South Carolina Department of Health and Environmental Control
Total Maximum Daily Load Development for
Beaverdam Creek (Station SV-345)
Fecal Coliform Bacteria

August 17, 1999

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Bureau of Water

Beaverdam Creek
03060102-150

BASIS FOR 303(d) LISTING

Introduction:

Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to develop total maximum daily loads (TMDLs) for water bodies that are not meeting designated uses under technology-based pollution controls. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and in stream water quality conditions so that states can establish water quality-based controls to reduce pollution and restore and maintain the quality of water resources (USEPA 1991).

Problem Definition:

Impaired Waterbody: **Beaverdam Creek (Oconee County)**

Water Classification: **Freshwater**

The impaired stream segment, Beaverdam Creek, is designated as Class Freshwater. Waters of this class are described as follows:

> "Freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses." (R.61-68)

Water Quality Standard Being Violated: **Fecal Coliform Bacteria**

Pollutant of Concern: **Fecal Coliform Bacteria**

Fecal Coliform Criteria:

> "Not to exceed a geometric mean of 200/100 ml, based on five consecutive samples during any 30 day period; nor shall more than 10% of the total samples during any 30 day period exceed 400/100 ml." (R.61-68)

The *South Carolina Watershed Water Quality Assessment: Savannah and Salkehatchie River Basins* (SCDHEC 1997) was used to identify this stream segment as impaired and for listing the water body on the 1998 South Carolina 303(d) list. Waters in which no more than 10% of the samples collected over a five year period are greater than 400 colonies/100 ml are considered to comply with the South Carolina water quality standard for fecal coliform bacteria. Waters with more than 10 percent of samples greater than 400 colonies/100 ml are considered impaired and listed for fecal coliform bacteria on South Carolina's 303(d) List. There is one SCDHEC ambient monitoring

station, SV-345, on Beaverdam Creek at county road S-37-66 in Oconee County. Data from this station show that recreational uses are not supported due to violations of the 400/100 ml fecal coliform criterion. During the assessment period (1992-96), 38% of the samples did not meet the fecal coliform criterion. Station SV-345 is also considered impaired for aquatic life use based on an assessment of macroinvertebrate community health. However, this TMDL will address only the recreational use impairment.

TMDL TECHNICAL BASIS

Target Identification:

Target levels for fecal coliform bacteria in water bodies are those levels established in South Carolina's Water Quality Standards, Regulation 61-68, as described earlier. The criterion used in this TMDL will be "not to exceed a geometric mean of 175/100 ml," allowing an explicit margin of safety of 25/100 ml to ensure that the 200/100 ml criterion will be met.

This target of a geometric mean of 175/100 ml is expected also to satisfy the criterion, "nor shall more than 10% of the total samples during any 30 day period exceed 400/100 ml." Based on a review of water quality assessments in South Carolina, over 75% of waters that have a fecal coliform geometric mean of 175/100ml also meet the criterion "not more that 10% of samples exceed 400/100ml" (SCDHEC unpublished data). Most of the data in those assessments, however, reflect fecal coliform concentrations in areas that do not have sufficient best management practices (BMPs) in place. Thus, implementation of BMPs as described in this TMDL will likely achieve an even greater rate of compliance with the latter criterion since the BMPs are generally focused on reducing fecal loadings during runoff events, the condition most likely to result in an exceedence of the 400/100ml criterion.

Source Assessment:

General Sources of Fecal Coliform:

Both point and nonpoint sources may contribute fecal coliform to a given water body. Potential sources of fecal coliform are numerous and often occur in combination. Nationwide, poorly treated municipal sewage is a major source of fecal coliform, but data presented below suggest this is not the case here. Urban storm water runoff, sanitary sewer overflows, and combined sewer overflows can be sources of fecal coliform. Rural storm water runoff can transport significant loads of fecal coliform from livestock pastures and animal feedlots. Failing septic systems and wildlife can also be sources of bacteria. Sources of fecal coliform loads to water bodies can be assigned to two broad classes: point source loads and nonpoint source loads.

Point Sources in Beaverdam Creek Watershed:

There are no point sources in the Beaverdam Creek watershed.

