



Love Central Virginia, Inc
P.O Box 238
Cumberland, VA 23040

September 27, 2022

Norfolk District Corps of Engineers
ATTN: CENAO-WR-R
803 Front Street
Norfolk, VA 23510-1011

steven.a.vanderploeg@usace.army.mil

Re: Public Notice NAO-2018-00995

Dear Mr. Vanderploeg:

On behalf of the members of the non-profit corporation, Love Central Virginia, Inc., which operates under the name Cumberland County Landfill Alert (CCLA), we are submitting these comments regarding the water permit application filed by Green Ridge Recycling and Disposal LLC for the construction and operation of a mega-landfill in Cumberland County.

CCLA started in June 2018 after the citizens of Cumberland and Powhatan counties became aware of the actions taken by the Cumberland County Board of Supervisors regarding a proposed 1200-acre mega landfill. As detailed within this letter, the environmental, cultural, and social risks of this project are significant, while the public need for the project is nonexistent. The proposed landfill lacks public support: the landfill project was approved by a close vote of the Cumberland Board of Supervisors, 3-2, all of whom lost their subsequent re-election campaigns. The Cumberland County Planning Commission, charged with evaluating a proposal's consonance with cultural, historical, and infrastructure resources of the county, rejected the project, stating that it violated the spirit and rules of the County's Comprehensive Plan. Over five thousand people have signed a petition circulated by CCLA opposing the landfill. The site has immense cultural significance to longtime residents of the area, including the AMMD who have staunchly opposed the landfill despite attempts to financially sway them. There is no public need for the project because our solid waste needs are well met at every level of analysis. The site selection has been one of political convenience and citizen vulnerability, not suitability or stewardship. The impacts to waters were not adequately considered by the applicant before embarking on expensive site plans, forcing the landfill to change their application numerous times to avoid wetlands, correct stream classifications, and acknowledge a pre-20th century dam immediately upstream of the site. All these problems and more demand a close analysis of the plan for the Green Ridge Landfill. It would be negligent to accept Green Ridge's research as sufficient. Experts who have examined the application have found serious omissions and inaccuracies throughout, from need to demographics to hydrogeology. **If the permit request is not denied outright, an environmental impact study must be performed to clearly understand the**

diverse and substantial impacts to people and the environment. A Public Hearing is highly recommended so the voice of the people can be heard.

SUBSTANTIVE CONCERNS

CCLA has many concerns with the proposed Green Ridge 1200-acre mega landfill in Cumberland County. These concerns include, but are not limited, to the following:

There is no public need for this landfill:

The Clean Water Act directs that permits to impair/destroy wetland cannot be issued unless there is no practicable alternative. It is critical to note that, for the Green Ridge project, the assertion that no practicable alternative exists cannot be rebutted. This is because there is no public need for the project. Thus, the least environmentally damaging practicable alternative is the no action alternative, i.e., not to build the landfill. There is no public need for this landfill, and at the same time, the waters impacts are substantial. These impacts would also be arbitrary. Unlike bridges or other water specific projects, a landfill has no inherent need to be built in wetlands.

The proposed landfill will take in trash from a radius of 500 miles away, up to 5000 tons per day. This service area and capacity far exceeds the needs of the rural community in which it is to be sited (producing roughly 80 tons per day across two counties). It even far exceeds the needs of the Commonwealth of Virginia. Statewide capacity exceeds 23 years, according to the latest numbers published by Virginia DEQ in 2022. The host community planning region (Cumberland and Prince Edward counties) has no need for additional capacity. The landfill was rejected by the Cumberland Planning Commission as incongruent with County plans for the future. There is a landfill in Prince Edward County that can be expanded, and the solid waste management plan shows that plenty of funds are held in reserve to address all the county's future waste needs. The regions' waste management plan states there will be no need for additional capacity for 20 years or more. There is also a very large multi-state landfill (Maplewood) only 23 miles away from the proposed site with 70 years of capacity remaining. Further, capacity is even higher than stated in the counties' solid waste plan because its population projections have incorrectly expected growth in the region. The population has declined by 4% (Cumberland) and 6% (Prince Edward) over the past decade rather than increasing by 10% as projected by the region's solid waste management plan. The surrounding geographic area has no need for additional capacity. Seven of the 10 (70%) of the Commonwealth's largest landfills are in the same planning region as the proposed site (Piedmont) and all have more than 20 years capacity. The closest waste management authority (Central Virginia) has no need for additional capacity for the next 20 years.

Waste pressures described by the applicant are demonstrably false. There is no "exponential" growth in waste production or disposal costs. Both are actually declining in Virginia. As can be observed in the DEQ data, trends for waste generation are stable or declining, not increasing, for the past 20 years. Further, the future will look different with regard to amounts of household waste. Recycling is increasing, and in areas where it is tracked, increases in recycling are accompanied by declines in municipal solid waste (MSW) generation. Composting and landfill reclamation technology are rising, and the roles of these alternatives are ignored by the applicant (though they are included in the regions' waste management plan). All these trends place downward pressure on MSW volumes, which are already declining. The assertion by the applicant that public costs of disposal are greatly increasing is false. There is no evidence that tipping fees are increasing as a result of capacity pressures. Waste industry surveys have shown that tipping fees have

declined over the past decade. There is no evidence for increasing pressure from out-of-state waste. It has been stable or declining for the past decade.

The site selection is based on convenience:

The site is located just a few hundred feet west of the Powhatan County line. Therefore, the eastern borders of the landfill impact many citizens who have no political power to oppose. The possibility of opposition is further reduced due to the site's location among populations disproportionately too young to oppose (children), lacking in resources (low income), and/or historically disadvantaged (minority) – discussed below. The convenience of the decision is underscored by a statement made on local radio, WRVA, where on 7/13/2022, a landfill representative, Jay Smith, stated that the County chose the site. Other evidence also indicates that the applicant did not really consider site features prior to site selection. Specifically, the site and supposed alternatives were clearly not seriously evaluated a priori with respect to water impact, as the chosen site had more than 2.0 acres of wetlands impacts upon submission to DEQ (this is disallowed), and streams impacts and flood risk had to be upgraded post-submission from negligible to significant.

