

**Revised TMDL Implementation Plan
HUC 0307010105 - Carr Creek
April, 2003**

HUC 0307010105 and the drainage to Carr Creek are located entirely within Athens-Clarke County.

The stream segment of concern in this TMDL implementation plan is Carr Creek from its headwaters to the North Oconee River

Carr Creek is listed on the Section 303(d) list as a segment not supporting its designated use for fishing, based on pH, biotic diversity (sediment), and fecal coliform. Carr Creek drains an industrial area with known problems, including one site whose responsible parties have entered into a consent order with Georgia EPD for assessment and corrective action of the site under the Georgia Hazardous Waste Management Act. Because of its unique situation, Carr Creek is being treated with a separate TMDL implementation plan.

The pollutants of concern are pH, sediment (biota impaired), and fecal coliform. The streams were listed on the Georgia 303(d) list of impaired water bodies after sampling conducted by EPD in 1999. A Total Maximum Daily Load for fecal coliform was established by EPA for the entire Oconee River basin in February, 2002, that recommended a reduction in the fecal coliform loading for Carr Creek of 76%. A TMDL was prepared for pH for Carr Creek by the U.S.E.P.A. in February, 2002. It did not assign a loading factor, but prescribed all future discharges to the stream to meet water quality standards (pH 6.0 to 8.5). A TMDL was prepared for Carr Creek for sediment by U.S.E.P.A in January, 2002. It recommended a reduction in sediment loading of 87%.

Land use in the drainage of Carr Creek is predominantly industrial, with some residential land uses in the lower reaches. There are three major industrial developments in the watershed: Hanson Aggregates, operating a gravel quarry; Thomas Concrete, operating a concrete manufacturing plant; and Vigindustries, which owns a disused, abandoned site once used for producing commercial fertilizer.

The Vigindustries site is a suspected contributor of pollutants to Carr Creek and a corrective action plan has been developed and is being implemented to treat ground water for low pH. The ground water remediation is being carried out by consultants for Vigindustries, including ENSR or Raleigh, N.C. The source is legacy deposits of sulfuric acid used for fertilizer production. Ground water with low pH (average pH is less than 4.0) leaches from the site into Carr Creek, potentially contributing to pH problems. There are other potential pollutants of concern under examination on the site that are not related to this TMDL. The proposed remediation BMP is to construct a ditch and dike of limestone down-gradient of the contaminated ground water. Leaching through the rock is expected to neutralize the acidity in the ground water, causing it to arrive at Carr Creek at a pH within water quality standards. Eight stations in Carr Creek will be monitored for two years, at which time the effectiveness of the remedy will be evaluated. ENSR has

conducted many sampling events on Carr Creek, walked the creek to its headwaters, and made many observations of its conditions.

Thomas Concrete's site is upstream of the Vigindustries site. The potential pollutant of concern is water from the concrete production process that has very high pH levels. Laboratory tests of water collected on site have shown pH as high as 11.9. The plant was acquired by Thomas Concrete in about 1999, and the current environmental consultants, MSI Environmental, have been working on the site since 2002. The site has an NPDES discharge permit requiring no discharge from the site into Carr Creek. To attain this goal, MSI and Thomas Concrete have installed berms, detention ponds without discharge, and a backup plan for emergency, high-rainfall events. MSI has conducted several observations of Carr Creek and performed a few sampling events on the creek, although most of their data comes from on-site sampling.

The Upper Oconee Watershed Network, a volunteer citizen group operating in Athens-Clarke County, Jackson County, and Oconee County, has monitored Carr Creek on a regular basis.

Input from these and other stakeholders indicated the following information about the watershed:

- It appears that the sediment TMDL was developed in response to biota sampling. There is no visible problem with sediment loads, although some granite dust, presumably from the Hanson Aggregates site, is visible in the stream. Local biological sampling by stakeholders has found the creek to be essentially abiotic. Anecdotal evidence (preliminary toxicity tests) has indicated that the water in Carr Creek is toxic to macroinvertebrates.
- There is a white sediment coating portions of the creek bed, most likely formed as a result of chemical interaction between runoff from the concrete plant and leachate from the fertilizer plant. It has been identified as calcium sulfate (gypsum).
- There is no known source of fecal coliform in Carr Creek. Local volunteer sampling (UOWN) has found extremely low fecal counts, in fact the lowest in the Athens-Clarke County area. Sampling data from 1999 included in the TMDL show very high counts. The most likely source appears to be failed septic tanks. Source identification through monitoring will be necessary to address the fecal TMDL.
- Hanson Aggregates is under the jurisdiction of EPD's mining branch. Mining regulations require quarries to have no sediment runoff from mining operations.