Nonpoint Sources in Beaverdam Creek Watershed:

As there are no point sources, fecal coliform loadings in this watershed can be attributed to nonpoint sources. The land use in the watershed is 30.4% forest, 68.7% agriculture/grass, and 0.9% other. There is no sanitary sewer service in this area.

Agricultural land can be a significant source of fecal coliform bacteria. Runoff from pastures, animal operations, improper handling and land application of animal wastes, and animals having access to creeks are all sources of fecal coliform. Agricultural best management practices (BMPs), such as buffer strips, alternative watering sources, fencing cattle out of creeks, and proper land application of animal wastes reduce fecal coliform loading to water bodies. Failing septic systems at homes scattered in rural areas can also be a source of fecal coliform bacteria. Proper siting and maintenance of these systems can drastically reduce their contributions of bacteria to water bodies.

Fecal coliform bacteria also originate in forested areas. Sources are generally wild animals such as deer, racoons, wild turkeys, water fowl, etc. The primary means for directly controlling fecal coliform from forested lands would include relocating or killing wildlife. These are generally not acceptable management alternatives.

Linkage Between Numeric Targets and Sources:

The types of land use existing in this watershed indicate that the major sources of fecal coliform are forested areas and agricultural areas. As previously described, wildlife is the main source of fecal coliform in forested areas, and there are no acceptable management tools for controlling fecal coliform from wildlife sources at this time. On the other hand, acceptable BMPs exist for agricultural lands that can successfully reduce fecal coliform levels in adjacent water bodies. Therefore, load reductions in this TMDL will be allocated to agricultural lands.

The loading from forested lands will be considered background conditions. The geometric mean of fecal coliform concentration in water bodies flowing through forested areas in South Carolina during all flow conditions is estimated to be 30 colonies/100 ml (SCDHEC unpublished data). The 30 colonies/100 ml observed in South Carolina falls well within the range reported by Schueler (1999) of 10 to 100 colonies/100 ml of fecal coliform from forested lands. Thus, 30 colonies/ 100 ml will be considered the background condition.

Data Availability and Analysis:

***Watershed Characteristics*:**

Beaverdam Creek, located in the Upper Savannah River basin, is a tributary to the Tugaloo River arm of Lake Hartwell. The drainage area of concern for this TMDL is located in watershed 03060102-150 in Oconee County and consists of the area of land draining to station SV-345. All references to the Beaverdam Creek watershed in this TMDL refer specifically to the area draining to SV-345. This includes 9,099 acres in the Piedmont region of South Carolina.

Beaverdam Creek Watershed Land Use

Land Use	Acres	Percentage
Forest	2769	30.4%
Agriculture/Grass	6247	68.7%
Urban	44	0.5%
Water	36	0.4%

Fecal Coliform

SCDHEC monitors water chemistry on Beaverdam Creek at ambient monitoring station SV-345 once a month for one year of every five years. Existing data from this monitoring station is available through STORET and included in the data appendix. The geometric mean of fecal coliform using the available data (1995-96) is 376 colonies/100ml.

Flow

Flow information for Beaverdam Creek was estimated using the relationship between runoff and drainage area utilized by Bloxham (1979).

$$Qa \text{ (in cfs)} = \frac{\text{Runoff in in/yr} * \text{Drainage area in square miles}}{13.58}$$

$$Qa = \frac{25*14.22}{13.58} = 26.17 \text{ cfs}$$

The average annual flow for Beaverdam Creek is calculated to be 26.17 cfs.

Critical Conditions:

Novotny & Olem (1994) find statistically lower fecal coliform counts in cold weather urban runoff samples than in warmer weather urban runoff. To substantiate this, winter and summer fecal coliform values were compared at ambient water quality monitoring stations thought to be impacted by nonpoint sources in the Piedmont Region of South Carolina. This analysis showed summer fecal levels to be generally higher than or approximately the same as winter levels. Therefore, summer months (May-October) are generally considered critical conditions. This can be explained by the nature of summer and winter storm events. Thunderstorms are typical in the summer months. This pattern of rainfall allows for the accumulation and washing off of fecal coliforms into the streams resulting in spikes of fecal coliform concentrations. In the winter, longer and slower rain events are the norm. This pattern of rainfall does not allow for the high build-up of coliform that characterizes the summer. Rather, coliform are washed into the stream at a more even rate. This, coupled with the increased winter flows that provide more dilution, usually results in lower winter fecal coliform concentrations.