The local population is disadvantaged:

As noted above, the chosen site is located among populations who will have difficulty opposing it. In addition to political powerlessness, there are a disproportionate number of children, and low-income individuals in the area surrounding the landfill. An expert economist and demographics data scientist, Dr. Patten, writes the following:

After thoroughly studying the demographic report provided for Green Ridge concerning their building of a landfill, I found severe deficiencies in the reporting, which lead to a bias in Green Ridge's favor. The purpose of this study is to evaluate and report the full demographic data in the area which would be affected by the proposed landfill. I show that building the proposed landfill in eastern Cumberland County presents an environmental justice concern as it would disproportionately impact minority and younger populations. It is important to note as well, that the residents of Cumberland County and surrounding counties have not had significant meaningful impact on a project which could affect their air quality, water quality and overall quality of life.

Race Analysis

In the affected area, the percentage of residents that are Black (alone) is 33.0%¹, which is 77.4% higher than the Black population percentage in Virginia, and 166% higher than the Black population percentage in the US. Even comparing the affected area with Cumberland County, which has a Black population percentage significantly higher than Virginia's Black population percentage, the affected area has a Black population percentage that is 12.6% higher than the Black population percentage in Cumberland County. Within a mile and a half of the landfill, there is a significantly larger percentage of Black residents compared with counties adjacent to Cumberland County, Virginia, and the US (with this percentage increasing the closer you get to the landfill).

Age Analysis

Of the residents living in the affected area, 32.1% are under 18 years of age. The affected area has 46.6% higher percent of residents under 18 than Virginia, and 57.4% higher percent of residents under 18 than Cumberland County. Of the Black (alone) residents living in the affected area, 40.5% are under 18 years of age. The affected area has 78.4% higher percent of Black residents under 18 than Virginia, and 121% higher percent of Black residents under 18 than Cumberland County. Within two miles of the landfill, there is a significantly larger percentage of residents under 18 compared with counties adjacent to Cumberland County, Virginia, and the US.

Meaningful Involvement

Many of the potentially affected residents in the community have not had appropriate opportunity to participate in decisions about the landfill as many of the negotiations and planning was done behind closed doors months before the deal was announced. The residents had little to no say in the rulemaking decisions, and their concerns were not considered in the decision making process (as evidenced by the fact that it only took the Cumberland County Board of Supervisors 35 days from when they officially announced Green Ridge would be building a landfill in Cumberland County to when they officially approve Green Ridge's request to build the landfill).

Conclusions

The results of this study have shown that the building of the Green Ridge landfill will disproportionately affect minority and younger populations. By implementing closed door negotiation policies, residents were not given enough notice to properly show their disapproval of this project. It is, therefore, incumbent upon the Board of Supervisors of Cumberland County to do their due diligence and make a decision based on the full evidence report given here and to listen to the protests of their constituents. I urge a serious reconsideration for approval of this landfill.

Dr. Patten included two figures detailing the concentration of children and Black residents at the landfill site and declining as one moves further away:

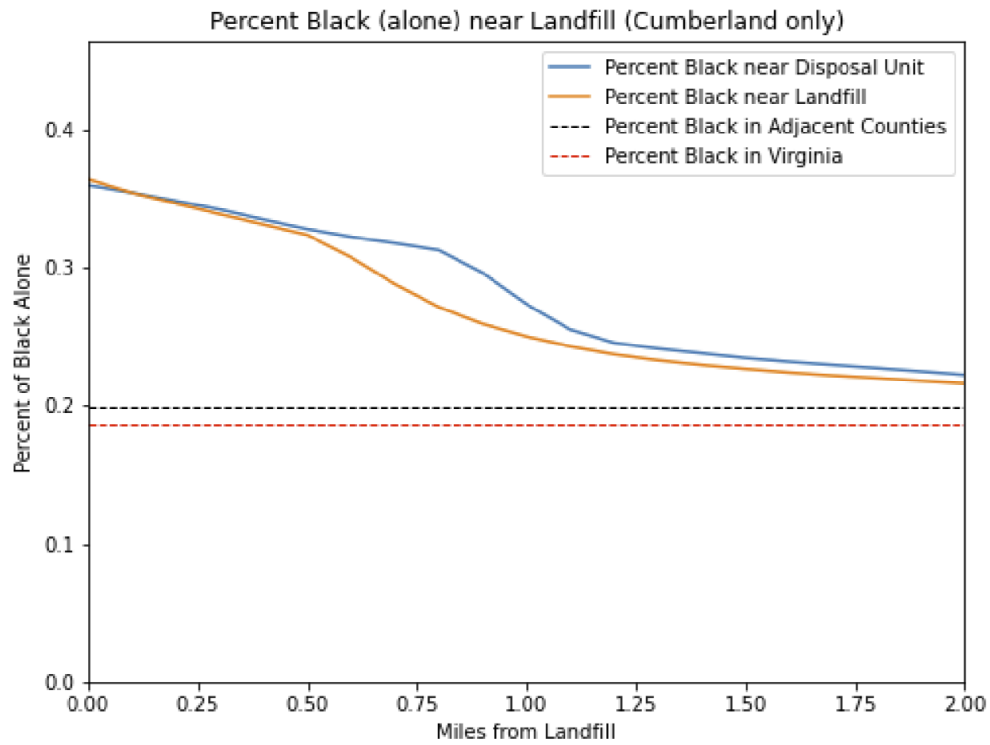


Figure 15: The above plot shows the percent of Black (alone) Cumberland residents near the landfill (as shown by the orange line), and the percent of Black (alone) Cumberland residents near the disposal unit (shown in blue). The black dotted line is the percent of Black residents in counties adjacent to Cumberland County, and the red dotted line is the percent of Black residents in Virginia.

