RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services

TRANSMITTAL FORM

K985

If enclosures are not as noted or
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please notify us immediately

Received
JUN 2008
Waste Management

June 23, 2008

By: US Mail [ ]
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Mr. Ed Mussler, P.E.
NCDENR Division of Waste Management
401 Oberlin Road, Suite 150
Raleigh, NC 27605
(919) 508-8400

SUBJECT: **Davidson County C&D Landfill (Permit 29-06)**
Johnston County C&D Landfill (Permit 51-03) K985
Washington County C&D Landfill (Permit 94-04)
Permit Applications for Continued Operations

RSG PROJECT NO: **DAVDCO-08-1; JOHNSTON-07-2; WASH-08-3**

We are sending you the following items:

COPIES	ITEM	DESCRIPTION
3	Binders	Davidson County Permit Application
3	Binders	Johnston County Permit Application
3	Binders	Washington County Permit Application
3	CDs	PDF File of Each Application

These are transmitted as checked below:

[ ] For Information
[ ] As Requested
[ ] For Review and Comments
[ ] For Revision
[X] **For Approval**
[ ] Approved
[ ] Approved as Noted
[ ] Approved as Noted-Revise and Resubmit
[ ] Not Approved-Revise and Resubmit
[ ] For Record and File
[ ] Submittal
[ ] For Recording

REMARKS: Ed: Just let me know if you have any questions. Thanks!

cc:

Pieter K. Scheer, P.E.

14 N. BOYLAN AVENUE • RALEIGH, NC 27603 • TEL. 919-828-0577 • FAX 919-828-3899 • WWW.RSGENGINEERS.COM

RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services

June 20, 2008

Mr. Edward F. Mussler, P.E.
Permitting Branch Supervisor
NC DENR - Division of Waste Management
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

RE: Johnston County C&D Landfill (Permit No. 51-03)
Application for Continued Operations

Dear Ed:

On behalf of Johnston County, Richardson Smith Gardner & Associates, Inc. (RSG) would like to submit for your review information required for the continued operations of Johnston County's active construction and demolition debris (C&D) landfill unit (Area 2) in accordance with 15A NCAC 13B .0547 for existing landfills as of January 1, 2007. As outlined in the aforementioned rule, the following must be submitted by July 1, 2008:

1. Closure and Post-Closure Plan {.0547 (2)(a)}
2. Financial Responsibility {.0547 (2)(b)}

Each of these requirements is described below:

Closure and Post-Closure Plan

Johnston County intends to install a final cover system consisting of the following components (top-down) on C&D units at the site:

- a 24-inch thick vegetative soil layer (including 6 inches of topsoil);
- a drainage geocomposite (with drainage breaks)
- a 30-mil textured LLDPE geomembrane; and
- a 12-inch thick intermediate cover layer.

This final cover system has been demonstrated in prior permit applications to allow less infiltration than the prescriptive final cover system[1] [2].

A Closure and Post-Closure Plan has been prepared in accordance with .0543(d) and is provided in **Attachment A**. Note that this plan addresses both municipal solid waste (MSW) and C&D landfill units at the site. Note also that the attached plan is a revised version of that submitted as part of the most recent permit amendment application for the site[3]. Technical specifications, construction quality assurance (CQA) information, and drawings related to the closure of the facility's C&D landfill units were provided as part of previous permit applications for the MSW Phase

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[1] Permit Modification Application, Johnston County C&D Landfill Vertical Expansion (Area 1), Johnston County, NC, prepared by G.N. Richardson & Associates, Inc., as revised through August 2005 (approved by NC DWM on 8/1/05).

[2] Permit to Construct Application, Johnston County C&D Landfill - Area 2, Johnston County, NC, prepared by G.N. Richardson & Associates, Inc., as revised through May 2006 (approved by NC DWM on 8/31/06).

[3] Permit Amendment Application, Johnston County MSW Landfill - Phase 4A - Cell 3, Smithfield, NC, prepared by Richardson Smith Gardner & Associates, Inc., dated June 2007 (pending NC DWM approval).

4A - Cell 3 landfill unit (covers Area 1 closure)[4] and the C&D Area 2 landfill unit[5].

