

## Summary of Listing Decisions

The Georgia Environmental Protection Division (EPD) used its 2016 Listing Assessment Methodology in making its listing decisions. This document provides more detail to explain why certain listing decisions were made including (1) how the “natural conditions” provisions in our water quality standards are used when making listing decisions; (2) why 7 waters on Georgia’s coast have been placed in Category 3 for FCG(As) – arsenic in fish tissue; (3) why other waters were placed or remain in Category 3; and (4) introduction of Category 4c.

### Assessment of Waters Based on “Natural Water Quality”

Chapter 391-3-6-.03(7) of the Rules and Regulations for Water Quality Control recognizes that some waters of the State “naturally” will not meet the instream criteria and that this situation does not constitute a violation of water quality standards. Many waters in Georgia, specifically areas in South Georgia and near the Coast, have “natural” dissolved oxygen concentrations below the State’s standard dissolved oxygen (DO) criteria (daily average of 5.0 mg/l and an instantaneous minimum of 4.0 mg/l). Many of these waters were placed in Category 3 (Assessment Pending) when the DO criteria were not met, but it was determined that the cause was likely due to natural water quality conditions versus a human caused condition. The placement of waters in Category 3 for DO is explained in more detail later in this document.

EPD also considered things such as the presence of beaver dams when evaluating water quality data. While the presence of beaver dams and ponds can help improve water quality by trapping sediment and removing nutrients through increased plant production, the stagnant water in the beaver pond will naturally have different characteristics than a free flowing stream (e.g. lower DO). Waters were not listed as being impaired for DO if they were impacted by a beaver dam and it was determined that human activities were not contributing to the low DO.

In addition, Georgia has many blackwater streams. The pH of blackwater streams is naturally low. If a water has been identified as a blackwater stream, then it was not listed as impaired for pH as long as there are not point source or land use issues that may be contributing to the low pH measured in the stream.

### Placement of Seven waters into Category 3 for FCG(As) – Arsenic in Fish Tissue

Georgia monitors the concentration of a number of pollutants including PCBs and mercury in fish tissue from fish collected across the State. Georgia uses this information to develop the document “Guidelines for Eating Fish From Georgia Waters,”

which is published each year. This publication provides the public with information they can use to determine how much of what types of fish they can safely eat from Georgia's waters.

Recently, arsenic has been found in fish tissue in some waters along the coast. Arsenic in fish tissue can occur in different forms (organic and inorganic). The inorganic form of arsenic is more toxic to humans and the fish consumption guidelines for arsenic are based on inorganic arsenic concentrations. When arsenic is analyzed in the fish tissue, the analysis is performed for total arsenic, which is the organic plus the inorganic fractions. Fish tissue samples are analyzed for total arsenic rather than partitioned inorganic arsenic concentrations because the generalized analysis is less costly to run and because the lab EPD uses cannot run the inorganic arsenic test. Therefore, EPD does not know exactly how much arsenic is in the inorganic form. Based on a literature review, EPD is assuming that 10% of the total arsenic is in the inorganic form. This is a conservative assumption, and there is a good possibility that the percentage in the inorganic form is lower than this. However, fish consumption guidelines have been issued for fish from the Altamaha Sound, Cumberland Sound, St. Simons Sound, Sapelo Sound, Wassaw Sound, and two sections of the Mud River.

Georgia's 305(b)/303(d) Listing Assessment Methodology states that for fish tissue contaminants other than mercury, waterbodies are determined not to be supporting use designation if the State's fish consumption guidelines document recommends limiting consumption. At this time, Georgia is not assessing the above listed waters as impaired for arsenic in fish tissue because there is uncertainty regarding what the actual concentration of inorganic arsenic in the fish. If the proportion of inorganic to total arsenic is less than 10%, then fish consumption advisories may not be warranted and the waters would not need to be listed as impaired. While EPD determined that it was justified to err on the side of caution when developing fish consumption guidelines to protect public health, we believe the best course of action is to place these waters in Category 3 (Assessment Pending) on the 305(b)/303(d) list until data can be collected regarding the fraction of the arsenic in fish tissue in the more toxic inorganic form. EPD feels that in order to determine the actual fraction of inorganic arsenic in fish tissue, at least 25 – 30 composite samples per target fish species will need to be collected across different areas of the Georgia coast. This information will provide EPD with a statistically sound data set with which to calculate the fraction of inorganic arsenic in fish tissue for the different species collected. EPD can then reevaluate the need for fish consumption guidelines for arsenic and also be able to make an assessment as to whether these waters are meeting their designated use or need to be added to the 303(d) list of impaired waters.

