SUBCHAPTER 15 – CLOSURE & POST-CLOSURE CARE

INTRODUCTION

This Closure and Post-Closure Plan applies to the Big Fork Ranch coal combustion residual (CCR) reclamation facility operated by Evans & Associates Construction Company, Inc. (EVANS). The Big Fork Ranch facility contains existing, active CCR reclamation, i.e. monofills, that are currently permitted by the Oklahoma Department of Mines, but are not currently permitted by DEQ. It is expected that both CCR reclamation and beneficial reuse will occur at Ash Reclamation Cells 3 and 8.

252:517-15-1 Performance Standard

EVANS will close the facility in accordance with the approved closure plan and in accordance with all applicable requirements. The closure of the facility will be in such manner as to minimize the need for further maintenance and controls and minimizes the post-closure release of CCR into the environment.

252:517-15-2 Final Closure Notification

EVANS will notify the DEQ Land Protection Division in writing before final closure of a CCR reclamation unit commences at the Big Fork Ranch facility.

252:517-15-3 Certification of Final Closure

(a) Certification Requirements

After Big Fork Ranch site closure, EVANS will submit a Certification of Final Closure to DEQ, containing the following elements:

1. Signature by the owner/operator.

2. A statement that the Big Fork Ranch facility was closed according to the permit, DEQ-approved closure plan, and the applicable DEQ regulations.

3. A closure report, with drawings, plans, and a description of how closure was performed.

4. A description of whether groundwater or surface water monitoring indicated elevated levels of any constituent was detected, and what corrective actions were taken.

(b) Final Closure Map

A Final Closure Map, Map MP-10, will be included in the Certification of Final Closure. The Final Closure Map will show the following features:

1. Final contours of the entire site
2. Permit boundary and the boundaries of the CCR units
3. Groundwater monitoring well locations
4. Surface impoundments (no leachate management system is proposed for this facility).
5. Permanent surface drainage structures
6. Aesthetic enhancements
7. Any other relevant information

(c) Professional Engineer Certification

The Certification of Final Closure will be prepared by and sealed by a qualified Oklahoma Registered Professional Engineer.

252:517-15-4 DEQ Approval of Final Closure

EVANS will obtain the approval of DEQ for the final closure of the Big Fork Ranch facility before the Post-Closure Period commences.

DEQ may extend the closure period and require additional financial assurance if:

1. Any testing shows the confirmed presence of elevated levels of any constituent
2. Any evidence of contamination related to the site operations
3. Final closure of the site is found to be inadequate

252:517-15-5 Inactive CCR Impoundments

There are no current or expected future CCR impoundments at the Big Fork Ranch facility. This section does not apply.

252:517-15-6 Closure or Retrofit of CCR Units

(a & b) Existing Unlined CCR and CCR Surface Impoundments

CCR had already been placed in the remaining Cell Nos. 3 and 8 prior to the effective date of the CCR rules. There are no CCR surface impoundments at the Big Fork Ranch facility. This section does not apply.

(c) New CCR Surface Impoundments

No new CCR surface impoundments are planned at the Big Fork Ranch facility. This section does not apply.

(d) Existing CCR Landfills

The Big Fork Ranch CCR facility is in compliance with applicable sections of the location restrictions at Part 252:517-5. Therefore, closure under Part 252:517-15-6(d)(1) is not required.

252:517-15-7 Criteria for Conducting the Closure or Retrofit of CCR Units

(a) Closure of CCR Unit

Closure of a CCR unit or any lateral expansion of a CCR unit must be completed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR unit, as described below.

(b)(1)(A and B) CCR Unit Closure Plan

Existing CCR reclamation cells at the EVANS facility will be closed when no ash product is received or ash product removed from the facility for the beneficial reuse.

