**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION III**
**1650 Arch Street**
**Philadelphia, Pennsylvania 19103-2029**

MAR 1 1 2016

Mr. William T. Walker
Chief, Regulatory Branch
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510-1096

Re: PN: NAO-2006-5097 Centerville Properties Development; Tri-City Properties, LLC; City of Chesapeake, Virginia

Dear Mr. Walker:

The U.S. Environmental Protection Agency (EPA) has reviewed the public notice and updated supplemental documentation to the application for Centerville Properties Development. The applicant indicated that these materials were provided as an addendum to the application submitted in 2005. Tri-City Properties, LLC (Tri-City or applicant) currently proposes to place fill in 47.1 acres of forested wetlands to develop 53.8 acres in the northwestern portion of a 428 acre site for a proposed mixed-use development on the east side of Centerville Turnpike south of Virginia Beach City in the Greenbrier area of Chesapeake, Virginia.

EPA's review is intended to help ensure that the proposed project is consistent with requirements of the Clean Water Act (CWA) and its implementing regulations, including the CWA Section 404(b)(1) Guidelines (Guidelines) (40 C.F.R. Part 230). In response to previously issued public notices, EPA provided comment letters in 2005, 2007, and 2009 which expressed concern that the CWA Section 404(b)(1) Guidelines (Guidelines) (40 C.F.R. Part 230) were not met by the project and recommended that the permit be denied. Although the proposed project footprint and subsequent wetland impacts have been reduced since the original application, EPA's comments and concerns stated in our previous letters have not been addressed and remain relevant to the current proposal. Based on the information provided, the proposed project does not appear to comply with the Guidelines, and EPA is notifying the U.S. Army Corps of Engineers (Corps) that the project as proposed may result in substantial and unacceptable impacts to aquatic resources of national importance as covered in Part IV, paragraph 3(a), of the 1992 CWA Section 404(q) Memorandum of Agreement (MOA) between the EPA and the Department of Army.

The project is located in wetlands and waters adjacent to a tributary to Stumpy Lake and the North Landing River. The southern portion of the property drains to Gum Swamp, which is also within the North Landing Watershed. The North Landing River is a tributary to the Currituck Sound and Albemarle Sound. The Albemarle-Pamlico estuary is the second largest estuary in the contiguous United States. In our previous letters, EPA identified Stumpy Lake, Gum Swamp, and the North Landing River Natural Preserve Area and watershed as aquatic resources of national importance (ARNI) and stated that the forested wetlands on this parcel are part of a larger unique and valuable wetland

ecosystem. The age, vegetative community, and location of the resources onsite makes the loss substantial and potentially irreplaceable; the onsite wetlands were historically part of a much larger system located on the outer coastal plain of Virginia and North Carolina. In addition to Albemarle Sound, the larger watershed includes the Great Dismal Swamp and Back Bay. Each of these resources have also been described as ARNI by EPA. Therefore, the aquatic resources of national importance includes both the extensive forested wetland onsite and the offsite wetland with its suite of ecological services provided locally and to the larger watershed and region. Aquatic resources in the coastal plain have experienced significant losses from development and degradation. These past and ongoing losses, along with new threats such as climate change, increase the value of the existing aquatic resources and their contributing functions in the watershed.

The information provided does not clearly demonstrate that the proposed project represents the least damaging practicable alternative (LEDPA), as directed by the Guidelines [40 C.F.R. § 230.10(a)], for achieving the project purpose. Based on the materials provided for review, the applicant has not yet demonstrated that there are no practicable alternatives either on or offsite that would have fewer or less severe impacts to waters of the U.S. On the contrary, it appears that an upland alternative is available and may be practicable; at least 60 acres of uplands have been mapped onsite, but this area is not being utilized for the proposed 53.8 acre development. The Guidelines prohibit discharges when there is a practicable alternative that would have less adverse impacts on the aquatic ecosystem and states that an alternative that does not impact special aquatic sites is presumed to exist unless the applicant demonstrates otherwise. Overall, it appears that the alternatives evaluated are based on a number of constraints and considerations for the previous design, but these may not be relevant to the current proposal. EPA recommends the applicant re-evaluate potential available alternatives based on current conditions and engage in new discussions with the City of Chesapeake to ensure that a thorough analysis of potentially less damaging alternatives has been conducted and that the proposed project represents the LEDPA.