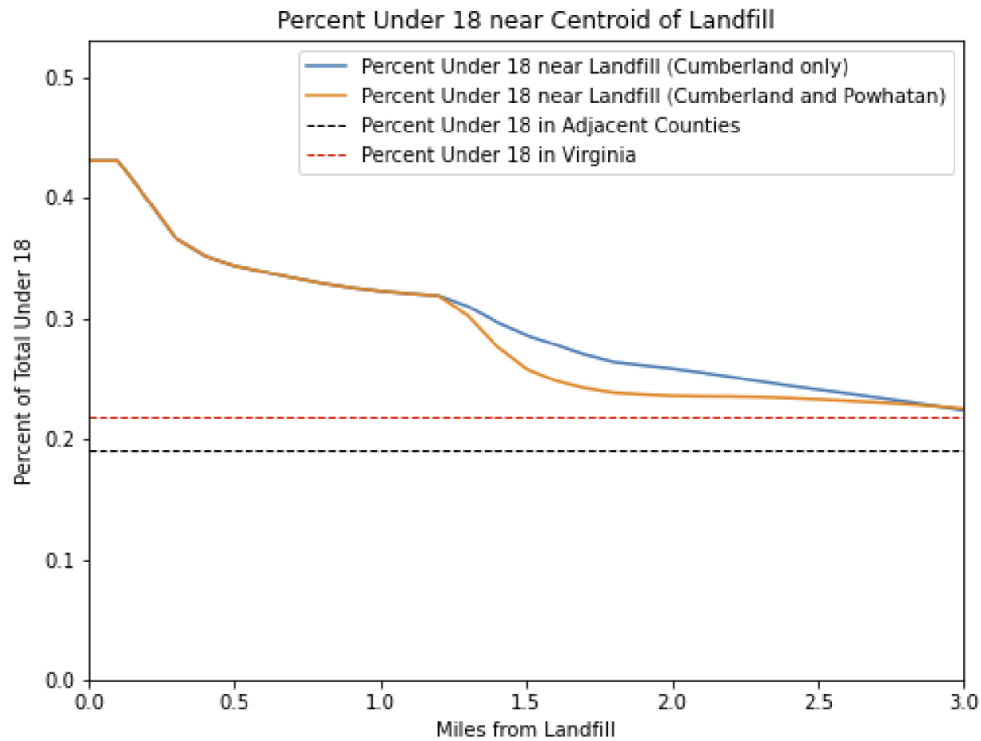


Figure 17: The plot above shows the percent of persons under 18 near the centroid of the landfill. The blue line includes only Cumberland residents, while the orange line includes both Cumberland and Powhatan residents. The black dotted line is the percent of persons under 18 in counties adjacent to Cumberland County, and the red dotted line is the percent of persons under 18 in Virginia.

In addition to disproportionate age and race factors, the residents of the area surrounding the landfill are low-income. According to Dr. Patten:

“In 2020, the median income for Cumberland County, VA was \$50,565, which was 51% below the median income for Virginia and 33.5% below the median income for the US. Fig. 1 shows how the median household income for Cumberland County has changed over the years, and how it compares with other neighboring counties. The Small Area Income and Poverty Estimates (SAIPE)²⁵ Program estimates the poverty rate for Cumberland County was 13.5% in 2020 while the statewide poverty rate was 9.2%. Additionally, the poverty rate for individuals under 18 in the county was 22% while the statewide under 18 poverty rate was 12.2%. According to the poverty level and the median income, it becomes quite clear that due to the rampant poverty in Cumberland County, residents are likely more vulnerable to pollution and negative externalities.”

Dr. Patten’s full report is appended to this letter.

Along with Dr. Patten in his full report, we further note that there are serious concerns with the quality and scope of the demographics data submitted in the permit application, strongly indicating the need for

further independent investigation. The report does not present the degree of measurement error, a basic and critical aspect to the interpretation of statistics. In reality, the presented income levels of the area are highly estimated and based on small samples (potentially as few as one household), and as such are highly imprecise and unreliable. This is easily demonstrated by examining income data by ZIP codes from the same survey (American Community Survey 5 year estimates 2014-2018), ZIP code regions being much larger than the strangely arbitrary 2.2-, 4.2-, and 6.2-mile radii circles submitted by Green Ridge. The income data from the ACS for ZIP codes for the site and the area immediately to the north have a margin of error of 22% and 52% respectively, and the error margin includes an income of zero. Again, ZIP codes are much larger in area with likely more responses to the survey and so the margin of error for the small circles will be even greater. These very large margins indicate that the data presented cannot and should not be used to describe the community or any differences within it as pertains to the landfill's socioeconomic impact.

The site is culturally and historically significant to the residents of Cumberland:

The U.S. Department of Interior has designated Pine Grove School, which is immediately across Pinegrove Road from the proposed Green Ridge facility, as a National Historic Place. The Virginia Department of Historic Resources has added Pine Grove School to the Virginia Landmarks Register. The construction and operation of a mega-landfill will have a significant, adverse effect of Pine Grove School, including realignment of Pinegrove Road, increased traffic, noise, dust, odor, visual impacts, and the general incompatibility of a landfill adjacent to a historic resource. The movement of Pinegrove Road will also isolate the Pinegrove School from the community.

The Virginia Department of Historic Resources has noted, and Green Ridge has acknowledged, that there are several other known historic resources within or adjacent to its 1,200-acre site. Several may be eligible for designation on the National Register of Historic Places.

The 1,200-acre Green Ridge site contains at least twenty-two graves of African Americans that the applicant does not propose to relocate, that should not be relocated and that should not be adversely affected by the construction and operation of a mega-landfill. The applicant's consultant acknowledges that the graves likely have historic significance. Relocation of the graves by Green Ridge, which its consultant recommends against, is unwarranted because there is no "more suitable repository" because of their historical significance. Va. Code § 57-38.1. They are plainly an essential part of the history of the area, which included the community of freed slaves and their descendants who resided there and continue to identify with Pine Grove School as the heart of that community. If the Green Ridge facility is constructed and becomes operational, appropriate access to these graves by the interested community and its oversight of the maintenance of the graves would be difficult to assure. Since Green Ridge acquired the site, it has imposed unreasonable burden on access to the graves, which the community has requested pursuant to Va. Code § 57-27.1.

The members whom CCLA represent are opposed to relocation of the graves in any event. More to the point, we request your determination that the proposed location of the mega-landfill would be unsuitable because of its unacceptable impact on the historic graves within the site and to the community to which those graves are linked.

The land in the immediate vicinity of the landfill has cultural as well as economic significance as hunting lands. Several area hunt clubs, which have existed for generations, and many of which are primarily

minority-run, use the area for hunting. This is both a social activity and is used to supplement food supplies. The landfill will permanently disrupt the function of the hunting land as it will disrupt migrations and unbalance ecology.

