used to detect potential pump malfunction. While taking weekly sump readings the operator shall also record the leachate level within the leachate pond. Should the leachate pond minimum freeboard level of 12 inches be exceeded the NCDENR will be notified immediately.

Leachate that is trucked off-site is also recorded.

### **13.2.2 Qualitative Monitoring**

Per Rule .1626 (12) (c) semi-annual leachate quality sampling is required.

### **13.2.3 Recordkeeping**

All records shall be maintained at the landfill by the operator and made available to Solid Waste Section (SWS) personnel for inspection when requested.

## **13.3 Leachate Disposal Approval**

Per Rule .1626 (12) (d), approval for final leachate disposal is required. Leachate from the landfill will be pumped from the storage pond to the truck loading station, which will fill trucks used to haul the leachate to the MSD sanitary sewer system for final disposal. An approval letter from MSD stating that they will accept the landfill leachate will be included in the operating records.

## **13.4 Leachate Management Contingency Plan**

The leachate management contingency plan is prepared in accordance with Rule .1626 (12) (e).

### **13.4.1 Leachate Sump Pump Station**

Should a pump station not appear to be functioning properly, based upon weekly monitoring records, the pump will be removed and evaluated in accordance with manufacturer recommendations. If troubleshooting techniques do not provide a prompt resolution, one of the spare pumps located on-site will be installed in its place and necessary repairs will be made.

Should power be lost at the site the pump station control panels are equipped with receptacles for a portable emergency generator to operate the pump stations until power is restored. A portable emergency generator will be available within 12 hours and used in the event of a power outage.

### **13.4.2 Leachate Storage**

During periods when components of the leachate pond pump station are inoperative or down for maintenance, or when storm flows are extremely high, excessive leachate will be dealt with using either of two contingency plans.

The storage capacity of the leachate storage pond is approximately 1,000,000 gallons, when completely full to within 12 inches of the top of the pond liner. This will provide up to 17 days of storage during peak leachate flow periods, and about 69 days storage for average annual daily flows. If surface evaporation rates are considered, even longer storage periods can be achieved. This volume is also adequate to capture the leachate from the peak rainfall event from the five years of rainfall data used in the HELP model leachate projections (assuming several acres of open cell area with only the first solid waste lift installed) and still have reserve capacity for additional daily flows. Therefore, considerable storage capability is provided by the leachate pond for periods of unusually high precipitation or unusual operating conditions.

Should a period of substantial rainfall persist, and the leachate pond approach full stage, the pumping stations can be turned off. The leachate would be temporarily stored in the disposal cells until the level in the pond is adequately reduced. The cells would be monitored daily to ensure that overflow does not occur. If the storage pond encroaches to within 6 inches of the ponds 12-inch freeboard (18 inches from the top of the pond liner), leachate hauling will be increased to a frequency adequate to deplete the leachate volume in the storage pond to an acceptable level.

Should power be lost at the site the pump station control panel at the leachate pond is equipped with receptacles for a portable emergency generator, to operate the pumps long enough to control leachate flow volumes. A portable emergency generator will be available within 12 hours of a power outage.

### **13.4.3 Leachate Breakout**

In the event of a breakout, leak or pipe failure, the County will immediately notify SWS and identify the areas contaminated by the breakout/leak/pipe failure, if any. Should leachate collect in a sediment pond or other surface waters, the County will analyze the contaminated water for the Appendix 1 list of constituents and BOD<sub>5</sub>, COD, phosphate, nitrate and sulfate. The sample results will be forwarded to SWS and used to determine whether the pond or surface waters are impacted by the release.

# Buncombe County, North Carolina

## Buncombe County Solid Waste Management Facility

### Operation Plan Appendix A - Waste Screening Plan

November 2009



# Appendix A – Operation Plan Waste Screening Plan – Contents

<b>Section A1</b>	<b>Introduction</b>	
<b>Section A2</b>	<b>Overview of Waste Screening Plan</b>	
<b>Section A3</b>	<b>Regulatory Background</b>	
A3.1	Federal and State Regulations .....	3-1
A3.2	Materials Prohibited From MSW Landfilling.....	3-1
A3.3	County Regulations.....	3-1
<b>Section A4</b>	<b>Applicability</b>	
<b>Section A5</b>	<b>North Carolina Solid Waste Determination Process</b>	
<b>Section A6</b>	<b>Training</b>	
<b>Section A7</b>	<b>Designated Area For Waste Screening</b>	
<b>Section A8</b>	<b>Identifying Suspicious Waste Loads via Standard Landfill Operation</b>	
<b>Section A9</b>	<b>Random Inspections of Incoming Loads</b>	
A9.1	Selecting Loads for Sampling.....	9-1
A9.2	Screening the Wasteloads.....	9-1
A9.3	Procedures .....	9-1
<b>Section A10</b>	<b>Records of Inspections</b>	
<b>Section A11</b>	<b>Contingency Plan</b>	
<b>Section A12</b>	<b>Responsible Party</b>	
<b>Section A13</b>	<b>Fines and Penalties</b>	
<b>Figures</b>		
A8-1	Suspicious Loads Decision Tree .....	8-2
A9-1	Random Inspections Decision Tree.....	9-3
A10-1	Record of Inspection Form .....	10-2

# Section A1

## Introduction

This Waste Screening Plan sets forth the procedures and programs implemented by the solid waste management staff of Buncombe County to identify and safely dispose of unauthorized wastes brought to the County owned landfill. This plan also presents the procedures and policies established by Buncombe County that comply with State and Federal regulations requiring random waste screening by owners of Municipal Solid Waste Landfills (MSWLF).

Buncombe County manages the storage, collection, and disposal of solid wastes in accordance with state and federal regulations and in a manner that protects the public health, safety, and welfare of the residents of Buncombe County. Some of the standard operating procedures at the landfill are designed to insure that unauthorized wastes, as defined by state and federal regulations, are not landfilled.

Current County programs and procedures fulfill some state and federal regulations for waste screening to detect or prevent landfilling of prohibited or unauthorized solid wastes. Some of these programs and facilities include:

- Hazardous waste awareness certification training for landfill staff
- County owned and operated drop-off facilities for lead acid batteries, yard wastes, white goods, and whole scrap tires

# Section A2

## Overview of Waste Screening Plan

This Waste Screening Plan presents the standard operating procedures at the County landfill. It presents the procedures and contingency plan that the County will implement to comply with applicable State and Federal regulations.

This Waste Screening Plan:

- identifies the federal and state regulatory authority for prohibiting the landfilling of certain categories of solid waste;
- identifies and defines the wastes to which waste screening applies;
- describes the required training for facility personnel; and, describes the designated area to be used to screen waste loads;
- presents the procedures, decisions, and actions which will be taken if a waste load is suspected of containing a waste covered by this plan or is found to contain such a waste;
- explains how records of inspections will be kept and how notification of the proper authorities will take place if prohibited waste is discovered; and
- clarifies the financial and legal responsibility of the County and the waste hauler who brings the prohibited waste to the landfills.

# Section A3

## Regulatory Background

Federal, state, and county regulations each prohibit certain categories of waste from being landfilled. This section presents the regulatory authority prohibiting certain categories of waste from being landfilled and the requirement for waste screening.

### A3.1 Federal and State Regulations

US EPA Subtitle D, Subpart C Operating Criteria, 40 CFR Section 258.20 (Procedures for Excluding the Receipt of Hazardous Waste) and North Carolina State Solid Waste Management Rules Title 15A NCAC 13B .1626 (1)(f) require that owners or operators of all municipal solid waste landfill (MSWLF) units to implement a program at the facility for detecting and preventing the disposal of regulated quantities of hazardous wastes and PCB waste. This program must include:

- random inspections of incoming loads,
- records of any inspections,
- training of facility personnel to recognize regulated hazardous waste and polychlorinated biphenyls (PCB) waste, and,
- a contingency plan including notification to authorized state or EPA RCRA Subtitle C administrator if a regulated hazardous waste is discovered at the facility.

