SOLID WASTE FACILITY PERMIT
PERMIT NUMBER 440

Facility Name: Chesapeake Energy Center
Facility Type: Electric Generating Facility with a CCR Industrial Landfill and Surface Impoundment

Site Location: Chesapeake, Virginia
Latitude: N 36° 45' 48"
Longitude: W 76° 18' 10"

Location Description: The facility is located off Military Highway, along the Southern Branch of the Elizabeth River, in Chesapeake, Virginia. The landfill is located south of the power station on a peninsula of land that was formerly a wet ash disposal pond.

Background: The facility has a captive industrial landfill for the disposal of coal ash residuals (CCR). The landfill footprint is approximately 23 acres. At closure, the landfill will contain approximately 976,000 CY of CCR. The landfill ceased accepting CCR prior to October 19, 2015 and therefore is not subject the 2015 EPA Final Rule on the Disposal of CCR (40 CFR 257.50(d)).

In 1985, the landfill was designed and constructed on top of an approximately 20-foot thick layer of consolidated ash from the former wet ash disposal pond operation. A new inner perimeter dike was constructed atop of the pond within the confines of the pond’s original perimeter dike. A 20-mil HDPE liner was installed within the limits of this new area bounded by the inner dike and extended up the dike’s slopes. There is no record of installation of a leachate collection system, so all water infiltrating the landfill collects on top of the HDPE liner and seeps laterally towards the perimeter. This provides for free drainage out of the landfill, draining leachate into the perimeter ditches formed between the original dike and inner perimeter dike. This leachate drains to the Stormwater/Leachate Basin B which discharges into the Southern Branch of the Elizabeth River. The discharges are regulated under the Virginia Pollutant Discharge Elimination (VPDES) Permit # VA0004081, (VPDES Permit).

During closure construction, a perimeter collection system will be installed around the toe of the landfill within the limits of the liner system and beneath the final closure cap. Leachate will flow by gravity and force main to the Stormwater/Leachate Basin A for initial pre-treatment, and then to the Stormwater/Leachate Basin B where it is comingled with stormwater run-off and discharged through Outfall 002 into Deep Creek. Outfall 002 is a permitted outfall regulated under the VPDES Permit. The
Stormwater/Leachate Basin B will be retrofitted with a 60-mil HDPE liner in accordance with this VPDES Permit. The facility leachate management plan is incorporated into this Permit as Attachment VIII.

The facility also has a surface impoundment, referred to as the Bottom Ash Pond, adjacent to the landfill that managed coal ash residuals (CCR). The bottom ash pond footprint is approximately 4.6 acres. At closure, the impoundment will contain approximately 41,250 CY of CCR. The impoundment ceased accepting CCR prior to October 19, 2015, and is considered an inactive CCR surface impoundment under the 2015 EPA Final Rule on the Disposal of CCR (40 CFR 257 Subpart D). The Bottom Ash Pond is currently permitted under VPDES permit VA0004081. Closure of the impoundment is being handled under the VPDES permit; however, post-closure care requirements, including groundwater monitoring, are being incorporated into this permit.

**Permit Modification:** Chesapeake Energy Center ceased coal burning operations at the end of December 2014, and ash placement ceased prior to October 19, 2015. This permit modification incorporates a revised Closure Plan for the design of the final cover system which includes a perimeter leachate collection system and design profile that meets the minimum requirements of 9 VAC 20-81-160.D.2.e. The maximum closure side-slopes are 6H:1V. The closure cap for the landfill will extend over the adjacent bottom ash pond which will be closed under the facility’s VPDES Permit. The bottom ash closure cap design is the same as that of the landfill. Both the landfill and bottom ash pond will be inspected and maintained in post-closure under the requirements of the Post-Closure Inspection, Monitoring, and Maintenance Plan. This permit modification also includes changes to the groundwater monitoring system to incorporate aspects of the 2015 EPA Final Rule on the Disposal of CCR. A requirement for surface water monitoring was added as well. This permit modification also includes new site-specific conditions for the facility to evaluate its corrective action remedy and take other measures related to the facility’s groundwater monitoring network.

All previous permit modifications are outlined in detail in Module I, Section I.G.

**THIS IS TO CERTIFY THAT:**

Virginia Electric and Power Company (d.b.a. Dominion Generation)
5000 Dominion Boulevard
Glen Allen, Virginia 23060

is hereby granted a permit to construct, operate, and maintain Chesapeake Energy Center (CEC) as described in the attached Permit Modules I, X, XI, XII, XIII, XIV, and XVIII and associated permit attachments. These Permit Modules and Permit Attachments are as referenced hereinafter and are incorporated into and become a part of this permit.

The herein described activity is to be established, modified, constructed, installed, operated, used, maintained, and closed in accordance with the terms and conditions of this permit and the plans, specifications, and reports submitted and cited in the permit. The facility shall comply with all regulations of the Virginia Waste Management Board. In accordance with Chapter 14, Section 10.1 - 1408.1(D) of the Code of Virginia, prior to issuing this permit, any comments by the local government and general public have been investigated and evaluated and it has been determined that the proposed facility poses no substantial present or potential danger to human health or the environment. The permit contains such conditions and requirements as are deemed necessary to comply with the requirements of
the Virginia Code, the regulations of the Board, and to prevent substantial or present danger to human health or the environment.

Failure to comply with the terms and conditions of this permit shall constitute grounds for the revocation or suspension of this permit and for the initiation of necessary enforcement actions.

The permit is issued in accordance with the provisions of Section 10.1-1408.1.A, Chapter 14, Title 10.1, Code of Virginia (1950) as amended.