The Section 404(b)(1) Guidelines direct consideration of both secondary and cumulative impacts. EPA is concerned with the potential secondary effects from the project, including further water quality degradation, impacts to hydrology, habitat loss, habitat degradation for both flora and fauna, loss of biodiversity, and the loss of nutrient cycling in the remaining resources onsite. These secondary effects were not fully addressed in the application materials and should be thoroughly evaluated. While stormwater best management practices may help reduce the severity of impacts to water quality and quantity from development, these practices do not function better than natural systems nor do they not offset the loss of mature forested wetlands and their entire suite of functions.

Cumulative impacts should also be fully evaluated. Cumulative impacts, as defined at 40 C.F.R. § 230.11(g)(1) are the changes in an aquatic ecosystem that result from the collective effect of a number of individual discharges. The entire development plan for the site and City proffers should be evaluated. The current application includes 264 acres of the 428 acre site; it appears that additional impacts may occur to the remaining 164 acres of mostly PFO wetlands in a future phase. Also, the status of the road previously proposed through the site is unclear.

The updated narrative provided by the applicant states that there are no significant impacts because of the limited percentage of drainage area to the headwaters for the Stumpy Lake system and North Landing River impacted by the proposed development, it also indicates that the water quality in Stumpy Lake is impaired due to stormwater from development in the watershed. Existing impacts from development in the watershed appear to be causing impairment of water resources, filling in mature

forested wetlands along with increased impervious cover resulting from the development of the site, in proximity to Stumpy Lake, is likely to exacerbate these problems. Therefore, the additional development associated with future phases and the potential direct, secondary, and cumulative impacts on the aquatic ecosystem from the entire project, along with other existing and projected development in the watershed, should be thoroughly considered to evaluate whether the combined effect of these activities has resulted in, or may result in, significant degradation of aquatic resources.

To fully assess the direct, secondary, and cumulative impacts under the Guidelines, detailed baseline data is needed so that that the current condition and functions of the aquatic resources in the project site can be fully assessed and impacts to high quality, high functioning, and sensitive resources are identified and avoided to the maximum extent practicable. Also, a thorough evaluation of the current condition and functions of the impact areas should ensure that aquatic resource functions are adequately replaced. The environmental information provided does not fully characterize the onsite aquatic resources. The assessment provided is based on the *Highway Methodology Workbook Supplement – Wetland Functions and Values, A Descriptive Approach.* This approach is inadequate given the scope of the impacts and the quality of the onsite resources. The provided narrative primarily discounts the vital functions that wetlands contribute to the ecosystem. No data was provided to support the contention that the wetlands onsite are impaired and lack the opportunity to perform significant wetland functions. Given the scope of the impact, a detailed assessment, such as outlined in *A Regional guidebook for applying the hydrogeomorphic approach to assessing wetland functions of wet hardwood flats on mineral soils in the Mid-Atlantic coastal plain,* should be used to fully characterize resources.

Once the LEDPA has been identified, the applicant has taken all practicable steps to avoid and minimize impacts, and the resources are adequately assessed, appropriate compensatory mitigation should be identified. Tri-City has offered to preserve a 145-acre forested conservation buffer and provide reestablishment and creation of wetland functions on 65.2 acres of prior-converted cropland and cut-over upland areas onsite. Mature forested wetlands are difficult to replace; even if mitigation is successful, it will not replace the structure and function of the existing wetlands for many decades. Consequently, the proposed mitigation is insufficient to offset the proposed environmental losses.

In conclusion, EPA believes that the project as currently proposed does not comply with the Section 404(b)(1) Guidelines and may result in substantial and unacceptable impacts to aquatic resources of national importance. The discharge of fill material in the wetlands may have significant adverse effects, which in turn may have an adverse effect on the Stumpy Lake watershed and may result in significant degradation of waters of the United States. The impacts to vital watershed functions and potential resultant impacts to downstream receiving waters, including the North Landing River, Currituck and Albemarle Sounds, need to be considered and thoroughly assessed. It appears that less environmentally damaging practicable alternatives exist and need to be fully evaluated. Please refer to the enclosure for additional detailed comments.