Implementation

The plan identifies the following steps for load reduction:

- Implementation of an approved corrective action plan for Vigindustries' industrial site as described above to ensure leachate from the site does not adversely impact Carr Creek, i.e., contribute to in-stream pH below water quality standards.
- Sampling at eight sites in Carr Creek to measure the effectiveness of the remediation plan.
- Modification of the corrective action plan based on monitoring results.
- Continued monitoring of the stream to evaluate any real sediment-related problems not currently identifiable.
- Coliform monitoring for source identification.
- Continued monitoring by EPD for fecal coliform to determine if the non-attainment situation persists.

Oconee River Basin
TMDL Implementation Plan
North Oconee River Watershed
HUC 0307010105

STATE OF GEORGIA
**REVISED TMDL
IMPLEMENTATION PLAN**
OCONEE RIVER BASIN

STREAM APPROACH

TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies. With input from appropriate stakeholder groups, a TMDL Implementation Plan has been developed for a cluster of impaired waterbodies and the corresponding pollutant(s). The following impaired waterbodies are located in the same sub-basin identified by a HUC10 code (Figure 1).

This portion of the Implementation Plan addresses individual waterbodies and the corresponding pollutant sources, stakeholders, education/outreach activities, and potential funding sources. In addition, the Plan describes (a) regulatory and voluntary practices/control actions (*management measures*) to reduce target pollutants, (b) milestone schedules to show the development of the management measures on reducing target pollutants (*measurable milestones*), and (c) a monitoring plan to determine the efficiency of the management measures and measurable. The overall goal of the Plan is to define a set of actions that will help achieve water quality standards in the state of Georgia.