Financial Responsibility

As part of the Closure and Post-Closure Plan, estimates have been prepared for closure and post-closure costs (ref. Section 3.0 of the plan) as summarized below:

MSW Phase 4A (Cells 1-3) - Closure Cost	$3,707,126
MSW Phase 5 - Closure Cost	$2,421,237
C&D Area 1 - Closure Cost	$1,628,324
C&D Area 2 (Cell 1) - Closure Cost	$1,504,208
MSW Phases 1-4A & C&D Areas 1-2 - Post-Closure Cost (30 Year)*	$5,004,417
MSW Phase 5 - Post-Closure Cost (30 Year)	$2,607,528
Total:	**$16,872,840** (2008$)

*The post-closure costs for MSW Phases 1-4A and C&D Areas 1 and 2 are combined in that these units are in the same portion of the site.

Johnston County intends to provide financial assurance for the above estimated costs in the form of a local government financial test upon approval of the estimates.

Should you have any questions or comments on this application, please contact us at your earliest convenience.

Sincerely,
Richardson Smith Gardner & Associates, Inc.

Pieter K. Scheer, P.E.
Principal, Project Manager

NORTH CAROLINA PROFESSIONAL SEAL 021666 ENGINEER PIETER K. SCHEER 6/20/08

Attachment

cc: Tim Broome, P.E., Johnston County
Haywood Phthisic, Johnston County
Rick Proctor, Johnston County

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[4]Ibid.

[5]Permit to Construct Application, Johnston County C&D Landfill - Area 2, Johnston County, NC, prepared by G.N. Richardson & Associates, Inc., as revised through May 2006 (approved by NC DWM on 8/31/06).

Closure And Post-Closure Plan

Johnston County Landfill
Smithfield, North Carolina

Prepared for:

Johnston County Department of Public Utilities
Smithfield, NC

June 2008

RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services
14 N. Boylan Avenue
Raleigh, North Carolina 27603

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JOHNSTON COUNTY LANDFILL

CLOSURE AND POST-CLOSURE PLAN

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SECTION 1.0
CLOSURE PLAN

1.1 OVERVIEW

This plan is intended to serve as a guide for the proposed closure. A formalized Closure Plan for each landfill unit (or incremental portion thereof) will be submitted to the Solid Waste Section of the North Carolina Department of Environment and Natural Resources Division of Waste Management (DWM) for approval prior to beginning closure construction.

1.2 MAXIMUM CLOSURE AREA AND WASTE CAPACITY

The following are the estimated areas and capacity for each landfill unit to be closed under this plan.

Landfill Unit	Closure Area (Acres)	Gross Capacity (CY)[1]	Net (Waste) Capacity (CY/Tons)[1]
MSW Landfill Units			
Phase 4A (Through Cell 3 - Fill Sequence 1)	29.4	2,484,365	2,111,984 CY 1,228,165 Tons
Phase 5	19.2	1,087,199	884,625 CY 514,181 Tons
Total (MSW):	48.6	3,571,564	2,996,609 CY 1,742,346 Tons
C&D Units			
Area 1	12.9 (See Note 2)	572,734	479,645 CY 289,285 Tons
Area 2 (Cell 1)	11.9	451,611	389,897 CY 233,938 Tons
Total (C&D):	24.8	1,027,345	869,542 CY 523,223 Tons

Notes:

1. With the exception of the Phase 4A landfill unit, the volume and tonnage figures assumed for each landfill unit are based on the currently approved Facility Plan. Refer to Section 2.0 (Facility Report) of the Facility and Engineering Plan prepared as part of the Permit to Construct Application for the Johnston County C&D Landfill - Area 2. For Phase 4A, the volume and tonnage figures have been adjusted based on the final design for Cell 3. Refer to Section 2.0 (Quantities) of the Engineering Plan (**Attachment A**).

2. The Area 1 C&D landfill unit has a total area of 16.2 acres but has a reduced closure area due to the overlying Phase 4A - Cell 3 MSW landfill unit.

1.3 FINAL COVER SYSTEM

The final cover system will consist of the following components (top-down):

- a 24-inch thick vegetative soil layer (including 6 inches of topsoil);
- a drainage geocomposite (with drainage breaks)
- a 30-mil textured LLDPE geomembrane; and
- a 12-inch thick intermediate cover layer.