Given the scale and scope of this proposal and its proposed impacts to aquatic resources, a robust analysis in accordance with the National Environmental Policy Act that would allow for a full study of direct, secondary and cumulative impacts and consideration of a range of alternatives and potential future scenarios seems to be warranted. It is also unclear whether the proposed mitigation is sufficient to offset the impacts proposed and would support the finding of no significant impact. Should permit issuance remain an option, EPA continues to recommend development of an Environmental Impact Statement.

Thank you for the opportunity to provide comments. EPA would like to continue to work with the Corps and the applicant to resolve our concerns. If you have any questions please do not hesitate to contact Ms. Carrie Traver, staff contact, at 215-814-2772 or by email at traver.carrie@epa.gov.

Sincerely,

Jeffrey D. Lapp, Associate Director
Office of Environmental Programs

**Enclosure – PN: NAO-2006-5097 Centerville Properties Development; Tri-City Properties, LLC; City of Chesapeake, Virginia**

**Background**

The proposed project has a long history. The joint permit application (JPA) initially placed on public notice by the Army Corps of Engineers (Corps) in 2005 proposed a development with permanent impacts to 144.6 acres of forested wetlands. Several iterations of the project were subsequently proposed and placed on public notice in 2007 and 2009. During each of these project updates, EPA expressed concern that the CWA Section 404(b)(1) Guidelines (Guidelines) (40 C.F.R. Part 230) were not met by the project and therefore recommended that the permit be denied.

Fundamental to the Guidelines is the premise that no discharge of dredged or fill material may be permitted if: (1) it causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable state water quality standard; (2) a practicable alternative to the proposed discharge exists that would have a less adverse impact on the aquatic environment; or (3) the discharge would cause or contribute to significant degradation of waters of the United States (WOUS), with emphasis placed on both the individual and cumulative persistence and permanence of effects. EPA has concerns regarding the project and its compliance with the Guidelines, and identified a number of issues including loss of valuable aquatic resources for non-water dependent development, insufficient analysis of practicable alternatives, and a lack of demonstration of avoidance and minimization. Other significant issues included inadequate characterization of the resources onsite, the potential for significant secondary and cumulative impacts, and a deficient mitigation proposal. These concerns and the comments previously provided remain unaddressed by the latest addendum to the application.

*Watershed/ landscape context*

The project is located in the outer coastal plain east of the Suffolk Scarp. The outer coastal plain included in HUC 03010205 is 3750 square miles in Virginia and North Carolina. This landscape is within the Mid-Atlantic Embayed Region, "a region of sounds, embayments, and flatwoods stretching from Back Bay, Virginia to the Neuse River in North Carolina. In Virginia, the Embayed Region includes the Great Dismal Swamp and the North Landing and Northwest Rivers, northern extensions of Currituck Sound," as stated in *The Natural Communities of Virginia Classification of Ecological Community Groups Second Approximation* (Fleming et al. 2016).

Extensive wooded wetlands were once present on the outer coastal plain. According to the USFWS, The Great Dismal Swamp National Wildlife Refuge "is the largest intact remnant of a vast habitat that once covered more than one million acres of southeastern Virginia and northeastern North Carolina." The site is located at the northern extent of another remnant of mostly intact habitat along the North Landing River. As previously noted by EPA, the North Landing River Natural Area Preserve is one of Virginia's largest natural area preserves. The combination of the preserve protected by the Commonwealth of Virginia and the Nature Conservancy includes more than 10,000 acres, and includes one of the largest expanses of freshwater marsh habitat along the east coast. This wetlands system includes five wetland communities which are rare in Virginia, provides important habitat for breeding and wintering waterfowl, and supports a number of rare species of plants and animals. It is home to more rare plants, animals, and natural communities in Virginia than any other place east of the Blue Ridge. The project site also abuts the Stumpy Lake Natural Area, which was created in 1910 at the head of the Gum Swamp. Stumpy Lake Natural Area consists of approximately 970+ acres of undeveloped