### A3.2 Materials Prohibited From MSW Landfilling

By North Carolina and federal regulations, a MSWLF shall only accept for landfilling those solid wastes which it is permitted to receive. According to Rule .1626(1) the following wastes are prohibited from disposal at a MSWLF unit:

- Hazardous waste as defined within 15A NCAC 13 A, to include hazardous waste from conditionally exempt small quantity generators.
- Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761.
- Liquid wastes unless it is household waste other than septic tank waste or waste oil.
- Containers holding liquid waste unless the container is a small container similar in size to those normally found in household wastes.

### A3.3 County Regulations

Buncombe County only accepts for landfilling materials it is permitted to receive by state solid waste permit. This is limited to materials which comply with federal and

state regulations as acceptable for MSW landfilling. Special wastes which receive state approval as described in Section A5 of this plan are accepted.

Buncombe County reserves the right to turn away any waste hauling vehicle containing materials it is not permitted to accept based on federal or state regulations and which in its judgement require special handling and cannot safely be managed by the operating staff of the Buncombe County landfill.

# Section A4

## Applicability

This Waste Screening Plan and related programs apply to all wastes regulated as hazardous waste as defined by Subpart D of 40 Code of Federal Register (CFR) Part 261; wastes which exhibit hazardous characteristics (including ignitability, corrosivity, reactivity, and toxicity) as defined in Subpart C of 40 CFR 261; wastes which are a mixture of hazardous and non-hazardous wastes; and PCB wastes as defined by 40 CFR Section 761.60.

This plan does not address: residential solid waste; waste that is exempt as a conditional small quantity as defined by 40 CFR Section 261.4(b) and 261.5; or, small quantities of PCB's found in items such as fluorescent ballasts and small capacitors typically found in consumer electric appliances. This plan does not apply to yard waste and scrap tires which are prohibited from landfilling primarily for recycling and waste reduction reasons. This plan does not apply to wastes that have been conditionally approved for landfilling by Buncombe County based on approval by North Carolina Department of Environment, and Natural Resources (NCDENR) through the "waste determination" process as described in Section A5 of this plan.

# Section A5

## North Carolina Solid Waste Determination Process

Some industrial and manufacturing solid wastes that may, by definition, be regulated and prohibited from being landfilled can be accepted for landfilling by Buncombe County if determined to be safe by NCDENR. A letter detailing the waste determination and the associated appropriate laboratory analysis must be completed by the generator, approved by NCDENR, and submitted to Buncombe County to receive this conditional approval for landfilling. When this waste is hauled to the landfill, the hauler must provide a letter verifying that the County has agreed to accept the waste.

Special waste disposal requires prior approval.

# Section A6

## Training

The Buncombe County Solid Waste Inspector should be certified by satisfactorily completing SWANA's course, waste screening at municipal solid waste management facilities, or similar. All County solid waste management staff are encouraged to complete this training. The Solid Waste Inspector has been instructed in the procedures, as described in this plan, to follow if hazardous or regulated waste is identified or suspected in a waste load received at the landfill.

# Section A7

## Designated Area For Waste Screening

A special area will be designated as the waste screening area. The designated area will be:

- inside the landfill site on property owned and managed by the County;
- at least 100 feet from the working face of the landfill and easily accessible to truck traffic;
- at least 100 feet within the landfill's disposal boundaries;
- on leveled ground with a surface of compacted soil similar to the soil throughout the landfill; and,
- in an open area where it is protected or screened from to high winds (such as at the bottom of a hill)

Waste loads selected for random screening and suspicious waste loads will be taken to this designated area for screening. If the load is dumped or unloaded onto the ground in the designated area, and is found to contain hazardous or other wastes prohibited from being landfilled, the party who brought the waste to the landfill will be required to cover all costs associated with removal, treatment, and safe disposal of that waste load as well as any contaminated soil and surrounding natural features which occurred because of the unloading of the prohibited waste at the designated area. Verification of proper disposal of the waste and any additional and reasonable testing of the soil and water in the designated area, necessary to insure that no contamination remains are the legal and financial responsibility of the party who brought the waste to the landfill.

## Section A8

# Identifying Suspicious Waste Loads Via Standard Landfill Operation

As part of the standard operating procedures at Buncombe County landfill, all drivers of incoming loads are questioned about the content and source of their wasteload. Scale house operators and landfill staff, trained as per Section A6 to recognize hazardous waste and wastes prohibited from being landfilled, have the authority to:

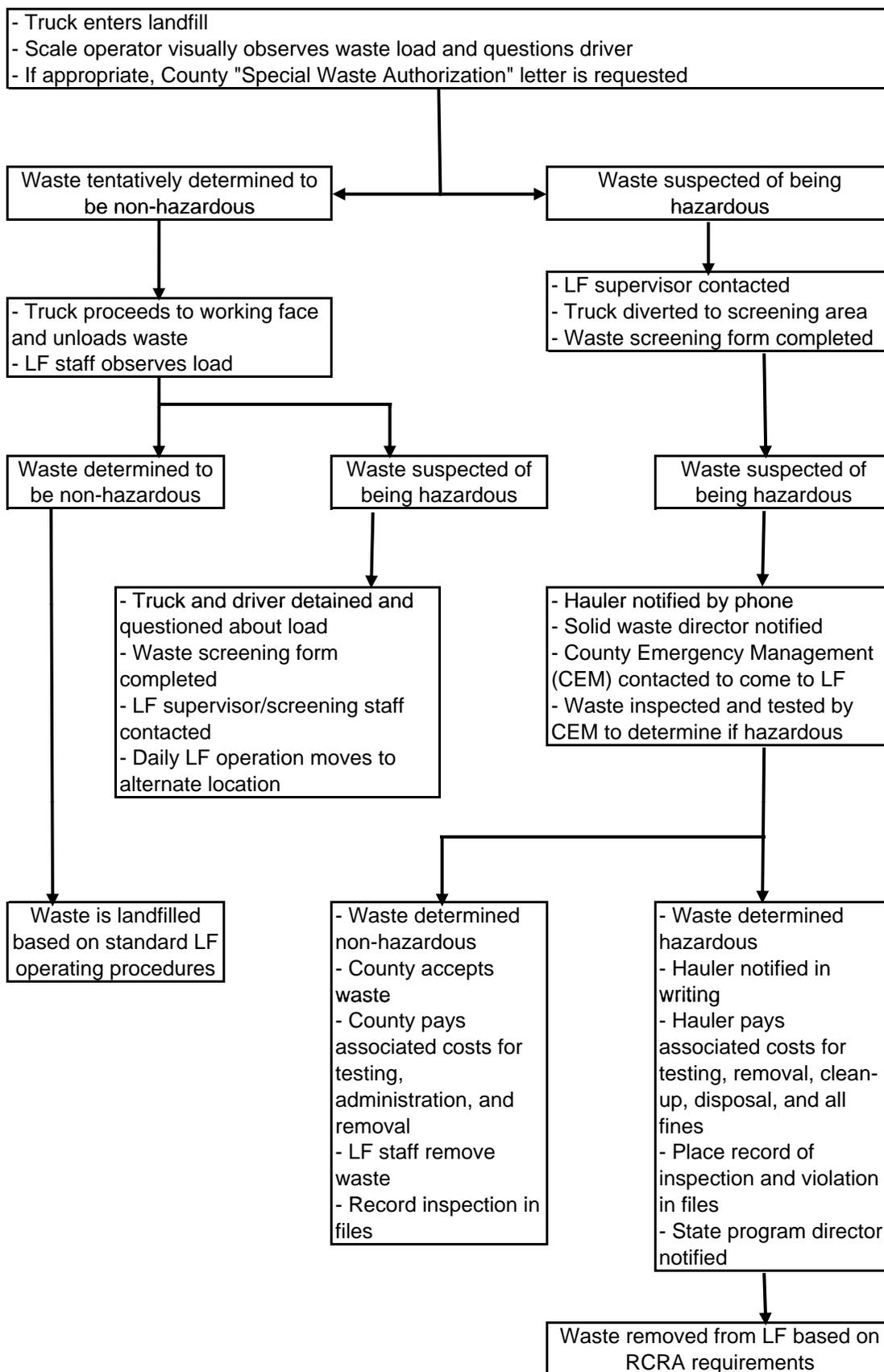
- detain a waste load from being unloaded at the working face of the landfill,
- request additional information from the driver about the wasteload,
- divert the driver to the designated waste screening area,
- temporarily prohibit the wasteload from being deposited at the working face, and
- contact the landfill supervisor who has the authority to reject the waste load.

