



November 1, 2012

John Murray, PE
Regional Engineer
NC DENR – DWM
Mooresville, NC 28115
Phone: (704) 235-2163

Via email at: john.murray@ncmail.net

Dear John:

Subject: Greenway Waste Solutions of Apex, LLC Financial Assurance
Greenway Waste Solutions of Apex, LLC
Permit No. 6013-CDLF-1992
CEC Project No. 111-370

On behalf of Greenway Waste Solutions of Apex, LLC, please find attached a written estimate, in current dollars, of the cost of hiring a third party to close the entire area of all C&DLF units, post-closure estimates, and corrective action estimates per 15A NCAC 13B .0546. The \$2,000,000 Corrective Action cost estimate was prepared using a scenario of groundwater contamination at the facility. The selected remedy assumed was natural attenuation with monitoring for 30 years. The estimate was divided into 16 separate action items per 15A NCAC 13B .0545.

Once you have approved the cost estimate, Greenway Waste Solutions of Apex, LLC will establish financial assurance for closure, post-closure, and corrective action pursuant to G.S. 130A-294(b) and 130A-309.27.

Please let me know if you have any questions or comments. I can be reached at (704) 773-6465 or by e-mail at sbrown@cecinc.com.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Scott L. Brown, PE
Vice President

Cc: Ron Gilkerson, Greenway Waste Solutions of Apex, LLC

Attachment

Civil & Environmental Consultants, Inc.

Charlotte	2030 S. Tryon Street Suite 3E Charlotte, North Carolina 28203 Ph: 980/224-8104 / Fx: 980/224-8172 Toll Free: 855/859-9932 charlotte@cecinc.com www.cecinc.com	Austin	855/365-2324	Columbus	888/598-6808	North Central PA	877/321-2324
		Boston	866/312-2024	Detroit	866/380-2324	Phoenix	877/231-2324
		Chicago	877/963-6026	Export	800/899-3610	Pittsburgh	800/365/2324
		Cincinnati	800/759-5674	Indianapolis	877/746-0749	St. Louis	866/250-3679
		Cleveland	866/507-2324	Nashville	800/763-2326	Toledo	888/598-6808

**Summary of Closure, Post-Closure, and Corrective Action Estimated Costs
Greenway Waste Solutions of Apex, LLC**

Facility Name: Greenway Waste Solutions of Apex, LLC
Permit Number: 92-30
Facility Address: Old Smithfield Rd, Apex, NC
Facility Owner: Greenway Waste Solutions of Apex, LLC
Date Completed: November 1, 2012

Operational C&D Landfill

Total Area Requiring Closure: 23.95 Acres
Total Area Requiring Post-Closure Care: 23.95 Acres

Total Closure Estimated Cost	\$1,642,000
Total Post-Closure Estimated Cost	<u>\$1,050,000</u>
Total Closure and Post-Closure Care (For 30 Year Period)	\$2,692,000

Corrective Action

Total Corrective Action	\$2,000,000
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TOTAL CLOSURE, POST-CLOSURE, AND CORRECTIVE ACTION	<u>\$4,692,000</u>
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North Carolina Board of Examiners for
Engineers and Surveyors
License No. C-3035

Scott L. Brown

November 1, 2012



Worksheet 1: ESTIMATION OF CLOSURE COSTS

Greenway Waste Solutions of Apex, LLC

Facility Name: Greenway Waste Solutions of Apex, LLC
 Permit Number: 92-30
 Facility Address: Old Smithfield Rd, Apex, NC
 Facility Owner: Greenway Waste Solutions of Apex, LLC
 Date Completed: November 1, 2012

Total Surface Area:	17.80	Acres
Total Surface Area with Composite Cap System:	0.00	Acres
Total Surface Area with only Soil Cover:	17.80	Acres
Total Area for LFG Management System:	17.80	Acres

II. PROTECTIVE (CLAY) SOIL COVER

a. Surface area	17.80	acres x 4,840 yd ² /acre	86,152	yd ²
b. Depth of soil for slope and fill	18	inches x 1 yd/36 in	0.50	yd
c. Quantity of soil needed		a x b	43,076	yd ³
d. Percentage of soil from off-site	0%	%	0%	
e. Purchase unit cost off-site material (to include delivery cost)	\$0.00	per yd ³	\$0.00	/yd ³
f. Percentage of soil from on-site	100%	(1 - d)	100%	
g. Excavation unit cost (on-site material)	\$ 4.15	per yd ³	\$4.15	per yd ³
h. Total soil unit cost		(d x e + f x g)	\$4.15	
i. Placement and spreading unit cost	\$ 1.50	per yd ³	\$1.50	per yd ³
j. Compaction unit cost	\$ 1.43	per yd ³	\$1.43	per yd ³
k. Total soil unit cost		(h + i + j)	\$7.08	/yd ³
l. Total soil cost			\$305,107.31	
m. Percent compaction	80%		80%	
<i>Subtotal</i>		<i>(l x (1 + m))</i>		<u>\$549,193</u> <u>\$550,000</u>