In the Beaverdam Creek watershed, the fecal coliform geometric means for warm weather months

and for a full year are similar. Since the annual data set includes more data than the warm weather data set, the full year will be used as the critical condition in this TMDL.

Load Calculations:

With the observed geometric mean of 376 colonies/100 ml and the average annual flow of 26.17 cfs, the current loading at SV-345 is determined to be 2.41×10^{11} colonies/day using the following equation:

Fecal Coliform * Qa * Factor = Loading

where: Fecal Coliform = # colonies/100ml
Qa = average annual flow in cfs
Factor = conversion factor = 24468984
Loading = # fecal coliform colonies/day

Using a geometric mean of 200 colonies/100 ml, the allowable load during average annual flow is 1.28×10^{11}.

Assuming the flow attributable to forest lands is proportional to the percent of forest land in the watershed, the loading from forest lands was calculated to be 5.85×10^{9} colonies/day (using the equation above and the geometric mean of 30 colonies/100 ml). The remaining fecal loading from the watershed, 2.35×10^{11} colonies/day, is the load attributable to agriculture/grass land. This loading translates to a mean in-stream concentration of 534/100ml. This concentration falls within the range reported by Doran et al (1981) of 1.20×10^{2} to 1.30×10^{6} colonies/100 ml for fecal coliform from agricultural lands.

TMDL Development:

A total maximum daily load (TMDL) for a given pollutant and waterbody is comprised of the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving water body. Conceptually, this definition is represented by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while still achieving water quality standards. In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established and thereby provide the basis to establish water quality-based controls.

For some pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). For bacteria, however, TMDLs can be expressed in terms of organism counts (or resulting concentration), in accordance with 40 CFR 130.2(l).

Since there are no contributing point sources, the TMDL for Beaverdam Creek is equal to the load

allocations from nonpoint sources and background conditions plus the MOS.

$$\text{Beaverdam Creek TMDL} = \sum \text{LAs} + \text{MOS}$$

Margin of Safety:

There are two basic methods for incorporating the MOS (USEPA 1991): 1) implicitly incorporate the MOS using conservative model assumptions to develop allocations, or 2) explicitly specify a portion of the total TMDL as the MOS; use the remainder for allocations.

An explicit MOS is used for this TMDL by establishing a target concentration level of 175 colonies/ 100 ml. This level is below the state standard of 200 colonies/ 100 ml.

TMDL

TMDL calculation:

The target level of fecal coliform bacteria is 175 colonies/100ml. For the Beaverdam Creek watershed, this is equivalent to a loading of 1.12×10^{11} colonies/day. The load from agricultural lands plus the load from forest lands must equal this target of 175 colonies/100ml.

Allocation of Load:

The existing 5.85×10^{9} colonies/day load from forest land can not reasonably be targeted for reduction. Thus, the existing load of 2.35×10^{11} colonies/day from agricultural lands must be reduced by 55% (to 1.06×10^{11}) to obtain the TMDL of 1.12×10^{11} colonies/day. So, an allocation strategy that will allow the target TMDL to be maintained is as follows:

Beaverdam Creek Land Use	Current Loading	% Reduction	Final Loading
Forest (Background)	**5.85×10^{9}**	**0%**	**5.85×10^{9}**
Agriculture/Grass	**2.35×10^{11}**	**55%**	**1.06×10^{11}**
Total	***2.41×10^{11}***	***54%***	***1.12×10^{11}***

Implementation Strategy:

As discussed in the *Implementation Plan for Achieving Total Maximum Daily Load Reductions From Nonpoint Sources for the State of South Carolina* (SCDHEC 1998), South Carolina has several tools available for implementing this nonpoint source (NPS)TMDL. Specifically, SCDHEC's animal agriculture permitting program addresses pollution generated by animal operations and land application of animal wastes. In addition, SCDHEC will work with the existing agencies in this area to provide nonpoint source education in the Beaverdam Creek watershed. Local sources of nonpoint source education include Clemson Extension Service, the Natural Resource Conservation Service (NRCS) and the South Carolina Department of Natural Resources. Clemson Extension Service offers a Farm-A-Syst package to farmers. Farm-A-Syst is a guide that allows farmers to

evaluate practices on their property for potential NPS impacts and recommends best management practices (BMPs) to correct these NPS problems on the farm. NRCS can provide cost share money to land owners installing BMPs. In addition, Clemson Extension has developed a Home-A-Syst handbook that can help urban or rural homeowners reduce sources of NPS pollution on their property. This document guides homeowners through a self-assessment, including information on proper maintenance practices for septic tanks. SCDHEC also employs a nonpoint source educator who can assist with distribution of these tools as well as provide additional BMP information.

Another available tool for addressing nonpoint sources in this watershed is implementation of NPS reduction projects through DHEC's Section 319 program. Funded by EPA through the Clean Water Act, this program provides resources for implementing projects that address NPS pollution problems. DHEC uses some of these funds internally for NPS projects and also provides funds for outside NPS projects through a competitive grants program. During 1993-1997, Clemson University implemented a nonpoint source pollution reduction project in Oconee County, including the Beaverdam Creek watershed, with funding from the section 319 grant program. The focus of this project was reducing nutrient pollution from the many large poultry facilities in the area and involved evaluating and improving waste management and land application practices. The project also included installation of a dead bird composter demonstration site. Although focused primarily on nutrient issues, the improved BMP implementation encouraged through this project could also reduce fecal coliform from poultry facilities. Any resulting improvements would likely not have been evident in the existing data from SV-345 but should be detected during the next monitoring cycle.

DHEC will continue to monitor water quality in Beaverdam Creek according to the basin monitoring schedule in order to evaluate use support and the effectiveness of implementation measures.

References

Bloxham, William M. 1979. Low-Flow Frequency and Flow Duration of South Carolina Streams. S.C. Water Resources Commission. Report Number 11.

Doran, J.W., J.S. Schepers, and N.P. Swanson. 1981. Chemical and Bacteriological Quality of Pasture Runoff. J. Soil Water Conserv. May-June:166-171.

Novotny, V. and H. Olem. 1994. Water Quality Prevention, Identification, and Management of Diffuse Pollution. Van Nostrand Reinhold, New York.

SCDHEC. 1997. Watershed Water Quality Assessment: Savannah and Salkehatchie River Basins. Technical Report No. 003-97.

SCDHEC. 1998. Implementation Plan for Achieving Total Maximum Daily Load Reductions From Nonpoint Sources for the State of South Carolina.

Scheuler, T. R. 1999. Microbes and Urban Watersheds: Concentrations, Sources, and Pathways. Watershed Protection Techniques 3(1): 554-565.

United States Environmental Protection Agency (USEPA). 1991. Guidance for Water Quality-Based Decisions: The TMDL Process. Office of Water, EPA 440/4-91-001.

Public Participation

The public notice on pages 12-13 was sent to a mailing list of over 300 individuals statewide interested in water quality issues. In addition, the notice was sent to local organizations and Oconee County officials with a possible interest in this TMDL.

Th public notice on page 14 was published in the following six South Carolina newspapers on July 9, 1999: *The Greenville News*, the Anderson *Independent-Mail*, Charleston's *The Post & Courier*, Columbia's *The State*, *The Herald* in Rock Hill, and Camden's *Chronicle-Independent* .

Comments Received and Responsiveness Summary

Comments were received from the Southern Environmental Law Center (SELC), the South Carolina Department of Natural Resources (SC DNR), the Sierra Club South Carolina Chapter, and the South Carolina Department of Parks, Recreation & Tourism (SC PRT).

The comments are enclosed in Appendix B. A summary of the comments and DHEC's response are found in the Responsiveness Summary on page 15.