The final cover system will be placed on prepared intermediate cover at a maximum slope of 4H:1V. Surface water control devices will also be incorporated into the final cover of each landfill unit and some units will have a landfill gas (LFG) control system. The final cover surface will be vegetated upon completion of the final cover installation according to the project seeding specifications.

Placement of the vegetative soil layer over the cover geosynthetics must be done with care to avoid damage to these materials. This soil layer should be placed from the bottom up using a small dozer equipped with low ground contact pressure (6 psi or less) tracks. A minimum of 12 inches of soil should be maintained between the dozer tracks and the underlying geosynthetics. The soil buffer should receive no compaction other than that provided by the dozer tracks. Pans or other heavy equipment should not operate on the vegetative soil layer.

Refer to the appropriate permit application for a detailed discussion and details related to the design of the final cover system for each landfill unit.

1.4 LANDFILL GAS SYSTEM

For the MSW landfill units and C&D landfill units overlying MSW units, a landfill gas system is provided in the final cover design. This system includes a system of collection wells placed within the waste to capture the gas and either passively vent or flare the gas via utility flares or, as required, actively collect and flare the gas via header piping and a blower/flare system. The collection wells should be placed before any geosynthetics are placed.

Refer to the appropriate permit application for a detailed discussion and details related to the design of the landfill gas system for each landfill unit.

1.5 SURFACE WATER SYSTEMS

Precipitation falling on the cover will infiltrate into the cover or run off the cover. Short-term the run-off runs down the surface of the intermediate cover. Long-term the run-off is collected in a series of drainage breaks built into the areas covered by final cover. These drainage breaks are provided along side slopes (rain gutters and diversion berms). Water captured by rain gutters or diversion berms is routed toward one of the down pipes. Flow in the down pipes is routed to the base of the landfill and to one of the site sediment basins.

Refer to the appropriate permit application for a detailed discussion and details related to the design of surface water systems for each landfill unit.

1.5.1 Incremental Operation

During much of the life of the landfill, surface run-off will be handled by the intermediate cover system. Operations must strive to provide operational grading that encourages run-off from the intermediate cover to drain to the perimeter channels along the perimeter berms or to areas covered by final cover. Corrugated polyethylene (CPE) piping and temporary soil berms must be installed if required to accomplish this run-off routing.

1.5.2 Required Maintenance

The surface water systems must be inspected annually and immediately after every major storm. Sediment build-up in the drainage features/devices must be cleaned out on a regular basis to promote run-off. Sediments removed can be used as daily or intermediate cover.

1.6 CLOSURE SCHEDULE

Closure activities must begin on the following schedule:

MSW Landfill Units (15A NCAC 13B.1627(c)(5)):

- No later that 30 days after the date on which the MSWLF unit receives the known final receipt of wastes; or
- If the MSWLF unit has remaining capacity and there is a reasonable likelihood that the MSWLF unit will receive additional wastes, no later than one year after the most recent receipt of wastes.

C&D Landfill Units (15A NCAC 13B.0543(c)(5)):

- No later that 30 days after the date on which the C&DLF unit receives the known final receipt of wastes;
- No later than 30 days after the date that a 10 acre or greater area of waste, is within in 15 feet of final design grades; or
- No later than one year after the most recent receipt of wastes, if the C&DLF unit has remaining capacity.

All closure activities shall be completed within 180 days. Exemptions and extensions may be approved by the DWM.

1.7 CLOSURE VERIFICATION

The following procedures will be implemented following closure:

- A Construction Quality Assurance (CQA) report will be submitted to the DWM. This report will describe the observations and tests used before, during, and upon completion of construction to ensure that the construction materials meet the final cover design specifications and the construction and certification requirements. The CQA report will contain as-built drawings.

- A signed certification from a registered Professional Engineer verifying that closure has been completed in accordance with the closure plan will be submitted to the DWM.

- At least one sign notifying all persons of the closing of the landfill (or incremental portions thereof) and that wastes are no longer accepted will be posted. Suitable barriers will be installed as necessary at former access points to prevent new waste from being deposited.

- Within 90 days, a survey plat, prepared by a registered Professional Land Surveyor, indicating the location and dimensions of landfill disposal areas, will be prepared.

- A notation will be recorded on the deed notifying any potential purchaser of the property that the land has been used as a landfill facility and that future use is restricted under the approved closure plan. A copy of the deed notation as recorded will be filed with the operating record.