III. TOPSOIL COVER

a. Surface area	17.80	acres x 4,840 yd ² /acre	86,152	yd ²
b. Depth of topsoil needed	18	inches x 1 yd/36 in	0.50	yd
c. Quantity of topsoil needed		a x b	43,076	yd ³
d. Percentage of soil from off-site	0%	%	0%	
e. Purchase unit cost off-site material (to include delivery cost)	\$0.00	per yd ³	\$0.00	/yd ³
f. Percentage of soil from on-site	100%	(1 - d)	100%	
g. Excavation unit cost (on-site material)	\$ 4.15	per yd ³	\$4.15	per yd ³
h. Total soil unit cost		(d x e + f x g)	\$4.15	
i. Placement and spreading unit cost	\$ 1.50	per yd ³	\$1.50	per yd ³
j. Compaction unit cost (Not Required)	\$ -	per yd ³	\$0.00	per yd ³
k. Total soil unit cost		(h + i + j)	\$5.65	/yd ³
l. Total soil cost			\$243,508.63	
m. Percent compaction	80%		80%	
<i>Subtotal</i>		<i>(l x (1 + m))</i>		<u>\$438,316</u> <u>\$439,000</u>

IV. VEGETATIVE COVER

a. Surface area	17.80	acres	17.8	acres		
b. Unit cost for soil preparation, grading, seed, and fertilizer	\$ 1,984.40	per acre	\$1,984.40	per acre		
<i>Subtotal</i>		<i>(a x b)</i>			<u>\$35,322</u>	<u>\$36,000</u>

VIII. LANDFILL GAS (LFG) MANAGEMENT SYSTEM

a. Number of acres	17.80	acres	17.80	acres		
b. Average passive LFG system unit cost	\$1,882.00	per acre	\$1,882.00	per acre		
<i>Subtotal</i>		<i>(a x b)</i>			<u>\$33,500</u>	<u>\$34,000</u>

VIII. MOBILIZATION / DEMOBILIZATION / INSURANCE / BONDS

a. Cost for Mobilization / Demobilization / Insurance / Bonds	\$10,000.00	lump sum	\$10,000.00	lump sum		
<i>Subtotal</i>					<u>\$10,000</u>	<u>\$10,000</u>

X. SEDIMENT AND EROSION CONTROL AND STORM WATER MANAGEMENT

a. Sediment and erosion control	\$10,000.00	lump sum	\$10,000.00	lump sum		
b. Grass lined channel length	600	linear foot	600	linear foot		
c. Grass lined channel with matting unit cost	\$ 10.00	per linear foot	\$10.00	per LF		
d. Total grass lined channel cost		<i>(b x c)</i>	\$6,000.00			
e. Slope down drain piping length	1,800	linear foot	1,800	linear foot		
f. Piping unit cost (18-inch PE)	\$ 20.62	per linear foot	\$20.62	per LF		
g. Total slope drain piping cost		<i>(e x f)</i>	\$37,116.00			
h. Outlet and inlet protection	6	each	6	each		
i. Outlet and inlet protection unit cost (20 SY each)	\$1,728.00	per each	\$1,728.00	per each		
j. Total outlet and inlet protection cost		<i>(h x i)</i>	\$10,368.00			
<i>Subtotal</i>		<i>(a + d + g + j)</i>			<u>\$63,484</u>	<u>\$64,000</u>

XI. ENGINEERING, CQA TESTING AND CERTIFICATION

a. Number of acres to be capped	17.80	acres	17.80	acres		
b. Cost for engineering services	\$35,000.00	lump sum	\$35,000.00	lump sum		
c. CQA testing / field services and documentation unit cost	\$ 882.80	per acre	\$882.80	per acre		
d. Total CQA testing / field services and documentation cost		<i>(a x c)</i>	\$15,713.84			
<i>Subtotal</i>		<i>(b + d)</i>			<u>\$50,714</u>	<u>\$51,000</u>

XII. SURVEY AND DEED NOTATION

a. Area	17.80	acres	17.80	acres		
b. Survey unit cost	\$500.00	per acre	\$500.00	per acre		
<i>Subtotal</i>		<i>(a x b)</i>			<u>\$8,900</u>	<u>\$9,000</u>

XIII. ADMINISTRATION

a. Announcements, deeds, fees, etc. cost	\$5,000	lump sum	\$5,000.00	lump sum		
<i>Subtotal</i>					<u>\$5,000</u>	<u>\$5,000</u>

TOTAL ESTIMATED CLOSURE COST \$1,198,000

Worksheet 2: ESTIMATION OF CLOSURE COSTS
Greenway Waste Solutions of Apex, LLC

Facility Name: Greenway Waste Solutions of Apex, LLC
 Permit Number: 92-30
 Facility Address: Old Smithfield Rd, Apex, NC
 Facility Owner: Greenway Waste Solutions of Apex, LLC
 Date Completed: November 1, 2012

Total Surface Area: 6.15 Acres
 Total Surface Area with Composite Cap System: 0.00 Acres
 Total Surface Area with only Soil Cover: 6.15 Acres
 Total Area for LFG Management System: 6.15 Acres