Issued: July 27, 1984
Modification 1: February 17, 1993 (Major)
Modification 2: April 16, 2002 (Major)
Modification 3: August 12, 2002 (Minor)
Modification 4: July 28, 2009 (Minor)
Modification 5: March 10, 2011 (Major)
Modification 6: December 13, 2013 (Minor)

APPROVED: ________________________________________

Maria Nold, Regional Director

DATE: _____________________________________________

Modification 7
PERMIT MODULES AND PERMIT ATTACHMENTS

REFERENCE LIST

PERMIT MODULE I -- GENERAL PERMIT CONDITIONS

Permit Attachment I-1 - Variance for Omitting Organic Constituents
Permit Attachment I-2 - Variance for Using Alternate Concentration Limits (ACLs)

PERMIT MODULE X – FIRST DETERMINATION GROUNDWATER MONITORING REQUIREMENTS

Permit Attachment X-1 Groundwater Monitoring Plan

PERMIT MODULE XI – ASSESSMENT / PHASE 2 GROUNDWATER MONITORING REQUIREMENTS

PERMIT MODULE XII – CLOSURE

PERMIT ATTACHMENT XII-1 – LANDFILL CLOSURE PLAN

PERMIT MODULE XIII – POST-CLOSURE CARE

PERMIT ATTACHMENT XIII-1 – POST CLOSURE PLAN
PERMIT ATTACHMENT XIII-2 – LEACHATE MANAGEMENT PLAN

PERMIT MODULE XIV – METALS ATTENUATED BASED CORRECTIVE ACTION

Permit Attachment XIV - 1 Corrective Action Plan (Including Surface Water Monitoring)
Permit Attachment XIV- 2 Corrective Action Groundwater Monitoring Plan (Including Surface Water Monitoring)

PERMIT MODULE XVIII – SURFACE WATER MONITORING

NOTES:
1. Should information contained in an attachment(s) to any permit module, which consists of documents submitted by the permittee, conflict with any requirement or condition set forth by the Department in the permit modules or set forth in 9 VAC 20-80-10 et seq; the regulatory/permit module requirement or condition shall prevail (unless an appropriate variance has been granted).
2. The Department is not responsible for spelling, typographical, or syntax errors in modules based on information submitted by the Permittee.
3. As permit attachments are typically extracted from previously submitted information, they may contain references to calculations and other supporting data which may be omitted from the permit documents. All such information submitted in support of the application may be found in the Department’s files.

4. For consistency between SWP440 and VPDES Permit # VA0004081 and permittee supplied attachments as applicable, new nomenclature for the active basins/ponds at the site was established. The Low Volume Waste Pond referred to in the VPDES Permit as the Oil/Water Retention Basin will now be referred to as the Stormwater/Leachate Basin A. The Stormwater Basin referred to in the VPDES Permit as the Stormwater Pond will now be referred to as the Stormwater/Leachate Basin B.
PERMIT MODULE I
GENERAL PERMIT CONDITIONS

I.A. EFFECT OF PERMIT

Compliance with the terms of this permit does not constitute a defense to any order issued or any action brought under Sections 10.1-1402(18), 10.1-1402(19), or 10.1-1402(21) of the Virginia Waste Management Act (Chapter 14, Title 10.1, Code of Virginia (1950), as amended); or any other law or regulation for protection of public health or the environment including the 2015 U.S Environmental Protection Agency Disposal of Coal Combustion Residuals from Electric Utilities Final Rule (40 CFR 257). The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstances is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby. For purposes of this permit, terms used herein shall have the same meaning as those in the Virginia Waste Management Act, and Part I and other pertinent parts of the Virginia Solid Waste Management Regulations (VSWMR, 9VAC20-81), unless this permit specifically provides otherwise; where terms are not defined in the regulations or the permit, the meaning associated with such terms shall be defined by the generally accepted scientific or industrial meaning of the term or a standard dictionary reference. "Director" means the Director of the Department of Environmental Quality, or his designated or authorized representative.

I.B. DUTIES AND REQUIREMENTS

The permittee shall comply with all conditions of this permit and 9VAC20-81. The effect of this permit is detailed in 9VAC20-81-490, and it shall be the duty of the permittee to ensure the applicable requirements are met. Additionally, the permittee is subject to the recording and reporting requirements detailed in 9VAC20-81-530. In addition to these requirements, the following additional conditions are invoked per 9VAC20-81-430, and shall be complied with:

I.B.1. Noncompliance may be authorized by a schedule of compliance [9VAC20-81-490.D. and 9VAC20-81-490.H.]. Any other permit noncompliance constitutes a violation of Virginia Waste Management Act and is grounds for enforcement action, or for permit revocation, revocation and reissuance, or modification [9VAC20-81-570 and 9VAC20-81-600].

I.B.2 The permittee shall comply with the requirements of this permit and any provisions of RCRA Subtitle D (Title 40, Code of Federal Regulations, Section 258) requirements as they become applicable upon their effective date. This permit may not act as a shield against compliance with any part of RCRA or any other applicable federal regulation, state regulation or state law.
I.B.3. In an enforcement action, it shall not be a defense for the permittee that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

I.B.4. In the event of noncompliance with this permit, the permittee shall take all reasonable steps to minimize releases of solid wastes or waste constituents to the environment and shall carry out measures to prevent substantial adverse impacts on human health or the environment.

I.B.5. The permittee shall at all times properly maintain all units (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper maintenance includes effective performance, adequate funding, adequate staffing, and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary equipment only when necessary to achieve compliance with the conditions of this permit.

I.B.6. The permittee shall furnish to the Director, within a reasonable time, any relevant information that the Director may request to determine compliance with this permit, regulations or the Act. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit by the date specified in the request.

I.B.7. The permittee shall allow the Director, or an authorized representative, at a reasonable time, upon the presentation of appropriate credentials, to:

I.B.7.a. Enter the permitted facility where a regulated unit or activity is located or conducted, or where records must be kept under the conditions of this permit;

I.B.7.b. Have access to and copy any records that must be kept under the conditions of this permit;

I.B.7.c. Inspect any unit, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

I.B.7.d. Sample or monitor, for the purposes of assuring permit compliance or as otherwise authorized by Virginia Waste Management Act, any substances or parameters at any location within his control.

I.B.8. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample to be analyzed must be the appropriate method from the
Laboratory samples shall be analyzed in accordance with 1 VAC 30-45, Certification for Noncommercial Environmental Laboratories, or 1 VAC 30-46, Accreditation for Commercial Environmental Laboratories.

I.B.9. This permit is not transferable to any person, unless approved by the Director. The Director may require modification or revocation and reissuance of the permit pursuant to 9VAC20-81-490.G. Before transferring ownership or operation of the facility during its operational life, the permittee shall notify the new owner or operator in writing of the requirements of Parts III and V, of the Virginia Solid Waste Management Regulations, the Financial Assurance Regulations, 9VAC20-70, and this permit.