There is a significant probability of disruption to hydrogeology and surrounding private well viability:

The U.S. Geological Survey and the Virginia Department of Health have reported that the area in which the landfill would be located is 100% susceptible to groundwater contamination. In 2008, the U.S. Geological Survey, in cooperation with the Virginia Department of Health, published a report, Aquifer Susceptibility in Virginia, 1998-2000, concluding that the area in which Green Ridge proposes to construct and operate a landfill is 100% susceptible to groundwater contamination over a 50-year period.

The risk to the residents of the area of contamination of their groundwater supply is significant. There are at least 44 private wells within 500 feet of the proposed landfill. These residents have no practicable alternative to groundwater from their private wells. Many are unable to perform monitoring. The County is financially and incapable of providing water to the residents in the vicinity of the proposed landfill in case of contamination.

Contamination of Muddy Creek via groundwater is a significant concern. Due to groundwater flow patterns, leachate breach of the landfill liner would very likely end up in Muddy Creek, according to the expert hydrologist hired by CCLA. Muddy Creek flows offsite and to the James River, and so off-site or unpredictable contamination from creek flow is a serious risk of a landfill on this site. Green Ridge proposes to place the landfill liner directly on bedrock, which according to our expert geologist, is highly inappropriate due to the elevated risk of tearing, particularly in a seismic zone. He notes that this is even illegal in some states, including New York state.

In addition to contamination, groundwater recharge is a significant concern. The landfill will create a large impermeable surface that will reduce the ability of the local aquifer to recharge. This could lower the water table in the area, which could lead to loss of well capacity. The lack of groundwater recharge will also reduce the flow of groundwater to local creeks. An expert hydrologist hired by CCLA to evaluate the proposal, Dr. Burbey, writes: "it is estimated that natural groundwater flows to the Muddy Creek will be reduced by 6.7×10^6 ft³ /year. The amount of lost flow toward Maple Swamp Creek is estimated to be 7.5×10^5 ft³ /year."

Well viability is also threatened by the construction itself, where the creation or expansion of fractures in the bedrock due to blasting could negatively impact private wells in the immediate vicinity of the landfill site.

A second expert, geologist Dr. Dean, stated that the geologic evaluations performed by the applicant have not characterized the area well enough to protect the welfare of the people. Specifically, he notes that nature of the hydraulic conductivity tests done by the applicant (slug tests) were inadequate, and that additional pump tests should be performed to account for the true variation in water flow direction. He writes: "It is my opinion that the hydrogeology of the landfill site has not been characterized without a pump test that evaluates the anisotropy of the aquifer." He further notes that the applicant's assumptions that there is little water flow in bedrock are outdated, and current understanding holds that "a shallow

water table aquifer exists in the soil, weathered rock, and shallow bedrock fractures, but deeper fractured rock aquifers exist at depth that are associated with ancient faulting and tectonic stresses.” His full report, appended, presents his analysis of surface features that strongly indicate deeper fractures not included in the applicant’s analysis. These faults and fractures are likely beneath the surface of the landfill can have serious impact to flow predictions through anisotropy. Accordingly, we hold that the potential for groundwater contamination via this deeper aquifer and unacknowledged anisotropic flow is not addressed in the application but should be studied as part of the EIS.

Secondary impacts are a third concern. The radical impacts to the hydrology of the groundwater and perennial waters are outlined above, and there will doubtless be secondary impacts of this loss of flow to the surrounding area, including Pine Grove School. Without complete independent review, it is unknown how construction will impact water flow in contiguous off-site streams and ponds that are used for agriculture, fishing, or enjoyment.

There is a significant risk of flooding of the disposal area:

Documentation shows the proposed landfill site is situated on a 100-year floodplain or so close to the boundary it requires verification. The last in-depth review of the FEMA Floodplain Map for Cumberland County Virginia was completed over 20 years ago. Our research indicated the request to FEMA for this in-depth review had to come from the Cumberland County Board of Supervisors. CCLA started in the Spring 2019 to formally request this in-depth FEMA floodplain map update by the Cumberland County Board of Supervisors. This was asked of the prior Board members and those currently in office. The subject was brought at a regular board meetings, sending certified letters to Board members, and hand-delivery of letters to each Board member. All to no avail.

How can residents know the entire proposed landfill site is not within the 100-year Floodplain if this in-depth is not completed by FEMA? There are so many changes over the last 20+ years in factors affecting this review such as climate change, flooding, growth of new homes and businesses, earthquakes, forest harvesting, and Cobbs Creek reservoir – all putting a drain on the water supply for private wells. The proposed landfill only adds to the concerns of the residents. What impact will these factors have on possible flooding within and around the landfill site and washing debris and leachate into the waterways?

Additionally, the soil types map shown in the County’s Comprehensive Plan was created by the Commonwealth Regional Council (CRC) using USDA Natural Resources Conservation Service data. Is their soil map correct for their timeframe and has the soil content in and around the landfill site been altered by any flooding caused by the changing weather patterns (increased rains, flooding, and tropical storms/hurricanes)?

The latest information provided by Green Ridge in their application, addresses the filling of several streams and the use of an underdrain/dewatering system. This is being done to maintain a five-foot separation between base grade and the seasonal high water table. These underdrain systems will be directed to Muddy Creek, the underdrain system will alter the base flow of Muddy Creek and the 100-year floodplain in the vicinity and downstream of the landfill. AN EIS is needed to fully understand the flooding risk of the site in light of all of the contributing variables, including the construction itself.

Cumberland County continues to operate on an outdated Comprehensive Plan and continue to approve all these projects based on the same outdated floodplain map and outdated flood insurance study? Disturbing

1,200 acres of natural habitat for this mega landfill project will affect all these projects and have environmental effects, but to what extent? The answers to these questions warrant an updated floodplain map, flood insurance study, and environmental impact study.

Flippen Pond Dam – Flippen Pond is a large body of water (1700 feet by 400 feet) impounded by a generations old dam on Muddy Creek immediately upstream of the proposed landfill. Assuming an average depth of 5 feet behind the impoundment, if the dam failed over 25,000,000 gallons of water would torrent down Muddy Creek and wash out a portion of the landfill.

We learned there was a breach in the dam during the last 20 years that was not properly repaired and inspected. There is no documentation to support any recent inspections of the dam. This is a major concern, especially if it breaches again. We are doing further research on this issue to determine if the dam is in violation of inspections and compliance and if so, who would be responsible for paying for the cost of the repairs.