Figure A8-1 presents a flow chart/decision tree summarizing the points at which a landfill staff can stop a truck, which they believe to contain prohibited wastes, for further inspection. The procedure begins with a visual observation by landfill staff and a questioning of the driver as to the contents of the wasteload. Drivers of suspicious loads are asked if they have an approved waste determination letter as described in Section A5. Files are searched to verify whether or not this letter exists for the load in question. Depending on the satisfactory answering of these questions and the judgement of the landfill staff, either the load is disposed of at the working face or the landfill supervisor is contacted, a waste screening form/record of inspection is completed, and a further screening of the waste load takes place. If a wasteload is suspected of containing hazardous or prohibited materials covered by this plan, the waste hauler and the Buncombe County Solid Waste Inspector are immediately contacted by telephone and requested to send an authorized representative to the site of the wasteload. The driver and truck are released as soon as they have adequately completed their sections on the waste screening form and the waste hauler has been reached. If the wasteload was deposited at the working face, the wasteload is not moved or altered. Landfill operations will be moved away from the load until a final disposition can take place. Based on the discretion of the landfill supervisor and the County's Solid Waste Inspector, Buncombe County Emergency Management (BCEM) is contacted to come to the site and determine if the materials are hazardous or prohibited waste.

If the waste is determined to be non-hazardous and is permitted for landfilling under state, federal, and county laws, the County absorbs the cost for the testing by BCEM. If the waste is found to be hazardous or prohibited, the hauler will be billed for the testing by BCEM and be required to immediately remove the waste and demonstrate

Buncombe County  
Standard Landfill Operating Procedures

Decision Tree for Waste Loads Suspected of Containing  
Hazardous Waste and Dangerous Materials



to the County and the State that it was disposed of properly. The hauler will also be required to cover all costs associated with site clean-up and verification that the site is safe. If the waste is not removed within 24 hours as required, the County shall have the waste removed and disposed of properly and bill the waste hauler for all the costs associated with its removal and site cleanup and repair.

Within one business day, the County will notify NCDENR and the waste hauler, make documentation of the load and contents and generator, the attempted illegal disposal of prohibited waste, the actions taken by the County, and the disposition of the waste. All future waste loads from a hauler found to be in violation by attempting to dispose of hazardous and prohibited materials in the Buncombe County sanitary landfill, may be subject to additional waste screening. This additional screening may include screening every load of the hauler who has been previously found to be in violation.

# Section A9

## Random Inspections of Incoming Loads

While all loads entering the landfill are visually screened by landfill staff, they are generally not inspected in detail. Therefore random inspections are used to provide a reasonable means to adequately control the receipt of prohibited wastes.

### A9.1 Selecting Loads for Sampling

In accordance with SWANA training courses, random inspections of incoming loads is based on 1% of weight received per day.

### A9.2 Screening the Wasteloads

Waste loads selected for random screening will be diverted to a waste screening area where the driver will be questioned about the loads contents. The waste screening form will be completed for all loads selected for screening. Upon answering the necessary questions for the waste screening form and unloading the waste load, the driver and truck may be released. Because this load has been randomly selected for waste screening, this release of the driver and vehicle is not intended to imply the County accepts the waste load.

The waste will be spread over the area for easy visual observation. Care should be used not to break open any containers or drums. Containers and drums that are not easily identifiable or whose contents cannot be seen should be opened by properly trained waste screening personnel. Only trained waste screening personnel, wearing protective safety equipment should come in physical contact with the waste contained in the load selected for screening.

Upon verification that the solid waste passes the screening and is acceptable, Buncombe County will officially accept it for disposal.

All wastes suspected of being hazardous will be handled and stored as hazardous until proven otherwise. All hazardous and prohibited waste testing at the landfill will be conducted by Buncombe County Emergency Management or other registered hazardous waste contractor hired by the County.

### A9.3 Procedures

Figure A9-1 presents a flow chart/decision tree summarizing the procedures that will be followed for the waste screening and procedures to be followed if prohibited wastes are identified. If a wasteload is suspected of containing materials covered by this plan, the waste hauler and County Solid Waste Inspector are immediately to be contacted by telephone and requested to send an authorized representative to the site of the wasteload. The driver and truck are released as soon as they have adequately completed their sections on the waste screening form and the waste hauler has been reached. Based on the discretion of the landfill supervisor and the County Solid

Waste Inspector, Buncombe County Emergency Management is contacted to come to the site and determine if the materials are hazardous or prohibited wastes.

If the wastes are determined to be non-hazardous and are permitted for landfilling under state, federal, and county laws, the County absorbs the cost for the testing. If the wastes are found to be hazardous or prohibited, the hauler will be billed for the testing and be required to immediately remove the wastes and demonstrate to the County and the State that they were disposed of properly. The hauler will also be required to cover all costs associated with site clean-up and verification that the site is safe. If the wastes are not removed within 24 hours, as required by the County, the County shall have the wastes removed and disposed of properly and bill the waste hauler for all the costs associated with their removal and site cleanup and repair.

The landfill owner or operator shall notify the Division with 24 hours of attempted disposal of prohibited waste. If a hauler is found to have attempted to dispose of hazardous or prohibited materials in the Buncombe County sanitary landfill, future additional waste screening for that hauler may be required. This additional screening could include screening every load of the hauler who has been previously found to be in violation. The County also reserves the right to refuse all future waste loads from a hauler found to be in violation.