I.B.10. Specifications for all drainage media should specify that the material shall contain no greater than 15% calcium carbonate equivalent. Department literature regarding research on leachate collection media indicates that weight loss greater than 15% results in an unacceptable loss of performance. If a greater percentage is specified or allowed, a demonstration that performance is not adversely affected must be provided to the Department for review and approval.

I.B.11. The closure cost estimate must reflect the maximum cost of closure at all times. The owner has the responsibility to maintain the closure and post closure cost estimate and associated financial assurance funding as conditions change.

I.C. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The permittee shall maintain the following documents at the facility, or another location approved by the Director, until post-closure is complete and certified by a professional engineer, and shall maintain amendments, revisions, and modification to these documents:

I.C.1. Design Plans.


I.C.4. Detailed, written estimate, in current dollars, the cost of post-closure care and corrective action measures.

I.C.5. All other documents/records required and applicable from the following:
I.C.5.a. Monitoring records from leachate, surface, and groundwater monitoring.

I.C.5.b. Inspection records as required from post-closure inspection requirements.

I.C.5.c. Personnel training records

I.C.5.d. Construction quality assurance reports, record drawings and engineers certifications for all final cover construction

I.C.6. Documentation of the authorization to discharge leachate into the publicly/privately owned treatment works, leachate volumes sent to the POTW, and periodic leachate sampling analytical results

I.D. DOCUMENTS TO BE SUBMITTED

In addition to the documents/records/reports to be submitted per the requirements of this permit or 9 VAC 20-80-10, et seq., the permittee shall also submit the following documents to the Director according to indicated schedules:

I.D.1. Report and supporting documents resulting from quality control/quality assurance activities performed in accordance with quality assurance (CQA) program as required by 9 VAC 20-81-130 Q.1(6) during construction and installation of the final closure systems, including the installation contractor's written acceptance of the surfaces to be lined, synthetic liner manufacturer and installer warranties, laboratory test results of the permeability of the drainage media, and representative copies (sufficient to demonstrate responsible control) of the accumulated inspection schedules resulting from the professional engineer's oversight of the construction.

I.D.2. The as-built plans of all new groundwater monitoring wells shall be submitted within 44 days of well completion. Information to be included on the as-built plans shall include, but is not limited to, the total depth of the well, the surveyed elevations of the top of casing and ground surface (or apron), and the length and location of the screened interval and annular space seal. All dimensions are to be shown on well construction schematics.

I.E. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DIRECTOR

All reports, notifications, or other submissions which are required by this permit to be sent or given to the Director should be sent to:

Director
Virginia Department of Environmental Quality
Solid Waste Permitting/Compliance
I.F. SITE SPECIFIC CONDITIONS

The provisions of this section are in addition to the permit conditions and regulatory requirements and are specifically developed for this facility. The permittee shall comply with all conditions of this section, as follows:

I.F.1. The final permit is based on permit application submittals (drawings and reports) that may contain the word “proposed” and similarly tentative language. The documents that are incorporated into Permit No. 440 have been evaluated for administrative and technical adequacy and have been approved as proposed. Therefore, any references to a design, construction, operation, monitoring or closure criteria are considered to be approved as proposed.

I.F.2. The facility shall comply with relevant sections of 40 CFR 257 Subpart D as applicable to the landfill and CCR Surface Impoundment. This includes any sections that may become applicable through any EPA rule-making or other revision to 40 CFR 257 Subpart D.

I.F.3. Prior to the completion of closure and no later than 60 days following construction of the final cover system for all units, the permittee shall submit an updated Groundwater Monitoring Plan through a major permit amendment request for Department approval. The updated Groundwater Monitoring Plan shall include the following at minimum:

I.F.3.a. Identification of existing and/or installation of new groundwater monitoring wells that characterize the groundwater in the Norfolk formation.

I.F.3.b. Provide a schedule for installation of new groundwater monitoring wells as applicable.

I.F.3.c. Provide the statistical methodology for evaluation of wells screened in and outside of the Norfolk formation.

I.F.3.d. Provide an updated map depicting all monitoring well locations.

I.F.3.e. Ensure sufficient monitoring of the Stormwater/Leachate Basins.

I.F.4 Within 90 days of permit amendment issuance, the permittee shall submit to the Department an evaluation of current and other alternative corrective measures that may be implemented at the facility, a proposed selection of an alternative, and proposed timeline for implementation. Upon approval of the evaluation, the permittee shall submit an updated Corrective Action Plan and Corrective Action Monitoring Plan through a major permit amendment request to reflect the proposed selected corrective action measure and schedule for implementation.

I.F.5 Upon permit amendment issuance, the permittee shall sample the Performance Wells, Sentinel Wells, and Surface Water Sampling Points identified in Permit Module XIV for the constituents listed in 40 CFR 257 Appendix III and IV during the regularly scheduled semi-annual sampling events. After completing one year of sampling and analysis, the permittee may petition the Director to discontinue analyzing groundwater samples in the Performance Wells and Sentinel Wells for those 40 CFR 257 Appendix III and IV constituents that were not detected in any of the facility’s Compliance Wells, Performance Wells, Sentinel Wells, or Surface Water Sampling Points.

I.F.6 The facility shall maintain a publically accessible Internet site (CCR Web site), titled “CCR Rule Compliance Data and Information” as required by 40 CFR 257.107. The applicable information as specified in 40 CFR 257.107 (e) through (i) must be posted to the CCR Web site within 30 days of placing the pertinent information, as required by 40 CFR 257.105, in the operating record. The information must remain on the CCR Web site for at least five years following the date on which the information was first posted.

I.G. PERMIT MODIFICATIONS

I.G.1. A major permit modification was issued on February 17, 1993, for vertical expansion of the landfill allowing an increase of the final elevation from 51 feet to 89 feet above mean sea level and an additional 222,000 cubic yards of air space. Due to beneficial uses for ash through an ash utilization program, not all of this capacity was utilized and the final closure elevation was revised downward to 75 feet above mean sea level.

I.G.2. A major permit modification was issued on April 16, 2002, to establish groundwater protection standards and to incorporate a groundwater monitoring plan.

