



Engineers and Environmental Consultants

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VIA EMAIL ONLY

December 16, 2022

Mr. Lonzo Lester
County Administrator
Russell County Board of Supervisors
137 Highland Drive, Suite A
PO Box 1208
Lebanon, Virginia 24266

RE: Letter Report
Landfill Feasibility Information Review near
Clinchfield, Russell County, Virginia
Potesta Project No. 0103-22-0164

Dear Mr. Lester:

Potesta & Associates, Inc. (POTESTA) is pleased to present our letter report summarizing our evaluation of information obtained from Russell County Reclamation, LLC (RCR) regarding a proposed solid waste disposal facility (landfill) located on property owned by RCR.

Based on information obtained from a review of Russell County, Virginia interactive GIS mapping, RCR owns a parcel(s) of land totaling 782.74 acres located near the community of Clinchfield. A portion of this property was historically used for coal mining and coal preparation. The coal mining and coal preparation operations included cleaning coal and disposal of coal refuse. Coal refuse is shale, rock, undersized coal, and other material removed from mined coal to make the coal more marketable. Coal refuse can consist of coarse and fine particles. Coarse particles are most often handled dry and placed in a disposal area by spreading and compacting. Fine coal refuse is often handled by mixing with water and pumping or sluicing to a disposal area such as a pond or impoundment.

The area being proposed by RCR for development of the solid waste disposal facility is an area previously used for coal refuse disposal. This area includes both coarse and fine coal refuse disposal. Coarse coal refuse was placed in valley areas of the property to form fills. Some of these fills were configured to form dam embankments to create impoundment areas for the disposal of fine coal refuse. Fine coal refuse mixed with water was pumped from the coal preparation plant to the impoundment areas. Coal refuse fines settled in these ponds and water was decanted and pumped back to the coal preparation plant and reused for coal cleaning.

RCR retained Draper Aden Associates of Richmond, Virginia to prepare a fatal flaw screening analysis to be used to evaluate the potential for the development of a landfill on RCR's property near

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Clinchfield in Russell County, Virginia. RCR provided POTESA with a copy of the fatal flaw screening report dated July 26, 2021 for review. The report included a preliminary evaluation of the RCR site with respect to siting requirements established for solid waste disposal facilities as contained in the Virginia Solid Waste Management Regulations (9 VAC 20-80-120 – Siting Requirements). The screening report addressed regulatory siting criteria including floodplains; geological stability; distance setbacks; proximity to parks, recreation areas, wildlife management areas, etc.; proximity to public water supply intakes, areas vulnerable to flooding from dam failures, sinkholes/karst caverns, and faults; seismic impact zones; areas where groundwater monitoring cannot be conducted in accordance with Solid Waste Management Regulations; wetlands; site characteristics requiring limitations on site use or incorporation of engineering controls; adequate area and terrain for leachate management; and airport safety.

The fatal flaw screening analysis did not identify site conditions that would result in a clear violation of the siting requirements established by Virginia Department of Environmental Quality's (VDEQ) Solid Waste Management Rules. The analysis did identify some siting standards that require further evaluation to determine the adequacy of the site including:

- Geotechnical stability of coal refuse areas.
- Geotechnical evaluation of underground mine workings to verify there are no voids resulting from coal extraction under the footprint of the landfill.
- Location of disposal unit boundary (landfill) with respect to local roads.
- Evaluation of existing coal refuse disposal dams and possible site impacts to those dams.
- Stability evaluation of possible geologic faults.
- Seismic activity evaluation of the site.
- Engineering evaluation of slopes, soils, groundwater conditions, etc.

POTESA attended a site visit on November 3, 2022 with representatives of RCR, TRC Companies, Inc., and Russell County Industrial Development Authority. TRC Companies, Inc. acquired Draper Aden Associates after Draper Aden Associates prepared the fatal flaw analysis report. The site visit included driving to the top of the coal refuse disposal area to view the proposed area of the solid waste disposal landfill.

The site being proposed by RCR for development as a solid waste landfill is a former coal refuse disposal area. Coal refuse was generated from Pittston Coal Company's Moss No. 3 Preparation Plant from the 1950s until the plant closed in the 1980s. The historical coal refuse disposal area is approximately 400 acres as estimated based on review of aerial photography.

RCR is considering a portion of the coal refuse disposal area for development as a solid waste landfill. The area being considered is located between two coal refuse dams making up a portion of the coal refuse disposal area. Dam 3 is located upstream and west of the proposed landfill area. Dam 1 is located on the downstream side and is south of the proposed landfill area.

The base area of the landfill includes a depression between the two dams. Both dams were created by filling and disposal of coarse coal refuse. The depression contains water and possibly some fine coal refuse. RCR indicated they have removed coal refuse fines from the depression, but there could be some fine coal refuse remaining under the water. Coal refuse fines were processed and marketed as fuel by RCR. RCR's envisioned landfill would be developed in this depression. The approximate bottom elevation of the landfill is 1900 feet. The top of the existing coal refuse pile and top of Dam 1 is at approximate elevation 2000 feet. Initial development of the landfill would include constructing a liner system in the depression followed by filling the depression with approximately 100 feet of solid waste. The proposed maximum elevation of the solid waste landfill is 2600 feet. To reach this elevation, RCR's plan will include developing and lining the hillside slope north of the depression, and placing solid waste over the lined northern hillside slope, followed by mounding the landfill near the center to elevation 2600 feet. The base area of the landfill is approximately 280 acres. The envisioned disposal volume of the landfill is just over 115 million cubic yards. At an assumed solid waste disposal rate of 5,800 tons per day, 6 days per week, the landfill life is estimated at approximately 38 years.