Buncombe County  
Standard Landfill Operating Procedures

Decision Tree for Random Waste Screening Program

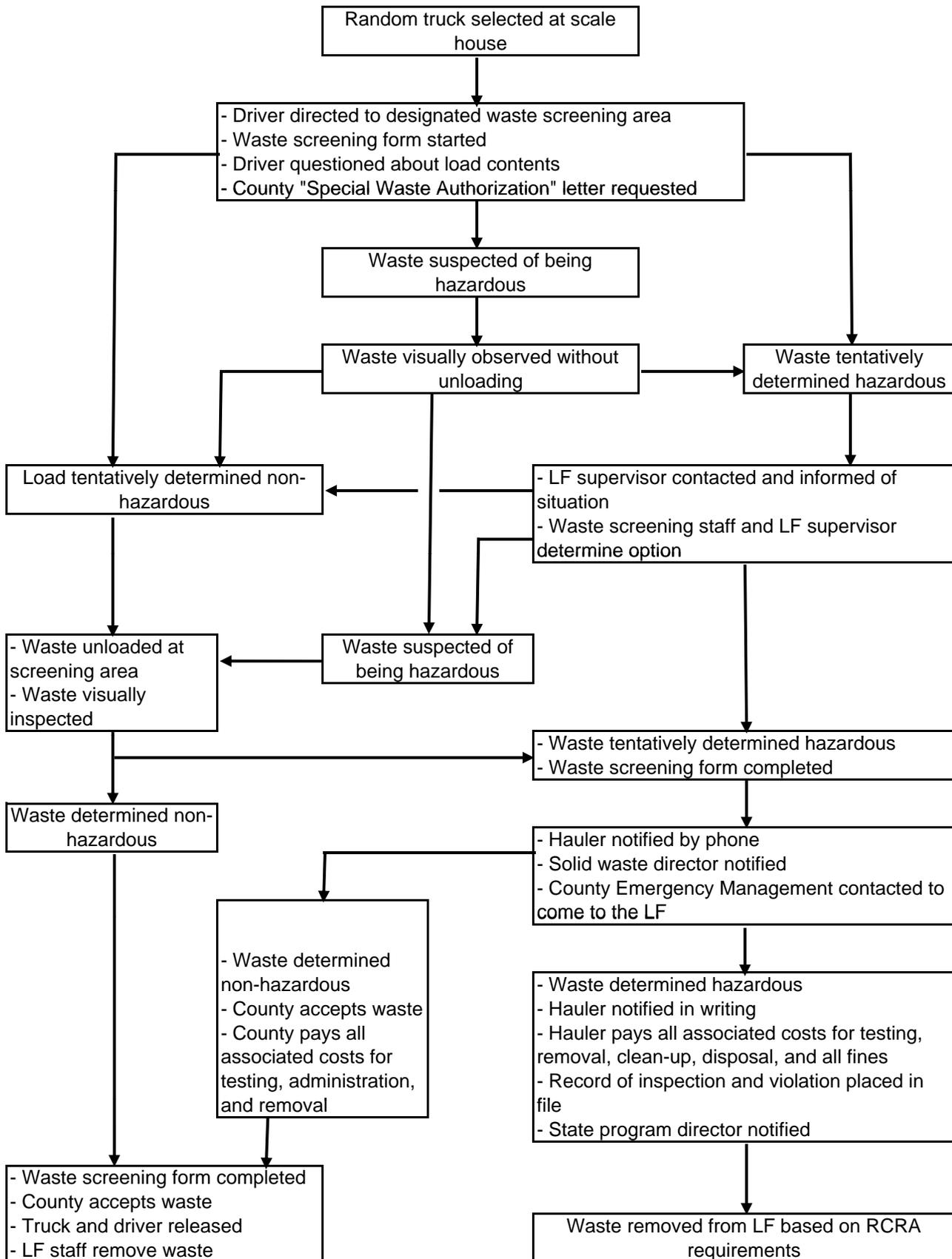


Figure A9-1  
Random Inspections

# Section A10

## Records of Inspections

Figure A10-1 presents a sample waste screening inspection form. It, or a similar form, will be completed for every wasteload screened through the random inspection program and for every incident where landfill staff suspect a waste load contains prohibited or hazardous waste and the driver cannot verify that these suspicions are false. The form will be completed by landfill staff, waste screening staff, and if appropriate signed by the waste driver. One copy will be kept on file at the landfill where the wasteload was received. If the waste load is found to contain materials that are prohibited or hazardous based on this plan, copies of the form will be sent to the NCDENR and the waste hauler.

**Figure A10-1**

**Buncombe County Solid Waste Management Facility  
85 Panther Branch Road  
Alexander, NC 28701**

**828-250-5462**

**RECORD OF INSPECTION**

Day: \_\_\_\_\_ Time Crossed Scales: \_\_\_\_\_  
Truck Owner: \_\_\_\_\_ Driver Name: \_\_\_\_\_  
Truck Type: \_\_\_\_\_  
Vehicle ID# or Tag #: \_\_\_\_\_  
Weight: \_\_\_\_\_  
Tare: \_\_\_\_\_  
Waste Generating Company/Source: \_\_\_\_\_

---

---

Reason Load Inspected: \_\_\_\_\_ random inspection \_\_\_\_\_ staff initials  
\_\_\_\_\_ detained by scale house \_\_\_\_\_ staff initials  
\_\_\_\_\_ detained by LF operating staff \_\_\_\_\_ staff initials

NCDENR Approved waste determination letter present \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ N/A

Description of waste load: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Disposition: Load Accepted (signature) \_\_\_\_\_ Date: \_\_\_\_\_  
Load Not Accepted (signature) \_\_\_\_\_ Date: \_\_\_\_\_

---

---

**Reason Load Not Accepted: (complete this section only if waste NOT ACCEPTED)**

**Description of Suspicious Contents:**

color \_\_\_\_\_ Haz. Waste markings \_\_\_\_\_  
texture \_\_\_\_\_ smell \_\_\_\_\_  
drums present \_\_\_\_\_ approx Cu. Yds. present in load \_\_\_\_\_  
approx tons present in load \_\_\_\_\_

County Emergency Management Contacted: \_\_\_\_\_ Yes \_\_\_\_\_ No

Hazardous or dangerous materials present: \_\_\_\_\_  
(County Emergency Management test results or verification attached)

**Hauler notified (if waste not accepted)**

Phone: \_\_\_\_\_ Time person contacted: \_\_\_\_\_

Other observations: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Final Disposition: \_\_\_\_\_

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

(Waste Screening Inspector or Landfill Supervisor)

# Section A11

## Contingency Plan

If during a random screening or during regular operation of the landfill, hazardous materials or materials defined by this waste screening plan as dangerous are discovered at the landfill, the landfill supervisor on duty has the authority to contact appropriate emergency personnel (911) and request their immediate action to remove and safely dispose of the prohibited waste. All telephone and written notification will take place within the first business day of the discovery of such materials. A completed waste screening form, letters of notification, and test results will be filed as required in Section A10.

## Section A12

### Responsible Party

Legal responsibility for all waste entering the landfill remains with the waste hauler until such a time that it is determined to be permitted solid waste and is accepted by the County. The County does not accept the legal responsibility for waste which is prohibited from being landfilled in a sanitary landfill. The hauler is defined as the responsible party who attempted to, either knowingly or unknowingly, illegally deposited the prohibited waste in the landfill. The hauler shall be billed by the County for all costs associated with illegal disposal non-acceptable of solid waste. This includes, but is not limited to, costs in testing the waste, removing the waste from the sanitary landfill, for the cost of transporting the waste to an appropriate waste management facility, for the disposal fee, and for all necessary and related site clean-up and testing.

If after testing at the landfill by Buncombe County Emergency Management (BCEM) or the County's authorized contractor, the waste load is found to be materials which can legally be landfilled, the County will accept legal responsibility for it. The County or their contractor (as per contract agreement) will absorb all costs for testing and removal or disposal of the waste.

If BCEM or the County's authorized contractor, finds that the waste load contains hazardous or regulated materials that should not be landfilled, the County will not absorb the costs for any further testing either at the landfill or at another laboratory. If further testing by other laboratories indicate the materials could legally be landfilled, the County will be assumed to have "acted in good faith" to protect the public health and safety by refusing to landfill the waste. The County will not reimburse any cost associated with removal of the materials from the landfill site or its subsequent testing or disposal.

# **Section A13**

## **Fines and Penalties**

Buncombe County reserves the right to institute fines and penalties to any person found to have attempted to landfill waste prohibited from being landfilled by state or federal regulations. These fines and penalties are in addition to the costs identified in Section A12.