II. PROTECTIVE (CLAY) SOIL COVER

a. Surface area	6.15	acres x 4,840 yd ² /acre	29,766	yd ²	
b. Depth of soil for slope and fill	18	inches x 1 yd/36 in	0.50	yd	
c. Quantity of soil needed		a x b	14,883	yd ³	
d. Percentage of soil from off-site	0%	%	0%		
e. Purchase unit cost off-site material (to include delivery cost)	\$0.00	per yd ³	\$0.00	/yd ³	
f. Percentage of soil from on-site	100%	(1 - d)	100%		
g. Excavation unit cost (on-site material)	\$ 4.15	per yd ³	\$4.15	per yd ³	
h. Total soil unit cost		(d x e + f x g)	\$4.15		
i. Placement and spreading unit cost	\$ 1.50	per yd ³	\$1.50	per yd ³	
j. Compaction unit cost	\$ 1.43	per yd ³	\$1.43	per yd ³	
k. Total soil unit cost		(h + i + j)	\$7.08	/yd ³	
l. Total soil cost			\$105,416.29		
m. Percent compaction	80%		80%		
<i>Subtotal</i>		<i>(l x (1 + m))</i>			<u>\$189,749</u> <u>\$190,000</u>

III. TOPSOIL COVER

a. Surface area	6.15	acres x 4,840 yd ² /acre	29,766	yd ²	
b. Depth of topsoil needed	18	inches x 1 yd/36 in	0.50	yd	
c. Quantity of topsoil needed		a x b	14,883	yd ³	
d. Percentage of soil from off-site	0%	%	0%		
e. Purchase unit cost off-site material (to include delivery cost)	\$0.00	per yd ³	\$0.00	/yd ³	
f. Percentage of soil from on-site	100%	(1 - d)	100%		
g. Excavation unit cost (on-site material)	\$ 4.15	per yd ³	\$4.15	per yd ³	
h. Total soil unit cost		(d x e + f x g)	\$4.15		
i. Placement and spreading unit cost	\$ 1.50	per yd ³	\$1.50	per yd ³	
j. Compaction unit cost (Not Required)	\$ -	per yd ³	\$0.00	per yd ³	
k. Total soil unit cost		(h + i + j)	\$5.65	/yd ³	
l. Total soil cost			\$84,133.60		
m. Percent compaction	80%		80%		
<i>Subtotal</i>		<i>(l x (1 + m))</i>			<u>\$151,440</u> <u>\$152,000</u>

IV. VEGETATIVE COVER

a. Surface area	6.15	acres	6.15	acres	
b. Unit cost for soil preparation, grading, seed, and fertilizer	\$ 1,984.40	per acre	\$1,984.40	per acre	
<i>Subtotal</i>		<i>(a x b)</i>			<u>\$12,204</u> <u>\$13,000</u>

VIII. LANDFILL GAS (LFG) MANAGEMENT SYSTEM

a. Number of acres	6.15	acres	6.15	acres	
b. Average passive LFG system unit cost	\$1,882.00	per acre	\$1,882.00	per acre	
<i>Subtotal</i>		<i>(a x b)</i>			<u>\$11,574</u> <u>\$12,000</u>

VIII. MOBILIZATION / DEMOBILIZATION / INSURANCE / BONDS

a. Cost for Mobilization / Demobilization / Insurance / Bonds	\$10,000.00	lump sum	\$10,000.00	lump sum	
<i>Subtotal</i>					<u>\$10,000</u> <u>\$10,000</u>

X. SEDIMENT AND EROSION CONTROL AND STORM WATER MANAGEMENT

a. Sediment and erosion control	\$10,000.00	lump sum	\$10,000.00	lump sum	
b. Grass lined channel length	180	linear foot	180	linear foot	
c. Grass lined channel with matting unit cost	\$ 10.00	per linear foot	\$10.00	per LF	
d. Total grass lined channel cost		(b x c)	\$1,800.00		
e. Slope down drain piping length	0	linear foot	0	linear foot	
f. Piping unit cost (18-inch PE)	\$ 20.62	per linear foot	\$20.62	per LF	

g. Total slope drain piping cost		(e x f)	\$0.00			
h. Outlet and inlet protection	3	each	3	each		
i. Outlet and inlet protection unit cost (20 SY each)	\$1,728.00	per each	\$1,728.00	per each		
j. Total outlet and inlet protection cost		(h x i)	\$5,184.00			
<i>Subtotal</i>		(a + d + g + j)			<u>\$16,984</u>	<u>\$17,000</u>
XI. ENGINEERING, CQA TESTING AND						
a. Number of acres to be capped	6.15	acres	6.15	acres		
b. Cost for engineering services	\$35,000.00	lump sum	\$35,000.00	lump sum		
c. CQA testing / field services and documentation unit cost	\$ 882.80	per acre	\$882.80	per acre		
d. Total CQA testing / field services and documentation cost		(a x c)	\$5,429.22			
<i>Subtotal</i>		(b + d)			<u>\$40,429</u>	<u>\$41,000</u>
XII. SURVEY AND DEED NOTATION						
a. Area	6.15	acres	6.15	acres		
b. Survey unit cost	\$500.00	per acre	\$500.00	per acre		
<i>Subtotal</i>		(a x b)			<u>\$3,075</u>	<u>\$4,000</u>
XIII. ADMINISTRATION						
a. Announcements, deeds, fees, etc. cost	\$5,000	lump sum	\$5,000.00	lump sum		
<i>Subtotal</i>					<u>\$5,000</u>	<u>\$5,000</u>
TOTAL ESTIMATED CLOSURE COST					<u>\$44,000</u>	<u>\$44,000</u>