forested land surrounding a 278-acre lake on a 1400 acre site. The lake supports waterfowl and attracts migrating shorebirds, and other birds reported on the site include prothonotary warbler and nesting bald eagle. As stated in the *Status and Trends of Wetlands in the Conterminous United States 2004 to 2009*, "[f]orested wetlands are ecologically important systems and represent some of the most diverse, complex, and productive freshwater wetlands in the Nation. They also are dynamic, experiencing changes in area, ecological condition, and successional stage over time" (Dahl 2011).

Historic wetland losses in the watershed and region cannot be ignored. Both permitted and unpermitted impacts have resulted in a significant loss of wetlands over time. EPA's 2005 letter noted that an estimated 4,800 acres of vegetated wetlands were lost in the Norfolk/Hampton region of Virginia between 1982 and 1990 (Tiner and Foulis 1994). The loss of wetlands has continued. More than 2,100 acres of forested wetlands were converted to uplands in southeastern Virginia from 1994 to 2000 (Tiner et al 2005). The latest *Status and Trends of Wetlands in the Conterminous United States* report indicated that forested wetlands sustained significant losses nationwide in 2004 to 2009, with the rate representing the largest losses since the 1974 to 1985 time period. One of the regions identified with the highest rate of freshwater wetland loss was the Gulf-Atlantic Coast, including southeastern Virginia. Changes in wetland area between 2004 and 2009 indicated that the coastal freshwater forested watersheds of the Atlantic declined by an estimated 204,370 acres. The *Status and Trends of Wetlands in the Coastal Watersheds* noted "The estimated losses of freshwater forested wetland in the coastal watersheds made up over 64 percent of all forested losses in the conterminous U.S. between 2004 and 2009; thus the causes for those losses have far reaching implications for wetland management, protection and regulation strategies" (Dahl and Stedman 2013).

*Hardwood flats*

The wetlands on the project site would generally be classified as non-riverine saturated forests or wet flatwoods. *The Natural Communities of Virginia Classification of Ecological Community Groups* notes that most remaining examples of these saturated forests in Virginia occur on the outer Coastal Plain from the Eastern Shore to the Embayed Region. The habitats are nearly flat, usually with seasonally perched water tables. While these are non-riverine systems, they often have shallow, braided channels and microtopographic depressions. Late-successional stands of these forests contain mixtures of hydrophytic oaks (*Quercus* spp.). Cutting and other disturbances result in higher proportions of sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and other trees. Herb layers often are typically sparse but usually contain netted chain fern (*Woodwardia areolata*) and sedges.

Mature forested hardwood wetlands are increasingly rare resources in the Mid-Atlantic region. In much of the central and northern part of the property, the age of the trees exceeds 70 years old, and the canopy is dominated by oaks. Many Mid-Atlantic wet forests have been extensively logged in the past 50 years; and many are dominated by pines or red maple due to the effects of timber management, draining, fire suppression, and other anthropomorphic impacts. (Note: The 2005 application noted that the site consists of an approximately 50-60 year old mixed deciduous late successional forest. At this point, many of the overstory trees are at least 65 years old and some are likely to exceed 80 years old.) In addition, many of these trees are oaks, including *Quercus michauxii, Q. pagoda, Q. nigra, and Q. phellos.*

*The Natural Communities of Virginia Classification of Ecological Community Groups* characterizes oak-dominated non-riverine Wet Hardwood Forest into two types – the Embayed Region Type and