I.G.3. A minor permit modification was approved on August 12, 2002, allowing the replacement of monitoring well CECW-4.

I.G.4. A minor permit modification was approved on July 28, 2009, allowing the replacement of monitoring well CECW-6 and to incorporate an updated groundwater monitoring plan.
I.G.5. A major permit modification was issued on March 10, 2011, to implement groundwater corrective action and to incorporate a corrective action plan and a corrective action monitoring plan.

I.G.6. A minor permit modification was issued December 13, 2013, to incorporate beryllium, cobalt, and sulfide as constituents of concern in the Corrective Action Plan and Corrective Action Groundwater Monitoring Plan as well as document the replacement of corrective action monitoring well CECW-10 with CECW-10R.
PERMIT MODULE XI
ASSESSMENT / PHASE 2 MONITORING REQUIREMENTS

This monitoring program is designed to recognize impacts to the uppermost aquifer at levels which exceed groundwater protection standards and therefore trigger potential groundwater remediation.

Monitoring at this facility will take place under the program described herein and the actions undertaken shall be consistent with 9 VAC 20-81-250 of the VSWMR as well as applicable requirements of 40 CFR 257.90-257.98 and 257.105-107.

XI.A. GROUNDWATER COMPLIANCE POINT

XI.A.1. Uppermost Aquifer

XI.A.1.a Groundwater monitoring shall take place in an underlying aquifer which meets the definitions of 9 VAC 20-81-10 and 40 CFR 257.53. Monitoring shall target any identified preferential flow pathways within the saturated portion of the aquifer which includes the zone between the first encounter with groundwater (not to include any perched water) and the first encounter with a confining unit forming the lower boundary of the saturated portion of the aquifer.

XI.A.1.b Identification of the uppermost aquifer on site must be determined by completion of a hydrologic investigation meeting the technical requirements set forth under 40 CFR 257.91.(b).

XI.A.2. Monitoring Well Locations

XI.A.2.a All wells in the point of compliance monitoring network must be located at the waste boundary (40 CFR 257.91.(a)(2)) and be screened within the zone of saturation of the aquifer. Use of nested well pairs screened at different depths below ground surface may be required to monitor all potential contaminant migration pathways identified under XI.A.1.b.

XI.A.2.b Monitoring wells shall be set and screened totally within the saturated portion of the monitored aquifer.

XI.A.2.c Newly installed monitoring wells pursuant to Permit Condition I.F.3 and replacement wells shall not be screened within CCR material.

XI.A.3. Location Restrictions
Downgradient point of compliance Monitoring well(s) shall not be located outside of the permitted facility boundary. Wells related to groundwater corrective action which are proposed outside of the permitted facility boundary will require Director approval prior to construction.

XI.B. MONITORING NETWORK REQUIREMENTS

XI.B.1. The owner or operator must obtain a certification from a qualified professional engineer (40 CFR 257.91(f)) stating that the groundwater monitoring system has been designed, constructed, and meets the requirements of 40 CFR 257.91, including:

XI.B.1.a. No fewer than one upgradient, and three downgradient wells (40 CFR 257.91.(c).(1)) with additional downgradient wells, as needed, to assess groundwater quality passing the waste boundary.

XI.B.1.b. If applicable, a multi-unit (combo) monitoring well network consistent with the allowance under 40 CFR 257.91.(d).(1) as long as the Permittee demonstrates conformance with the technical criteria under 40 CFR 257.91.(d).(1).(i – iv).

XI.B.2. Installation, Operations and Maintenance

All wells shall be installed, operated and maintained (40 CFR 257.91.(e).(2)) in a manner which allows them to operate as designed during the life of the monitoring program.

XI.B.2.a. Wells requiring replacement due to non-performance shall be reported to the Department within 30 days of recognizing the non-performance. The notification shall include a site plan depicting the proposed location for the replacement well(s) for Department review.

XI.B.2.b. Wells that require replacement must be replaced prior to the next regularly scheduled groundwater sampling event unless the Director has granted an extension.

XI.B.2.c. Any wells that require abandonment shall be sealed and abandoned in accordance with existing EPA Resource Conservation and Recovery Act (RCRA) guidance as well as any applicable state or local requirements.

XI.B.3. Well Designations

The following wells shall be included in the groundwater monitoring network.
XI.C. AQUIFER INFORMATION

XI.C.1. Data Acquisition - Requirements

XI.C.1.a. Static groundwater elevations shall be:

XI.C.1.a.(1). measured in all monitoring wells prior to purging.

XI.C.1.a.(2). measured to an accuracy of 0.01 foot.

XI.C.1.a.(3). measured each time groundwater is sampled on site.

XI.C.1.a.(4). obtained from all wells in the network within a single 4-hour period to avoid temporal variations/fluctuations in the groundwater table.

XI.C.1.b. Groundwater flow rate and direction shall be:

XI.C.1.b.(1). determined each time groundwater is sampled on site.

XI.C.1.b.(2). calculated using technical methods accepted for use in EPA RCRA groundwater programs.

XI.C.2. Data Acquisition - Response

XI.C.2.a. The Permittee shall evaluate the function of each monitoring network well each time groundwater is sampled. If the evaluation shows that one or more of the well(s) no longer functions in a manner that meets performance requirements of the VSWMR and 40 CFR 257.91, the Permittee shall:

XI.C.2.a.(1). Within 30 days of recognizing the non-performance, notify the Department of the need to modify the number,
XI.C.2.a.(2). Complete additions or modifications to the network, prior to the next regularly scheduled groundwater sampling event, unless an extension has been granted by the Director for meeting the monitoring system compliance requirements.

XI.D. SAMPLING ACTIONS

The Permittee shall:

XI.D.1. Maintain a site-specific groundwater monitoring program that meets the requirements of the VSWMR and 40 CFR 257.93.

XI.D.2. Analyze groundwater samples via methods of EPA SW-846, as amended, for those constituents listed in the VSWMR on Table 3.1.

Those constituents listed in 40 CFR 257 Appendix III and IV which are not on the VSWMR Table 3.1 list may be analyzed by non-SW 846 methods as long as the alternate method is performed by a Virginia Environmental Laboratory Accreditation Program (VELAP) accredited laboratory.

XI.D.3. Not filter groundwater samples prior to laboratory analysis.