(b)(1)(C) CCR Unit Final Cover

At the end of CCR reclamation at this facility, remaining CCR that is unsold will be covered with a minimum of two (2) feet of final cover material excavated from the borrow area on-site. The top layer of the final cover will consist of a minimum of six (6) inches of earthen material capable of sustaining vegetative growth. The bottom layer of

the cover will consist of eighteen (18) inches of earthen material. The lower layer will be placed in nine (9) inch layers and compacted between layers. The lower 18 inches of cover will be tested in the field to verify it has a permeability not exceeding 1×10^{-5} cm/sec.

(b)(1)(D) CCR Unit In-Place Closure

EVANS will provide DEQ with an inventory of residual CCR to be left in-place and the areal extent of residual CCR requiring final cover.

(b)(1)(E) CCR Left In-Place

The largest area of CCR cell requiring final cover, at any given time, will not exceed 6.3 acres.

(b)(1)(F) CCR Unit Closure Schedule

The applicant anticipates placement of the final cover system over the CCR cell within 30 days of receiving the final shipment of the ash product or removal of beneficial reuse, whichever occurs last. The topsoiled areas will be revegetated according to the following schedule within the required timeframe of 180 days.

Table 3, Appendix F, presents the species, seeding or planting rates, dates, and methods to be used to revegetate all topsoiled areas. The species listed on this table will be established on the topsoiled areas alone or as a mixture.

After topsoil has been redistributed, leveled, and smoothed, soil samples will be

collected, from those areas that could be revegetated, and analyzed to determine the nutrient and lime deficiencies. Soil samples will be analyzed for pH, buffer index, nitrogen, phosphorus, and potassium. Any deficiencies will be corrected, according to Natural Resources Conservation Service recommendations, based on the results of the analysis, before permanent seeding takes place. Lime and fertilizer will be broadcasted over the topsoiled areas. However, it is preferable to place fertilizer in the rows at the time of seeding or planting, if possible. Other than customary soil preparation, nutrient and lime application, no other soil remediation will be performed to make the soil suitable and capable for revegetation.

After fertilizing is completed, the topsoil will be disked to a depth of 6 inches to provide a smooth and firm bed suitable for seeding. The disking operation will be performed along the contour. A cultipacker or harrow will be used to firm the soil, when needed. Seedbed preparation should be conducted within 24 hours preceding the seeding. This will ensure (a) a suitable seedbed for planting and seeding, and (b) that the topsoiled area will not be left unrevegetated and plowed up (disked) for a prolonged period of time.

When seeding of the permanent species is not feasible due to climatic or biological conditions, temporary species (listed in Table 3) will be broadcasted as in situ mulch in order to provide a quick vegetative cover. Wheat straw or improved pasture grasses hay will be used as mulch material. The hay mulch will be applied in a uniform thickness at the rate of 2.5 tons per acre on the topsoiled and revegetated areas which are susceptible to erosion. Mulch will be applied by a hay blower or by hand. Mulch will

be anchored, when necessary, by treading or cutting the hay into the soil 2 to 3 inches deep on the contour at less than 8-inch spacing. A bulldozer or disk will be used to crimp the mulch into the topsoil.

A Closure Schedule will be submitted to DEQ providing estimated completion dates for each phase of CCR unit closure.

(b)(2) Timeframes for Preparing the Initial Closure Plan

The initial closure plan for existing CCR cells appears at Part 252:517-15-7 of this application.

(b)(3) Amendment of the Written Closure Plan

The applicant does not have any amendment to the closure plan at this time.

(c) Closure by CCR Removal

Existing CCR reclamation cells at the Big Fork Ranch facility will be closed when no ash product is received or ash product removed from the facility for the beneficial reuse.

(d) Closure Performance Standard when Leaving CCR in Place

(1) Closure Standard

EVANS will ensure the CCR unit is closed in a manner that will:

(A) Infiltration and Leachate Prevention

The lower eighteen (18) inches of the final cover will consist of earthen material, emplaced in six (6) inch layers and compacted between layers. After placement, the lower 18 inches of cover will be field-tested to verify its permeability does not exceed $1x10^{-5}$ cm/sec to minimize precipitation infiltration and formation of leachate.