# Buncombe County, North Carolina

## Buncombe County Solid Waste Management Facility

### Operation Plan Appendix B - Methane Monitoring Plan Subtitle D Landfill

November 2009



# Appendix B - Operation Plan

## Methane Monitoring Plan - Contents

### Subtitle D Landfill

<b>Section B1</b>	<b>Introduction</b>	
B1.1	Purpose .....	1-1
B1.2	General Characteristics of LFG and Methane Generation.....	1-1
B1.2.1	Decomposition Rate and Volume .....	1-2
B1.2.2	LFG Migration .....	1-2
<b>Section B2</b>	<b>Regulatory Background</b>	
B2.1	Subtitle D and North Carolina Regulations.....	2-1
B2.2	Clean Air Act.....	2-2
B2.3.1	Summary of the Proposed Regulations.....	2-2
B2.3.2	Compliance.....	2-2
<b>Section B3</b>	<b>Methane Monitoring System</b>	
B3.1	Summary of Recommendations .....	3-1
B3.2	Well Design and Depth.....	3-1
B3.3	Well Layout .....	3-3
B3.4	Monitoring Equipment .....	3-3
<b>Section B4</b>	<b>Methane Monitoring Program</b>	
B4.1	Frequency of Routine Monitoring.....	4-1
B4.2	Staffing .....	4-1
B4.3	Monitoring Procedures.....	4-1
B4.4	Recordkeeping .....	4-1
<b>Section B5</b>	<b>Exceedance Response Plan</b>	
B5.1	Actions If Regulatory Limit Detected in Structures.....	5-1
B5.2	Actions If Regulatory Limit Detected at Monitoring Wells.....	5-1
B5.3	Subtitle D Compliance Action Plan .....	5-2
B5.3.1	Immediate Action.....	5-2
B5.3.2	Actions Within Seven Days.....	5-3
B5.3.3	Actions Within Sixty Days .....	5-3
B5.4	Public Relations and Information.....	5-3
<b>Section B6</b>	<b>Options for Controlling LFG</b>	
B6.1	Migration Control Techniques.....	6-1
B6.1.1	Impermeable Physical Barriers.....	6-1
B6.1.2	Passive Removal System .....	6-1

B6.1.3 Active Removal System.....6-1

**Section B7 Bibliography**

**Figures**

B3-1 Typical Methane Gas Monitoring Well Design.....3-2  
1 Methane Monitoring Plan .....3-4

# Section B1

## Introduction

Landfill gas (LFG) is a natural by-product of the anaerobic decomposition of landfilled bio-degradable waste. LFG can present a danger to human health and the environment and therefore must be monitored. For these reasons, LFG is regulated by Federal and North Carolina state legislation. This Plan describes the systems and programs needed to fulfill federal and state regulations concerning LFG. In addition, this Plan describes the characteristics of LFG and its migration patterns; and provides alternative methods to control and destroy its harmful components. This additional background information is presented in the Plan to insure it is readily available should a situation occur that requires information and action beyond that described in this Plan.

This Plan is intended for the Subtitle D landfill only.

### B1.1 Purpose

This Plan fulfills the requirements set forth in Rule .1626 (4) for monitoring methane. This Plan:

- is intended only for the Subtitle D landfill,
- describes the necessary methane monitoring systems,
- sets forth the monitoring procedures and programs, and
- identifies the actions needed if levels of methane exceed regulatory limits.

### B1.2 General Characteristics of LFG and Methane Generation

Landfill gas (LFG) can be an energy resource as well as a source of environmental pollution. What makes LFG valuable as an energy resource is its methane content. LFG is composed of approximately 50 percent methane in contrast to natural gas which consists of approximately 95 percent methane. LFG programs which focus on recovering gas as an energy resource include collection and extraction systems used to maximize its recovery. What makes LFG a source of environmental pollution is its odor, its potentially explosive properties, and its contribution to global warming. LFG programs which focus on the environmental hazards of landfill gas include collection systems to monitor the migration of gas and control or neutralize its environmental impacts.

LFG is composed of 50 - 55 percent methane (CH<sub>4</sub>); 45 - 50 percent carbon dioxide (CO<sub>2</sub>); and, less than one percent non-methane organic compounds. These individual gases remain co-mingled and do not naturally separate.

### **B1.2.1 Decomposition Rate and Volume**

The decomposition of bio-degradable waste begins with aerobic decomposition that typically lasts three to 18 months until the oxygen in the landfill is depleted.

Following this, the anaerobic phase begins which results in LFG production. This anaerobic phase continues until all of the carbon-based materials are broken down or oxygen is reintroduced. Some historical LFG production generation models suggest that LFG generation continues for as long as 20 years. However, recent LFG recovery projects in California have demonstrated that production may continue beyond these 20 year estimates.

A reintroduction of oxygen does not stop the production of LFG, it just retards it. The volume of LFG generated over the life of a landfill is a function of the total volume of organic waste in the landfill as influenced by age, moisture, compaction, and pH.

### **B1.2.2 LFG Migration**

The production of LFG creates a positive pressure within the landfill that forces the gas to migrate. Methane is lighter than air and tends to rise, while carbon dioxide is heavier than air and tends to migrate to lower areas of the landfill. LFG will move laterally along the path of least resistance or lowest pressure. LFG migration is a function of soil conditions, hydrogeologic conditions, and weather conditions such as barometric pressure changes, ambient temperatures, air movement, precipitation, and other parameters (for example, ice and snow). LFG moves through porous soils, along underground pipes, and through trenches. In some cases the LFG migration path can be observed at the surface through observations of stressed vegetation. In these instances LFG replaces the oxygen in root structures and eventually destroys the plants.

If tightly capped, LFG will move downward or laterally. Unless LFG is collected, it may migrate laterally, off the landfill site. If the landfill does not have an impermeable cover cap, LFG may migrate upward, through the landfill surface and cause odor and air quality problems. The lining and capping of a landfill does not effect the production of gas, it only improves the potential to collect and control it.

# Section B2

## Regulatory Background

Because of the real and potential dangers from LFG and the methane in landfill gas, to the public health and safety and to the environment, existing and pending federal and state regulations require owners of municipal solid waste landfills (MSWLFs) to monitor and control it. The regulations are contained in Section 258.23 of Subtitle D of the Resource Conservation and Recovery Act (RCRA), Title 15 A NCAC Subchapter 13 B Section .1626 (4), and Section 111 of the Clean Air Act (CAA).

### B2.1 Subtitle D and North Carolina Regulations

Methane gas is explosive when present within the range of 5 percent to 15 percent by volume in air. When present in concentrations greater than 15 percent, the mixture will not explode. The 5 percentage mixture is referred to as the Lower Explosive Limit (LEL) while the 15 percentage concentration is referred to as the Upper Explosive Limit (UEL). The State of North Carolina, through its 15A NCAC 13B .1626 (4) (a); and EPA, through the Subtitle D regulations part (a) of Section 258.23 parts (a) and (b) requires owners of operating MSWLFs, by October 9, 1993, to ensure that the facility:

- does not exceed 25 percent of the lower explosive limit for methane in facility structures; and
- does not exceed the lower explosive limit at the facility property boundary.

The lower explosive limit means the lowest percent by volume of a mixture of explosive gases in air that will promulgate a flame at 250 C and atmospheric pressure.

Part (b) of Section 258.23 and part (b) of Section .1626 of the North Carolina regulations require that a routine methane monitoring program be implemented to insure that these standards are met. A methane monitoring program typically involves sampling LFG emissions, using a specially designed meter, through a system of strategically located and specifically designed wells, on a regularly scheduled basis. The time and frequency of monitoring must be determined based on soil conditions, hydrogeologic conditions and hydraulic conditions surrounding the facility, and locations of structures and property boundaries. However, compliance with Subtitle D requires that the minimum frequency of monitoring be quarterly.

Part (c) of Section 258.23 and part (c) of Section .1626 of the North Carolina regulations require that if methane levels exceed the specified limits, the owner or operator must:

- immediately take all necessary steps to ensure the protection of human health;
- immediately notify the State Director (it is assumed that this will be the Director of the North Carolina DSWM);

- within seven days of detection, place in the operating record the methane gas levels detected;
- within seven days of detection, provide a description of the steps taken to protect human health;
- within 60 days of detection, implement a remediation plan for the methane gas release; the plan shall describe the nature and extent of the problem and the proposed remedy;
- within 60 days of detection, place a copy of the plan in the operating record of the landfill; and
- within 60 days of detection, notify the State Director that the plan has been implemented.

