



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
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January 22, 2016

Cathy C. Taylor
Director, Environmental Services
Dominion Resources Services, Inc.
5000 Dominion Boulevard
Glen Allen, VA 23060

RE: Breomo Bluff Facility (SWP 618) Surface Impoundments Submittal Review

Dear Ms Taylor:

The Virginia Department of Environmental Quality (DEQ) has reviewed the application provided by Dominion in accordance with the applicable provisions of the Virginia Solid Waste Management Regulations (VSWMR) and the EPA 2015 Final Rule on the Disposal of Coal Combustion Regulations (EPA Rule).

Please note that that this facility has been assigned Solid Waste Permit Number 618. Please use this number in future submittals for this facility.

Permit Application Fee

1. Based upon the modules applicable to the facility, Dominion needs to remit a permit application fee in the amount of \$5,470. This amount shall be paid by check, draft or postal money order made payable to "Treasurer of Virginia."

Closure by Removal

2. Dominion has proposed closure by removal of the West Ash Pond and portion of the Eastern Ash Pond. The submitted closure plan includes the appropriate demonstration pursuant to 40 CFR 257 §257.100(b)(5); however, the closure by removal and closure plan must address the required standard under 9 VAC 20-81-370(A) in addition to the EPA rule standard.

Please revise the closure plan to include an appropriate protocol to take additional action to meet the requirements of 9 VAC 20-81-370(A). This protocol should include additional excavation beyond visible residual as well as groundwater monitoring upon removal to make the require demonstration.

Closure Plan

3. Section 3.3.3 specifies a minimum transmissivity of 5.0×10^{-4} m²/s (permeability of 7.87 cm/s) for the 250-mil geocomposite. The specified permeability is lower than 33 cm/s used in the HELP model. Please provide a calculation to demonstrate that the specified geocomposite is adequate to prevent building up of liquid head that may cause the instability of the final cover system. The calculation should include adequate factor of safety and reduction factors.
4. It is understood from the submittal that the East and North Ash Ponds do not have traditional leachate collection systems (Section 3.6 of the Closure Plan); however, there are several instances within the submittal where the term leachate is used. It is unclear from the text of the Closure Plan what is being collected (leachate or stormwater infiltration) by the toe drains along the East and North Ash Ponds and how the collected material is to be handled. Please verify and correct the following instances of the term leachate accordingly and add a discussion to Section 3.6 of the Closure Plan to address the drainage mechanism for liquid entrained within the East and North Ash Ponds (i.e. saturated ash) after closure as referenced in Section 2.3.4 of the Geotechnical Design Report found in Appendix E of the Closure Plan.
 - The drawings (specifically Drawing 21 and Detail 14 on Drawing 23) appear to use the term toe drain forcemain and leachate forcemain interchangeably.
 - Technical Specification 014516 - HDPE Pipe & Manhole Leak Test has two instances:
 - Section 1.03 A - "Prior to placing the leachate conveyance system into service..."
 - Section 3.01 A - "All new non-perforated leachate conveyance pipe..."
 - Appendix D of the Closure Plan contains several references to leachate, when it appears those references should be to stormwater drainage due to infiltration above the geomembrane in the final cover system. See specifically:
 - Section 3.0 Model Inputs and Assumptions states "The geomembrane layer was modeled conservatively to generate the maximum leachate head."
 - The last graph of Section 4.3, titled Total Collected Drainage, shows volume of leachate over a 30 yr period. The graphed results appear to be the summation of the quantity of stormwater drainage shown for the North Ash and East Ash Ponds from the landfill cap drainage layer above the geomembrane and should not be labeled as leachate.
 - The table headers in the Appendix D attachments are labeled as leachate flow.
 - The Groundwater Monitoring Plan contains two instances:

- The fifth paragraph of Section 6.3 states "... purge water generated during sampling activities in the Facility's leachate collection system or by another approved means."
 - Appendix C, Section 6.3 states "... well development water ... subsequently transported to a POTW or the site's leachate collection system for disposal."
5. 9 VAC 20-160.D.5.a. requires posting one sign at the entrance of the facility notifying all persons of the closing, and the prohibition against further receipt of waste materials. A sign shall be posted to identify the prohibition against further receipt of waste materials in the East and North Ash Ponds. Please include this requirement.
 6. Section 4.3 addresses closure certification of the East and North Ash Ponds; however, certification of closure by removal of the West Ash Pond and eastern portion of the East Ash Pond to be repurposed as a Stormwater Management Pond is also required in accordance with 40 CFR 257.100(c)(3).