There would be substantial destruction of wetlands and perennial waters, and the significant extent of on site and contiguous wetlands makes the probability of off-site contamination high:

The site is bordered by large, perennial Muddy Creek on the West, Maple Swamp Creek to the East, Maple Swamp at the North and to the South-West is an unnamed tributary that runs all year from a wetland/pond off of Brown Road that flows close to the property to join Muddy Creek, an area known locally as Scott's Bottom. State documents show that this complex of waterways is responsible for draining forty-five square miles of land.

The amount of streams proposed to be filled/destroyed is 11,637 lineal feet. This exceeds stream impacts of all other landfill projects in the region by four to 100 times: 2817 lineal feet of streams (Maplewood Landfill), 2642 lineal feet of streams (BFI Old Dominion Landfill), 1135 lineal feet of streams (Butcher Creek Landfill). 953 lineal feet of streams (Brunswick Waste Mgt Facility), and 129 lineal feet of streams (Lunenburg Landfill).

The site plan and stream ratings have been revised several times since initial DEQ permit application and so the impact to the numerous wetlands on the property has been difficult to assess. However, it is clear that impacts will be substantial, and likely exceed those currently described in the application. For example, the applicant has had to update the status of at least four streams from intermittent to perennial after site visits from state water regulators.

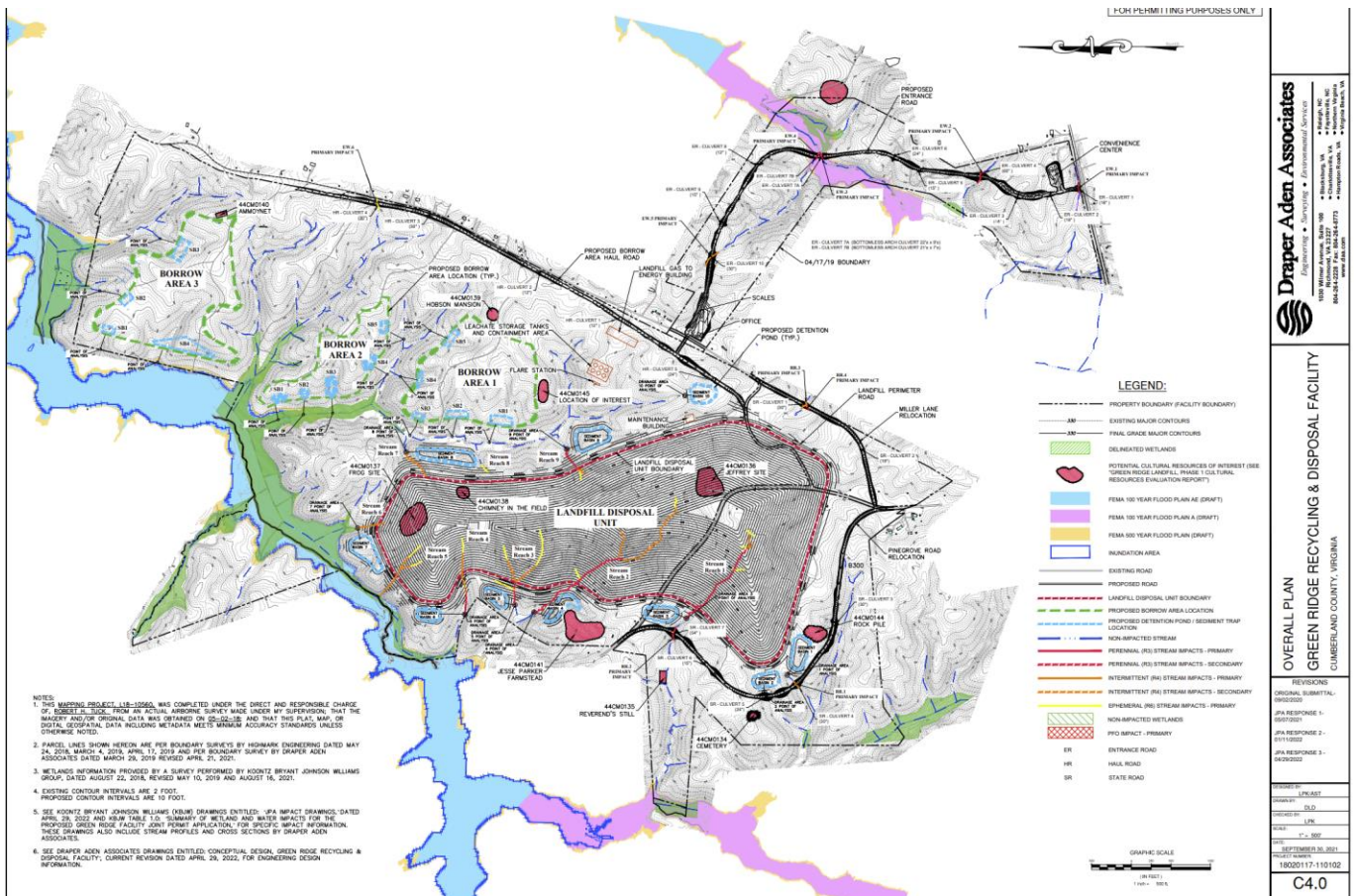
The disposal area (not just the "site" but the disposal area specifically) is proposed to encompass four perennial streams that flow to Muddy Creek and then the James River. The destruction of these four streams and other perennial waters (nearly a mile of high-quality perennial stream) will occur to construct the disposal area. It well known that riparian buffers (forested streams) are essential to the health of waterways, absorbing nutrients, filtering non point-source pollutants from the water, and preventing flooding and erosion, among other functions. What will the effect of the elimination of these riparian buffers be to the health of downstream waters, including the James River? How will the loss of large amount of surface perennial stream affect the ability of the local aquifer to recharge? Many laws and programs, at all levels from federal to Cumberland County ordinances, strive to protect and maintain these

ecologically vital surface riparian buffers. In contrast to these efforts, the Green Ridge project will needlessly destroy a significant amount of important riparian buffers and will be damaging to biodiversity and clean water.

After closure, the site will transform 500 acres that are currently laced with perennial streams and wetlands into a permanently impermeable surface due to the landfill cap. How will this affect the health of the riparian environment and the aquifer?

Extensive wetland impacts beyond those indicated by the applicant are likely, given that the disposal area skirts along applicant-provided wetland boundaries and the 100-year floodplain to the west, coming within 200 feet of them in places.