(B) Ponding/Impoundment Prevention

The final cover will be graded to a uniform slope of approximately two percent (2%), without depressions and compacted to prevent ponding of rainfall over the CCR fill, and to minimize precipitation infiltration and erosion that might expose CCR to rainfall.

(C) Slope Stability and Erosion

Grading the final cover to slopes less than 4H:1V is expected to assure slope stability and prevent potential mass movement. Establishment of permanent vegetative cover will be the principal means of preventing erosion. The vegetative cover will consist of a seeding mixture of Common Lespedeza, Bermuda grass, and Perennial Ryegrass. The specific seeding rate will be determined in consultation with the OSU Noble County Cooperative Extension Service. Soil testing and application of soil amendments, if required, will be conducted in consultation with the Noble County Cooperative Extension Service.

(D) Maintenance Reduction

Establishment of permanent vegetative cover will be the long-term measure to reduce long-term maintenance of the final cover.

(E) Expedited Activities

All activities will be implemented as expeditiously as possible to close the CCR unit.

(2) CCR Impoundments

Not applicable. No CCR impoundments exist or are planned for this facility.

252:517-15-7(d)(3) Final Cover System

(A) Final Cover System

CCR landfills to be closed in-place will be covered with a composite final cover. The upper layer of the final cover will consist of six (6) inches of earthen material capable of supporting permanent vegetation. The lower layer will be a minimum of eighteen (18) inches of earthen material with a permeability no greater than 1×10^{-5} cm/sec to minimize rainfall infiltration. Settling and subsidence of the final cover will be minimized by placing the cover material in nine (9) inch layers and compacting, before the next layer is emplaced.

(B) Alternative Final Cover System

The applicant is not proposing any alternative final cover system.

(C) Final Cover Certification

The final cover system design will be certified by a qualified Oklahoma Registered Professional Engineer that the cover meets the requirements of Section 252:517-15-7.

252:517-15-7(e) Initiation of Closure Activities

EVANS will commence closure of a CCR unit within thirty (30) days after receipt of the known ***final*** CCR, or when the known ***final*** CCR has been removed from a CCR unit for beneficial reuse.

EVANS will commence closure of a CCR unit that has not received CCR or is no longer removing CCR for the purpose of beneficial use within two (2) years of the ***last*** receipt of CCR or within two (2) years of the ***last*** removal of CCR for the purpose of beneficial use.

EVANS may, depending on operating conditions and market demand, request an additional two (2) years to commence closure if it reasonably expects to receive future CCR shipments or continue CCR removal for beneficial reuse, per DEQ rules at 252:517-15-7(e)(2). EVANS' request for an extension will be supported by documentation that CCR delivery or removal will resume in the near future.

252:517-15-7(f)(1 and 2) Closure Activities Completion

EVANS will complete the closure activities of a CCR unit within six (6) months of commencement of closure, unless delayed by weather conditions or factors beyond the control of EVANS. Should such conditions arise, EVANS will request a one (1) year extension of time to complete CCR unit closure per 252:517-15-7(f)(2)(B). The request for extension will include a certification statement to the effect that the closure was delayed by circumstances beyond EVANS control. EVANS understands no more than two (2) one-year extensions may be obtained for any CCR facility.

252:517-15-7(f)(3) Closure Certification

EVANS will provide a certification from a qualified Oklahoma Registered Professional Engineer that the CCR unit was closed in compliance with the closure plan described in Part 252:517-15-7(b).

252:517-15-7(g) Intent to Close Notification

EVANS will place a notification of intent to close its CCR unit in its Big Fork Ranch facility's operating record (as required by 252:517-19-1(i)(7)), no later than the date EVANS initiates the closure of a CCR unit. The notification will include a statement that a qualified Registered Profession Engineer certifies the final cover design meets DEQ requirements at 252:517-15-7(d)(3)(iii).