XI.D.4. Provide final results as total metals (40 CFR 257.93.(h).(2).(i)).

XI.E. SAMPLING FREQUENCY

XI.E.1. The Permittee shall, during the active life and post-closure care periods, sample groundwater and analyze for the VSWMR and 40 CFR 257.95 required constituents in all monitoring wells on a semi-annual basis.

XI.E.2. The length of the semi-annual sampling period shall be an interval corresponding to approximately 180 days. For the purposes of scheduling monitoring activities, sampling within 30 days of the 180-day interval will be considered ‘semiannual’.

XI.F. SAMPLING LIST

XI.F.1. All 40 CFR 257 Appendix III constituents.

XI.F.2. All 40 CFR 257 Appendix IV constituents.

XI.F.3. VSWMR Table 3.1 Column A constituents plus any previously detected Table
3.1 Column B constituents.


XI.G. DETERMINATION OF BACKGROUND & GPS

XI.G.1. The Permittee shall establish site-specific background values for the constituents of XI.F in a manner consistent with 40 CFR 257.93.(d) and 94.(b).

XI.G.2. The Permittee shall establish site-specific Groundwater Protection Standards (GPS) for the constituents of XI.F.2, XI.F.3, and Boron using the process defined under 40 CFR 257.95.(h) and 9 VAC 20-81-250 A.6.

XI.G.3. Use of risk-based GPS shall not be allowed for constituents listed in 40 CFR 257 Appendix IV, Boron, and VSWMR metals.

XI.G.4. Groundwater Protection Standards shall be updated as follows:

XI.G.4.a. Federal Maximum Contaminant Level-based GPS, immediately upon promulgation of a new or revised Federal MCL.

XI.G.4.b. Background-based GPS, every two years such that the eight most recent background well sampling results shall replace the oldest eight background well sampling results.

XI.G.4.c. Alternate Concentration Limit-based GPS by following the process under 9 VAC 20-81-250.A.6.e.

XI.H. STATISTICAL PROCEDURES

XI.H.1. A P.E. must certify (40 CFR 257.93.(f).(6)) the selected statistical method used by the Permittee is appropriate for evaluating the groundwater monitoring data. The certification must include a narrative description of the statistical method selected to evaluate the groundwater monitoring data.

XI.H.2. When evaluating the groundwater sampling event results, the Permittee shall: within 30 days of completion of the laboratory analysis for each sampling event, determine whether or not there is a statistically significant increase over site background and GPS for each monitoring constituent using an appropriate statistical method meeting the requirements of 40 CFR 257.93 (e) - (g).

XI.H.2.a. If no statistical exceedances over background are identified in any downgradient well, monitoring will continue under the Assessment / Phase 2 Monitoring Program.
XI.H.2.b. If there is a statistically significant increase (SSI) over Facility-specific GPS, the Permittee will proceed with the actions described in 40 CFR 257.95(g) and required by 9 VAC 20-81-260 and notify the DEQ of the SSI over GPS within 44 days of issuance of the laboratory report, identifying the constituent exceeding its Facility-specific GPS.

XI.H.3. For the purpose of this Permit, laboratory analysis is considered complete upon issuance of the final analytical report under laboratory signature.

XI.H.4. Statistical comparisons are not required during the collection of background data during the Assessment / Phase 2 background period.

XI.I. RECORD-KEEPING REQUIREMENTS

XI.I.1 The owner or operator shall comply with the applicable recordkeeping and notification requirements of 40 CFR 257.105 and 106, and the public record internet requirements specified in 257.107, as well as all relevant actions required by the VSWMR.

XI.I.2 The Permittee shall retain all records identified under 9 VAC 20-81-250.E.1 as well as 530.B.1 and B.2 throughout the facility active life (including closure) and post-closure care period. The records shall be retained at the facility, or at an alternate location approved by the Director, within an Operating Record (40 CFR 257.105.(a)).

XI.I.3 The Regional Director (delegated authority) shall be copied on any groundwater report, notification, request, demonstration, certification or documentation submitted under 40 CFR 257.90-257.98 or 9 VAC 20-81-250 or defined under 40 CFR 257.105.(h), 106.(h)., and 107.(h).

XI.J. REPORTING REQUIREMENTS

The Permittee shall meet all the reporting and notification requirements of 40 CFR 106.(h) and 9 VAC 20-81-250.E as well as 530.B. throughout the facility active life (including closure) and post-closure care period.

XI.J.1. Groundwater monitoring reports

XI.J.1.a. The Annual groundwater monitoring report shall be due no later than 120 days from the completion of sampling and analysis conducted for the second semi-annual event and no later than January 31 of the following calendar year. The Permittee may use existing DEQ Annual Report Submission Instructions as a guide when completing the Annual Report.
XI.J.1.b.  The Annual report shall include at a minimum, the content found under 9 VAC 20-81-250.E.2.a. and 40 CFR 257.90(e)(1-5).

XI.J.1.c.  A semi-annual report summarizing the groundwater sampling results defined under 9 VAC 20-81-250.E.2.b shall be due no later than 120 days from the completion of sampling and analysis conducted for the second semi-annual event. The Permittee may use existing DEQ Semiannual Report Submission Instructions as a guide when completing this Report.

XI.J.2.  **Facility Background Determination Report**

XI.J.2.a  Within 30 days of initially establishing background, re-establishing background due to the installation of new monitoring wells or a change in sampling technique, the Permittee shall report the background values and statistical computations forming the basis for those values in a report entitled *Facility Background Determination Report*.

XI.J.2.b  The background determination results shall be submitted in the timeframe defined under 9 VAC 20-81-250.C.3.b.(2).

XI.J.3.  **Well Installation Report**

XI.J.3.a  Within 44 days of well completion, the Permittee shall supply the Director a *Well Installation Report* containing the well number, surveyed elevation, boring log, casing length, total depth, and a completion diagram for each monitoring well, along with a certification from a qualified groundwater scientist that the monitoring wells have been installed in accordance with 9 VAC 20-81-250 A.3.c and d.

XI.J.4.  **Well Abandonment Report**

XI.J.4.a  Within 44 days of well abandonment, the Permittee shall supply the Director a *Well Abandonment Report* containing information including field methods utilized, and a certification from a qualified groundwater scientist verifying the well abandonment activities met all applicable requirements.