Even the contiguous wetlands and streams that are not destroyed will remain vulnerable to runoff contamination and groundwater contamination, which once in waterways can be carried far off site. The very large area of contiguous wetland makes this likely (see below from Green Ridge submission to Virginia DEQ of 4/2022; blue and green areas are wetlands and streams co-located with 100 floodplain zone A; red are impacted perennial streams; purple is 100-year floodplain zone AE).



The site is vulnerable to earthquakes and potentially unstable soils:

Cumberland County is situated within the Central Virginia Seismic Zone, which experiences on average six earthquakes per year, of which one is severe enough to be felt at the earth's surface. A magnitude 5.8 earthquake occurred in this zone near Mineral, Va. approximately 40 miles northeast of the proposed site on August 23, 2011. The impact of that earthquake was experienced as far away as southeastern Canada and caused damage to the Washington Monument, among many other distant structures. An earthquake of that magnitude was not anticipated and has been studied extensively by numerous scientists since its occurrence.

The Virginia Department of Mines, Minerals and Energy and the U.S. Geological Survey have concluded that earthquake epicenters in the Central Virginia Seismic Zone do not align with identified faults. Earthquakes in this zone, unlike earthquakes in California, "usually occur at depths anywhere from three to fifteen miles and it is not always possible to associate a specific earthquake with a specific fault." Further, the earthquake in Mineral in 2011 exceeded the expected ground acceleration that had been mapped at the time, as well as highlighted the existence of previously unknown fault, the Quail fault. Thus, the potential for strong earthquakes in Virginia was underestimated, and their location is very difficult to predict.

Solid waste landfills can be adversely and unpredictably affected by seismic activity. A consultant's report to EPA¹ recommended that "caution is warranted in concluding unconditionally that landfills will perform well in earthquakes and investigations and analyses are required to demonstrate that landfills are properly designed to resist the effects of strong ground motions and liquefaction." The tension in a landfill liner rises significantly during an earthquake and can cause tearing of the liner. The top of the landfill may crack, and methane collection systems can be compromised. The waste itself may become unstable and create unpredictable shear stress, which can tear the liner. Of three landfills with geosynthetic liners exposed to an earthquake similar to the Mineral earthquake, one experienced a tear in the liner (30% probability of failure).²

Seismic waves and subsequent liquefaction of soil, as was observed in the region following the 2011 Mineral earthquake (see photo), can cause instability in a landfill that results in leachate and methane gas leaks or even structural collapse. Published research from 2021 found evidence of liquefaction from previous earthquakes in the landfill region, specifically the James and Rivanna Rivers and their smaller tributaries³. Muddy Creek is a significant James River tributary less than 200 feet from the proposed disposal area. The high degree of risk associated with shear stress on the geosynthetic liner and soil liquefaction urges an independent review of the soil as part of an Environmental Impact Study.

¹ Richardson, Kavazanjian and Matasovi (1995). RCRA Subtitle D (258): Seismic Design Guidance for Municipal Solid Waste Landfill Facilities. US EPA.

² Anderson and Kavazanjian (1995). Performance of Landfills Under Seismic Loading." International Conferences on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics. 14.

³ Tuttle et al (2021). The Liquefaction Record of Past Earthquakes in the Central Virginia Seismic Zone, Eastern United States. *Seismological Research Letters*



Liquefaction sand boils in alluvium along the South Anna River in Louisa County generated by shaking from the August 23rd, 2011, earthquake. Photo courtesy of Mark Carter, USGS. From <<https://www.dmme.virginia.gov/DGMR/EQHazardMapping.shtml>>

To address the risks to landfills associated with earthquakes, EPA has promulgated regulations applicable to the Green Ridge proposal: 40 CFR Part 258, subtitle D. Those requirements provide that new landfills usually should not be sited within 200 feet of a known fault that has exhibited movement during the last 11,000 years. 40 CFR §258.13(a). Because of the inability to identify where earthquakes are likely to occur within the Central Virginia Seismic Zone by reference to fault lines, there is a risk of locating a landfill anywhere within this zone. The risks to local groundwater supply adjacent to the proposed landfill in the event that seismic activity causes failure of the liner and leachate collection systems in the future makes the proposed site inappropriate for that use. For that reason, the ACOE should determine that the site proposed for the Green Ridge facility is unsuitable. At a minimum, ACOE should require a site-specific analysis of the risks associated with locating a landfill in the Central Virginia Seismic Zone before making the determination required by Va. Code § 10.1-1408.4 of the suitability of the site for the proposed Green Ridge facility.

The area is not adequately served by highways and is already overburdened with traffic fatalities; the project will require culturally disruptive road relocations:

Considering transportation issues from safety and historical perspective, the proposed location of the Green Ridge mega-landfill is a very poor choice.

If the landfill comes to fruition, Pine Grove Road will need to be moved. Pine Grove Historic site is listed on the National Register of Historic Properties. PART 325 - PROCESSING OF DEPARTMENT OF THE

ARMY PERMITS details adverse impact. Among adverse impacts discussed in Part 325 are “the introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting”.

Pine Grove School Historic Site is depicted to be within 500 feet of the center of the southern and highest portion of the landfill disposal unit and it is served by a drinking water well. The primary access route to the school will be via the proposed relocated Pine Grove Road which will skirt the Southern and Western portions of the landfill disposal unit. The relocated Pine Grove Road is clearly within the "Permitted Area" as well as the "Area of Potential Effect."

If the road is moved visitors will travel on the relocated Pine Grove Road to access the Historic Site. During their visit they will encounter numerous negative sensory impacts that are out of character with the property. These adverse impacts would include a mountain of trash rising 331 feet above grade, blowing litter, noise from back up alarms, noise from heavy trucks and heavy equipment, odors from 5000 tons per day of decaying garbage, diesel smoke from trucks and heavy equipment, dust from landfill operations, and avian defecation from the crows, seagulls, and vultures that will feast at the landfill working face. Visitors will experience firsthand the adverse impacts that clearly represent visual, audible, or atmospheric elements that are out of character with the Pine Grove Historic Site.