DRAFT

NOTICE OF AVAILABILITY OF PROPOSED TMDLS FOR WATERS AND POLLUTANTS OF CONCERN IN SC

The South Carolina Department of Health and Environmental Control (DHEC) has developed a proposed total maximum daily load (TMDL) for fecal coliform bacteria for each of the following waterbodies: Unnamed tributary to Catawba River (York County), Camp Creek (Lancaster County), Beaverdam Creek (Oconee County), Brushy Creek (Greenville County), and Middle Tyger River (Greenville County). DHEC has also developed a proposed TMDL for dissolved oxygen downstream of dams for each of the following waterbodies: Cawtaba River (downstream of Great Falls Reservoir Dam), Wateree River (Lake Wateree Dam), and Saluda River (Lake Murray Dam). These TMDLs have been developed in accordance with Section 303(d) of the Clean Water Act, and SCDHEC is now proposing to establish them as final TMDLs.

Persons wishing to offer comments or new data regarding these proposed TMDLs may submit data and comments in writing no later than August 9, 1999 to Anne Runge, DHEC, Bureau of Water, 2600 Bull Street, Columbia, SC 29201. For more information, please contact Ms. Runge at (803) 898-3701 or visit our website at www.state.sc.us/dhec/eqpubnot.htm.

July 9, 1999

Responsiveness Summary:

Summarized comments received on fecal TMDLs public noticed on July 9, 1999, are listed below along with DHEC response. (Summarized comments are in italics, name of respondent is in parentheses)

Middle Tyger River, Camp Creek, Beaverdam Creek TMDLs:

1) *Respondent questions the assumption that no fecal coliform contamination originates from forested land. Forestry activities, including land clearing, cultivating, and harvesting, can generate non-point source pollution, particularly if carried out without using Best Management Practices.* (SELC)

Estimates of fecal coliform bacteria loading from forested lands were made using SC DHEC water quality monitoring data from forested areas. As stated in the TMDLs, the estimates used are consistent with the typical values of loadings from forested areas seen in the literature and in other studies.

2) *Agricultural land is treated as a single source of fecal loadings, without assessing individual contributions from intensive livestock operations. Monitoring data pinpointing the locations of major contribution areas or sources within the watershed are not provided. These data are necessary to develop an adequate implementation strategy*. (SELC)

The implementation of these TMDLs will include education about and installation of best management practices that reduce fecal coliform loadings from agricultural lands. These BMPs, to be implemented to the extent possible under voluntary programs such as the Section 319 program and agricultural cost-sharing programs, will be focused on lands that are likely sources of fecal coliform loadings, including the intensive livestock operations and land application sites mentioned by the respondent. As any livestock operation or land application site that does not have adequate BMPs in place is a probable source of fecal coliform bacteria, such implementation measures will reduce fecal loadings to the waterbodies.

3) *The TMDLs do not provide "reasonable assurance" that nonpoint sources of fecals will be adequately addressed by the measures identified, as required by EPA guidance. No statement specifying when implementation actions by DHEC or other agencies will occur is provided. No information or commitments are provided regarding future monitoring and steps to be taken if impairment is not resolved*. (SELC)

EPA guidance acknowledges that in watersheds impaired solely by nonpoint sources, the primary implementation mechanism will be the Section 319 program and other state or federal assistance programs such as cost-sharing and incentive programs (Robert Perciasepe memo, 1997). As these are all voluntary programs, they involve a process of landowners, agencies, or organizations submitting and receiving approval for project proposals to implement appropriate practices. This project development and evaluation process, which will target fecal sources in these watersheds, will take place after TMDL approval by EPA has been granted. According to EPA guidance (1991), implementation of the TMDL is to take place after the state has obtained EPA approval. Commitment and funding for implementing these BMPs will thus be arranged after TMDLs have been approved.

As is stated in the TMDLs, DHEC will continue to monitor water quality in these waters according to

the basin monitoring schedule in order to evaluate use support and the effectiveness of implementation measures.