## **B2.2 Clean Air Act**

On May 30, 1991, EPA proposed new source performance standards (NSPS) and emission guidelines for air emissions from municipal solid waste landfills. These guidelines are under Section 111 of the Clean Air Act (CAA).

### **B2.2.1 Summary of the Proposed Regulations**

The portion of the NSPS that affect MSWLFs are under Section 111(b) and 111(d) of the CAA. The standards and guidelines require the periodic calculation of an annual non-methane organic compound (NMOC) emission rate at each affected or designed MSWLF facility. The calculation involves the use of a US EPA model. At each facility where the calculated emission rate is equal to or exceeds the regulatory cut off of 50 Mg per year of NMOC, the MSWLF will be required to design and install a LFG collection system and then combust (with or without energy recovery) the captured LFG. The standards are based on the use of an active collection system (i.e. a system that "actively" or mechanically draws out the LFG) and flares the gas to satisfy a 98 percent destruction criteria. Other control devices will be acceptable if they can demonstrate this level of destruction.

### **B2.2.2 Compliance**

Currently, the Subtitle D landfill has a Title V Operating Permit. Tier 2 testing was completed in August 2007 and indicated that the landfill was below the 50 MG per year NMOC concentration therefore an active gas collection system is not required. The County is in compliance with all requirements in the Title V Operating Permit.

## **Section B3**

# **Methane Monitoring System**

The first step needed to meet Subtitle D and North Carolina methane monitoring requirements involves installing a methane monitoring system. The next step involves implementing a methane monitoring program. The third step requires developing a plan for the actions that will be taken if monitoring results meet or exceed the regulatory limits. This section describes the methane monitoring system. Section B4 describes the methane monitoring program. Section B5 described the proposed plan for actions.

A methane monitoring system could consist of trenches, wells, or probes designed and equipped to monitor methane migration and concentration. Portable monitoring equipment is needed to complete the system if it is not installed at the well heads. Equipment can include portable hand-held meters or probes that can be used to measure the level of methane and non-methane trace elements in the LFG.

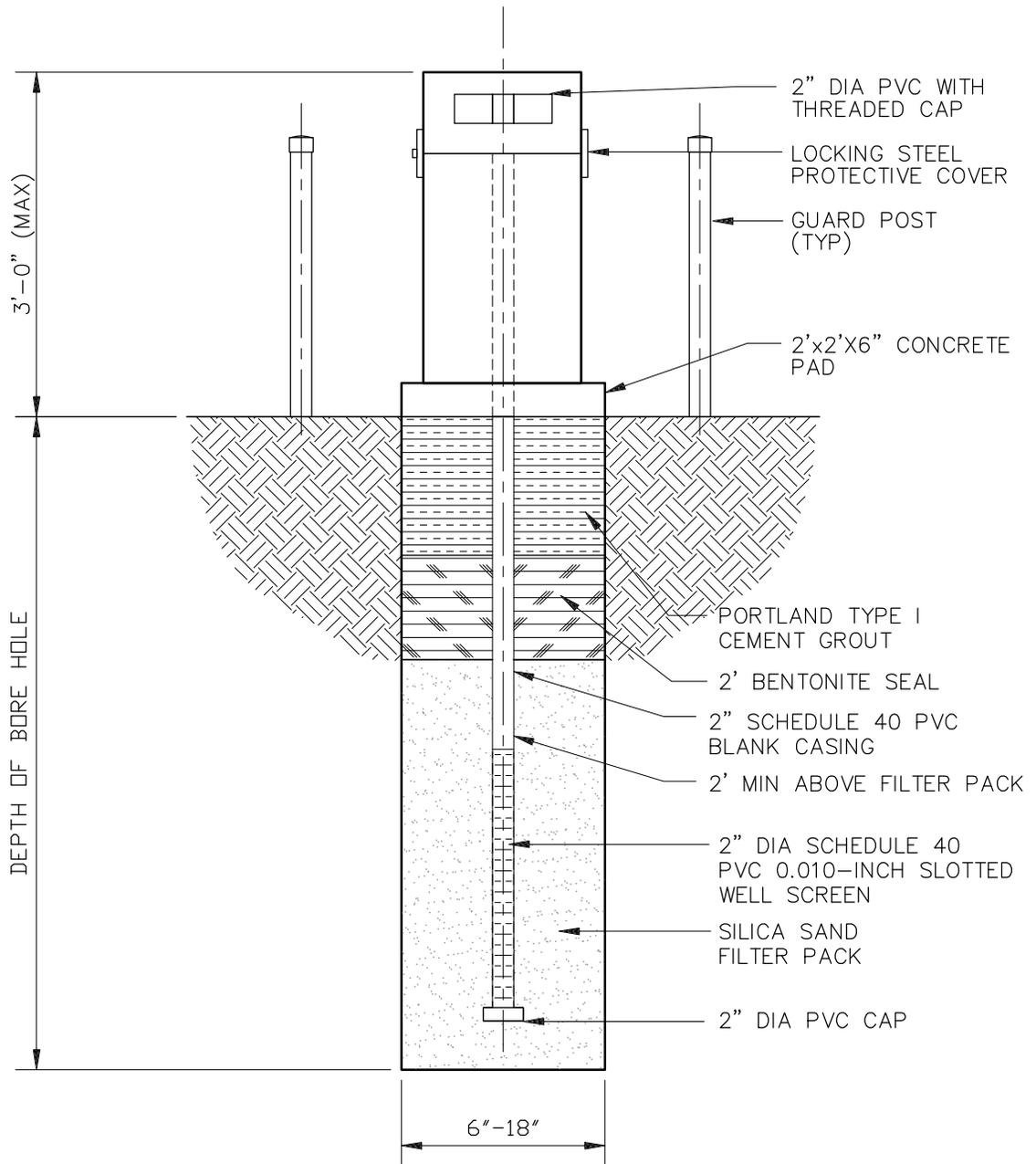
### **B3.1 Summary of Recommendations**

Subtitle D regulations do not provide specific guidance regarding design requirements for methane monitoring systems. A methane monitoring system should be constructed in phases as landfill development progresses. System design based on several factors, including: 1) the observation of no visible sign of methane migration, 2) the assumption that the soils in the landfill are fairly uniform in composition and compaction (which would indicate that there is no specific path that the methane would take to migrate away from the site), and 3) the site specific size and logistic layout of the landfill.

### **B3.2 Well Design and Depth**

Subtitle D does not provide specifications for either well design or spacing. The state, through the Solid Waste Section, has not formalized well design nor spacing requirements as of this writing.

It is proposed by this report that the well design compliment the standards defined in the CAA regulations (see Figure B3-1). Current methane monitoring wells were installed per Figure B3-1 and it is proposed to continue to use this detail.



NOTE:  
1. MIN. SCREEN LENGTH OF 5'

Each well is to be installed using a drill rig to a depth of approximately 18 inches above the seasonal high ground water table. Based on a review of the existing groundwater monitoring wells and boring logs, the average depth to the ground water is approximately 20 feet. It is recommended that each well be dug to ground water to insure adequate depth. A pipe, perforated over the bottom two thirds of the well depth will be placed in the center of the well. A minimum requirement for perforations is holes or slots with an open area equivalent to .01-m (1/2 in.) diameter spaced 90 degrees apart every 0.1 to 0.2 m (4 to 8 in.).

After the pipe is placed in the center of the hole, it is backfilled with pea gravel to a level 0.3 m (one ft) above the perforated section. A layer of back-fill material at least 1.2 m (four ft) thick is added. A layer of bentonite 0.45 m (18 inches) thick is added and the remainder of the hole is backfilled with cover material or material equal in permeability to the existing cover cap material.