After review of the fatal flaw screening documentation and following the site visit, POTESA identified certain site conditions that will require engineering evaluation and provisions included in the development and operation plans for the landfill so that the landfill can be constructed and operated in an environmentally sound manner and achieve regulatory requirements. These items are discussed below.

1. RCR's conceptual plans for the landfill include developing the landfill in a bowl-shaped depression on the existing coal refuse disposal area. The depression is approximately 100 feet in depth. The landfill will be developed with a composite liner system in order to collect and contain leachate. The liner system will include a leachate collection layer and leak detection layer. Both of these layers will require piping so that they drain to an area outside of the landfill. This may include excavation or horizontal drilling, installation of casing pipes for leachate monitoring and conveyance, and installation of piping so leachate and the detection layer can drain by gravity to a location outside of the landfill. Of equal importance is the adequacy of a plan to treat and discharge leachate (wastewater) generated by the landfill or remove it from the site for treatment at an offsite location.
2. As a portion of the landfill is proposed over the bowl area which formerly contained (and may still contain) coal refuse fines, evaluation and measures will be required so that adequate foundation support is provided for the landfill. This will in part require that ponded water be removed, coal fines and/or soft, unsuitable soils be removed, and the resulting surface prepared and tested to result in an acceptable foundation to support the landfill without settling during the placement of solid waste.
3. Where the landfill will be developed above and over existing coarse coal refuse, the existing coal refuse will require evaluation to make sure that coal refuse is adequate and sufficiently stable to support the landfill. This may require geotechnical

exploration, laboratory testing, and engineering analysis of the coal refuse to address slope stability, bearing capacity, consolidation, and liner system/landfill stability.

4. This project will require a detailed analysis of slope stability of the existing coal refuse materials along the sides of the landfill, existing coal refuse dam embankments, and the proposed landfill liner system and landfilled wastes to verify that the minimum required factors of safety will be achieved for the landfill. Of particular concern is the stability of the coal refuse fill slopes comprising the dam embankments of the coal refuse disposal impoundments, Dam Nos. 1 and 3. Dam 3 will be located under a portion of the new landfill. Dam 3 will impound water and coal refuse upstream of the new proposed landfill. Dam 3 is approximately 200 feet high. Dam 1 may still impound water and coal refuse and is approximately 400 feet high.
5. RCR will need to coordinate engineering design and planning associated with the landfill with the federal Mine Safety and Health Administration (MSHA). MSHA reviews and approves designs for coal-mining dams that meet certain criteria. Dams 1 and 3 likely fall under the jurisdiction of MSHA and may also be under the jurisdiction of other regulatory programs. MSHA and possibly other agencies that regulate dams will require consultation, review, and approval of any changes to the coal refuse dams. This will likely include detailed engineering analysis of proposed construction.
6. Existing ground slopes in both the existing coal refuse disposal area as well as the hillside above and north of the coal refuse disposal area may be too steep to construct a composite landfill liner system with an adequate factor of safety for slope stability. Excavation and fill will likely be necessary to obtain satisfactory slopes for development of the landfill liner system. Liner system stability will need to be considered as part of the engineering design of the landfill.
7. Extensive underground coal mining has been completed in the general area of the proposed landfill. Underground mining below the proposed landfill may present concerns with regard to monitorability of the site and performance of the landfill liner system. An evaluation of historical underground mining should be performed including horizontal location, coal seam thicknesses, and the angle of draw to rule out impacts from mine subsidence.

RCR is considering developing a solid waste landfill over an area historically used for coal mining and disposal of coal mining wastes. The conditions resulting from the historical mining and coal waste disposal will require detailed engineering design and analysis to be completed to ensure that the landfill is designed and constructed in accordance with rules established by Virginia's regulatory requirements. This letter report identifies some of the issues for which engineering analysis will be required. In summary, at this point, POTESTA has not identified issues that make this site "unpermissible" for use as a landfill; rather the above items will require evaluation and proper

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technical design to address the various issues to VDEQ's satisfaction. Before moving forward, Russell County may want to have RCR provide more detailed information regarding the issues identified in this letter report, and how RCR plans to collect information and further evaluate the site to verify that no fatal flaws will exist for the development of the project.

CLOSING

This report has been prepared to aid the Russell County Board of Supervisors in their evaluation of information obtained from RCR regarding a proposed solid waste disposal facility located on property owned by RCR. Its scope is limited to the specific project and location described herein and represents our understanding of the factors as presented in this report. If these factors change as additional data concerning this study is obtained, we should be informed so that we may examine the data and, if necessary, modify or revise the conclusions and recommendations presented in this report.

Respectfully submitted,

POTESTA & ASSOCIATES, INC.



Dave Paylor
Vice President of Environmental



D. Mark Kiser

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Chief Engineer

DP:DMK/clr