Northern Coastal Type. Both communities are now globally uncommon to rare. Fleming et al. (2016) states "[l]ate-successional non-riverine saturated forests have been greatly reduced in extent or modified by extensive agricultural clearing, logging, conversion to pine for silviculture, and hydrologic alterations such as ditching and draining." NatureServe ranks the global status of the Embayed Region community type (CEGL007449) as 'G2 – Imperiled' and states, "[t]his unusual forest association is restricted to areas with saturated rather than temporarily flooded hydrology. It generally occurs in association with large peatlands of the Atlantic Coastal Plain, where small examples are conserved. Few stands of this vegetation type have been studied, and rangewide information is limited. This community and its composition and structure are dependent on local groundwater or sheet flow due to the saturated hydrology. Examples that are not protected would be threatened by removal of commercially valuable species (e.g., *Quercus michauxii, Quercus pagoda, Quercus laurifolia*, and *Quercus nigra*) and changes to the hydrology which could disrupt groundwater volume and seasonality. The high value of the dominant trees, the typical failure of regeneration of the dominant trees after logging, the ease of drainage of the sites, and the relative fertility of the soil makes these communities among the most subject to loss of any wetland community type in the region." (NatureServe 2015)

The combination of location, maturity, vegetative communities, and other factors suggest that the onsite resources not only have substantial functions, but also are valuable to the larger watershed. Analysis of the current conditions is imperative to understanding the potential environmental impacts resulting from the project and loss of resource functions and values.

*Assessment*

The approach used for the resource assessment provided was a narrative based on the structure of the Highway Methodology, but was created specifically for the project site. *The Highway Methodology Workbook Supplement – Wetland Functions and Values, A Descriptive Approach* ("Highway Methodology") (US Army Corps of Engineers New England District 1999) provides a framework for and describes the evaluator's rationale in determining if a wetland is suitable for the 13 identified functions and values and determining which functions and values are principal. While the Highway Methodology may provide useful information and may direct a narrative assessment, it has a number of limitations. The results of the narrative assessment are subjective, are not likely to be reproducible, and may easily be biased. No quantitative or semi-quantitative data is provided to measure either function or condition.

It appears that the intention was to adapt the Highway Methodology for the site, but using this new approach does not present an assessment that is sufficiently rigorous or can be compared to other assessments. In addition, the five assessment plots selected to characterize the site were chosen randomly. While random sampling is critical for scientific studies, it is not useful for the purposes of characterizing a site for permit impacts or determining the range of conditions across a site. Given the extent of the proposed impacts, a robust methodology should be used to direct the appropriate assessment of hardwood flats in the southern Mid-Atlantic coastal plain.

Wetlands exhibit variability in a range of climatic, geologic, and physiographic situations. Their physical, chemical, and biological characteristics also vary. To better capture the specific functions of mineral soil hardwood flats, EPA has recommended using a Hydrogeomorphic (HGM) approach for assessment of the wetlands onsite. The HGM classification system groups wetlands that function

similarly using geomorphic setting, water source, and hydrodynamics, which fundamentally influence how wetlands function (Brooks et al. 2011).

The structure and sustained functioning of mineral soil hardwood flats depends on seasonally saturated soil conditions and intact soils and vegetation communities. *A regional guidebook for applying the hydrogeomorphic approach to assessing wetland functions of wet hardwood flats on mineral soils in the Mid-Atlantic coastal plain* provides assessment models and methods for conducting assessments of the extent to which hardwood mineral flats of the Mid-Atlantic coastal plain perform the following four functions: maintain characteristic habitat, maintain characteristic plant community, maintain characteristic water level regime, and maintain characteristic carbon cycling processes. A number of attributes can be measured to evaluate the four functions, including the presence of woody debris, tree density and canopy, the size and number of trees, plant species and cover, natural landcover surrounding the sites, and impacts from invasive plants, ditching, and filling. A wetland's capacity to perform a function is determined relative to reference data obtained from relatively unaltered sites belonging to wetlands within its regional wetland subclass (Havens et al., 2012).

Vegetative assessment is a critical component of the HGM assessment. Assessment of vegetation has been increasingly used as an effective tool to evaluate ecological integrity in wetlands, so much of this data would be useful in assessing the current condition of the wetlands. As described in the *National Wetland Condition Assessment Draft Technical Report:* " In wetland ecosystems, vegetation provides biodiversity, primary productivity, habitat for organisms in other trophic levels, and contributes to energy, nutrient, and sediment or soil dynamics…[and] responds to and influences hydrology, water chemistry, soils and other components of the biophysical habitat of wetlands. Because plants respond directly to physical, chemical, and biological conditions at multiple temporal and spatial scales, they can be excellent indicators of ecological condition or stress."