The existing Pine Grove Road that cuts through the landfill disposal unit has one gentle curve. The proposed realignment of Pine Grove Road skirts around the southern and western waste management boundary. The relocated Pine Grove Road contains one gentle curve, one moderate curve, and one severe curve. Stream Reach 1 will pass under the moderate curve in a 54-inch culvert encased in fill which requires Corps approval. Further complicating matters is that the relocated road will drop steeply in grade along its new route.

We have concerns that the moderate curve and the severe curve may not meet VDOT design safety standards regarding curve radius, curve banking, and curve line of site visibility. The curve design is ultimately dependent on the speed limit. It is therefore requested that Green Ridge demonstrate that the moderate curve and the severe curve meet VDOT design safety standards.

The relocation of Pine Grove Road from its existing route to an indirect much longer circuitous less rural route clearly would cause the isolation of the Pine Grove Historic property from and alteration of the character of the property's setting. The current rural setting (with the exception electric poles) of the Pine Grove School is close to the original setting through which African American children traversed on foot up to 3 miles from 1917 through 1964 to attend grade school.

The location of the proposed mega-landfill on a two-lane highway presents unacceptable risks that make the site unsuitable due to the increased truck traffic it would generate. All other Virginia mega landfills are located on four lane highways and most have rail service to help mitigate truck traffic. The entrance to the proposed Green Ridge mega-landfill would be off U.S. Route 60, which is a two-lane highway from just west of its intersection with U.S. Route 522 in Powhatan County to the landfill entrance and a two-lane

highway west of its intersection with U.S. Route 45 near the Cumberland County Courthouse area. The route goes beyond that intersection to U.S. Route 15 and U.S. Route 24, which may be routes used to transport waste from a proposed Appomattox County transfer station to the Green Ridge mega-landfill. U.S. Route 522, U.S. Route 15, and U. S. Route 24 are two-lane highways. Each highway would experience significantly increased truck traffic if the Green Ridge proposal is approved. If waste is transported over U.S. Route 522, the safety risk is increased due to of the lack of adequate shoulders on that narrow highway. The Powhatan County Board of Supervisors has recently voted unanimously in favor of a “resolution opposing the Landfill” (R-2022-22). They oppose the Green Ridge proposed mega landfill for many reasons including the adverse impact on the County’s highways which would lead to an increase of as many as 500 trips per day by large trucks hauling waste to the proposed mega-landfill. That number of trips may be understated for a particular day because the facility will be limited to a weekly average of 5,000 tons per day, which means that on a particular day, the amount of waste could exceed 5,000 tons and require more than 500 trips. Green Ridge has assumed that all transport of waste to its mega-landfill would be by tractor-trailer. If the transport of waste to the facility is handled by a mix of tractor-trailers and smaller vehicles, the number of vehicles involved would be higher than Green Ridge’s projection.

Pursuant to §10.1-1408.4. the Landfill siting review, Green Ridge traffic submissions to date have done an inadequate job of addressing the impact of the landfill on highway safety. Mr. Jerry Cifor has compared the traffic impacts of the Green Ridge Landfill to the Luck Stone Quarry in Powhatan County with statements like the following: "Does Luck Stone Quarry pay a host community fee for its traffic impacts which are almost twice what ours will be? About 65% of their traffic goes through Chesterfield County. Green Ridges only impact to Powhatan County will be incremental traffic."

Luck Stone opened for business in 1985. At that time, they paid for the installation of a Traffic Light at the intersection of Luck Stone Road and Route 60 to safely accommodate the heavy trucks that utilize their facility. At the present time two hundred dump trucks per day utilize their facility mostly during daylight hours. On the other hand, the Green Ridge Landfill will be utilized by a minimum of 500 tractor transfer trailers and 31 tractor trailer leachate tankers per day. Green Ridge is proposing to restrict most of this traffic to off peak darkness hours. Even though Green Ridge will restrict traffic to dangerous darkness hours and will be utilized by far more trucks than the Luck Stone Quarry they have no intention of installing a traffic light at the intersection of the landfill and Route 60. The only way to safely accommodate all these heavy trucks at night is to install a traffic light at the landfill entrance.

A VDOT October 2020 US 60 Corridor study highlights numerous significant safety concerns and recommendations regarding the corridor between Clinton Road 601 and US 522. Some general concerns are as follows. Safety Edges should be installed to shape the edge of the shoulder to 30 degrees allowing drivers who drift off the road to return safely. Tractor trailers and trash truck are particularly susceptible to overturning. Rumble Strips using noise to alert drivers who are leaving the travel lane and are proven to be effective in reducing roadway should be installed. New sinusoidal rumble strip designs significantly reduce exterior noise compared to conventional rumble. Wide shoulders are needed to provide an area for users to avoid crashes, move disabled vehicles out of the travel lane, perform maintenance activities, and allow for law enforcement activities. Some specific recommendations are as follows. AT US 60 Milepost 158 to 159