Worksheet 3: ESTIMATION OF POST-CLOSURE COSTS

Greenway Waste Solutions of Apex, LLC

Facility Name: Greenway Waste Solutions of Apex, LLC
 Permit Number: 92-30
 Facility Address: Old Smithfield Rd, Apex, NC
 Facility Owner: Greenway Waste Solutions of Apex, LLC
 Date Completed: November 1, 2012

I. MONITORING

a. Total number of monitoring events per year	<input type="text" value="2"/>	events/year	2	events/year		
b. Sampling, analysis, and reporting	<input type="text" value="\$ 5,184.00"/>		\$5,184	per year		
<i>Annual Subtotal</i>		<i>(a x b)</i>			<u>\$10,368</u>	<u>\$11,000</u>

II. ROUTINE MAINTENANCE AND REPAIRS

a. Mowing frequency	<input type="text" value="2"/>	visits/year	2	visits/yr		
b. Area involved in maintenance and repairs	<input type="text" value="23.20"/>	acres	23.20	acres		
c. Mowing unit cost per visit	<input type="text" value="\$ 77.10"/>	/acre/visit	\$ 77.10	/acre/visit		
d. Total mowing cost per year		<i>(a x b x c)</i>	\$3,577	per year		
e. Area reseed and fertilized	<input type="text" value="2"/>	acres per year	2	acres per year		
f. Fertilizer unit cost	<input type="text" value="\$100"/>	per acre	\$100	per acre		
g. Total fertilizer cost per year		<i>(e x f)</i>	\$200	per year		
h. Reseeding unit cost	<input type="text" value="\$800"/>	per acre	\$800	per acre		
i. Total reseeding cost per year		<i>(e x h)</i>	\$1,600	per year		
j. Cap erosion and settlement repair cost (assume 2.5% of cap area repaired annually)	<input type="text" value="1,871"/>	cy	1,871	cy		
k. Cap erosion and settlement repair unit cost	<input type="text" value="\$ 7.08"/>	per cy	\$ 7.08	per cy		
l. Total cap erosion and settlement repair cost per year		<i>(j x k)</i>	\$13,256	per year		
<i>Annual Subtotal</i>		<i>(d + g + i + l)</i>			<u>\$18,633</u>	<u>\$19,000</u>

III. ACCESS, SECURITY, AND SIGNS

a. Access, security and signs	<input type="text" value="\$ 500.00"/>		\$500	per year		
<i>Annual Subtotal</i>					<u>\$500</u>	<u>\$1,000</u>

IV. FEES, INSPECTION, AND REPORTING

a. Fees	<input type="text" value="\$500"/>	DENR Fee Schedule	\$500	per year		
b. Inspection services and reporting	<input type="text" value="\$3,000"/>		\$3,000	per year		
<i>Annual Subtotal</i>		<i>(a + b)</i>			<u>\$3,500</u>	<u>\$4,000</u>

TOTAL ESTIMATED ANNUAL POST-CLOSURE CARE COST **\$35,000**

LENGTH OF POST-CLOSURE CARE PERIOD

TOTAL ESTIMATED POST-CLOSURE CARE COST FOR 30-YEAR PERIOD **\$1,050,000**

Worksheet 4: Suggested and Minimum Default Values

I. Native soil - Excavate, Load, and Haul

native soil	Excavating, Bulk Bank Measure, excavator, hydraulic, crawler mounted, 2 CY capacity	\$	1.42	CY	Means 02315 424 0260
loading	add 15%	\$	0.21	CY	Means 02315 400 0020
hauling	Hauling, Excavated or Borrow, Off Highway Haulers, 1/2 mile round trip, 4.2 loads/hr, 22 CY rear or bottom dump	\$	2.52	CY	Means 02315 490 2020
Subtotal:		\$	4.15	CY	

II. Native soil - Place and Spread

Spread	Spread fill, from stockpile with dozer 300 HP, 300' haul	\$	1.50	CY	Means 02315 300 5600
Subtotal:		\$	1.50	CY	

III. Native soil - Compact

Compact - Sheepsfoot	Compaction, Sheepsfoot or wobbly wheel roller, 6" lifts, 3 passes	\$	0.96	CY	Means 02315 310 5620
Compact - Vibrating Roller	Compaction, Vibrating roller, 6" lifts, 3 passes	\$	0.47	CY	Means 02315 310 5020
Subtotal:		\$	1.43	CY	

IV. Topsoil

Topsoil	Purchase price delivered	\$	13.10	CY	Means 02315 0200 7000
Spread	Spread by dozer, 50' haul	\$	1.50	CY	Means 02315 410 2020
Compact - Sheepsfoot	Compaction, Sheepsfoot or wobbly wheel roller, 6" lifts, 3 passes	\$	0.96	CY	Means 02315 310 5620
Subtotal:		\$	15.56	CY	