## Other Waters in Category 3 and Waters where Assessment of a Parameter is Pending

A water is placed in Category 3 (Assessment Pending) when there is insufficient data or information to make an assessment on whether the water is meeting its designated use. The 2016 list of waters has 121 waters in Category 3 and has an additional 96 waters for which a use assessment has been made, but for which assessment of a one or more parameters is pending. Details regarding why a water has been placed in Category 3 or explaining what parameter may be in a pending status can be found in the “notes” column of the 305(b)/303(d) list of waters. The most common reasons for why waters have been placed in Category 3 are provided below.

Currently, Georgia’s listing assessment methodology states that waters with macroinvertebrate data with a narrative rank of “fair” are put in Category 3. One reason that this is the case is that EPD has been working to revise the multi-metric index (MMI) used to assess macroinvertebrate data. We believe that for the most part, waters that were assessed as “supporting” under the current index (narrative rank of very good or good) will still be assessed as “supporting” under the revised index. Likewise, we believe that waters assessed as “not supporting” under the current index (narrative rank of poor or very poor) will still be assessed as “not supporting” under the revised index. We are less certain how waters ranked “fair” under the current index will rank once new indices are established. EPD has been working diligently to revise the MMI used to assess the health of the macroinvertebrate community. This is a lengthy process as EPD has determined that additional data need to be collected from some areas of the State prior to MMI revision. Collection of additional data is currently ongoing. In addition, EPD is currently working on revising the taxa list and tolerance values which are also needed for the MMI revision to be completed. EPD plans to keep the waters with a narrative rank of “fair” in Category 3 until the new indices can be established. The draft 2016 305(b)/303(d) list of waters has 38 waters in Category 3 based on sites that have a narrative rank of “fair” for macroinvertebrate sampling. There are an additional 31 waters that have been assessed for other parameters, but for which the assessment of macroinvertebrate data is pending.

Forty-eight waters are in Category 3 while EPD works to determine the “natural DO” concentration for the water. There are an additional 43 waters that have been assessed as “not supporting” for other parameters for which the assessment of DO is pending determination of the “natural DO”. These waters are located in the Southeastern Plain and Coastal Plain where DO can be naturally below the State’s criteria of 5.0 mg/L (daily average) and 4.0 mg/L (minimum). EPD has been working to develop new DO criteria for the Southeastern and Coastal Plains. Some issues that are being studied are potential differences in DO between blackwater, clear water, and tidal streams and the impact of stream order on “natural DO”. Once the new criteria have been adopted

and approved by U.S. EPA, EPD will use these criteria to assess whether waters in this portion of the State are meeting their criteria for dissolved oxygen.

Six waters are in Category 3 for pH. EPD intends to collect more data to confirm if the pH criteria are being violated. There are an additional 20 waters that have been assessed as “not supporting” for other parameters for which the assessment of pH is pending. In a few cases the data sets were too small to make a sound listing decision. In other cases, there is a question as to the accuracy of the pH data that were collected. Procedures have been put into place to confirm suspect data when excursions of the pH criteria are measured by EPD. Waters will be resampled to determine whether the data collected were valid or if EPD may have been experiencing problems with its monitoring equipment.

There are various reasons why the remaining waters have been placed in Category 3. The most common reason was that while we had data that indicated that the water is “supporting” its use (such as fish tissue data, wastewater treatment plant effluent data, etc.), there is no instream water quality data available. Without having instream data, we decided to put the water in Category 3 instead of making the assessment that the waters were “supporting” their uses.