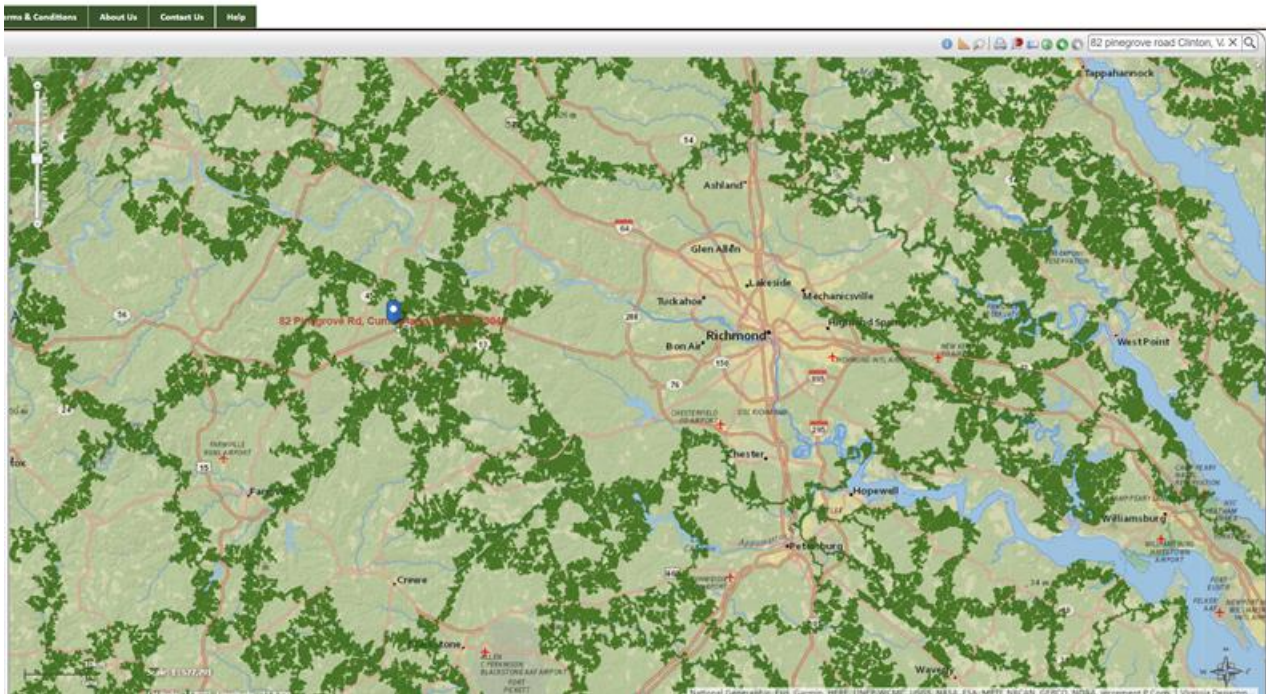
(Bell Road Area) it is recommended that the road be widened to a three-lane cross section with wider shoulders, with the middle lane dedicated as a two way left turn lane. At Old Tavern Road and US 60 it is recommendation to construct a westbound right turn lane and reconfigure the access of the parking lot to the convenience store to reduce sight line obstructions. At US 60 Milepost 152 to 153 at Ballsville Road area it is recommended that fully paved shoulders with rumble strips and safety edge are installed. These safety recommendations are based on current conditions and will cost millions of dollars to implement. Adding more tractor trailer transfer trucks and residential trash pickup trucks will add to the costs, accidents, and fatalities. According to the Virginia DMV, in 2021 there were 33 accidents including fatalities between Clinton Road (U S 601) and US 522. Route 60 in Cumberland and Powhatan saw 8 fatalities in 2021. Again, adding hundreds of trash trucks and tractor trailers hauling trash would exacerbate the safety issues on an already dangerous stretch of road.

The rural area is home to substantial amounts of wildlife, with fishing and hunting an essential basis of the local economy, and the area features prominently in statewide protected corridors:

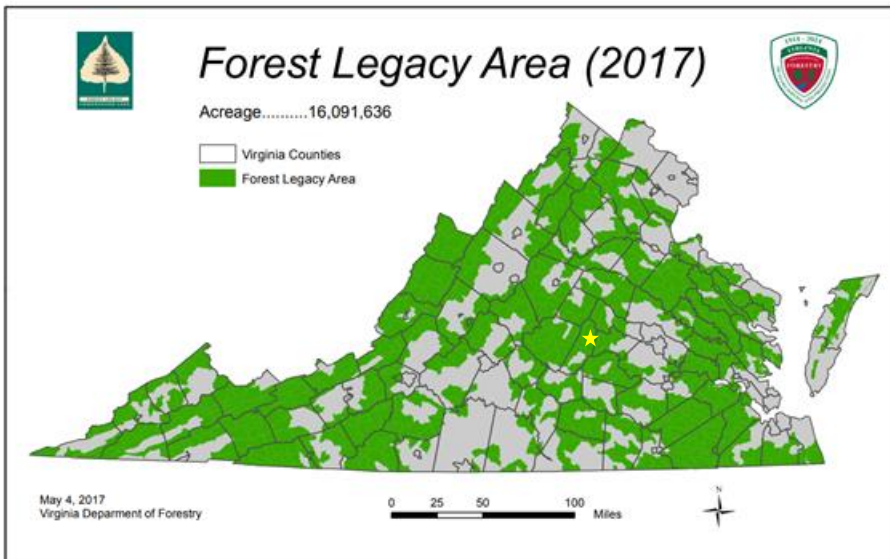
Cumberland County is a splendid example of Virginia's natural beauty. Deer, wild turkeys, bears, bald eagles and many other species of wildlife and plants are found around the proposed landfill. Bald eagles are spotted in areas a short distance of the proposed landfill site. The exact locations of the nests are unknown, because official state surveys are confined to the Tidewater region only, but reasonably they cannot be not far from the eagle sightings.

There are several hunt clubs in Cumberland County bringing in additional revenue and help controlling the population of wildlife within the area. Fishing is also a very popular local activity that also draws many people to our parks and waters. This would change drastically if the proposed Green Ridge dump is approved. There is a significant likelihood of contamination of Muddy Creek and the James, which would impact fish and game, and subsequently hunting, fishing, and tourism for the county.

The particular ecological significance of the region is also recognized by the state, as the area where the landfill is to be sited is included both in inventories of the state's forests most valued for conservation (Department of Forestry) and the state's map of critical wildlife migration pathways (Conservation and Recreation; see figure below).



Natural Land Networks of Virginia, Virginia Natural Heritage Data Explorer. The blue dot is the proposed location of the landfill.



Forest Legacy Areas of Virginia (important forests for conservation). The yellow star is the proposed location of the landfill.

Finally, the limited, off-site review completed by Green Ridge concerning Threatened and Endangered Species for this application is not adequate. Just expanding the distance a short way from the proposed site, using the US Fish and Wildlife Service Information for Planning and Consultation tool, to include wetlands and creeks surrounding the area identifies additional endangered species. Due to the

numerous wetlands and perennial streams on site, the area is likely to support endangered mussels, including the Atlantic Pigtoe. An independent, on-site evaluation should be done as part of the EIS.

Conclusion

There are many reasons why the proposed Green Ridge 1200-acre, mega landfill is not good for Cumberland County or Virginia. The landfill would have significant cultural, environmental, and safety impacts for the region that alongside the lack of public need, should result in permit denial. **If the permit application is not denied at this stage, we urge that you determine that the proposed project is likely to have a significant effect on the human environment of the relevant area. This can be accomplished by doing an Environment Impact Study and hosting a Public Hearing.**

Sincerely,

Betty Myers

Betty Myers
CCLA, Chairperson

2 Incls



**Demographic
Report for the Surro**

1. Dr. Patton's Report



**Green Ridge
Landfill Document R**

2. Dr. Dean's Report