252:517-15-7(h) Closure Notification

Within 30 days of the closure completion of a CCR unit, EVANS will place a notification in its facility's operating record (as required by 252:517-19-1(i)(8)) that a CCR unit has been closed. The notification will include a certification by a qualified Oklahoma Registered Professional Engineer as required by OAC 252:517-15-7(f)(3).

252:517-15-7(i) Deed Notation

The deed to the Big Fork Ranch facility will be modified to include a statement to the effect that: 1) the property was used as a CCR unit, and 2) the property is subject to post-closure care requirements as provided by OAC 252:517-15-9(d)(1)(iii). Within thirty (30) days of recording the deed notification with the County, a statement that the

deed was modified will be placed in the Big Fork Ranch operating record as required by 252:517-19-1(i)(9).

252:517-15-7(j) Recordkeeping

EVANS will maintain the required records for a period of five (5) years for each incident, measurement, surface and groundwater monitoring, maintenance, record, report, designs, study, closure, post-closure care, financial assurance, and corrective action, in compliance with OAC 252:517-19-1(i), OAC 252:517-19-2(i), and OAC 252:517-19-3(i).

Record Keeping - DEQ Notification

DEQ will be notified within 30 days of placing any required notification in the Big Fork Ranch operating record, in compliance with OAC 252:517-19-2.

Record Keeping – Publicly Accessible Internet Site

In compliance with OAC 252:517-19-3, the Big Fork Ranch facility on-line public operating record, titled "CCR Rule Compliance Data and Information" will be maintained for a period of five (5) years after posting of initial notifications. In general, notifications will be posted on the Big Fork Ranch on-line public operating record within thirty (30) days of placing the pertinent information required by OAC 252:517-19-1 in the operating record.

252:517-15-7(k) CCR Surface Impoundment Retrofit

This section does not apply. There are no CCR surface impoundments at the site, and none are planned.

252:517-15-8 Alternative Closure Requirements

EVANS may request an extension of time for Big Fork Ranch facility closure, and continue receiving CCR if a lack of alternative CCR disposal capacity exists, due to efforts by EVANS to procure additional CCR capacity. Once alternative disposal capacity is ready, the site CCR unit closure will commence.

252:517-15-9 Post-Closure Care Requirements

(a) Applicability

This section applies to Big Fork Ranch facility as they are subject to the closure criteria under OAC 252:517-15-7.

(b) Post-Closure Care Maintenance Requirements

(1) Final Cover

Following final closure of a CCR unit, EVANS will maintain the final cover by conducting repairs to correct effects of erosion, vegetative failure, and preventing effects of run-off and run-on.

(2) Leachate Collection System

The Big Fork Ranch facility is an existing facility which was not required to have any leachate system.

(3) Groundwater Monitoring

Following final closure, EVANS will maintain and monitor the groundwater in accordance with OAC 252:517-9-1 through OAC 252:517-9-9. This includes collection

and analysis of groundwater samples, maintenance of samples, quality control/quality assurance, statistical analysis of groundwater data, preparation of annual groundwater monitoring reports, and posting the information in the facility operating records and on on-line public record.

(c) Post-Closure Care Period

EVANS will, in general, maintain post-closure care for a period of thirty (30) years after final site closure, provided the Big Fork Ranch facility is under detection monitoring. If at the end of the post-closure care period, the CCR unit is operating under assessment monitoring in accordance with OAC 252:517-9-6, EVANS shall continue to conduct post-closure care until the facility returns to detection monitoring in accordance with OAC 252:517-9-6.

DEQ may extend the post-closure monitoring and care period if:

(A) Sampling shows the presence of elevated levels of any constituent;

(B) Evidence on contamination resulting from site operations is found to exist;

(C) Prior maintenance or monitoring of the site is found to be inadequate;

(D) The site is producing leachate that must be treated prior to discharge;

(E) If other conditions are present that indicate a need for additional post-closure monitoring and care.

When post-closure period is extended, DEQ may require the maintenance of existing financial assurance, the posting of additional assurance, and/or may require corrective action.