#### Introduction of Category 4c

Category 4c is one of the categories in EPA’s five-part categorization system. A water may be placed into Category 4c if data indicate that at least one designated use is not being met, but the impairment is not caused by a pollutant, but by pollution. A water in Category 4c is considered to be impaired, but a TMDL does not need to be completed since TMDLs are to be written to address pollutants and not pollution. Examples of pollution include things like habitat and hydrologic alterations.

The Nottely River (Downstream Lake Nottely) - GAR060200020601 has been placed in Category 4c on Georgia’s draft 2016 305(b)/303(d) list of waters. This section of the Nottely River has been assessed as being impaired for Bio F based on Fish IBI data collected by the Tennessee Valley Authority (TVA) from 2002 to 2008. TVA also collected Fish IBI data on the Nottely River upstream of Lake Nottely. The IBIs calculated upstream of the lake were determined to be supporting designated uses. Based upon the fact that the fish community is not impaired above the lake and that water quality data downstream of the Lake is meeting water quality criteria, EPD has determined that the cause of the impairment to the fish community downstream of the dam is the impact of the dam itself (e.g. habitat and hydrologic alteration are negatively impacting the fish community). EPD is therefore placing this water into Category 4c.

It should be noted that TVA has done a lot of work to make improvements to the operation of its dams to improve water quality and aquatic habitat downstream of its

dams including the one on Lake Nottely. The following information was taken from a letter submitted by TVA during the public notice period of Georgia's 2008 305(b)/303(d) list and it highlights some of the work they have done:

### General Comments

*"In the early 1980's TVA began a systematic effort to improve conditions downstream of its dams (tailwaters) where issues were known to exist. TVA's capital investment of \$44 million during 1991-1996 to reoxygenate hypolimnetic releases and current spending levels of several million dollars annually of combined capital and operational expenses have demonstrated positive results. Dissolved oxygen levels were increased by one to five milligrams per liter in more than 300 miles of river downstream from TVA dams and flows were improved in 180 miles of river. In addition, TVA's Reservoir Operations Study (ROS), completed in May 2004, resulted in a change in the focus of reservoir operations from achieving specific summer pool elevations to managing the flow of water through the system. This resulted in more stable flow and improved water quality and habitat in tailwater reaches and downstream. Additional capital investments were made in 2005 to upgrade (expand) aeration systems in eight tailwaters in Tennessee and two in Georgia (Nottely and Blue Ridge), which are expected to achieve additional gains in water quality and habitat improvements. In spite of all improvements, however, tailwaters will remain non-natural/"altered" environments because conditions different from free flowing, unimpeded rivers have been created. Therefore, unless Georgia develops biological criteria more suitable to tailwater habitats, improvements in these permanently altered environments likely can only minimally achieve the current expectations."*

### Comments Specific to the Nottely River

*"Following implementation of TVA's ROS managed flow policy and installation of a new 21,000 gallon oxygen tank and 8,000 feet of new diffuser line in 2005 to improve water quality discharged from Nottely Lake, TVA has measured improvements in the fish community at Nottely River miles 20.4 and 15.8, the five-mile reach immediately downstream from Nottely Dam that includes the two-mile stream reach listed as impaired. TVA's overall Fish Index of Biotic Integrity (IBI) scores have improved from "Poor" in 2002-2006 to "Poor/Fair" in 2007 at mile 20.4 (half mile downstream from Nottely Dam) and from "Poor" in 2003-2005 to "Poor/Fair" in 2006 and 2007 at mile 15.8 (5.2 miles downstream from the*

*dam). These improvements resulted mostly in the IBI metric scores for “Total Number of Native Fish species” that increased from 7 species in 2005, to 8 species in 2006, to 10 species in 2007, and in the IBI scores for “Catch Rate (average number of fish per 300 square-foot sampling unit)” that increased from 6 fish in 2005, to 16 fish in 2006, to 19 fish in 2007, at mile 20.4. Similar IBI metric score improvements occurred at mile 15.8 where number of native fish species increased in 2005, 2006, and 2007, respectively, from 6, to 7, to 10 and catch rates improved from 8 fish, to 16 fish, to 14 fish.”*