SECTION 2.0
POST-CLOSURE PLAN

2.1 OVERVIEW

This Post-Closure Plan has been developed to outline steps to be taken to ensure the integrity of the landfill during its post-closure care period. The post-closure care period will last at least 30 years after final closure and, at a minimum, will consist of the following:

- Maintaining the integrity and effectiveness of final cover system;
- Performing groundwater and surface water monitoring;
- Maintaining and operating a gas monitoring system; and
- Maintaining run-on/run-off controls.

No wastes will remain exposed after closure of the landfill. Access to the closed site by the public will not pose a health hazard.

2.2 POST-CLOSURE CONTACT

All correspondence and questions concerning the post-closure care of the unit should be directed to:

Johnston County Department of Public Utilities
Attn: Director
309 E. Market Street
Smithfield, NC 27577
Phone: (919) 209-8333
Fax: (919) 934-7174.

2.3 POST-CLOSURE USE

After filling operations cease at the landfill and the landfill is officially closed in accordance with the Closure Plan, each landfill unit will be maintained as a grassy hill. Johnston County will maintain control of the property and prevent public access to it during the post-closure period.

There may be (an) access road(s) on the final cover to allow proper maintenance during post-closure. Precise location of the access road(s) will be determined as a part of operations. Low ground pressure and rubber tire vehicles will be used for maintenance.

2.4 MAINTENANCE

2.4.1 Repair of Security Control Devices

All security control devices will be inspected and maintained as necessary to ensure access to the site is controlled. Locks, vehicular gates, and fencing will be replaced if functioning improperly. Warning signs will be kept legible at all times and will be replaced if damaged by inclement weather or vandalism.

2.4.2 Erosion Damage Repair

If erosion of the final cover occurs during post-closure, the affected area will be repaired and reseeded as necessary. If necessary, rolled erosion control products (RECPs) will be used to expedite rapid revegetation of slopes and to secure topsoil in place.

2.4.3 Correction of Settlement, Subsidence, and Displacement

Minimum slopes of 5 percent will be maintained after settlement in order to prevent ponding and allow for proper drainage without infiltration. If vertical or horizontal displacement occurs due to differential settlement, cracks will be filled with appropriate material and final cover will be reestablished. Excessive vertical displacement is not anticipated.

2.4.4 Leachate Management System (Lined Units)

In order to maintain the free flow in leachate collection piping, they will be cleared of debris using the manholes or cleanout locations for access. If pipes should crush or buckle within the landfill, leachate will flow through the gravel columns. The leachate collection system (LCS) includes a continuous blanket drain on the base of the landfill which will allow drainage of leachate even in the very unlikely event of total failure of the leachate collection pipes.

2.4.5 Closure of Leachate Storage Lagoon

After closure of the lined landfill units has been achieved, the generation of leachate will eventually curtail. The flow rate immediately after closure should decrease to approximately 100 gallons/acre/day. Toward the end of the 30-year post-closure period, the flow should approach zero, at which time the storage lagoon will not be required. The following procedures will be followed to properly close the leachate storage lagoon:

- Completely drain and remove all liquids, sludges, sediments, etc. from the storage lagoon.
- Disassemble the lagoon, piping, and appurtenances and dispose of the contents in a manner approved by the DWM.

- Sample and analyze the underlying soil for appropriate constituents inherent to leachate. Assess the results for evidence of contaminant migration.

- If contamination of underlying soils is exhibited, perform an assessment as to the degree of contamination and develop remedial actions.

- Obtain approval of the DWM for the assessment and associated remedial measures.

- Perform the remedial actions as necessary to limit any threats to public health and the environment.

- Restore the area to closely match pre-existing conditions in the vicinity of the containment areas. Activities may include: filling, grading, topsoiling, and seeding.

2.4.6 Repair of Run-On/Run-Off Control Structures

All drainage swales, ditches, and perimeter channels will be repaired, cleaned, or realigned in order to maintain their original condition. Any culverts that are damaged will be repaired or replaced.

2.4.7 Landfill Gas System

The landfill gas system will be maintained by the County and operated in accordance with any site air quality permits. Proper operation of the system is verified through testing at the landfill gas monitoring wells.