XI.J.5.  **Groundwater Protection Standards**

XI.J.5.a  The Permittee shall place the GPS listing in the Operating Record and update that record as needed upon any changes in GPS values due to MCL revisions, ACL revisions, or Department approved updates to Background.
XI.K. **NOTIFICATION REQUIREMENTS**

XI.K.1. **GPS SSI Notifications**, shall be submitted to the Director within 14 days of determining an SSI over Facility-specific GPS.

XI.K.2. **Well Non-Performance Notifications** shall be submitted to the Director within 30 days of recognizing the non-performance issue.

XI.K.3. **Off-site Plume Notifications** required by VSWMR and 40 CFR 257.95(g)(2) shall be submitted to the affected landowner and copied to the Director within 15 days of identifying the groundwater impacts above GPS.

XI.L. **MISCELLANEOUS ALLOWANCES**

XI.L.1. **Use of Alternate Site Background.** The Permittee may request the Director allow site background to be developed using wells that are not hydrologically upgradient of the disposal unit as long as the request addresses the technical criteria contained in VSWMR and 40 CFR 257.91(a)(1) and is certified by a professional engineer. Until such time as Director approval is obtained, background shall be determined by sampling wells which are upgradient of the disposal unit.

XI.L.2. **Use of Alternate Statistical Method.** The Permittee may request the Director allow the use of an Alternate Statistical Method as long as the Permittee can demonstrate the alternate method can meet the technical criteria defined under 9 VAC 20-81-250.D.2 and 40 CFR 257.93(g). Until such time as Director approval is obtained, the statistical test(s) applied to site groundwater data shall be compliant with 9 VAC 20-81-250.D.1 and 40 CFR 257.93(f)(1)-(5). Whichever method is approved for use at the site, the method shall be listed in the facility Groundwater Monitoring Plan.

XI.L.3. **Verification Sampling.** The Permittee, at any time within 30 days of receipt of the laboratory report for a semi-annual sampling event, may obtain verification samples. Undertaking verification sampling shall not alter the timeframes associated with determining or reporting a statistically significant increase.

XI.L.4. **Data Validation.** The owner or operator may at any time within the 30 day statistical determination period undertake third-party data validation of the analytical data received from the laboratory. Undertaking such validation efforts shall not alter the timeframes associated with determining or reporting a statistically significant increase.

XI.L.5. **Table 3.1 Column B Detect Deletions.** With the exception of the constituents listed in Table 3.1 Column A and 40 CFR 257 Appendices III and IV, the Permittee may request the Director to allow previously detected Table 3.1
Column B constituents to be dropped from the semi-annual monitoring list as long as the request is certified by a qualified groundwater scientist and verifies that the Table 3.1 constituent(s) in question have not been detected for a period of two years.

XI.M. MISCELLANEOUS DEMONSTRATIONS

XI.M.1. To address an exceedance which is the result of something other than a release of solid waste constituents, the Permittee may submit a report entitled *Alternate Source Demonstration*, certified by a qualified groundwater scientist, for review by the Director within 90 days of providing the SSI notification.

XI.M.1.a. If a successful demonstration of an alternate source for the noted increase is made by the Permittee and approved by the Director within the 90 day timeframe, the Permittee may continue in the applicable monitoring program as defined in this Permit Module.

XI.M.1.b. If a successful demonstration of an alternate source for the noted increase is not made by the Permittee within the 90 day timeframe, the Permittee shall take actions required under 9 VAC 20-81-260 C and 40 CFR 257 within the required timeframes.

XI.N. PERMIT DOCUMENTS

The Permittee must have Design Plans that include detailed instructions concerning groundwater monitoring. These detailed groundwater monitoring instructions must at a minimum cover the items listed under 9 VAC 20-81-250.A.4.a and other applicable information under 9 VAC 20-81-250. The Department-approved document containing these instructions, called the *Groundwater Monitoring Plan*, shall be placed in the Operating Record.

XI.N.1 It shall be the responsibility of the Permittee to update this monitoring plan as needed, which may include actions otherwise defined under 9 VAC 20-81-600.A – F, if changes to the monitoring program have taken place since original Plan development. Items listed under Permittee Change in Table 5.2 of the VSWMR may be implemented without approval of the Department provided that the notification requirements of 9 VAC 20-81-600.F.1.a and b are met. All other modifications to the Groundwater Monitoring Plan must be approved by the Department in advance as required by 9 VAC 20-81-600.F.2 and 3.

XI.N.2. Should information contained in a Permittee authored *Groundwater Monitoring Plan* conflict with any requirement or condition of the VSWMR or this Module, the VSWMR or this Module condition shall prevail over the language in the Permittee supplied document.
XI.N.3. When the Permittee recognizes a failure to submit any relevant facts or has submitted incorrect information in any groundwater monitoring report to the Director, he shall, within 7 days, submit such omitted facts or the correct information with a full explanation.

XI.O. LIMITATIONS/AUTHORITIES

XI.O.1. The groundwater monitoring and reporting requirements set forth here are minimum requirements. The Director may require, by amending the Permit, any owner or operator to install, operate, and maintain a groundwater monitoring system and program that contains requirements more stringent than those of the Regulations whenever it is determined that such requirements are necessary to prevent significant adverse effects on public health or the environment.
PERMIT MODULE XII
CLOSURE

XII.A. CLOSURE PLAN MODIFICATION

XII.A.1. The closure plan shall be amended any time changes in operating plans or landfill design affect the closure plan.

XII.A.2. Amended closure plans shall be submitted to the department at least 180 days before the date the facility expects to begin construction activities related to closure.

XII.B. TIME ALLOWED FOR CLOSURE

The facility shall close each unit and install a final cover system in accordance with the timeframes specified in 9 VAC 20-81-140.D.1.e. and 9 VAC 20-81-160.

XII.C. FINAL COVER SYSTEM

The landfill final cover design profile from top to bottom is as follows:

- 6-inch vegetative support layer
- 18-inch soil protective layer
- 250-mil double sided geocomposite drainage layer
- 40-mil textured HDPE geomembrane layer

XII.D. CLOSURE CERTIFICATION

XII.D.1. Following construction of the final cover system for each unit, certification, signed by a registered professional engineer, shall be submitted verifying that closure has been completed in accordance with the permit, approved plans, and specifications. A certification will be required for each capped landfill phase and shall include the results of the CQA/QC requirements under 9VAC20-81-130.Q.1.b.(6).

