Pamlico-Tar River
FOUNDATION

February 12, 2013

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Re: Comments for City of Creedmoor: NEPA Environmental Assessment for Wastewater Collection and Treatment System Improvements

The Pamlico-Tar River Foundation (PTRF) submits these comments on the Environmental Assessment (EA) submitted by the City of Creedmoor to USDA for financial assistance to construct a new Wastewater Treatment facility and discharge to the Tar River in Granville County. I have also attached our comments submitted on January 25, 2012 in response to the Biological Assessment.

PTRF, in its 32nd year, is a grassroots environmental organization representing 1900 members and is a licensed member of Waterkeeper Alliance, Inc. Our mission is to monitor, protect, and enhance the Tar-Pamlico River and watershed while promoting environmental justice.

After review, PTRF believes the EA demonstrates that significant impacts are likely, therefore the USDA cannot issue a Finding of No Significant Impact (FONSI) and must require an Environmental Impact Statement (EIS) if the City of Creedmoor continues to push forward for funding for a new wastewater treatment plant and discharge into the Tar River. While the EA is lacking in important information (discussion below), it is clear, however, that significant impacts to the aquatic environment and threatened and endangered species are likely. PTRF backs up this assessment by citing recent letters and memos from the US Fish and Wildlife Agency and the NC Natural Heritage Program (USFWS). [1]

[1] Memo from Sarah McRae, NC Natural Heritage Program, to Melba McGee, NC DENR, March 11, 2010

Letter from Pete Benjamin, U.S. Fish and Wildlife Service to Bruce Pleasant, USDA — Rural Development, January 24, 2013

Congress passed NEPA to ensure that federal actions were not taken before there was a strong consideration of the environmental and human health effects that might accompany those actions. In this case, a thorough review would establish that the proposed wastewater treatment plant and discharge to the Upper Tar River, would have such extreme environmental impacts that it would be unreasonable for the USDA to approve of this request.

However, if the USDA feels as though it needs more information to accurately make this determination, it should, in the alternative, create a robust environmental impact statement (EIS) and analysis on this operation before it decides whether or not to approve this request. An environmental impact statement is designed to "serve as an action-forcing device to insure that the policies goals defined in the Act are infused into the ongoing programs and actions of the Federal Government." 40 C.F.R. § 1502.1. Included therein, the EIS ensures that a thorough review is undertaken in advance of a final determination by providing a "full and fair discussion of significant environmental impacts" as well as providing "reasonable alternatives which would avoid and minimize adverse impacts or enhance the quality of the human environment."

Upper Tar River

The upper Tar River watershed supports a diverse aquatic population and is the source of drinking water for the majority of communities located downstream. The area of the Tar River where the City is proposing to add a new wastewater treatment facility and discharge has been characterized as having good water quality, but that growth in the region has led to an increase in stressors that require additional management efforts and protections in order to maintain the integrity of the River system.

The largest threat to the quality of the upper Tar is the rapid growth the region is experiencing. Research regarding the protection of aquatic species and water quality point to the threat of zinc and chlorine, both highly toxic to aquatic species.[2] The 2010 Basinwide Water Quality Plan[3] notes that downstream of the proposed discharge point the river has shown signs of stress due to an increase in organic nitrogen, turbidity, fecal coliform bacteria, copper and zinc. In fact the Tar River is listed on the state's 303(d) list for impaired waters for turbidity approximately 7 miles downstream of the proposed discharge.

Endangered and Threatened Species

The Upper Tar River Subbasin in Person and Granville counties is a globally significant freshwater resource. In fact, it is considered a "Hot Spot" for freshwater conservation by The Nature Conservancy (TNC). In terms of rare species richness, it is considered one of the top 72 out of 2,000 subbasins across the United States.[4] Given nearly 80% of our nation's 300 mussel species are considered extinct, endangered, threatened, or special concern by our scientific community and 37% of our nearly 900 fish species are considered the same, it is extremely import to prevent any degradation of the Upper Tar River Subbasin.

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[2] US Fish and Wildlife Service. 1993. Dwarf Wedgemussel Recovery Plan. Hadley, Massachusetts. 52pp.

[3] 2010 Tar-Pamlico Basinwide Water Quality Plan.
http://portal.ncdenr.org/web/wq/ps/bpu/basin/tarpamlico/2010

[4] Master, Lawrence L., Stephanie R. Flack and Bruce A. Stein, eds. 1998. *Rivers of Life: Critical Watersheds for Protecting Freshwater Biodiversity*. The Nature Conservancy, Arlington, Virginia.