Brushy Creek and Unnamed tributary to Catawba River TMDLs:

1) *The TMDLs do not adequately identify the location of the causes of the impairment. Respondent submits that TMDLs should specifically describe additional monitoring work to pinpoint the primary sources of the contamination*. (SELC)

Fecal coliform is present in all sources of urban runoff including streets, lawns, parking lots, commercial and residential rooftops, and storm water drains (Schueler, Thomas R., ed. 1999. Microbes and Urban Watersheds: Concentrations, Sources, and Pathways. *Watershed Protection Techniques.* April 1999:3-1). It is difficult if not impossible to isolate all the contributing sources of fecal coliform in urban watersheds. However, the Municipal Separate Storm Sewer System (MS4) permit for Greenville County (to be public noticed in September 1999) and the MS4 Phase II permit for Rock Hill (Phase II regulations to be published in the Federal Register in November 1999) will require the identification of illicit discharges to the storm sewer system, a potential major contributor of fecal coliform. Language has been added to the Unnamed Tributary to the Catawba River TMDL discussing the MS4 permit for Rock Hill.

2) *The TMDLs do not provide "reasonable assurance" that nonpoint sources of fecals will be adequately addressed by the measures identified, as required by EPA guidance. No statement specifying when implementation actions by DHEC will occur is provided. No information or commitments are provided regarding future monitoring and steps to be taken if impairment is not resolved*. (SELC)

EPA guidance acknowledges that in watersheds impaired solely by nonpoint sources, the primary implementation mechanism will be the Section 319 program and other state or federal assistance programs such as cost-sharing and incentive programs (Robert Perciasepe memo, 1997). As these are all voluntary programs, they involve a process of landowners, agencies, or organizations submitting and receiving approval for project proposals to implement appropriate practices. This project development and evaluation process, which will target fecal sources in these watersheds, will take place after TMDL approval by EPA has been granted. According to EPA guidance (1991), implementation of the TMDL is to take place after the state has obtained EPA approval. Commitment and funding for implementing these BMPs will thus be arranged after TMDLs have been approved.

In addition to voluntary measures, both of the watersheds will be subject to (MS4) permits. These permits for Greenville County and Rock Hill will require the identification and removal of illicit discharges to the storm sewer system, a potential major contributor of fecal coliform. MS4 permits will also require the development and implementation of a public education program about storm water and how citizens can reduce storm water pollution. Language has been added to the Unnamed Tributary to the Catawba River TMDL discussing the MS4 permitting program.

As is stated in the TMDLs, DHEC will continue to monitor water quality in these waters according to the basin monitoring schedule in order to evaluate use support and the effectiveness of implementation measures.

Other Comments on all five Fecal TMDLs
1) *Respondent commends DHEC on TMDLs and believes implementation of the strategies will make waters safe for recreation. (SC DNR)*

No response necessary.

2) *Respondent has reviewed TMDLs and administrative record and has no questions, comments, or additional information to offer. (Sierra Club - SC Chapter)*

No response necessary.

3) *Respondent supports DHEC's effort to establish TMDLs and believes they are consisted with recommendations in Lower Saluda River Corridor Plan and the Catawba River Corridor Plan. (SC PRT)*

No response necessary.

Data

SCDHEC Monitoring Data for SV-345 (Beaverdam Creek)

DATE	Fecal Coliform Bacteria (#/100ml)	NOTES*
11/20/95	96	
12/13/95	140	J
1/25/96	200	
2/23/96	590	
3/20/96	17000	J
4/24/96	440	
5/8/96	210	
6/20/96	410	
7/31/96	660	J
8/12/96	300	L
8/30/96	240	
9/12/96	280	
10/21/96	220	

	1994-98
# Samples=	13
% Exc=	38%
Avg Exc=	2820
Geometric Mean=	376

**Notes codes:*
J = estimated
L = greater than

DRAFT

SV-345 (BEAVERDAM CREEK) - LOADS

AREA

ACRES	SQUARE MILES
9099.482	14.21794063

FLOW

Equation:

Qa = (Runoff in in/yr*Drainage area in mi)/13.58

For SV-345:

Qa = (25*14.218)/13.58=

LOADING CALCULATIONS

Whole watershed

	FC geo mean	Conversion factor	Qa flow in cfs	FC #/day
current level	376	24468984	26.17441205	2.40813E+11
standard	200	24468984	26.17441205	1.28092E+11
			difference	1.12721E+11
			% difference	46.81%
TMDL target	175	24468984	26.17441205	1.12081E+11
			difference	1.28733E+11
			% difference	53.46%