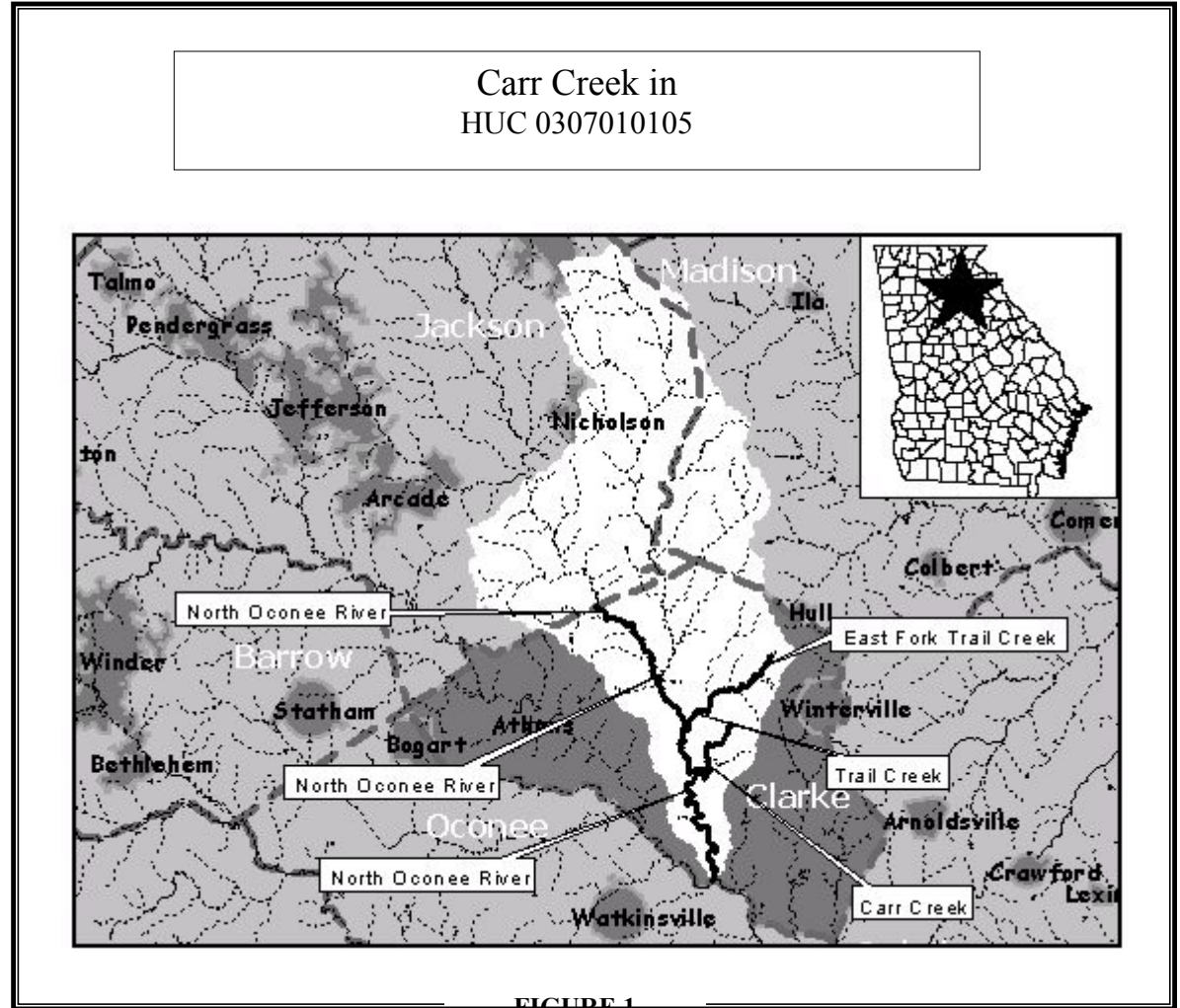


FIGURE 1

Impaired Waterbody*	Impaired Stream Location	Impairment
1. Carr Creek	Headwaters to N. Oconee River	Biota (Sediment), pH, FC

Impaired Waterbody*	Impaired Stream Location	Impairment
4. North Oconee River	Trail Creek to Oconee River	FC

*These Waterbody Numbers are referenced throughout the implementation plan.

CARR CREEK

NAME	LOCATION	MILES/AREA IMPACTED	CLASSIFICATION	PARTIALLY SUPPORTING/ NON SUPPORTING (PS/NS)
Carr Creek	Headwaters to North Oconee River, Athens	2 (Fecal Coliform & Sediment) 11 (pH)	Fishing	Partially Supporting
PRIMARY COUNTY	SECONDARY COUNTY	SECOND RDC	SOURCE (POINT/NON-POINT)	
Clarke			Nonpoint (Urban Runoff) Point (Municipal)	
POLLUTANTS	WATER QUALITY STANDARDS	REQUIRED REDUCTION	TMDL ID #	DATE TMDL ESTABLISHED
Biota (Sediment)	448 tons/year	87.3%		January 2002
pH	6.0 to 8.5 Standard Units	Not Listed in TMDL		February 2002
Fecal Coliform	1,000 per 100 ml (geometric mean Nov-April) 200 per 100 ml (geometric mean May-Oct)	76%		February 2002

SIGNIFICANT STAKEHOLDERS

Name/Organization	Address	City	State	Zip	Phone	E-mail
Gary Duck, David Bloyer / Athens-Clarke Co. Unified Government	P.O. Box 1868	Athens	GA	30603	(706)613-3470	gduck@co.clarke.ga.us
IMC Global/Kristen Wandland, ENSR representative	7041 Old Wake Forest Road	Raleigh	NC	27616	(919)872-6600	kwandland@ensr.com
Woody Bowen, MSI environmental	5072 Briston Industrial Way	Buford	GA	30518	(770)831-6830	
Thomas Concrete	1020 Winterville Road	Athens	GA	30601	706-546-7938	
Melanie Ruhlman / Upper Oconee Watershed Network	P.O. Box 531	Athens	GA	30603		