Flow Impacts

The Upper Tar River Subbasin is not a static environment. Since the early 2000s, aquatic biologists have become increasingly concerned about potential effects of climate change and landscape changes on slate belt streams, such as those found in Person and Granville counties. For example, in 2008, a major drought caused the loss of numerous dwarf wedgemussels in Granville County. Also, it is possible that changes in stream flows may have directly or indirectly caused the extirpation from the Upper Tar River Subbasin of the green floater (*Lasmigona subviridis*), a state endangered mussel and federal species of concern, and ridged lioplax (*Lioplax subcarinata*), a freshwater snail once found throughout most of the Tar River and its major tributaries. Both the green floater and ridged lioplax were last seen in the Upper Tar River Subbasin in Granville County in the 1990s.[8]

As seen in Figure 1, the median minimum monthly flows for three time periods starting in 1940 have been declining during most months of the year. The declines are slight starting in February (1.8%), accelerate during May through August (27.3% to 52.6%), and reach a maximum decline in median minimum flows in October (75%) when comparing data from the period 1940 – 1962 with data from 1986 - 2008. The flow declines can be related back to growth that leads to increased water use, diversion, and loss of groundwater that recharges the river system. These declining minimum flows can negatively affect stream temperatures, dissolved oxygen levels, nutrient processing, substrate composition, and numerous other parameters, which in turn affect species richness and abundances throughout the Upper Tar River Subbasin. Clearly, given that the upper Tar River is a documented stressed ecosystem (measured by loss of species richness and other population impacts), it is inappropriate to add stresses to this river by discharging additional effluent. As discussed above, municipal effluents contain a "witch's brew" of diverse pollutants, and if the median minimum monthly flows continue the trend toward zero to nominal flows, the pollutant impacts will become magnified (less and less dilution as stream flows decline in the future).

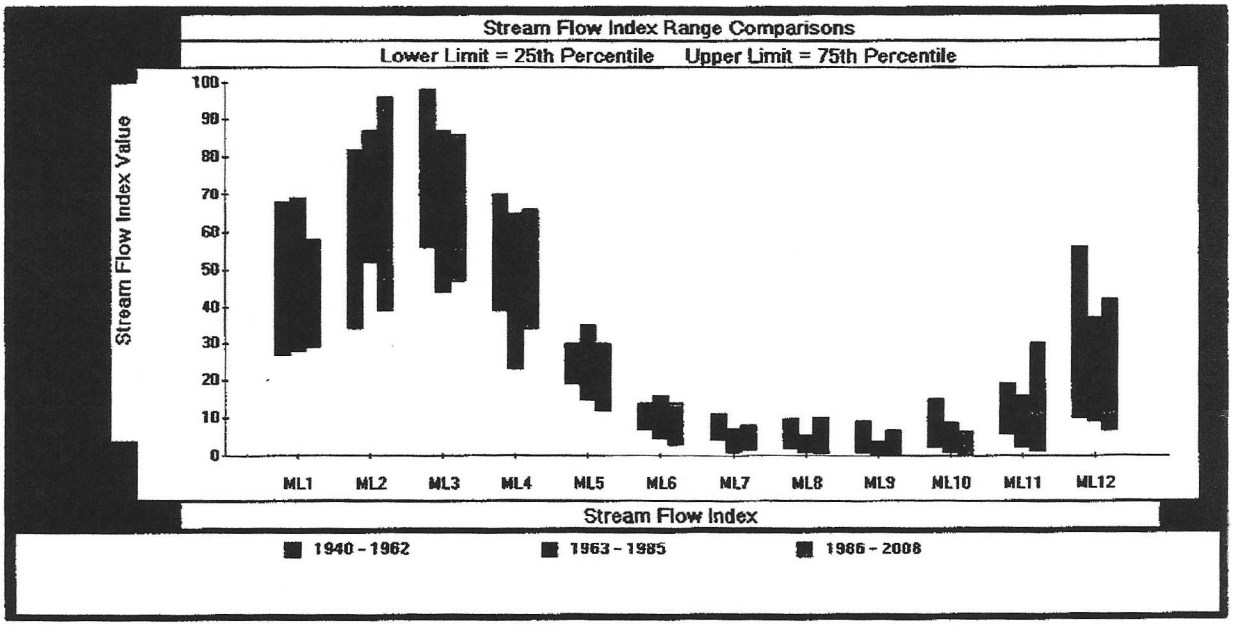

Figure 1. Median minimum monthly flows (CFS) for 3 periods of time for the Tar River at Tar River, Granville County, NC (USGS data 2008); ML1 (January) through ML12 (December)