V. Stone

stone	purchase price delivered	\$	7.50	CY	Means 02315 200 5000
spread stone	spread by dozer 50' haul	\$	1.31	CY	Means 02315 410 2000
Subtotal:		\$	8.81	CY	

VI. Clay - Excavate, Load, and Haul (on-site and off-site)

clay	purchase price delivered	\$	4.11	CY	Means
soil	excavation	\$	1.63	CY	Means 02315 400 0200
clay	add 60% for clay	\$	0.97	CY	Means 02315 400 4100
loading	add 15%	\$	0.24	CY	Means 02315 400 0020
hauling	12 CY truck 1/2 mile onsite	\$	2.52	CY	Means 02320 200 0320
Subtotal:		\$	5.36	CY	

VII. Clay soil - Place and Spread

spread clay	spread by dozer 50' haul	\$	1.38	CY	Means 02314 505 0010
Subtotal:		\$	1.38	CY	

VIII. Clay soil - Compact

compact clay	sheepsfoot 4 passes	\$	0.83	CY	Means 02315 300 6030
compact clay	vibrating roller 4 passes	\$	0.96	CY	Means 02315 300 6220
Subtotal:		\$	1.79	CY	

IX. Drainage Pipe

pipe	6"pvc	\$	4.22	LF	Means 02620 210 3020
trenching	48" deep compact add 50%	\$	0.99	LF	Means 02315 940 2600
18" PE Down drain pipe	Piping, Drainage & Sewage, Corrugated HDPE, Type S, not including excavation and backfill, bell & spigot, with gaskets, 18" diameter	\$	18.62	LF	Means 334113501060
	Elbows	\$	321.80	EA	Means 334113501160
	Tees	\$	488.50	EA	Means 334113501280
24" PE Down drain pipe	Piping, Drainage & Sewage, Corrugated HDPE, Type S, not including excavation and backfill, bell & spigot, with gaskets, 24" diameter	\$	26.22	LF	Means 334113501070
	Elbows	\$	475.80	EA	Means 334113501170
	Tees	\$	612.50	EA	Means 334113501300
30" PE Down drain pipe	Piping, Drainage & Sewage, Corrugated HDPE, Type S, not including excavation and backfill, bell & spigot, with gaskets, 30" diameter	\$	39.31	LF	Means 334113501080

	Elbows		\$	671.80	EA	Means 334113501180
	Tees		\$	858.50	EA	Means 334113501320
	Riprap Outlet (Machine placed, 18" min thickness)		\$	86.40	SY	Means 02370 450 0200
				Subtotal:		
X.	Synthetic Membrane					
	60 mil HDPE		\$	0.33	SF	Agru Quote for Allied (04-30-08)
	40 mil PVC		\$	0.25	SF	Means 33 08 0563
	40 mil Texturtd LLDPE		\$	0.18	SF	Price from Morris Farms
	installation and testing		\$	0.10	SF	Price from Morris Farms
				Subtotal:	\$	0.86 CY
XI.	Geotextile Filter Fabric					
	10 oz Geotextile		\$	0.07	SF	Means 33 080533
	installation		\$	0.01	SF	Local Installer Aug 2010
				Subtotal:	\$	0.08 CY
XII.	Geonet/geocomposite					
	Geonet .25 inch		\$	0.14	SF	Means 33 08 0511
	Geonet Geotextile 1 side		\$	0.30	SF	Means 33 08 0512
	geonet Geotextile 2 sides		\$	0.46	SF	Agru Quote for Allied (04-30-08)
	installation		\$	0.09	SF	Price from 2008 FA
				Subtotal:	\$	0.99 CY
XIII.	Geosynthetic clay liner					
	bentomat	Installed cost	\$	0.40	SF	Local Installer Aug 2000
				Subtotal:	\$	0.40 SF
XIV.	Soil Testing					
	Density	5/acre 35.36 EA	\$	177.80	AC	Means 33 08 0506 02231 2101
	Moisture Density Curve	1/acre	\$	80.00	AC	Proctor (ASTM D698) - Price from ACC
	Grain Size	1/acre	\$	55.00	AC	Particle Size (ASTM D422) - Price from ACC
	Moisture	5/acre 5.00 ea	\$	25.00	AC	Moisture (ASTM D2216) - Price from ACC
	Undisturbed Permeability	3/acre 18" soil 165.00EA	\$	495.00	AC	UD Perm (ASTM D5084) - Price from ACC
	Atterberg Limits	1/acre	\$	50.00	AC	Atterberg (ASTM D4318) - Price from ACC
				Subtotal:	\$	882.80 AC
XV.	Vegetative cover					
	Hydro seeding	Seeding, Mechanical Seeding, Hydro or air seeding for large areas, including seed and fertilizer, with wood fiber mulch added (\$0.41 per sy)	\$	1,984.40	AC	Means 02920 310 1100
				Subtotal:	\$	1,984.40 AC
XVI.	Landfill Gas Management System					
	Gas Probe	Assume 50' Probe, 20' Screen, 25' filter pack				
	boring	11" hollow stem auger (50' @ \$26.00/LF)	\$	1,300.00	EA	Means 33 23 1103
	screen	2" schedule 40 (20' @ \$10.00/LF)	\$	200.00	EA	Means 33 23 0211
	casing	2" schedule 40 (30' @ \$7.00/LF)	\$	210.00	EA	Means 33 23 0101
	filter pack	2" screen filter pack (25' @ \$8.00/LF)	\$	200.00	EA	Means 33 23 1401
	bentonite seal		\$	30.00	EA	Means 33 23 2101
	surface pad		\$	175.00	EA	Means 33 23 1502
				Probe Cost	\$	2,115.00 EA Means
	Gas Vent	Assume 40' vent, 20' screen, 30" diam.				
	drilling	bored piles 30" dia (40' @ \$41.00/LF)	\$	1,640.00	EA	Means 02465 600 0300
	screen	6" sch 40 (20' @ \$22.00/LF)	\$	440.00	EA	Means 33 23 0203
	casing	6" sch 40 (20' @ \$12.00/LF)	\$	240.00	EA	Means 33 23 0103
	stone	6 CY @ \$26.00/CY	\$	156.00	EA	Means 023 15 130 0100
	bentonite seal	Use 12" Means: 8 CF @ \$161.00/CF	\$	1,288.00	EA	Means 33 23 1806
				Vent Cost	\$	3,764.00
				Subtotal:	\$	5,879.00 EA