Closure and Post-Closure Cost Estimates

7. The Closure Cost Estimates for the North and East Ash Ponds need to be revised to address the estimated quantities of soil fill needed to stabilize slopes and dikes as referenced within the text of the Closure Plan and its Attachments.
8. The Closure Cost Estimate for the West Ash Pond needs to include additional costs to cover the closure by removal demonstration.
9. Section I of the Post-closure cost estimate should be adjusted accordingly for any proposed changes to the GW monitoring network.
10. Section IV of the Post-closure cost estimate should be calculated for monthly inspections as identified on the Inspection Checklist (Appendix A of the Post-Closure Care Plan). As per the note within the Cost Estimate Worksheet, the cost should account for personnel time to complete routine inspections per Post-Closure Care Plan Inspection Frequency.
11. Once the cost estimates are revised accordingly, please provide a signed DEQ Form CE SWDF certifying the cost estimates provided are in accordance with 9 VAC 20-70. Form provided:
<http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/Forms.aspx>

Closure Plan Drawings (Appendix B of the Closure Plan)

12. Drawing 14 - An area outside of the northwest corner of the East Ash Pond is marked as "area to be clean closed." This area was not identified in the Closure Plan. Please address this area and the plans for closure by removal within the text of the Closure Plan. Note whether the standards for closure by removal per 40 CFR 257.100(b)(5) or 40 CFR 257.102(c) apply to this area.

13. Drawings 15 and 16 – Please indicate the outlets of the channel underdrain pipe in the gabion downchutes as depicted in Detail 7/24.
14. Drawing 20 - Section J-J shows small eastern portion of the EAP will be closed by removal to become a stormwater pond. A new soil dike will be built at western end of the pond as a containment dike to ash. Please address any potential seepage through the dike including the possible installation of a liner.
15. Drawing 22 - The arrow on middle of the page states 'East Pond Liner Grade' while drawing is for North Ash Pond. Verify and correct accordingly.
16. Drawing 25 - The "Approximate limits of CCR Impoundment/CCR Unit Boundary" seems to include the Stormwater Management Pond adjacent to the East Ash Pond as shown on Drawing 16. No other drawings appear to identify the CCR Unit Boundary specifically and instead identify the Proposed Anchor Trench Location, which is assumed to coincide with the CCR Unit Boundary. Please confirm and revise accordingly.

Construction Quality Assurance Plan & Technical Specifications (Appendix C of the Closure Plan)

17. Section 1.3 - Please define the role of land surveyor.
18. Section 4.2.4 states “All protrusions extending more than one-half inch from the surface shall be removed, crushed, or pushed into the surface with a smooth-drum compactor.” Pushing stones into the surface should not be allowed because the stones may come out during the geomembrane deployment.
19. Sections 4.3.4.1 and 4.3.4.3 – Please verify the values specified in Table Minimum Polyethylene Seam Properties (per GRI GM-19) with those specified in GM-19. Note that GRI Test Method GM-19 was last revised 2/12/2015.
20. Section 4.5.4.1 starts with "EPDM trial seams..." however, the paragraph is included under the XR-5 section of the CQA Plan. It is likely this is a typo and should be XR-5 trial seams... Please confirm that trial seam procedures apply to XR-5 as well.
21. Technical Specification 015200 - Construction Facilities and Temporary Controls is listed in TOC, but not provided in the PDF copy of the submittal. In its place is a second copy of the Table of Contents.
22. Technical Specification 310000 - Section 3.02 A states that “... however CCR-mixed soils shall not be used as final protective cover (2.04) or vegetative support layer (2.05) materials.” Section 2.04 was not provided, and it appears that reference to Section 2.05 should be 2.03. Also, procedures to protect underlying geosynthetics from damage during the placement of protective cover layer should be included in this specification.

23. Technical Specification 310519.13 - Section 2.02 B says "woven geotextile shall..." when it should say nonwoven geotextile.
24. Technical Specification 311100 - Section 3.04 C.2. states that CCR-mixed debris consisting of wood may be burned on-site (within the bounds of the existing disposal facility) if allowed by local ordinances. Note that 9 VAC 20-81-140.A.4. states that open burning shall not be conducted on areas where solid waste has been disposed of or is being used for active disposal. Please strike any references to open burning within the bounds of the disposal facility.