[8] Personal communication with John Alderman

As described in the NC Wildlife Resource Commissions "Wildlife Action Plan", the Tar-Pamlico River basin is home to 39 priority aquatic species.[5] Of those 39, the NC Wildlife Resource Commission (WRC) and NC Natural Heritage Program (NHP) identifies twelve aquatic species that are either federally or state listed endangered, state or federal species of concern, or species that are classified as significantly rare (this does not include the Tar River spinymussel or the harperella) located near or downstream of the proposed discharge location.[6] The NHP lists the upper Tar River as a "nationally significant aquatic habitat". The US FWS characterizes the Tar River as a "mussel refugium of national significance," which supports "one of the two remaining best populations" of the federally endangered dwarf wedgemussel in North Carolina."[7]

Historically in North Carolina, there is precedent for not discharging effluent into habitats occupied by federally listed species or removing permitted discharges at a later date to prevent continuing habitat degradation:

1. The City of Garner contracts with the City of Raleigh for wastewater processing instead of a new NPDES permit for discharge into Swift Creek, which is habitat for the federally listed endangered dwarf wedgemussel in Wake County
2. Following significant resource agency concerns, withdrawal of permit application for a major new Union County WWTP discharge into Goose Creek, which is habitat for the federally listed Carolina heelsplitter
3. Following the required 2009 Site Specific Water Quality Management Plan for the Goose Creek Watershed in Union County (15A NCAC 2B.0600-.0609), "No new National Pollution Discharge Elimination System "NPDES" wastewater discharges or expansions to existing discharges shall be permitted."

Given these precedents and the fact that the Upper Tar River Subbasin should already be regulated under a Site Specific Water Quality Management Plan (required by 15A NCAC 02B .0110), an EIS is required. Clearly, given guidance by 15A NCAC 02B .0110, no factual information is presented in the EA which suggests that allowing a new discharge into the Tar River will ensure the following: "Maintenance and recovery of the water quality conditions required to sustain and recover federally-listed threatened and endangered aquatic animal species contributes to the support and maintenance of a balanced and indigenous community of aquatic organisms and thereby protects the biological integrity of the waters." Given our increasing knowledge of estrogenic, endocrine disrupting, DNA metabolism altering, and immune and reproductive altering effects of municipal effluent components on freshwater mussel individuals, the subject EA is grossly inadequate in its evaluations of these effects on all freshwater mussel taxa in the Upper Tar River, including the dwarf wedgemussel and other sensitive species. Limiting EA evaluations mostly to nutrient effects ignores a large and growing scientific understanding of the complex and often synergistic interactions of municipal effluent components on freshwater organisms. Allowing a new point source in the Upper Tar River Subbasin ignores the intent of 15A NCAC 02B .0110. The proposed project is not consistent with the intent of 15A NCAC 02B .0110.

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[5] NC Wildlife Resrouce Commission, "Wildlife Action Plan". 2005. http://www.ncwildlife.org/plan.aspx

[6] Memo from Shari Bryant, NC Natural Heritage Program, to Melba McGee, NC DENR, March 11, 2010

[7] Letter from Pete Benjamin, U.S. Fish and Wildlife Service to Bruce Pleasant, USDA – Rural Development, January 24, 2013

Furthermore, a new WWTP in southern Granville County will likely result in numerous requests for sewer services. The EA fails to discuss impacts due to growth for service areas that may lie outside of the City's planning and zoning jurisdiction. The EA should include information on mitigation options the City will employ for sewer services to areas outside of its jurisdiction.

Groundwater

The EA fails to describe how the anticipated future growth will impact groundwater supplies, both from the growth of groundwater wells, as well as the loss of groundwater recharge due to the increase in impervious surfaces. The Tar River benefits from groundwater recharge, especially during times of drought. The EA must address this impact to the River's flow and how that may impact the aquatic species and their habitat.