XVII. Sediment & Erosion Control and Stormwater Management

Grass Lined Channel		\$	10.00	LF	Morgan Corp quote for Anderson Landfill
Matting	\$1.96 per sy for 4 ft wide roll	\$	0.87	LF	Means 02370 700 0020
		Subtotal:	\$ 10.87	LF	

XVIII. Groundwater Monitoring Well

well boring, hollow stem auger	Up to 100 foot depth (50' @ \$16.11/LF)	\$	805.50	EA	Means 33 23 1101
casing	2" diameter pvc, sch 40 (40' @ \$6.86/LF)	\$	274.40	EA	Means 33 23 0101
screen	2" diameter pvc, sch 40 (10' @ \$9.85/lf)	\$	394.00	EA	Means 33 23 0201
		Subtotal:	\$ 1,473.90	EA	

XIX. Groundwater Monitoring - Analytical

conductivity		\$	11.75	EA	Means 33 02 0505
pH		\$	9.13	EA	Means 33 02 0505
TOC		\$	23.33	EA	Means 33 02 0505
TOX		\$	90.00	EA	Means 33 02 0505
hardness		\$	11.50	EA	Means 33 02 1639
sodium		\$	11.56	EA	Means 33 02 0508
chloride		\$	16.67	EA	Means 33 02 1653
iron		\$	11.56	EA	Means 33 02 0508
lead		\$	11.56	EA	Means 33 02 0508
Appendix I List	\$180-\$225 depending on number of wells sampled	\$	200.00	EA	Local consultant January 2001
Appendix II List	\$640-\$810 depending on the number of wells sampled	\$	725.00	EA	Local Consultant January 2001
		Subtotal:	\$ 397.06	EA	

XX. Groundwater Monitoring - Sampling

Personnel		\$	100.00	Well estimate	
Equipment		\$	50.00	Well estimate	
		Subtotal:	\$ 150.00	EA	

XXI. Gas Monitoring

LANDTEC GEM-200		\$	125.00	day	Price from Enviro-Pro
mobilization		\$	150.00	event	estimate
field technician	1 technician @ 75/hr for 8 hours	\$	600.00	event	estimate
engineer	report preparation @ \$120/hr for 4 hours	\$	480.00	event	estimate
		Subtotal:	\$ 1,355.00	event	

XXII. Routine Maintenance and Repairs

Mowing	Mowing with tractor & attachments, lawn mowing, smooth terrain, 5' (\$1.77 / 1,000 sf * 43,560 sf/acre)	\$	77.10	AC	Means 029353004210
reseeding	Hydroseeding	\$	800.00	AC	Hydro Spec Cost Estimate for Lee County
fertilizer	Fertilizer	\$	100.00	AC	
		Subtotal:	\$ 977.10	AC	

XXIII. Erosion Repair

native soil	Excavating, Bulk Bank Measure, excavator, hydraulic, crawler mounted, 2 CY capacity	\$	1.42	CY	Means 02315 424 0260
loading	add 15%	\$	0.21	CY	Means 02315 400 0020
hauling	Hauling, Excavated or Borrow, Off Highway Haulers, 1/2 mile round trip, 4.2 loads/hr, 22 CY rear or bottom dump	\$	2.52	CY	Means 02315 490 2020
spread native soil	Spread fill, from stockpile with dozer 300 HP, 300' haul	\$	1.50	CY	Means 02315 300 5600
Compact - Sheepsfoot	Compaction, Sheepsfoot or wobbly wheel roller, 6" lifts, 3 passes	\$	0.96	CY	Means 02315 310 5620
Compact - Vibrating Roller	Compaction, Vibrating roller, 6" lifts, 3 passes	\$	0.47	CY	Means 02315 310 5020
		Subtotal:	\$ 7.08	CY	

XXIV. Leachate Management

Treatment at POTW	based on 1.50/1000 gal	\$	0.0015	Gal	Means 33 19 7103
hauling		\$	0.03	Gal	
		Subtotal:	\$ 0.0315	Gal	