252:517-15-9(d) Written Post-Closure Plan

(1) Content of the Plan

The following post-closure plan is prepared in accordance with OAC 252:517-15-9(d)(1)(A) through (C):

(A) Monitoring and Maintenance Plan

EVANS will continue maintenance of the final cover by conducting repairs to correct effects of erosion, and preventing effects of run-off and run-on. Groundwater monitoring will continue, which will consist of monitoring well sample collection and analysis, continuation of the sample quality control/quality assurance program, statistical analysis of groundwater data, and preparation of annual groundwater monitoring reports.

(B) Contact Information

EVANS contact information, as of February 11, 2017, is:

Evans & Associates Construction Co., Inc.

3320 N. 14th Street

Ponca City, OK 74602

Telephone: (580)765-6693

(C) Post-Closure Planned Land Uses

EVANS is the owner of the property where Big Fork Ranch facility is located. It is anticipated that after establishment of a permanent vegetative cover, the property will revert to pastureland for cattle ranching. The post-closure use of the property shall not disturb the integrity of the final cover or any other component of the containment

system, or the function of the monitoring systems, unless necessary to comply with the applicable requirements. Disturbances may be allowed up on approval by DEQ.

(2) Deadline to Prepare Initial Written Post-Closure Plan

(A) Existing CCR Landfills and CCR Surface Impoundments

For existing CCR units such as Big Fork Ranch facility, the initial written Post-Closure plan shall be submitted no later than the date specified by DEQ.

(B) New CCR Landfills, New CCR Surface Impoundments, and any Lateral Expansion

This section does not apply. The Big Fork Ranch facility is an existing facility.

(C) Completion

The Big Fork Ranch Post-Closure Plan will be complete when the following steps are completed:

1. It is entered into the public on-line operating record.
2. The Post-Closure Plan has been certified by an Oklahoma Registered Professional Engineer as required by OAC 252:517-15-9(d)(4).
3. DEQ approval of the Post-Closure Plan has been granted as required by 252:517-15-9(d)(5).

(3) Amendment of a Written Post-Closure Plan

EVANS will obtain approval from DEQ prior to any modifications to the approved Post-Closure Plan.

252:517-15-15-9(e) Notification of Completion of Post-Closure Care Period

EVANS will notify DEQ that post-closure care has been completed with 60 days of completion of work, and will place a copy of this notification in its operating record as required by OAC 252:517-19-1(i)(13). The notification shall include the certification by a qualified Oklahoma Registered Professional Engineer verifying the post-closure care has been completed in accordance with the approved closure plan.

252:517-15-15-9(f) Recordkeeping

EVANS will maintain the required records for a period of five (5) years for each incident, measurement, surface and groundwater monitoring, maintenance, record, report, designs, study, closure, post-closure care, financial assurance, and corrective action, in compliance with OAC 252:517-19-1(i), OAC 252:517-19-2(i), and OAC 252:517-19-3(i).

252:517-15-10 Post-Closure Use of Property

EVANS is the owner of the site and will assume responsibility for maintenance and monitoring of the property during the post-closure period. No other use of the property will be allowed during the post-closure period unless it is approved by DEQ. As such, EVANS will have control over ultimate use of the property after the post-closure care period ends, which is proposed to be pastureland.

The post-closure use of the property shall not disturb the integrity of the final cover or any other component of the containment system, or the function of the monitoring systems.

EVANS shall not allow any other use of the property during the post-closure period unless it is approved by DEQ.

252:517-15-11 Post-Closure Performance Certification

Certification that post-closure care was completed according to the DEQ-approved post-closure plan, the DEQ permit, and applicable DEQ regulations will be prepared by a qualified Oklahoma Registered Professional Engineer. The post-closure certification will also indicate whether groundwater monitoring revealed elevated levels of contaminants and, if so, what corrective actions were taken. The certification will be submitted to DEQ and placed on the Big Fork Ranch public record website at the end of the post-closure period.