Impacts of pharmaceuticals and personal care products

The sources of organic waste compounds (OWCs) and pharmaceuticals includes outflow from wastewater treatment plants, which are not designed to eliminate these compounds from the waste stream . Current guidelines used by the health care industry recommends flushing of unused or expired pharmaceuticals, leading to 250 million pounds flushed annually in the US.[11] Furthermore, application of biosolids is also recognized as a potential pathway of pharmaceuticals and OWCs to the environment and surface waters.

A USGS study of treated wastewater, raw and finished water in the Tar River basin from 2003-2005 found numerous pharmaceuticals and organic waste compounds. The compounds found include flame retardants, antibiotics, heart medicines, herbicides, plasticizers, pesticides, BPA, caffeine, nicotine, allergy medicines, seizure drugs and others.[12]

We are genuinely concerned about the ecological and human health effects associated with exposure to low concentrations of pharmaceuticals via drinking water. Studies have linked reproductive problems and lowered immune response in fish and frogs to pharmaceutical hormone exposure. In a nationwide study, the occurrence of intersex fish was most prevalent in the Southeastern US. In particular, 91% of largemouth bass tested in the Yadkin-Pee Dee basin in North Carolina and South Carolina showed intersex characteristics.[13] The human health effects have been less studied to date, but from what we have learned in the past, biological indicators can provide good warning signs and signal potential negative consequences to the public's health. As noted above, a significant percentage of communities in the Tar River basin utilize surface water as their source of drinking water, including the Town of Louisburg whose water intake would be located within 25 miles of the discharge point.

The EA fails to adequately address the potential impacts to human health and aquatic species from the discharge of pharmaceuticals, personal care products and other organic waste compounds.

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[11] Donn J, et al. AP Impact: Health care industry sends tons of drugs into nation's wastewater system." April 2010. Retrieved April 2010 from:
http://hosted.ap.org/specials/interactives/pharmawater_site/sept14a.html

[12] USGS. 2009. Occurrence of Selected Pharmaceutical and Organic Wastewater Compounds in Effluent and Water Samples from Municipal Wastewater and Drinking-Water Treatment Facilities in the Tar and Cape Fear River Basins, North Carolina, 2003-2005. Open-File Report 2009-1046.

[13] Hinck J, et al. Widespread occurrence of intersex in black basses (*Micropterus spp.*) from U.S. rivers, 1995–2004. *Aquat. Toxicol.*. 2009. 95:60–70.

Inadequacies of the EA

Discrepancy with SGWASA

The EA dismisses the alternative of remaining with the City's current wastewater provider, the South Granville Water and Sewer Authority (SGWASA), without proper justification. The EA sites multiple times the inability for SGWASA to provide wastewater services due to the passage of the Falls Lake Rules. However, multiple correspondences from SGWASA demonstrate that SGWASA will have capacity to treat the City's future wastewater needs. The fact that the City itself publically states they are in continued negotiations with SGWASA is yet further evidence that the current wastewater provider is capable of providing sewer service for the City's current and projected future wastewater needs.

Sludge Application

The EA provides no information on the type and disposal options of biosolids for the proposed new treatment plant of biosolids, nor the expected direct, secondary and cumulative impacts of this disposal. The Preliminary Engineering Report mentions the plant will produce Class B biosolids and contract to a private vendor for disposal. [9]The EA must include information regarding the expected environmental consequences of this disposal, including impacts to water quality and aquatic habitat and organisms.

Flow

The EA relies on a calculated average 7Q10 flow of 1.4 cfs for its projected water quality and species impacts from a new wastewater discharge. However, the EA fails to appropriately describe the impacts or mitigation measures the City may employ for those times the river flow is below 1.4 cfs. Over the past 10 years, the upper Tar River has experienced numerous extended time periods where the river flow was much lower than the calculated 7Q10. [10] The EA should address this issue and how the resulting ammonia, heavy metal and other discharges may negatively affect aquatic species. The EA should also include mitigation measures the City will employ to reduce those impacts to water quality (e.g. cessation of direct discharge and transfer to land application site).

Mitigation

The EA does not adequately define the mitigation options the City will utilize to offset the likely significant impacts from the new wastewater discharge to the Tar River and resulting growth in the region. With respect to the likely impacts due to future urban, residential and industrial growth, the EA sites multiple times the City's Development Ordinance. The EA should include the relevant sections of the development ordinance, including but not limited to requirements for stormwater control and buffer protection.