Based on EPA's observations, many of the variables relevant to the functional assessment of coastal plain hardwood flats would score high and confirm the functions performed in such areas. Some of the resources outside and within the proposed development area may exceed HGM reference standards for mineral hardwood flat communities. In addition to the canopy dominance by wetland oak species, and degree of maturity, a diverse and developed mid- and understory with species assemblages indicative of oak-dominated hardwood flats are present. Invasive plant coverage is generally low throughout the site, although it is higher in areas where obvious disturbance was observed.

There is certainly variation in resource quality throughout the site. Edge effect from roads, ditches, and other disturbance was observed during the site visits and the vegetation, including the overstory, varies in different areas of the site. Nonetheless, the application does not demonstrate that the resources to be impacted are significantly degraded or that wetlands onsite are impaired such that their loss would be negligible. EPA continues to recommend the use of an HGM assessment with comparison to appropriate reference standard sites to fully assess the resources.

The extent of impacts from ditching should also be fully assessed. The wetlands historically may have had low energy braided stream discharges; the braided network may have been altered into the deepened and enlarged drainage network that currently exists. The extent of the impact of the ditching on the wetlands and their functions is currently unclear and appears variable. Some ditches may have minimal impacts on the wetlands, while others may be more significant. Ditches may also lose effectiveness over

time. Furthermore, as the ditching was done by the current property owner; the impact of this activity should be evaluated as part of the secondary and cumulative impacts. Impacts of ditching could cause wetlands to perform additional ecological functions associated with bottomland or low gradient riverine systems.

It should also be noted that even degraded wetlands may provide a number of functions and can perform important functions at a high capacity. The proposed impact is large enough to be severe even to a degraded system. In any case, large forested wetlands as well as upland forest provide a substantial land area where precipitation is collected and stored, providing water quality benefits. The plants in the canopy, understory, and herbaceous layer, along with microtopographic relief and woody debris intercept and store rainwater while providing nutrient cycling and habitat.

*Habitat*
The cumulative effects of losses in freshwater systems have had consequences for ecosystem connectivity. Reductions in wetland extent have resulted in habitat loss and fragmentation (Dahl, T.E. 2011). Given the connectivity to downstream resources, the impacts of habitat loss cannot be understated. Fragmentation of habitat has been shown to have a number of adverse effects on ecosystems, including reduced biodiversity and impacts on ecological processes, including nutrient retention. Haddad et al. (2015) recently concluded that much of the Earth's remaining terrestrial forest fragments are less than 10 hectares in area (approximately 24.71 acres) and that "[t]he capacity of the surviving forests and other natural habitats to sustain biodiversity and ecosystem services will hinge upon the total amount and quality of habitat left in fragments, their degree of connectivity, and how they are affected by other human-induced perturbations such as climate change and invasive species."

*Water quality*
Wetlands provide a critical role in nutrient cycling, and water quality is a critical issue, given the hydrological continuum of Stumpy Lake to the North Landing River and to the Currituck Sound and Albemarle Sound. Howarth et al. (2000) note that more than 60% of the coastal rivers and bays in every coastal state of the continental United States are moderately to severely degraded by nutrient pollution. In addition to sources from runoff, atmospheric nitrogen deposition is also a significant source. Swackhamer et al. (2004) identified an array of natural and anthropogenic sources of atmospheric nitrogen compounds, many of which are a function of urban, rural and agricultural development. They note that atmospherically deposited nitrogen has increased and cite studies that indicate that atmospheric deposition accounts for 27% of "new" nitrogen entering the Chesapeake Bay. Nutrient over-enrichment has been linked to a wide array of impacts on aquatic ecosystems, including changes in the function and composition of the algal community, changes in the food web, and declines in water quality and fisheries habitat. This degradation is particularly severe in the Mid-Atlantic States, in the southeast, and in the Gulf of Mexico.