### **B3.3 Well Layout**

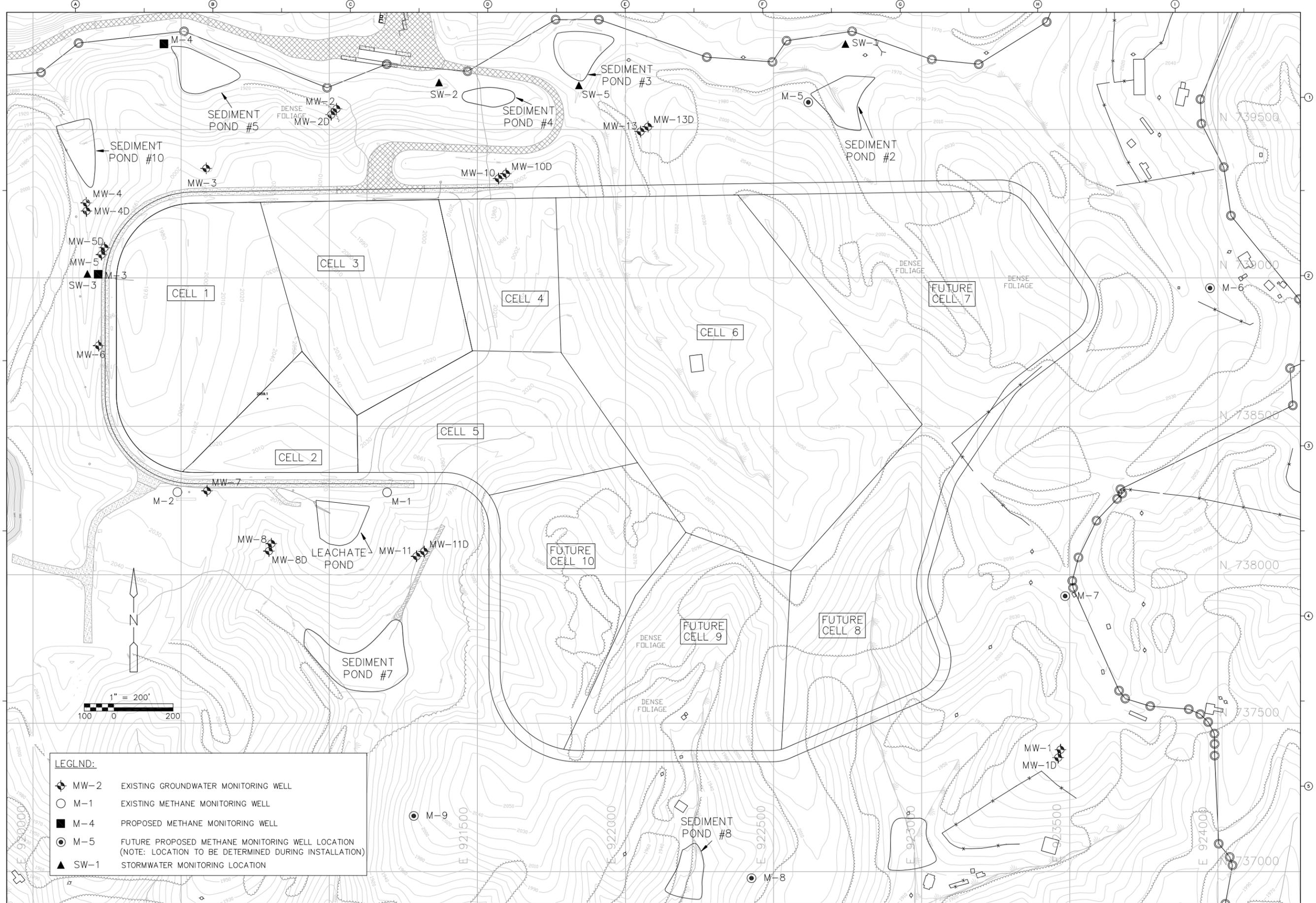
The methane monitoring well layout is presented in Figure 1. Existing methane monitoring wells M-1 and M-2 are south of Cells 1 and 2. These wells were installed in 1997 and, along with the existing structures at the site, have been monitored for methane gas quarterly. To date, neither of these wells have had a detection of methane gas.

Methane monitoring wells M-3 and M-4 were installed during the 2009 4<sup>th</sup> quarter. The well locations are shown on Figure 1 to monitor possible methane gas migration to the north and west of the existing landfill cells. Monitoring of these wells ensures that methane gas will not exceed the LEL at the facility property boundary.

Future proposed methane monitoring wells M-5, -6, -7, -8, and -9 will be installed as subsequent phases of the landfill are constructed. M-5 will be installed north of the future Cell 7; M-6 will be installed east of future Cell 7; M-7 will be installed east of future Cell 8; M-8 will be installed southeast of future Cell 9; and M-9 will be installed south of future Cell 10. Actual well locations for these future proposed wells may be modified as future Permit to Construct Applications are submitted.

### **B3.4 Monitoring Equipment**

The County currently uses a GEM 2000 for methane monitoring.



**LEGEND:**

	MW-2	EXISTING GROUNDWATER MONITORING WELL
	M-1	EXISTING METHANE MONITORING WELL
	M-4	PROPOSED METHANE MONITORING WELL
	M-5	FUTURE PROPOSED METHANE MONITORING WELL LOCATION (NOTE: LOCATION TO BE DETERMINED DURING INSTALLATION)
	SW-1	STORMWATER MONITORING LOCATION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: M. COLOMBE  
 DRAWN BY: A. WIERSPENNING  
 SHEET CHECK'D BY: K. YANEZ  
 CROSS CHECK'D BY: M. COLOMBE  
 APPROVED BY: \_\_\_\_\_  
 DATE: MAY 2009

**CDM** Camp Dresser & McKee  
 5400 Glenwood Avenue, Suite 300  
 Raleigh, North Carolina 27612  
 Tel: 919-787-5620 Fax: 919-781-5730

BUNCOMBE COUNTY  
 NORTH CAROLINA  
 SUBTITLE D LANDFILL

METHANE MONITORING PLAN

PROJECT NO. 6447-44253  
 FILE NAME: CHM Plan.rvt  
 SHEET NO.  
**FIG - 1**

# **Section B4**

## **Methane Monitoring Program**

A methane monitoring program includes a schedule for reading or monitoring methane concentrations at designated locations on a regular basis and a system for reporting the concentration levels.

The requirements for regularly reading the methane concentration levels, and the plan for actions if readings exceed safe levels should, at a minimum, be based on compliance with state and federal regulations.

### **B4.1 Frequency of Routine Monitoring**

Subtitle D and Rule .1626 (4) (b) (ii) regulations require quarterly monitoring of methane.

### **B4.2 Staffing**

Monitoring should be done by a SWANA certified landfill operator or MOLO using calibrated equipment designed to determine the level of methane in monitoring wells approved for the Subtitle D landfill and inside structures on the landfill site.

### **B4.3 Monitoring Procedures**

Each regular quarterly monitoring procedure should begin by checking methane levels in the scale house and any occupied structure on the landfill site. Next, the non-occupied buildings at the landfill should be checked. Finally, monitoring wells should be checked.

If the methane levels detected within on-site buildings are greater than 25 percent of the lower explosive limit, the technician shall immediately follow the actions presented in Section B5.1 of this report. If methane levels detected at the wells exceeds the lower explosive limit, the technician shall immediately follow the action plan presented in Section B5.2.

### **B4.4 Recordkeeping**

All readings will be recorded onto a methane monitoring log form, a sample form is included at the end of this section. This form or similar will be used. These forms will be reviewed by the landfill manager or the County's environmental consultant and placed on file at the landfill with other landfill records. These readings should be available for review by EPA and the State upon request.