EDUCATION/OUTREACH ACTIVITIES

Responsible Organization or Entity	Description	Target Audience	Anticipated Dates (MM/YY)

POLLUTANT SOURCES

Pollutant	Source	Description of Contribution to Impairment
pH	Nonpoint Urban	Ground water from former industrial site at Vigindustries. Ground water with low pH may discharge into the stream. Runoff from Thomas Concrete with pH over 11 may have entered the stream from runoff in the past.
Sediment (biota)	Nonpoint	Possible sediment from Hanson Gravel quarry upstream. Observable sediment is believed to be precipitate from mixing alkali from Thomas Concrete with acidic ground water from Vigindustries site. It is believed that the diminished biota scores are due to the toxicity of the creek, not sediment.
Fecal coliform	Nonpoint	Unknown

MANAGEMENT MEASURES, RESPONSIBLE PARTIES, AND MEASURABLE MILESTONES

Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status (In-progress, Planning, Enforced)	Regulatory/ Voluntary
Corrective action plan for Vigindustries site.	Vigindustries, ENSR.	Containment and treatment of ground water by limestone interceptor trench; two year monitoring plan; re-evaluation and further activities planned.	2003	Planned	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
pH, sediment (biota)	Legacy sulfuric acid deposits from abandoned fertilizer production facility.	Anticipated effectiveness is very good; will be monitored.

Measurable Milestones	Schedule		Comments
	Start	End	
pH will gradually come within water quality standards.	2003	2005	Monitoring for pH, along with other potential pollutants, will be carried out for at least two years, after which the effectiveness of the management measure will be evaluated and next steps determined.

Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status (In-progress, Planning, Enforced)	Regulatory/ Voluntary
Containment of runoff	Thomas Concrete and MSI environmental	Alkaline by-product of concrete manufacture is captured in ponds on site. Practices are in place to ensure that potential pollutants do not leave the site. Water is recycled into production.	Current, ongoing	In progress	Regulatory & Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
pH, sediment (biota)	Thomas Concrete	Very effective

Measurable Milestones	Schedule		Comments
	Start	End	
No releases of high pH liquid into Carr Creek	Ongoing	Ongoing	Continuous inspection and maintenance of containment procedures and implementation of the containment plan will prevent any discharge of material into Carr Creek.

Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status <small>(In-progress, Planning, Enforced)</small>	Regulatory/ Voluntary
Coliform monitoring	Athens-Clarke County	Source identification process through E. coli testing to determine the source of fecal coliform.	2003	Planned	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
Fecal coliform	Unknown, nonpoint.	Very effective

Measurable Milestones	Schedule		Comments
	Start	End	
Determine sources of high fecal coliform counts recorded at the testing site.	2003	2004	Once sources are identified, BMP's will be selected to address the individual source(s).

Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status <small>(In-progress, Planning, Enforced)</small>	Regulatory/ Voluntary
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Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
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Measurable Milestones	Schedule		Comments
	Start	End	

POTENTIAL FUNDING SOURCES

Source	Responsible Authority	Status	Anticipated Funding Amount
Section 319(h) of the Clean Water Act	EPD/State of Georgia	Must Apply	N/A
Section 604(b) and Section 106 of the Clean Water Act	EPD via RDC	Must Apply	N/A

MONITORING PLAN

Organization	Pollutants	Purpose/Description	Time Frame		Status: (Previous, Current, Proposed)
			Start	End	
IMC Global	pH, biota	Carr Creek and former Vigindustries industrial site will be monitored for at least two years to establish the effectiveness of the employed BMP's to treat low pH ground water.	2003	2005	Proposed
MSI	pH, biota	MSI, acting for Thomas Concrete, will monitor the effectiveness of the containment on site of all potential pollutants.	2003	Ongoing	Current
Athens-Clarke County	Fecal coliform	Source identification of coliform will be determined by sampling at multiple points on Carr Creek and its tributaries	2003	2004	Proposed
EPD	Fecal coliform	Monitoring data for Georgia 305(b)/303(d) List	2004	2004	Proposed

COMMENTS:

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**Environmental Protection Division of the Department of Natural Resources,
State of Georgia.**