An approved total maximum daily load (TMDL) in the Albemarle Canal and North Landing River has been established to address dissolved oxygen impairments. A study completed in 2010 examined the dissolved oxygen impairments in the Albemarle Canal and North Landing River. The study researched the cause of the dissolved oxygen impairments and concluded that high nutrient concentrations in the Albemarle Canal and North Landing River are accelerating the rate of organic matter decomposition in the streams and are creating low dissolved oxygen conditions.

Stumpy Lake is part of the Norfolk reservoir system, but it is currently owned by Virginia Beach as a recreation asset and is not used for drinking water. An aerial photo inspection of the Stumpy Lake watershed demonstrates that the contributing watershed has been largely converted to residential and commercial development over the time since the impoundment's creation early in the 20th century. The materials provided in the applicant's addendum cite two studies that discuss impairment in Stumpy Lake and conclude that the impairments are due to the poor quality of storm water flowing into the lake from "development in the watershed to the north, east and west as well as the golf course." The narrative identifies high nutrient loading and turbidity as the main water quality issues. Given this circumstance, the question arises as to whether or not the Stumpy Lake system is at or beyond the carrying capacity of the ecological system. It appears that most of the remaining wetlands in the contributing watershed to Stumpy Lake are now located within the Stumpy Lake Natural Area and in and near the Site. Additional development is unlikely to improve water quality because stormwater best management practices are not as effective as natural systems in protecting water quality. If the wetlands are converted to other land uses, the current processing sink could be a source of pollution to downstream receiving waters.

**Alternatives**

An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics, in light of overall project purpose [40 C.F.R. § 230.10(a)(2)]. The alternatives analysis provided remains inadequate. Again, due to the large impact proposed, the alternatives analysis for an impact of this size should be very thorough and demonstrate why there is no practicable less damaging alternative for the proposed development. In addition, the alternatives analysis should demonstrate how the high quality resources have been avoided and what measures are being undertaken to minimize impacts both locally and in the watershed. Finally, an alternatives analysis should thoroughly evaluate all available off-site and on-site options to achieve the project purpose.

A detailed and expanded analysis of offsite properties should be provided that evaluates all properties of an appropriate size and location that may be available to meet the project need. Four properties were listed within the Greenbrier area, but two of these are currently under development and are not available.

Several onsite alternatives are presented in the January 7, 2016 addendum; however, the applicant has not provided information that clearly demonstrates that the currently proposed project represents the least environmentally damaging practicable alternative (LEDPA). On the contrary, it appears that there is a clear upland alternative. Based on the 2007 delineation, a 90 acre upland portion of the site borders Elbow Road. This area has been effectively drained and is being used primarily as a farm field. The principal argument presented for not developing the southern upland portion of the site is the excessive cost of upgrading the road; however, improvements to Elbow Road have been started by others. Upgrades by the City of Chesapeake and for the Fieldstone subdivision are anticipated or underway. Therefore, the cost to the applicant should be substantially reduced. This alternative should be revisited based on current conditions.

Other less-damaging practicable onsite alternatives may also exist. The logistical constraints and conditions that exist currently should be provided in an updated, detailed alternatives analysis. The zoning and proffers from 1995 when Tri-City obtained rezoning approval from the City of Chesapeake to develop the entire site should be reevaluated. In March 12, 2013 and February 4, 2014 letters, Chesapeake Assistant Planning Director, Karen Shaffer, confirmed that the development proposal would

have to go through the City's Preliminary and Final Site Plan review procedures and noted that while the mixture of proposed land uses and road arrangements were consistent with existing zoning, any modification of the proffers would require a new rezoning application. Both letters stated "[i]f the development is scaled back, obviously the impact would be less than what was approved in 1995 and the suitability of the existing proffers can be evaluated during the proffer modification process."

Overall, the provided plan is conceptual. The proposal for the commercial portion of the property is unclear. Without ascertaining the specific needs of committed or potential end-users or tenants, it is extremely difficult to evaluate the full range of potential alternatives and to determine whether impacts to aquatic resources have been minimized. The construction as proposed may result in more impact to waters of the U.S. than is necessary to achieve the project purpose. To identify the LEDPA, the full range of practicable alternatives must be considered.