Geotechnical Design Report and Attachments (Appendix E of the Closure Plan)

25. Related to comment #4 above, the Geotechnical Design and Geotechnical Data Reports contain language referring to seepage from the East and North Ash Ponds. It is unclear what measures will be taken to collect seepage from these ponds after installation of the final cover system. Please clarify.
26. Section 2.2.1 of the Geotechnical Design Report states the design earthquake was taken from the 2008 USGS National Seismic Hazard Map. It should be revised using 2014 USGS map which will result in a PGA value of 0.18g to 0.20g depending on the exact location of the facility. Please update and make revisions accordingly.
27. Section 3.3.1.1 of the Geotechnical Design Report, second bullet, states that "Maintaining temporary stability during the re-grading activities will require lowering the water level in the ash. Water levels should be lowered to at least 15 feet below the lowest dike crest elevation and/or areas of ash re-grading." Dewatering to 15 feet below the dike were also stated in several locations throughout the Report, but the measures to achieve this dewatering goal were not provided in Closure Plan, Drawings, or cost estimate.
28. Drawings 4B and 5B – To improve the stability of side slopes, recommendations regarding 15 feet thick subgrade of the final cover system are presented in these two drawings, but these recommendations were not carried over to the Closure Plan, Drawings, or cost estimate. Please review and revise accordingly.
29. Attachment 6 Veneer Stability Analyses - The analyses under seismic forces should be provided.

Post-Closure Plan

30. Appendix A - Post-closure Inspection Schedule - Add inspection items for dike/dam stability as required by DCR Impounding Structure Regulations. The post-closure cost estimate should be adjusted to cover costs associated with these inspections during the post-closure care period.

Groundwater Monitoring Plan (GMP)

31. Please identify groundwater monitoring wells which can begin immediate monitoring under the solid waste permit. These wells should include appropriate upgradient, cross-gradient, and depending upon closure activity around the particular impoundment, downgradient wells. Locations of these wells should consider potential off-site receptors such as adjacent property and the James River.
32. Please identify a schedule for all proposed monitoring wells of when each well shall be established, if a new well, and when monitoring will begin of each well.
33. Please note that the facility should begin collecting background for the proposed groundwater monitoring constituents no later than 90 days after a final permit decision.
34. Please note that the facility should identify appropriate perimeter wells that can begin to be monitored no later than 90 days after a final permit decision.
35. Please include appropriate monitoring well to address Comment #2 above to make the required closure by removal demonstration under 9 VAC 20-81-370(A). These wells should be scheduled to be installed and monitored within 90 days after completion of excavation.
36. Because a railroad right-of-way is located on-site, the GMP should contain detailed maps showing the surveyed location of the right-of-way with respect to the extent of final waste unit closure cover and the adjacent limits of any receptor.

GMP Section 1.0 Introduction

37. Text should note that monitoring of groundwater will commence under the solid waste permit in the Phase 2 program, modified as needed to incorporate aspects of the EPA CCR rule.

GMP Section 3.1 Regional and Site Geology

38. Geologic description cited sources from 1969 which are outdated. The site is underlain by rocks associated with the Chopawamsic terrane including Ordovician to earliest Silurian volcanic arc rock and Ordovician granite unconformably overlain by post-orogenic clastic rocks of Devonian age (see Bailey and Owens, 2012; GSA Field Guide 29 – p.327-344 and references therein).

GMP Section 3.2 Site Soil Units

39. Throughout this discussion, and on the included boring logs, there appears to be confusion over the interpretation of the subsurface deposits. Nearly all of the sandy, silty, or lean or plastic clays encountered in the subsurface represent saprolite (insitu, chemically weathered bedrock). This material is not Cenozoic colluvium or alluvium

deposited upon the intact bedrock. Thin zones of “quartz gravel or sand” encountered within the thicker clay rich sections represents metamorphic vein quartz (which is chemically inert and therefore cannot weather into a saprolite). Please clarify.

GMP Section 3.3.1 Uppermost Aquifer

40. Section should discuss the uses and locations of any potable or non-potable supply wells onsite as well as depths and construction details of such wells.
41. The effective porosity value chosen for the slug test results may not be applicable to saprolite aquifers. Please evaluate.
42. It appears that groundwater flow on site may exist in the three main hydrologic ‘horizons’. Flow within the saprolite will be locally enhanced along relict quartz veins which will have random orientations in the subsurface. Groundwater flow will be accelerated along the diffuse, shallowly dipping, contact between saprolite and intact bedrock. Once in the bedrock, groundwater flow will be structurally controlled by metamorphic foliation and post tectonic fractures and jointing. Please evaluate the monitoring well network considering this information.