If gas wells/vents do not function as a result of irregular settlement, accumulation of liquids (condensate, leachate, water), binding or corrosion, additional and/or replacement wells/vents can be installed if necessary in accordance with the current Landfill Gas Management Plan.

2.4.8 Groundwater Monitoring Wells

Procedures outlined in the current Water Quality Monitoring Plan or subsequent revision will take precedence; however, a brief description follows. All groundwater monitoring wells have been installed with concrete pads and protective casings to prevent accidental damage by vehicles and equipment. The wells are also equipped with a locking cap to discourage vandalism. Groundwater wells will be inspected regularly (at the time of sampling) to ensure integrity. Persons inspecting a well should look at the overall condition of the well, for signs of well tampering, and cracking or degradation of the concrete pad. Should a well require replacement, the defective well should be abandoned in accordance with specifications provided in the SAP and a new well installed at a

location that is approved by the DWM.

2.5 MONITORING PLAN

The closed unit will be monitored for a minimum of 30 years. A series of inspections will be scheduled to ensure the integrity and effectiveness of the final cover system, surface water systems, groundwater monitoring system, landfill gas system, and to protect human health and the environment.

2.5.1 Inspection Frequencies

Inspections to be conducted during the post-closure care period will occur regularly as shown in **Table 2.1**.

2.5.2 Quarterly Inspections

Quarterly inspections of the closed site will be conducted by the County. These inspections will include examination of the security control devices for signs of deterioration or vandalism to ensure access to the site is limited to authorized persons. Each disposal area will be checked to ensure the integrity of the final cover system is maintained, erosion damage is repaired, vegetative cover persists, and that cover settlement, subsidence, and displacement are minimal. Drainage swales and channels will be cleared of litter and debris and benchmark integrity will be noted and maintained.

2.5.3 Semi-Annual Inspections

Semi-annual inspections of the site during the post-closure period will be conducted by the County with attention paid to integrity and drainage of the final cover system and condition of the groundwater and gas monitoring systems.

A report of findings will be made to the responsible party, including recommendations for actions deemed necessary to ensure the site continues to meet the closure performance standard.

2.6 ENGINEERING CERTIFICATION

Based on the County's monitoring reports, annual certifications by a registered engineer will be placed in the operating record. They will certify that the closure plan has been followed, noting discrepancies along with the corrective actions undertaken. At the end of the post closure period, the individual certifications will be compiled into a final document and forwarded to the DWM.

TABLE 2.1: POST-CLOSURE INSPECTION FREQUENCIES

INSPECTION ACTIVITY	YEAR 1	YEARS 2-30
Security Control Devices	Quarterly	Quarterly
Vegetative Cover Condition	Quarterly[1]	Quarterly
Surface Water Systems	Quarterly[1]	Quarterly
Erosion Damage	Quarterly[1]	Quarterly
Cover Drainage System	Quarterly[1]	Semi-Annually
Cover Settlement, Subsidence, and Displacement	Quarterly[1]	Semi-Annually
Leachate Management System	Quarterly	Semi-Annually
Landfill Gas System	Quarterly[3]	Semi-Annually[3]
Groundwater Monitoring System	Semi-Annually	Semi-Annually[2]
Benchmark Integrity	Annually	Annually
Leachate Collection Pipe Cleanout	Annually	Annually

Notes:

1. These items will be inspected after each large storm event (i.e. $\geq$ 1 inch in any 24 hours).
2. Or in accordance with groundwater monitoring schedule described in the current Water Quality Monitoring Plan.
3. Or in accordance with the current Landfill Gas Management Plan or air quality permit(s).

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SECTION 3.0
CLOSURE/POST-CLOSURE COST ANALYSIS

3.1 OVERVIEW

The purpose of this section is to provide a written estimate in current dollars of costs associated with all activities specified in the written closure and post-closure plans which have been developed for the MSW and C&D landfill units of the Johnston County Landfill.

3.2 ESTIMATED CLOSURE COSTS

Tables 3.1A, 3.1B, 3.1C, and 3.1D summarize the estimated costs for complete closure of the MSW Phase 4A (Cells 1-3), MSW Phase 5, C&D Area 1, and C&D Area 2 (Cell 1) landfill units, respectively (the maximum area to be closed). The cost estimate for each unit is based on a third party providing the necessary services and includes labor in the unit prices given. The estimated closure costs will be reviewed and updated as required to reflect adjustments for inflation, increased costs in construction or materials, or any other adjustments to the Closure Plan.