**Project Impacts**

The extent of proposed direct impacts associated with project and the development plan for the entire property is not clear at this time. Road impacts are not included in the current plan, but the Centerville Properties Development Alternative Plan C-1, dated 10/30/15, shows a "proposed public street" that extends east through the site with no terminus shown. Impacts for this road do not appear to be included in the current proposal. Also, while the property is described as 428 acres in the documents, this plan shows a total area of 411.1 acres.

Development of 53.8 acres, 65.2 acres of mitigation and 145 acres of preservation are proposed onsite. Based on the narrative, 164 acres of the 428 acre property are not addressed in the current plan. No development plan was provided for the approximately 60 acre upland portion of the site; the rest of the area not part of the development is predominantly mature wetlands in the interior of the site. Therefore, all proposed development phases, proffers, roads, and other relevant considerations such as the Southeastern Parkway and the DEQ permit area, and any other restrictions should be clearly indicated and the impacts should be assessed. In addition, all plans should be updated to show the resources as currently delineated, including the larger ditches through the site.

Potential secondary and cumulative effects that may result from the project should be fully evaluated, including habitat fragmentation and degradation, reduced or increased hydrology, water quality degradation and downstream impacts from the loss of nutrient cycling, sediment transport, and organic matter input and processing. Changes in hydrology can threaten the sustainability of the remaining wetland area. The development footprint will likely exacerbate edge effects, which may substantially affect habitat and hydrology provided onsite, further compromising the integrity of remaining wetland areas. These secondary impacts may also require mitigation.

The Section 404(b)(1) Guidelines prohibit the Corps from issuing a permit for any discharge of dredged or fill material that would cause or contribute to significant degradation of waters of the United States. 40 C.F.R. § 230.10(c). Impacts that may cause significant degradation include such things as "[s]ignificantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes," and "[s]ignificantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife

habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy." The applicant's analysis of Subpart C and Subpart D concluded that the project would have no effect or negligible impacts, based on the statement that no surface waters would be impacted. However, the analysis does not take into consideration that wetlands are surface waters and are special aquatic sites. The filling of 47.1 acres of wetlands should be analyzed to determine if the project has the potential to cause or contribute to significant degradation to the remaining resources on-site and downstream.

**Mitigation**

Once the LEDPA is determined, mitigation must comply with the Final Mitigation Rule. EPA continues to have concerns about the mitigation proposal, which includes re-establishment of forested wetlands in the southern portion of the parcel. Mature bottomland hardwood forested wetlands are difficult to replace ecosystems that will take many decades to be established, and replacement wetlands are still likely to have lower functions than the natural system for many decades.

A number of logistical issues will make the successful establishment of fully functioning hardwood flats difficult. Creating or re-creating appropriate hydrology for a flatwood system may be problematic, but is critical. Hydrologic regime drives ecosystem processes in hardwood flats and provides the environmental conditions under which hydric soils and specialized assemblages of plants and animals have evolved. In addition, the southern portion of the site where compensatory mitigation is proposed is largely disturbed and degraded from fill, ditching, silviculture, and other impacts. The existing invasive species would have to be intensively managed. Also, the mitigation proposal is located in the portion of the property that drains to Gum Swamp. Impairment in Stumpy Lake will not be addressed, and may be exacerbated by additional loss of resources and development in the watershed.

While preservation of high quality resources onsite is like to be valuable, it does not offset the impacts from the direct loss wetlands. It is also not clear that the proposed preservation area represents all of the most mature, least disturbed and highest functioning resources onsite. The proposed conservation area is shown north and east of the development, but no assessment plots were located within that area. Plot 2, which is used as the "reference area," appears to be located in the portion of the parcel that has no current proposal for either preservation or development. The quality of the resources to be preserved as mitigation should be fully assessed to demonstrate that they will contribute significantly to the ecological sustainability and will preserve important physical, chemical, and biological functions in the watershed. Additionally, if ditching has degraded the integrity of the resources, restoration may be necessary.

As previously noted, the overall build-out plan is currently unclear. Road(s) or other phases may impact mitigation and preservation areas. Direct and secondary impacts from roads or other disturbances could adversely impact the functioning and integrity of remaining resources.