252:517-15-12 Land Use Restrictions

EVANS will place a note on the property title warning future purchasers of the property of the presence of CCR and its potential impact on subsurface activity at the property.

Any person contemplating using the CCR area shall ascertain the depth of the CCR unit and the operating history of the site and shall avoid any activities that may pose increased threat to the human health and safety or the environment. Pilings or

foundation should not disturb or penetrate the final cover and/or bottom liner. Utilities and pipelines shall be routed around the CCR area.

SUBCHAPTER 17 – COST ESTIMATES & FINANCIAL ASSURANCE

PART 1- GENERAL PROVISIONS

252:517-17-1. Applicability

This section is applicable to all CCR cells.

252:517-17-2. Effective date

(a) Closure and post-closure care

EVANS has submitted the financial assurance for closure and postclosure care to DEQ for approval.

(b) Corrective action

DEQ approved financial assurance for corrective action shall be established no later than 120 days after the corrective action remedy has been selected in accordance with OAC 252:517-9-8, or an alternative corrective action plan has been approved.

(c) Permit modifications

DEQ approved financial assurance must be established and appropriately funded before the DEQ will issue a permit modification that results in an increase in closure or post- closure cost estimates.

TABLE 3

PERMANENT AND TEMPORARY SPECIES RATES, METHODS, AND PLANTING DATES 1 & 2/

Rate (lbs. PLS/Ac.)				
Species	Alone	Mixture	Method	Planting Dates
Permanent				
Guymon Bermudagrass	4	4	Broadcast	3/1 - 6/1
Common Lespedeza (Lespedeza striata)	20	10	Broadcast	9/15 - 10/15 3/15 - 4/1
Tall Fescue (Fescue arundinacea)	30	10	Broadcast	9/1 - 11/30 3/1 - 4/1
Perennial Ryegrass (Lolium perenne)	20	5	Broadcast	9/1 - 10/30 3/1 - 4/30
Temporary				
Italian Ryegrass (Lolium multiflorum)	50	10	Broadcast	9/1 - 10/30 3/1 - 4/30
Winter Rye (Secale cereale)	50	10	Broadcast	9/1 - 10/31 3/1 - 4/30
Wheat (Triticum aestivum)	50	15	Broadcast	9/1 - 11/30

1- Drilling is preferred.

2- The actual planting dates will fluctuate several days either way, depending on weather and soil conditions.

TABLE E.1

SITE DATA

2017 Worksheet for Calculating Closure and Post-closure Cost Estimates

All site data necessary to calculate estimates of closure and post-closure costs can be gathered by completing table E.1.

Data from Table E.1 should be inserted into Tables E.2 and F.1 to complete calculations.

Table E.1: Site Data

Facility Name: Big Fork Ranch

Permit Number:

Description	Quantity	Units
Total Permitted Area	55	acres
Active Portion		
Composite Lined	None	acres
Soil Lined	6.3	acres
Area of Largest Cell/Phase Requiring Final Cap		
Composite Lined	None	acres
Soil Lined	6.3	acres
Perimeter Fencing	None	linear feet
Groundwater Monitoring Wells	170	VLF
Methane Gas Probes	None	VLF
Terraces	None	linear feet
Letdown channels	None	linear feet
Perimeter drainage ditches	2,300	linear feet
Average Daily Flow	N/A	tons/day
Landfill Disposal Cost	N/A	$/ton

VLF = Vertical linear feet. The sum of the depths of all monitoring wells.