GMP Section 4.2 Monitoring Well Network

43. Monitoring wells to be used for groundwater compliance purposes should be installed and screened in a natural geologic formation not artificial fill or other anthropomorphic deposits. Please ensure all proposed compliance monitoring wells met these criteria.
44. If any existing wells will remain at the site in order to collect groundwater elevations, those wells should be listed in the Plan and include considerations from these comments.
45. To ensure a proper characterization both laterally and vertically, at least some of the point of compliance wells shall be installed as nested well pairs (i.e., screened interval within saprolite, and screened interval within competent bedrock). The identifiers “s” and “d” shall be used to differentiate the nested well pairs from monitoring wells installed as single screened intervals.
46. The downgradient monitoring wells should be installed to a depth below the original base grade of any valley subsequently filled with CCR, while the ‘cross gradient’ wells may be installed shallower (if groundwater is intercepted) to assess lateral dispersion.
47. Please document the reason, e.g. located in an area to be included in final closure cover, for any monitoring well which is slated for decommissioning.

GMP Section 4.3 Monitoring Well Construction

48. Because the groundwater constituents of concern are metals, all monitoring wells to be used as upgradient or downgradient components of the VSWMR compliance network

must contain a screened interval that lies below the top of the groundwater table such that at no time during the year, is the screened interval located within or above the capillary fringe zone.

49. The Plan should note the type of sampling device, e.g. bladder pumps or bailers, to be installed and whether the device will be dedicated to each well.
50. Compliance wells located near roadways should be protected from impact by four concrete bollards installed outside of the concrete apron.

GMP Section 5.1.2 Background Sampling

51. Because all the compliance wells are to be installed downgradient from existing surface impoundments, there will be no need to collect “interwell” background data from downgradient compliance wells. Statistical comparisons will be completed by comparing up versus down “intra-well” data only.
52. Please provide the boring log for MW-24.
53. Background data must be collected from screened intervals intercepting the same compliance point in the downgradient wells (i.e., same geologic unit). Because saprolite is chemically weathered bedrock, it will not contain the same mineralogical (chemical) composition as competent bedrock. This is important to avoid false exceedances in collected groundwater data.

GMP Section 5.1.5 Evaluation and Response

54. To ensure an even reporting schedule, the Department will require that the semi-annual and annual groundwater monitoring reports be submitted on a defined schedule of no later than June 30th and December 31st, respectively, each calendar year.

GMP Section 6.9.2 Laboratory Analysis

55. For groundwater constituents listed on Table 3.1 and those metals found on EPA Appendix IV of the CCR rule, SW-846 methods (as amended) shall be used. Methods used for the groundwater quality parameters that appear on the EPA appendix shall be VELAP accredited and shall be able to provide an accurate representation of groundwater quality.
56. Please note that samples shall not be field filtered.
57. All laboratory results for metals must be analyzed for and reported in total metals.

GMP Section 6.9.3 Limits of Quantitation

58. Laboratory LOQ's must be equivalent to, or lower than, the groundwater protection standard for that constituent.

GMP Section 7.3 Verification Procedure

59. Timeframes for completion of any verification sampling must be performed within the VSWMR required timeframe.

GMP Appendix C Well Construction Specifications Section 2.2

60. The proposed five-foot interval for logging should be examined to ensure it can evaluate the subsurface and characterize the geologic horizons. The interval should be guided by site conditions.

Surface Water Monitoring

61. Please note that the facility will be required to conduct surface water monitoring. The Department will be providing additional requirements regarding this monitoring.

Please provide the additional information and necessary revisions. Please note that this letter should not be considered a legal opinion or a case decision as defined by the Administrative Process Act, Code of Virginia § [2.2-4000](#) *et seq.* If there are any questions about this letter, please contact me at (804)-698-4185 or Justin.Williams@deq.virginia.gov.

Respectfully,



Justin L. Williams
Land Protection & Revitalization Division Director

cc: Graham Simmerman, VRO Regional Land Protection Program Manager
Nancy Perry, DEQ, Office of Financial Management
DEQ - PMT File, Permit No. 618