ESTIMATION OF CORRECTIVE ACTION COST
ASSUMED SCENARIO - GROUNDWATER CONTAMINATION - NATURAL ATTENUATION REMEDY
Greenway Waste Solutions of Apex, LLC

Facility Name: Greenway Waste Solutions of Apex, LLC
 Permit Number: 92-30
 Facility Address: Old Smithfield Rd, Apex, NC
 Facility Owner: Greenway Waste Solutions of Apex, LLC
 Date Completed: November 1, 2012

	<u>DESCRIPTION</u>	<u>ESTIMATED COST</u>		<u>COMMENT</u>	
I.	Installation of at least one wells at the compliance boundary	\$	16,572	\$ <u>17,000</u>	15A NCAC 13B .0545 (a)
II.	Submit an assessment monitoring work plan for Division review	\$	24,475	\$ <u>25,000</u>	15A NCAC 13B .0545 (a and b)
III.	Appendix II Background Sampling of Groundwater Monitoring Network (4 events per 11 sampling locations).	\$	45,616	\$ <u>46,000</u>	15A NCAC 13B .0545 (a and b)
IV.	Appendix II Sampling of Original Well Network and Compliance Boundary Wells Annually (First Semi-Annual Monitoring Event)	\$	15,955	\$ <u>16,000</u>	15A NCAC 13B .0545 (a and b)
V.	Appendix I and II Detects Sampling of Original Well Network and Compliance Boundary Wells Annually (Second Semi-Annual Monitoring Event)	\$	12,310	\$ <u>13,000</u>	15A NCAC 13B .0545 (a and b)
VI.	Installation of additional monitoring wells to characterize the nature and extent (N&E) of the plume	\$	52,187	\$ <u>53,000</u>	15A NCAC 13B .0545 (a and b)
VII.	Appendix II Background Sampling of N&E Monitoring Network (4 events per sampling location)	\$	33,596	\$ <u>34,000</u>	15A NCAC 13B .0545 (b)
VIII.	Appendix II Sampling of N&E Well Network Annually (First Semi-Annual Monitoring Event)	\$	13,725	\$ <u>14,000</u>	15A NCAC 13B .0545 (b)
IX.	Appendix I and II Detects Sampling of N&E Well Network Annually (Second Semi-Annual Monitoring Event)	\$	11,192	\$ <u>12,000</u>	15A NCAC 13B .0545 (b)
X.	Assessment of Corrective Measures (Report, Public Notice, Public Meeting)	\$	38,924	\$ <u>39,000</u>	15A NCAC 13B .0545 (c and d)
XI.	Selection of Remedy	\$	17,376	\$ <u>18,000</u>	15A NCAC 13B .0545 (e)
XII.	Corrective Action Plan Submittal, Approval, and Implementation	\$	1,659,493	\$ <u>1,660,000</u>	15A NCAC 13B .0545 (e and h)
XIII.	Installation of Additional Monitoring Wells to Monitor Effectiveness of Selected Remedy	\$	32,830	\$ <u>33,000</u>	15A NCAC 13B .0545 (e and h)
XIV.	Maintenance and Repair of Additional Monitoring Wells	\$	7,200	\$ <u>8,000</u>	15A NCAC 13B .0545 (e and h)
XV.	Sampling and Analysis of Additional Monitoring Wells	\$	-	\$ -	15A NCAC 13B .0545 (e and h)
XVI.	Corrective Action Remedy is Complete	\$	11,400	\$ <u>12,000</u>	15A NCAC 13B .0545 (l, m, n)
ESTIMATE OF PROBABLE COST - CORRECTIVE ACTION SCENARIO				\$ <u>2,000,000</u>	

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK I

15A NCAC 13B .0545 (a)

Installation of at least one wells at the compliance boundary

Well Development and Slug Testing (2 days)	<i>subtotal</i>	\$	2,108.00
Well Survey	<i>subtotal</i>	\$	1,440.00
Soil Laboratory Classification	<i>subtotal</i>	\$	214.00
Drilling Services	<i>subtotal</i>	\$	7,142.00
Drilling Oversight	<i>subtotal</i>	\$	3,018.00
Boring Logs, Well Logs, and Estimation of Groundwater Flow	<i>subtotal</i>	\$	2,650.00
	Total	\$	16,572.00

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK II

15A NCAC 13B .0545 (a and b)

Submit an assessment monitoring work plan for Division review

Project Professional

subtotal \$ 24,475.00

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK III

15A NCAC 13B .0545 (a and b)

Appendix II Background Sampling of Groundwater Monitoring Network

(4 events per sampling location)

11 Well Locations, 3 Days to Sample

Analytical (4 events)

subtotal \$ 29,418.40

Field Work (4 events)

subtotal \$ 16,115.40

Reporting (1 event)

subtotal \$ 3,489.00

Total \$ 45,615.80

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK IV

15A NCAC 13B .0545 (a and b)

Appendix II Sampling of Original Well Network and Compliance Boundary Wells Annually
(First Semi-Annual Monitoring Event)