XII.D.2. Following the closure of all units, certification, signed by a registered professional engineer, shall be submitted verifying that closure has been completed in accordance with the requirements of 9VAC20-81-160.D.5.a. through 5.c., which require posting a sign at the facility entrance and erecting suitable barriers to prevent access; submitting a survey plat to the local land reporting authority; and recording a notation on the deed to the facility property.
PERMIT MODULE XIII
POST-CLOSURE CARE

XIII.A. POST-CLOSURE CARE REQUIREMENTS

XIII.A.1. The facility shall conduct post-closure care of the landfill and bottom ash pond in accordance with its approved Post-closure Care Plan, Permit Attachment IV.

XIII.A.1.a. Leachate from the landfill shall be managed in accordance with 9 VAC 20-81-210 and the facility’s Leachate Management Plan, Permit Attachment VIII. If a leachate seep(s) occurs, the owner or operator shall repair the seep(s) and follow the procedures outlined in 9 VAC20-81-210.F. Leachate shall be discharged through Outfall 002 as regulated under the VPDES Permit # VA0004081.

XIII.A.1.b. As the landfill and bottom ash pond are mono-fills consisting of primarily ash, landfill gas is not expected to be generated. Therefore, a landfill gas management and/or monitoring system is not proposed at this time. If it is ultimately determined that landfill gas is being generated, a landfill gas monitoring plan shall be submitted and landfill gas shall be monitored in accordance with 9VAC20-81-200. If monitoring does verify that landfill gas is being generated, a Landfill Gas Management Plan may be required. If ultimately required, the gas management system shall be inspected at a rate consistent with the system's monitoring frequency.

XIII.A.1.c. Groundwater shall be monitored in accordance with 9VAC20-81-250, 40 CFR 257, Module X, and Module XI and the respective groundwater permit documents as applicable. The groundwater monitoring system shall be inspected at a rate consistent with the system's monitoring frequency.


XIII.A.1.e. Surface Water Monitoring shall be conducted in accordance with Permit Module XVIII and the facility’s surface water monitoring plan.
XIII.A.1.f. Post-closure care shall also be conducted in accordance with the applicable provisions of 40 C.F.R. 257.104.

XIII.A.2. Amended Post-closure Care Plans shall be submitted to the department for review and approval by the director.

XIII.B. POST-CLOSURE PERIOD

XIII.B.1. Post-closure care shall be conducted for 30 years.

XIII.B.2. The length of the post-closure care period may be decreased by the director if the owner or operator demonstrates that the reduced period is equally protective of human health and the environment and the demonstration is approved by the director. This demonstration shall contain:

XIII.B.2.a. Certification, signed by the owner or operator and a professional engineer licensed in the Commonwealth, verifying that decreasing the post-closure care period will be equally protective of human health and the environment; and

XIII.B.2.b. An evaluation prepared by a professional engineer or professional geologist licensed in the Commonwealth, which assesses and evaluates the landfill’s potential for harm to human health and the environment in the event that post-closure monitoring and maintenance are discontinued.

XIII.B.2.c. This provision shall not apply to the extent it is excluded by 40 C.F.R. 257.104.

XIII.B.3. The facility shall continue post-closure care and monitoring until such time that the department approves termination or the post-closure care and/or monitoring activity.

XIII.C. CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE

Not less than 180 days prior to the completion of the post-closure monitoring and maintenance period as prescribed by the Board’s regulations or by the Director, the owner or operator shall submit to the Director:

XIII.C.1. Certification, signed by the owner or operator and a professional engineer licensed in the Commonwealth, verifying that post-closure monitoring and maintenance have been completed in accordance with the facility’s Post-closure Care Plan; and

XIII.C.2. An evaluation prepared by a professional engineer or professional geologist licensed in the Commonwealth, which assesses and evaluates the landfill’s
potential for harm to human health and the environment in the event that post-closure monitoring and maintenance are discontinued.

If the Director determines that continued post-closure monitoring or maintenance is necessary to prevent harm to human health or the environment, he shall extend the post-closure period for such additional time as the Director deems necessary to protect human health and the environment and shall direct the owner or operator to submit a revised post-closure plan and to continue post-closure monitoring and maintenance in accordance therewith. Requirements for financial assurance shall apply throughout such extended post-closure period.
PERMIT MODULE XVIII
SURFACE WATER MONITORING REQUIREMENTS

This monitoring program is designed to determine if there is an impact to surface water that may be occurring as a result of potential groundwater to surface water exchange.

Surface Water Monitoring at this facility will take place under the program described herein and the actions undertaken shall be consistent with VSWMR, WQS, and VPDES regulations as applicable. The permittee must maintain a surface water monitoring program that meets the requirements of this module and outline that program in the *Surface Water Monitoring Plan*.

Nothing in the permit module authorizes the permittee to have an unauthorized discharge in contravention of State Water Control Law or accompanying regulations.

The surface water monitoring plan shall be developed in accordance with these requirements and submitted to the Department for approval within 30 days of the permit amendment issuance and shall be implemented within 30 days of approval by the Department.

XVIII.A. SAMPLING LOCATIONS

XVIII.A.1 A minimum of four sample locations shall be identified and approved by the Department. At a minimum, the locations shall be near-shore of the property where groundwater potentially could intersect with surface water and represent results from all units located at the facility. These locations:

- XVIII.A.1.a shall be noted on a site facility map and identified with GPS coordinates.
- XVIII.A.1.b may be augmented by additional sampling locations as needed, based on the results of the surface water sampling program, and to ensure potential impacts from groundwater to surface water are identified.
- XVIII.A.1.c. may be consistent with the surface water investigation locations pursuant to Permit Module XIV.
- XVIII.A.1.d. shall be permanently marked or flagged at the nearest shore to allow easy identification.