3.3 ESTIMATED POST-CLOSURE COSTS

Tables 3.2A and 3.2B summarize the estimated costs for the post-closure care maintenance activities for MSW Phases 1-4A and C&D Areas 1-2[1] and the MSW Phase 5 landfill unit. The cost estimate for each is based on a third party providing the necessary services and includes labor in the unit prices given. The estimated post-closure costs will be reviewed and updated as required to reflect adjustments for inflation, rising costs of anticipated post-closure care, or any other adjustments to the Post-Closure Plan.

[1]The MSW Phases 1-4 units (previously closed), the MSW Phase 4A unit, and the C&D Areas 1 and 2 units are combined in that these units are in the same portion of the site.

TABLE 3.1A: MSW - PHASE 4A - CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2008 $)
Surface Preparation	29.4	Acre	$10,000	$294,000
Landfill Gas System	29.4	Acre	$15,000	$441,000
30 mil Textured LLDPE Geomembrane	1,281,000	SF	$0.45	$576,450
Drainage Geocomposite	1,281,000	SF	$0.55	$704,550
Vegetative Soil Layer (24")	95,000	CY	$5.00	$475,000
Erosion Control (Rain Gutters, Diversion Berms, Down Pipes, Drainage Channels, Etc.)	29.4	Acre	$15,000	$441,000
Revegetation	29.4	Acre	$1,500	$44,100
Surveying	29.4	Acre	$2,000	$58,800
			Subtotal:	$3,034,900
Bonds, Mobilization, & Insurance			(4% of Subtotal):	$121,396
			Subtotal:	$3,156,296
			Contingency (10%):	$315,630
			Construction Subtotal:	**$3,471,926**
Engineering	29.4	Acre	$2,000	$58,800
CQA	29.4	Acre	$6,000	$176,400
			TOTAL:	**$3,707,126**

Notes:

1. Assumes closure of 29.4 acres (Phase 4A).

TABLE 3.1B: MSW - PHASE 5 - CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2008 $)
Surface Preparation	19.2	Acre	$10,000	$192,000
Landfill Gas System	19.2	Acre	$15,000	$288,000
30 mil Textured LLDPE Geomembrane	837,000	SF	$0.45	$376,650
Drainage Geocomposite	837,000	SF	$0.55	$460,350
Vegetative Soil Layer (24")	62,000	CY	$5.00	$310,000
Erosion Control (Rain Gutters, Diversion Berms, Down Pipes, Drainage Channels, Etc.)	19.2	Acre	$15,000	$288,000
Revegetation	19.2	Acre	$1,500	$28,800
Surveying	19.2	Acre	$2,000	$38,400
			Subtotal:	$1,982,200
Bonds, Mobilization, & Insurance			(4% of Subtotal):	$79,288
			Subtotal:	$2,061,488
			Contingency (10%):	$206,149
			Construction Subtotal:	**$2,267,637**
Engineering	19.2	Acre	$2,000	$38,400
CQA	19.2	Acre	$6,000	$115,200
			TOTAL:	**$2,421,237**

Notes:

1. Assumes closure of 19.2 acres (Phase 5).

TABLE 3.1C: C&D - AREA 1 - CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2008 $)
Surface Preparation	12.9	Acre	$10,000	$129,000
Landfill Gas System	12.9	Acre	$15,000	$193,500
30 mil Textured LLDPE Geomembrane	562,000	SF	$0.45	$252,900
Drainage Geocomposite	562,000	SF	$0.55	$309,100
Vegetative Soil Layer (24")	42,000	CY	$5.00	$210,000
Erosion Control (Rain Gutters, Diversion Berms, Down Pipes, Drainage Channels, Etc.)	12.9	Acre	$15,000	$193,500
Revegetation	12.9	Acre	$1,500	$19,350
Surveying	12.9	Acre	$2,000	$25,800
			Subtotal:	$1,333,150
Bonds, Mobilization, & Insurance			(4% of Subtotal):	$53,326
			Subtotal:	$1,386,476
			Contingency (10%):	$138,648
			Construction Subtotal:	**$1,525,124**
Engineering	12.9	Acre	$2,000	$25,800
CQA	12.9	Acre	$6,000	$77,400
			TOTAL:	**$1,628,324**