13 Well Locations, 2 Days to Sample

Analytical (1 event)

subtotal \$ 8,013.20

Field Work (1 event)

subtotal \$ 4,481.68

Reporting (1 event)

subtotal \$ 3,460.00

Total \$ 15,954.88

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK V

15A NCAC 13B .0545 (a and b)

Appendix I and II Detects Sampling of Original Well Network and Compliance Boundary Wells Annually
(Second Semi-Annual Monitoring Event)

Analytical (1 event)	<i>subtotal</i>	\$	8,013.20
Field Work (1 event)	<i>subtotal</i>	\$	1,428.81
Reporting (1 event)	<i>subtotal</i>	\$	2,868.00
	Total	\$	12,310.01

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK VI

15A NCAC 13B .0545 (a and b)

Installation of additional monitoring wells to characterize the nature and extent (N&E) of the plume

6 shallow and 3 deep wells

Well Development and Slug Testing (5 days)

subtotal \$ 4,189.68

Well Survey

subtotal \$ 4,690.00

Soil Laboratory Classification

subtotal \$ 1,284.00

Drilling Services

subtotal \$ 27,158.00

Drilling Oversight

subtotal \$ 10,636.60

Boring Logs, Well Logs, and Estimation of Groundwater Flow

subtotal \$ 4,229.00

Total \$ 52,187.28

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK VII
15A NCAC 13B .0545 (b)
Appendix II Background Sampling of N&E Monitoring Network
(4 events per sampling location)

Analytical (4 events)

subtotal \$ 14,266.40

9 N&E Well Locations, 2 Days to Sample
Field Work (4 events)

subtotal \$ 12,942.95

Reporting (1 event)

subtotal \$ 6,386.50

Total \$ 33,595.85

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK VIII

15A NCAC 13B .0545 (b)

Appendix II Sampling of N&E Well Network Annually
(First Semi-Annual Monitoring Event)

Analytical (1 event)

subtotal \$ 6,037.40

9 N&E Well Locations, 2 Days to Sample
Field Work (1 event)

subtotal \$ 3,702.80

Reporting (1 event)

subtotal \$ 3,984.50

Total \$ 13,724.70

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK IX
15A NCAC 13B .0545 (b)
Appendix I and II Detects Sampling of N&E Well Network Annually
(Second Semi-Annual Monitoring Event)

Analytical (1 event) Assume Appendix I VOCs, Appendix I Metals, and Appendix II Semi's	<i>subtotal</i>	\$	3,575.00
9 N&E Well Locations, 2 Days to Sample Field Work (1 event)	<i>subtotal</i>	\$	3,177.98
Reporting (1 event)	<i>subtotal</i>	\$	4,439.00
	Total	\$	11,191.98

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK X
15A NCAC 13B .0545 (c and d)
Assessment of Corrective Measures
(Report, Public Notice, Public Meeting)

ACM Report

subtotal \$ 31,163.50

Public Notice

subtotal \$ 4,070.00

Public Meeting

subtotal \$ 3,690.00

Total \$ 38,923.50

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK XI

15A NCAC 13B .0545 (e)

Selection of Remedy

Permit Modification

subtotal \$ 2,376.00

Permit Modification Fee

subtotal \$ 15,000.00

Total \$ 17,376.00

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK XII
15A NCAC 13B .0545 (e and h)
Corrective Action Plan Submittal, Approval, and Implementation

CAP Report	<i>subtotal</i>	\$	25,475.00
CAP Implementation (MNA) Field Work	<i>subtotal</i>	\$	53,408.00
Analytical	<i>subtotal</i>	\$	13,491.80
Reporting and MNA Screening Model	<i>subtotal</i>	\$	71,644.00
MNA Effectiveness Sampling and Reporting Field Work	<i>subtotal</i>	\$	663,000.00
Analytical (40 events)	<i>subtotal</i>	\$	752,514.00
Corrective Action Evaluation Report (6 reports, 1 report every 5 years)	<i>subtotal</i>	\$	79,960.00
	Total	\$	1,659,492.80

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK XIII

15A NCAC 13B .0545 (e and h)

Installation of Additional Monitoring Wells to Monitor Effectiveness of Selected Remedy

Installation of 3 Performance Wells and 3 Sentinel Wells

Drilling Services

subtotal \$ 13,363.00

Drilling Oversight

subtotal \$ 6,964.00

Well Development and Slug Testing

subtotal \$ 4,164.00

Soil Laboratory Classification (for porosity estimates)

subtotal \$ 1,284.00

Well Survey

subtotal \$ 1,440.00

Boring Logs, Well Logs, and Estimation of Groundwater Flow

subtotal \$ 5,615.00

Total \$ 32,830.00

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK XIV
15A NCAC 13B .0545 (e and h)
Maintenance and Repair of Additional Monitoring Wells

Repair of Protective Covers
Drilling Services

subtotal \$ 7,200.00

Total \$ 7,200.00

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK XV

15A NCAC 13B .0545 (e and h)

Sampling and Analysis of Additional Monitoring Wells

This item is included in Task XII

Total \$ -

Corrective Action Estimate of Probable Cost (2012 Dollars)

TASK XVI

15A NCAC 13B .0545 (l, m, and n)

Corrective Action Remedy is Complete

Project Professional

subtotal \$11,400.00

Total \$11,400.00