TABLE E.2

CLOSURE COST ESTIMATE

Table E.2: Closure Cost Estimate						
	Facility Name:					
	Permit Number:					
	Task/Service	**Quantity**	**Units**	**Multiplier[a]**	**Unit Cost[b]**	**Subtotal**
1	**Preliminary Site Work**					
a	Conduct Site Evaluation	1	Lump sum	1	$3,562.60	$3,562.60
b	Dispose Final Wastes					
	Average Daily Flow[c]	N/A	tons/day			
	Disposal Cost[d,e]	0	tons/day	5		$0.00
c	Remove Temporary Building(s)	0	lump sum	1	$3,266.92	$0.00
d	Remove Equipment	0	lump sum	1	$2,666.76	$0.00
e	Repair/Replace Perimeter Fencing	0	linear feet	0.25	$3.50	$0.00
f	Clean Leachate Line(s)	0	lump sum	1	$1,613.60	$0.00
2	**Monitoring Equipment**					
a	Rework/Replace Monitoring Well(s)	170	VLF	0.25	$74.92	$3,184.10
b	Plug Abandoned Monitoring Well(s)	170	VLF	0.25	$29.99	$1,274.58
c	Rework/Replace Methane Probe(s)	0	VLF	0.25	$64.70	$0.00
d	Plug Abandoned Methane Probe(s)	0	VLF	0.25	$23.64	$0.00
e	Rework/Replace Remediation and/or Gas Control Equipment[f]	0	lump sum	0.05		$0.00
3	**Construction**					
a	Complete Site Grading to include on- and off-site borrow areas	13	acres	1	$1,412.48	$18,362.24
b	Construct Final Cap					
	Compacted On-site Clay Cap or	15,246	cubic yards	1	$5.08	$77,449.68
	Compacted Off-site Clay Cap or	0	cubic yards	1	$8.25	$0.00
	Install Geosynthetic Clay Liner Cap	0	square feet	1	$0.53	$0.00
c	Construct Landfill Gas Venting Layer					
	Place Sand or	0	acres	1	$37,768.24	$0.00
	Install Net and Geotextile	0	square feet	1	$0.37	$0.00
d	Install Passive Landfill Gas Vents	0	acres	1	$904.78	$0.00
e	Install Flexible Membrane Liner	0	square feet	1	$0.41	$0.00
f	Drainage Layer					
	Place Sand or	0	acres	1	$37,768.24	$0.00
	Install Net and Geonet	0	square feet	1	$0.37	$0.00
g	Place On-site Topsoil	5,082	cubic yards	1	$2.18	$11,078.76
	Place Off-site Topsoil	0	cubic yards	1	$17.45	$0.00
h	Establish vegetative cover, including on- and off-site borrow areas	13	acres	1	$661.31	$8,597.03
4	Drainage/erosion control					
a	Construct Terraces	0	linear feet	1	$9.14	$0.00
b	Construct Letdown Channels	0	linear feet	1	$100.00	$0.00
c	Clean Perimeter Drainage Ditches	2,300	linear feet	0.5	$6.96	$8,004.00
5	Tasks Not Identified	0				$0.00
6	Subtotal					$131,512.99
7	Administrative Services[g]	1	lump sum	0.1	$131,512.99	$13,151.30
8	Technical and Professional Services[g]	1	lump sum	0.12	$131,512.99	$15,781.56
9	Closure Contingency[g]	1	lump sum	0.1	$131,512.99	$13,151.30
10	Total Final Closure[h]					$173,597.15
a	Multipliers are determined from the Solid Waste Financial Assurance Program Report, December 22, 2000.					
b	Unit costs include a 1.32% inflationary adjustment for 2017. Unit costs (Tasks 3h & 4b) have been updated per 2015 5-year evaluation (OAC 252:517-17-4). Task 3h unit cost will increase $132.26 each year through the 2020 update.					
c	New facilities: Insert the value for "W" in OAC 252:515-27-8(a)(2). Existing facilities: Insert reported tonnage for the previous annual year, divided by 312 operating days per year (52 weeks per year x 6 operating days per week).					
d	Insert number of tons/day from above.					
e	Insert landfill disposal cost per ton of waste ($/ton).					
f	Input capital cost for gas control/remediation equipment, if installed at the site.					
g	Input subtotal from line 6.					
h	Add rows 6 through 9.					