METHANE MONITORING LOG FORM  
(this report must be completed quarterly)

Buncombe County Subtitle D Landfill  
Buncombe County, North Carolina

Technician Name: \_\_\_\_\_

Date: (mo/day/year)\_\_\_\_\_

General weather conditions: \_\_\_\_\_

Temperature: \_\_\_\_\_

Barometric condition pressure: \_\_\_\_\_

MONITORING INSTRUCTIONS

1. Measure methane levels within structures on the landfill property. The landfill gas reading must not exceed 25% of the methane lower explosive limit (LEL). If methane measurements exceed 25% of the LEL, contact the landfill manager and follow the outlined plan in Appendix B, Section B5.1 of the operations manual.
2. Measure methane levels at current methane monitoring wells. The landfill gas reading must not exceed the methane LEL. If methane measurements exceed the LEL, contact the landfill supervisor and follow the outlined plan in Appendix B of the operations manual.
3. Complete the entire data sheet located on the following page or similar data sheet.
4. If methane levels exceed the above-mentioned levels at any monitoring location, report the measurements to the landfill manager at the following number: (828) 250-5460.
5. File the methane monitoring log sheet.

METHANE MONITORING DATA SHEET

<i>Monitoring Locations</i>	<i>% LEL Reading</i>	<i>Within Compliance</i>		<i>Landfill Supervisor Contacted</i>		<i>Monitoring Point within Structure</i>
		<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	
Scale house						
Admin. bldg.						
Drop-off facility						
Methane well-1						
Methane well-2						
Methane well-3						
Methane well-4						
Methane well-5*						
Methane well-6*						
Methane well-7*						
Methane well-8*						
Methane well-9*						
<u>Comments and Observations:</u>						
<u>Landfill Manager Actions Taken:</u>						

\*Wells M-5 through M-9 to be installed with subsequent landfill development.

# Section B5

## Exceedance Response Plan

Both Subtitle D and the North Carolina Solid Waste Management Rules require and an exceedance response plan for action if methane levels exceed the regulatory concentration limits. The plan of action includes the specific step by step actions needed should regulatory limits be detected.

### **B5.1 Actions if Regulatory Limits Detected in Structures**

If any structures on the landfill property measures a methane level equal to or more than 25 percent of the LEL the following actions should be taken:

- the building should be immediately evacuated
- the landfill manager should be immediately contacted
- all individuals in and around the structure should be ordered to immediately stop smoking
- all space heaters and similar appliances should be immediately disconnected from their power source
- all doors and windows in the structure which gave the reading should be opened to permit the methane to escape
- equipment used to take the readings should be tested immediately to verify it was giving accurate readings

The technician will then proceed to take readings at all methane monitoring wells at the landfill. All levels should be verified and recorded in the methane monitoring log book. This information, including the verification that the equipment is providing accurate readings, the current readings, and the levels at all monitoring locations for the previous three quarters should be provided to the County's landfill manager. The Buncombe County landfill manager will make the decision to return to business as usual; temporarily evacuate the site; or follow the plan proposed in Section B5.3.

### **B5.2 Actions if Regulatory Limits Detected at Monitoring Wells**

If any of the methane monitoring wells measure a level equal to or more than the lower explosive limit as defined by Subtitle D, the technician should:

- immediately contact the landfill manager

- recheck the methane levels inside the facility structures. (If levels are close to or exceed 25 percent of the lower explosive level the actions in Section B5.1 should be followed.)

Once it is verified that levels inside the buildings are safe, the technician should check and record readings at all remaining methane monitoring wells on the site.

- the equipment used to take the readings should be tested to verify it is giving accurate readings

This information, the current readings, and the levels for the previous three quarters should be provided to the Buncombe County landfill manager who will make the decision to: return to business as usual; temporarily evacuate the site; or, follow the plan proposed in Section B5.3.

## **B5.3 Subtitle D Compliance Action Plan**

If upon verification as described in Sections B5.1 and B5.2, the methane monitoring levels are equal to or exceed the regulatory limits as defined by Subtitle D, the following actions are proposed to both comply with Subtitle D regulations as well as protect the health and safety of the individuals at or near the landfill site.

### **B5.3.1 Immediate Action**

If methane levels exceed the specified limits, the landfill operator or the landfill manager will take immediate action to ensure the protection of human health and safety. This may include:

- evacuate all buildings on the site;
- open all doors and windows in buildings on the landfill site;
- notify the Buncombe County Manager Office's about the concentration levels;
- if warranted by the degree of intensity of the methane concentration, check the methane levels in structures near the landfill yet outside the facility boundary;
- if warranted by the degree of intensity of the methane concentration, evacuate the landfill area or evacuate the area adjacent to the landfill;
- notify the State Director of the Subtitle D compliance program about the reading;
- begin to identify or narrow down the source of the methane causing the readings exceeding the regulatory limits (i.e. the path that the methane is taking to the monitoring location);
- begin to identify the extent of the methane problem;

- as appropriate, begin to take corrective action to control the methane levels in building at the landfill site, at the boundaries to the landfill, and at the landfill site.

### **B5.3.2 Actions Within Seven Days**

If methane levels exceed the regulatory limits, in order to comply with Subtitle D, the County must take the following actions within seven days:

- place in the operating records of the landfill, the gas levels detected; and,
- provide a description to the approved state or federal EPA agency a description of the steps taken to protect human health.

It is also suggested that at this time, the operator begin to develop a plan which:

- describes the nature and extent of the problem and
- proposes the remedy for the problem.

### **B5.3.3 Actions Within Sixty Days**

If methane levels exceed the specified limits, the County must take the following actions within 60 days:

- implement a remediation plan for the methane gas release;
- place a copy of the plan in the operating record of the landfill;
- notify the appropriate State Director or EPA official that the plan has been implemented.

## **B5.4 Public Relations and Information**

As with any potentially dangerous situation, it is important to keep the public, public service agencies, and the media informed. False information, inaccurate information, or the lack of information concerning potential explosions at a public facility could create panic.

If the County Manager determines that a potentially dangerous situation exists, it is recommended that a one page explanation of the situation be written and distributed to all homes and businesses within a one-half mile radius of the landfill. This should be done within the first two to four hours of making the determination that a potential danger to human health and safety exists.

It is recommended that the County Manager appoint one individual to provide information to: the media; the police authorities with jurisdiction in the area; and area medical facilities. Area hospitals and police departments may receive calls once the local media releases the story. Centralizing the flow of information will avoid

conflicting information and inaccurate information. Providing detailed and honest facts about the situation being under control is critical.

# Section B6

## Options for Controlling LFG

This section presents several options which may be implemented by Buncombe County should methane readings exceed regulatory levels. It is presented in this Plan to insure that the information is readily available to the County if needed.

If regular LFG monitoring demonstrates levels that exceed the regulatory limits, Subtitle D requires actions by the owner of the MSWLF, to eliminate the problem. Remedial options to eliminate the problem include controlling the migration path or controlling the release of the LFG into the environment.

### B6.1 Migration Control Techniques

Four techniques which can be used for controlling the migration of LFG include:

- impermeable physical barriers
- passive removal system
- active removal system

#### B6.1.1 Impermeable Physical Barriers

An impermeable physical barrier, such as a landfill liner or a vertical impermeable barrier, can be installed to impede and ultimately stop the migration of LFG. This type of a barrier also helps to contain the gas thereby facilitating its collection.

#### B6.1.2 Passive Removal System

A passive removal system generally provides a safe path of least resistance for migrating LFG to exit the landfill. Passive removal systems include open air ditches or passive venting wells installed in porous gravel trenches. These systems are designed to rely on the difference between the internal landfill pressure and the atmospheric pressure to control the migration path that the LFG takes.

#### B6.1.3 Active Removal System

An active LFG collection and control system is in place at the Subtitle D landfill. An open flare destroys collected LFG. This system can be used to control methane migration.

# Section B7

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