Notes:

1. Assumes closure of 12.9 acres (Area 1).

TABLE 3.1D: C&D - AREA 2 - CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2008 $)
Surface Preparation	11.9	Acre	$10,000	$119,000
Landfill Gas System	11.9	Acre	$15,000	$178,500
30 mil Textured LLDPE Geomembrane	519,000	SF	$0.45	$233,550
Drainage Geocomposite	519,000	SF	$0.55	$285,450
Vegetative Soil Layer (24")	39,000	CY	$5.00	$195,000
Erosion Control (Rain Gutters, Diversion Berms, Down Pipes, Drainage Channels, Etc.)	11.9	Acre	$15,000	$178,500
Revegetation	11.9	Acre	$1,500	$17,850
Surveying	11.9	Acre	$2,000	$23,800
			Subtotal:	$1,231,650
Bonds, Mobilization, & Insurance			(4% of Subtotal):	$49,266
			Subtotal:	$1,280,916
			Contingency (10%):	$128,092
			Construction Subtotal:	**$1,409,008**
Engineering	11.9	Acre	$2,000	$23,800
CQA	11.9	Acre	$6,000	$71,400
			TOTAL:	**$1,504,208**

Notes:

1. Assumes closure of 11.9 acres (Area 2 - Cell 1).

TABLE 3.2A: MSW PHASES 1-4A - C&D AREAS 1-2 - POST-CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (2008 $)
Site Inspection And Record Keeping	80	HR	$75	$6,000
Revegetation (5% Total Area)	5	Acre	$1,500	$7,500
Mowing (once per year)	100	Acre	$100	$10,000
Erosion Control	1	LS	$5,000	$5,000
Gates/Fences	1	LS	$1,000	$1,000
Groundwater/Surface Water Monitoring & Reporting (36 Long-Term Wells/Points - Semi-Annual)	36	Each	$1,000	$72,000
Methane Monitoring & Reporting (Semi-Annual After Year 1)	2	Each	$2,500	$5,000
Leachate Management[2]	1	LS	$45,149	$45,149
			Subtotal:	$151,649
			Contingency (10%):	$15,165
			ANNUAL TOTAL:	**$166,814**
			30-YEAR TOTAL:	**$5,004,417**

Notes:

1. Assumes post-closure of 100 acres (MSW Phases 1-4A and C&D Areas 1 and Area 2 - Cell 1).
2. Leachate treatment based on 100 gal/ac/day x 41.3 acres lined x 365 x $20/1,000 gal. ($30,149/year) plus $5,000/year staff cost plus $3,000/year lab cost plus $2,000/year leachate collection line cleanout costs. Also include $5,000 per year to account for decommissioning leachate facilities (storage lagoon) (half of assumed $300,000 assumed cost) at the end of the post-closure period.

TABLE 3.2B: MSW PHASE 5 - POST-CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (2008 $)
Site Inspection And Record Keeping	20	HR	$75	$1,500
Revegetation (5% Total Area)	1	Acre	$1,500	$1,500
Mowing (once per year)	20	Acre	$100	$2,000
Erosion Control	1	LS	$5,000	$5,000
Gates/Fences	1	LS	$1,000	$1,000
Groundwater/Surface Water Monitoring & Reporting (17 Long-Term Wells/Points - Semi-Annual)	17	Each	$1,000	$34,000
Methane Monitoring & Reporting (Semi-Annual After Year 1)	2	Each	$2,500	$5,000
Leachate Management[2]	1	LS	$29,016	$29,016
			Subtotal:	$79,016
			Contingency (10%):	$7,902
			ANNUAL TOTAL:	**$86,918**
			30-YEAR TOTAL:	**$2,607,528**

Notes:

1. Assumes post-closure of 19.2 acres (MSW Phase 5).
2. Leachate treatment based on 100 gal/ac/day x 19.2 acres lined x 365 x $20/1,000 gal. ($14,016/year) plus $5,000/year staff cost plus $3,000/year lab cost plus $2,000/year leachate collection line cleanout costs. Also include $5,000 per year to account for decommissioning leachate facilities (storage lagoon) (half of assumed $300,000 assumed cost) at the end of the post-closure period.

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