Currently, the City's minimum required storwmater treatment is for the 1 year 24 hour storm. Experience in other urban cities in North Carolina, including the city of Greenville, demonstrate that controlling stormwater for the 1 year 24 hour storm is inadequate to protect urban stream function, habitat, and water quality. Less than adequate volume control leads to incised streams resulting in channelization and increased erosion as well as poorer water quality.

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[9] Preliminary Engineering Report for Wastewater Collection and Treatment System Improvements. City of Creedmoor, NC. November 2012. The Wooten Company, at 62.

[10] Letter from David Emmerling, PTRF. Comments on the Biological Assessment for Creedmoor Wastewater Project. January 25, 2013.

Alternatives Analysis

The EA failed to include an analysis of at least one reasonable alternative that would reduce the impact of a direct new discharge to the Tar River. Possible alternatives include utilizing created wetlands for further effluent treatment prior to discharge. In fact PTRF has advocated for this alternative to be researched by the City in written and personal communication with City staff and elected officials. [14] The use of created wetlands is not new to North Carolina. The City of Goldsboro has employed such a system since 2002, when it built a 42 acre wetland to provide greater treatment for its wastewater discharge. Constructed wetlands are recognized as a reliable wastewater treatment technology and they represent a suitable solution for the treatment, therefore this alternative should be explored.

Impacts to Water Supply.

The proposed discharge to the Tar River constitutes an interbasin transfer from the Neuse River watershed, specifically from Falls Lake, a designated water supply watershed. The EA fails to analyze the impacts to the Falls Lake water supply. Furthermore, the City of Louisburg's water supply intake is located downstream of the proposed new discharge. The EA also fails to mention the anticipated impacts to this water supply.

Summary

To conclude, the evidence in the EA and numerous correspondences from resource agencies clearly demonstrate that the proposed new wastewater treatment plant and discharge to the Upper Tar River is likely to have significant negative impacts to the aquatic environment and threatened and endangered species. Therefore, the USDA must prepare an EIS that fully analyzes the project's impact, proposed mitigation measures and all reasonable alternatives.

We appreciate the opportunity to comment. Please contact us if you have any questions.

Sincerely,

Heather Deck
Pamlico-Tar Riverkeeper
Pamlico-Tar River Foundation
252-946-7211

David A. Emmerling
Executive Director

[14] Letter from Heather Deck, PTRF and Hope Taylor, CWFNC to Mayor Darryl Moss, the City of Creedmoor. June 23, 2011.

Pamlico-Tar River
FOUNDATION

25 JAN 2013

Mr. Bruce Pleasant
Acting Director, Community Programs
USDA-Rural Development
4405 Bland Road, Suite 260
Raleigh, NC 27609

RE: Biological Assessment for Creedmoor Wastewater Project

Dear Mr. Pleasant:

This letter is submitted on behalf of the members, board of directors and staff of the Pamlico-Tar River Foundation (PTRF). PTRF has a 32-year history of monitoring, protecting and restoring the Tar-Pamlico River Basin. Our comments are in response to your Biological Assessment (BA), received on 27 December 2012. While we may support the conclusion that the effects of the Creedmoor Wastewater Discharge Project to the Tar River in Granville County will have "no effect" on the federally endangered smooth coneflower (Echinacea laevigata), we do not agree with your conclusion that the discharge "may affect, not likely to adversely affect" both the federally endangered dwarf wedgemussel (Alasmidonta heterodon) and harperella (Ptilimnium nodosum). We have carefully reviewed and considered the BA, the biological study, comments of the Fish and Wildlife Service. The assessments do not adequately or thoroughly address the direct, secondary, and cumulative impacts to the species and the species that support their existence. PTRF would welcome discussion about these issues.

The proposed project involves building a new 1.15 MGD wastewater treatment plant (WWTP) on the watershed divide between the Neuse and Tar River basins; effluent would be discharged into the Tar River just below the Cannady Mill Road crossing. While the Environmental Assessment (EA) provides a location map of the WWTP and a zoning map for the City of Creedmoor, an action area map (including all areas covering direct and indirect effects to listed species) would be useful to help visualize and assess the entirety of potential effects to listed species and their habitats.

The upper Tar River and its tributaries is a resource that is important to North Carolina and the nation. As detailed in the Fish and Wildlife Service comments, the area holds in addition to the two endangered species additional species that are in danger and of significant value. Examples

include the yellow lance, the green floater, and Atlantic pigtoe. Two species of interest to NC are the Carolina madtom and the Neuse River waterdog. In addition to wildlife the quality of the upper Tar River is also important to the human populations that are down stream and draw their drinking water form this surface water supply.