XIV.A.2 Sampling locations which do not contain a sufficient surface water column within which to sample will not be required to be re-sampled during the compliance period. However, sampling locations which have insufficient yield for 2 consecutive monitoring periods shall be evaluated for relocation and a new location proposed for approval by the
XVIII.B. SAMPLING ACTIONS

The Permittee shall:

XVIII.B.1. Collect samples from the surface water columns at the designated locations identified in XVIII.A. The samples shall be taken at mid-depth of the water column. Tidal samples shall be collected at low-tide if feasible.

XVIII.B.2. Conduct the surface water column sampling actions in a manner equivalent to the QA/QC procedures specified in the most current version of the Department’s Standard Operating Procedures Manual, Water Monitoring and Assessment Program, Section 4.8 - Collection of Trace Elemental Samples (Clean Metals), and others as applicable.

XVIII.B.3. Analyze surface water column samples in accordance with methods approved by the Department and performed by a VELAP accredited laboratory.

XVIII.B.4. Provide final results of surface water column samples as dissolved metals.

XVIII.C. SAMPLING FREQUENCY

XVIII.C.1. The Permittee shall, during the closure and post-closure care periods, sample surface water following a calendar quarterly schedule.

XVIII.C.2. The length of the quarterly sampling period shall be an interval corresponding to approximately 90 days. For the purposes of scheduling monitoring activities, sampling within 15 days of the 90-day interval will be considered ‘quarterly’.

XVIII.C.3. The Permittee shall sample more frequently when requested by the Department.

XVIII.D. SAMPLING CONSTITUENTS

XVIII.D.1. The permittee shall sample for the following constituents: Antimony, Arsenic, Cadmium, Chromium (total, III, and VI), Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, and Zinc.

XVIII.D.2. Boron and additional indicator and field collection data shall be provided including hardness, pH, and temperature.
XVIII.D.3. Any constituent not listed in XVIII.D.1. that has had an exceedance of a Groundwater Protection Standard established in Permit Module XI within the last three, consecutive years shall be included.

XVIII.D.4. Any additional constituents or parameters when notified in writing by the Department.

XVIII.E. DETERMINATION OF APPLICABLE STANDARDS FOR COMPARISON

Sampling results from surface water column testing of the constituents identified in XVIII.D.1. shall be compared to the lowest of the applicable standards established by 9 VAC 25-260-140. For any constituent not listed in XVIII.D.1. that has an exceedance of a Groundwater Protection Standard established in Permit Module XI, the constituent shall be compared to the Groundwater Protection Standard.

XVIII.F. REPORTING REQUIREMENTS

XVIII.F.1. After each quarterly sampling event, the permittee shall submit a surface water monitoring report under separate cover to the Department no later than 60 days from the completion of sampling and analysis unless as allowed under a director-approved extension. The surface water monitoring report shall include:

XVIII.F.1.a. Signature page certifying the results by a facility representative.

XVIII.F.1.b Facility name and permit number.

XVIII.F.1.c. Statement noting whether or not all sampling locations were sampled and if so, the reason a sample was not obtained or reported. If the sampling location did not contain sufficient water column for sampling, a statement noting the number of occurrences of lack of sufficient water column and, based upon the number of occurrences, a new proposed sampling location.

XVIII.F.1.d. Copy of the full Laboratory Analytical Report including dated signature page from laboratory manager or representative.

XVIII.F.2. The Permittee shall retain all surface water monitoring records throughout the closure and post-closure care period. The records shall be retained at the facility, or an alternate location approved by the Director, within an Operating Record and made available to the Department upon request.
XVIII.G.  **NOTIFICATION REQUIREMENTS**

Verified laboratory results indicating surface water column results above a standard identified in XVIII.E shall be submitted to the Director within 30 days of issuance of the laboratory report results.

XVIII.H.  **REQUIRED ACTIONS**

Within 30 days of submitting a notification in XVIII.G., the permittee shall submit a *Surface Water Investigation Report*. The following information shall be assessed in the investigation and discussed in the report:

XVIII.H.1. Any error in the collection of the sample that may be identified.

XVIII.H.2. Additional conditions and information regarding the surface water at the time of collection.

XVIII.H.3. Whether the constituent(s) were detected in groundwater monitoring sampling results.

XVIII.H.4. The identified or potential source(s) of the observed impacts, including any potential facility activities.

XVIII.H.5. Any additional sampling which has occurred or will occur to assess the extent of potential impact to surface water.

XVIII.H.6. Any mitigation action which has occurred or will occur as a result of the investigation.

XVIII.H.7. The permittee, depending on the results of this investigation, may be required to conduct additional monitoring, sampling including interstitial sampling or sediment sampling as feasible, or assessment measures including fish tissue sampling.

XVIII.H.8. The permittee shall submit a corrective action plan for Department review and approval or take other action in accordance with Permit Module XI when required by the Department in response to the *Surface Water Investigation Report*.

XVIII.I.  **PERMIT DOCUMENTS**

The Department-approved *Surface Water Monitoring Plan* shall be placed in the Operating Record. This *Surface Water Monitoring Plan* shall include at minimum the measures required for the facility to accomplish the monitoring required by this module.
XVIII.I.1. It shall be the responsibility of the Permittee to update this monitoring plan as needed, which may include actions otherwise defined if changes to the monitoring program have taken place since original Plan development.

XVIII.I.2. Should information contained in a Permittee authored *Surface Water Monitoring Plan* conflict with any requirement or condition of this Module, the Module condition shall prevail over the language in the Permittee supplied document.

XVIII.I.3. The permittee shall review and modify the surface water monitoring plan within 30 days of notification of the agency of required/requested modifications.

XVIII.I.4. When the Permittee recognizes a failure to submit any relevant facts or has submitted incorrect information in any surface water monitoring report to the Director, he shall, within 7 days, submit such omitted facts or the correct information with a full explanation.

XVIII.J. LIMITATIONS/AUTHORITIES

The surface water monitoring and reporting requirements set forth here are minimum requirements. The Director may require, by amending the Permit, any owner or operator to maintain a surface monitoring system and program that contains requirements more stringent than those of the Regulations and in this current permit module whenever it is determined that such requirements are necessary. Nothing in this permit module limits the Director or the Department from requiring additional actions consistent with applicable laws and regulations. Nothing in this permit module limits or alters the requirement to conduct surface water monitoring in accordance with groundwater corrective action and Permit Module XIV.