TABLE F.1

POST-CLOSURE COST ESTIMATE

Table F.1: Post-Closure Estimate							
	Facility Name:						
	Permit Number:						
	Task/Service	**Quantity**	**Units**	**Multiplier[a]**	**Unit Cost[b]**	**Subtotal**
1	Site maintenance					
	a Site Inspections	4	per year	30	$648.07	$77,768.40
				0	$648.07	$0.00
	b General Maintenance	1	per year	30	$1,942.97	$58,289.10
				0	$1,942.97	$0.00
	c Remediation and/or Gas Control Equipment[c, d]	0	lump sum	0.3		$0.00
2	**Monitoring equipment**				0	
	a Rework/Replace Monitoring Well(s)	170	VLF	0.25	$74.92	$3,184.10
	b Plug Abandoned Monitoring Well(s)	170	VLF	0.25	$29.99	$1,274.58
	c Final Plugging of Monitoring Wells	170	VLF	1	$29.99	$5,098.30
	d Rework/Replace Methane Probe(s)	0	VLF	0.25	$64.70	$0.00
	e Plug Abandoned Methane Probe(s)	0	VLF	0.25	$23.64	$0.00
	f Final Plugging of Methane Probes	0	VLF	1	$23.64	$0.00
	g Final Plugging of Piezometer(s)	0	VLF	1	$23.64	$0.00
3	**Sampling and analysis**					
	a Groundwater Monitoring Wells[e]	5	wells	60	$698.81	$209,643.00
	C&D	0	wells	16	$172.49	$0.00
	Alt. Constituents	0	wells	60		$0.00
	b Methane Gas Probes	0	probes	60	$45.34	$0.00
	c Surface Water Monitoring Points	0	points	60	$84.22	$0.00
	d Leachate	0	samples	60	$135.71	$0.00
4	**Final cover maintenance**					
	a Mow and Fertilize Vegetative Cover (MSWLF)	13	acres	30	$214.39	$83,612.10
	C&D LF	0		8	$214.39	$0.00
	b Repair Erosion, Settlement, and Subsidence for On-site Soils (MSWLF)	13	acres	30	$3.11	$1,212.90
	C&D LF	0		8	$3.11	$0.00
	Repair Erosion, Settlement, and Subsidence for Off-site Soils (MSWLF)	0	acres	30	$18.59	$0.00
	C&D LF	0		8	$18.59	$0.00
	c Reseed Vegetative Cover	13	acres	0.2	$661.31	$1,719.41
5	**Leachate management**					
	a Clean Leachate Line(s)	0	per year	30	$1,661.85	$0.00
	b Maintain Leachate Collection System and Equipment	0	per year	30	$2,581.75	$0.00
	c Collect, Treat, Transport, and Dispose of Leachate	0	gal/yr	30	$0.33	$0.00
6	Tasks not identified	0				$0.00
7	**Subtotal**					$441,801.89
8	Administrative Services[f]	1	lump sum	0.06	$441,801.89	$26,508.11
9	Technical and Professional Services[f]	1	lump sum	0.07	$441,801.89	$30,926.13
10	Post-closure Contingency[f]	1	lump sum	0.1	$441,801.89	$44,180.19
11	**Total Post-closure[g]**					$543,416.32
a	Multipliers are determined from the Solid Waste Financial Assurance Program Report, December 22, 2000.					
b	Unit costs include a 1.32% inflationary adjustment for 2017. Unit costs (Task 4c) have been updated per 2015 5-year evaluation (OAC 252:517-17-4). Task 4c unit cost will increase $132.26 each year through the 2020 update.					
c	5% of equipment capital cost, maintenance performed once per 5 yrs for 30 years.					
d	Input capital cost for gas control/remediation equipment, if installed at the site.					
e	If the approved groundwater monitoring plan requires monitoring for alternative constituents, unit costs shall be calculated in accordance with OAC 252:517-17-51(b) or (c).					
f	Input subtotal from line 7.					
g	Add lines 7 through 10.					