PTRF supports the sum and substance of the Fish and Wildlife Service comments and would like to expand on several points. First related to stream flow. The BA establishes a 1.4 cfs as the standard to test the percentage calculation of the percentage of wastewater to ambient flow and its compliance to EPA requirements, especially ammonia-n. However, this figure does not allow for a complete consideration of the potential direct impact at low flow periods. The table below presents the data on the consecutive days of flow below the 1.4 cfs standard as measured by the Tar Pamlico Basin Association monitor (ID #02081500) in closest proximity to the proposed discharge site. The flow data was analyzed. The total number of days that are below the established minimum (1.4 cfs) is 346 and 219 of the days had wastewater concentrations at or above 75% for the period 1 JAN 2007 to 31 DEC 2012. Concentrations are greater than the 56% maximum concentration 19% of this 5-year time span. To illustrate the wastewater impact during low flow times the data was analyzed and periods of 7 days or more consecutive flows where wastewater concentrations were greater than 56%.

PROJECTED WASTEWATER % CALCULATIONS 2007 TO 2009

DATE START	7/3/ 2007	7/21/ 2007	10/28/ 2007	6/16/ 2008	8/11 2008	8/28/ 2009
DAYS >56%	9	95	46	10	26	10
WWIAVG/DAY	64%	92%	90%	77%	86%	77%
DAYS >90%	0	70	33	0	10	0
DAYS >99%	0	48	0	0	0	0

PROJECTED WASTEWATER % CALCULATIONS 2010 TO 2012

DATE START	9/1/ 2010	7/21/ 2011	9/27/ 2011	7/2/ 2012
DAYS >56%	24	10	20	9
WWIAVG/DAY	85%	88%	82%	63%
DAYS >90%	12	7	8	0
DAYS >99%	4	1	0	0

The presumed and predicted consequence would be the extinction of the

harperella and dwarf wedgemussel. Projecting these numbers forward in time we the coming 5 years would likely have 5 periods of 20 days or more averaged concentrations of waste to ambient water with ranges from 82% to 92%. High concentrations of wastewater in the flow will likely eradicate the endangered species and others that are already proven to be sensitive to treated wastewater.

During one period of drought in 2007 there were 48 consecutive days of what would have been >99% wastewater flow if the proposed plant had been discharging. If replicated with this discharge, the Upper Tar River would become an open wastewater discharge pipe. Given the current predictions related to the impact of climate change we can expect an increase in extended periods of drought interspersed with intense weather events. This increases the probability that these destructive scenarios will occur more frequently.

An additional concern is the lack of consideration of the flow and wastewater concentrations on the fish hosts, Tessellated Darter and Johnny Darter, which allow the larval stage (glochidium) of the Dwarf Wedgemussel to become a temporary obligatory parasite on the fish hosts. There is no evidence that consideration is given to the impact of the discharge and flow on the impact to the environment needed to support the fish host.

The Tar-Pamlico Basin Plan states that during times of low water the Upper Tar is charged by groundwater. Consideration must be given to the impact that the population increase in the Upper Tar may have on the groundwater supply and the ability of groundwater to provide any charging of the surface water during low water conditions. Decreased groundwater availability may negatively exacerbate an already bleak scenario for the survival of the DWM and harperella.

An explanation of how this project might move forward with a plan and adequate safe guards to protect water quality during times of low flow and these safeguards and correlated limitations must be calculated in the cost analysis.

The BA would benefit from expanded consideration of the following:

- Thorough consideration of the impact of the temperature of the effluent at and below the discharge site
- Additional consideration of the negative impact of the effluent when added to the existing degradation occurring where Fishing Creek meets the Tar River and below that point
- Careful consideration of the impact of pharmaceuticals and personal

care products contained in the effluent on water quality and the river's ecology

- Thorough investigation of the impact of the effluent on the host fish required for mussel propagation
- Consideration and investigation of the impact of increasing the nitrogen and phosphorus discharge on the river's ecology
- Revaluation of the cost calculations and the discrepancy between SGWASA's ability to manage Creedmoor's needs versus building the proposed WWTP

Thank you for your consideration of these concerns. If you would like additional information please contact me. I would welcome the opportunity to discuss these issues with you or your designee.

Sincerely,

David A. Emmerling, EdD
Executive Director

CC:
Sarah McRae, FWS
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John Wright, USDA
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