Section B - Chapter 7
Catawba River Subbasin 03-08-36
Long Creek, Dallas Branch and South Fork Catawba River

7.1 Subbasin Overview

Subbasin 03-08-36 at a Glance

Land and Water Area

Total area:	104mi²
Land area:	101mi²
Water area:	3mi²

Population Statistics

2000 Est. Pop.: 57,125 people
Pop. Density: 522 persons/mi²

Land Cover (percent)

Forest/Wetland:	54%
Surface Water:	3%
Urban:	14%
Agriculture:	29%

Counties

Gaston

Municipalities

Belmont, Bessemer City, Cramerton, Dallas, Gastonia, Kings Mountain, Lowell, McAdenville, Ranlo and Spencer Mountain

Subbasin 03-08-36 is located entirely in Lincoln County in the Southern Outer Piedmont ecoregion. The small subbasin consists of the Long Creek watershed and a portion of the South Fork Catawba River between the Town of Stanly and Lake Wylie. Major metropolitan areas include the cities of Gastonia and Belmont, the Interstate 85 corridor, and parts of Bessemer City. These areas are not growing as quickly as other subbasins (Tables A-6 and A-7), yet urban stormwater remains a concern. Most of the streams are very sandy due to erosion problems throughout the area. Land use remains primarily forested.

Major dischargers in this watershed include Collins and Aikman Products (4 MGD) and the City of Gastonia's Long Creek WWTP (16 MGD), both discharging to the South Fork Catawba River.

There are six facilities in this subbasin required to monitor effluent toxicity. Five of these facilities had one or more failing tests since 1997: Cramerton WWTP (2), Dallas WWTP (6), Lowell WWTP (2), Pharr Yarns (1), and Yorkshire Americas (3).

There were six benthic macroinvertebrate community samples and two fish community samples (Figure B-7 and Table B-14) collected during this assessment period. Two sites improved and four sites were sampled for the first time during this assessment period. Refer to *2003 Catawba River Basinwide Assessment Report* at http://www.esb.enr.state.nc.us/bar.html and Section A, Chapter 3 for more information on monitoring.

There are four ambient monitoring sites located in this subbasin: Long Creek at SR 1456, Long Creek at SR 2042, South Fork Catawba River at NC 7, and South Fork Catawba River at SR 2524. The Long Creek at SR 1456 site has exhibited elevated conductivity levels since the early 1990s and has also shown elevated levels in pH since the middle 1980s. Long Creek at SR 2042 has shown declining levels of nutrients since the middle 1980s.

Benthic macroinvertebrate sampling could not be conducted in 2002 at the South Fork Catawba River and Long Creek sites due to flow problems. However, a fish community assessment was conducted on Long Creek in 2002 and resulted in a Good-Fair rating.

Figure B-7 Catawba River Subbasin 03-08-36

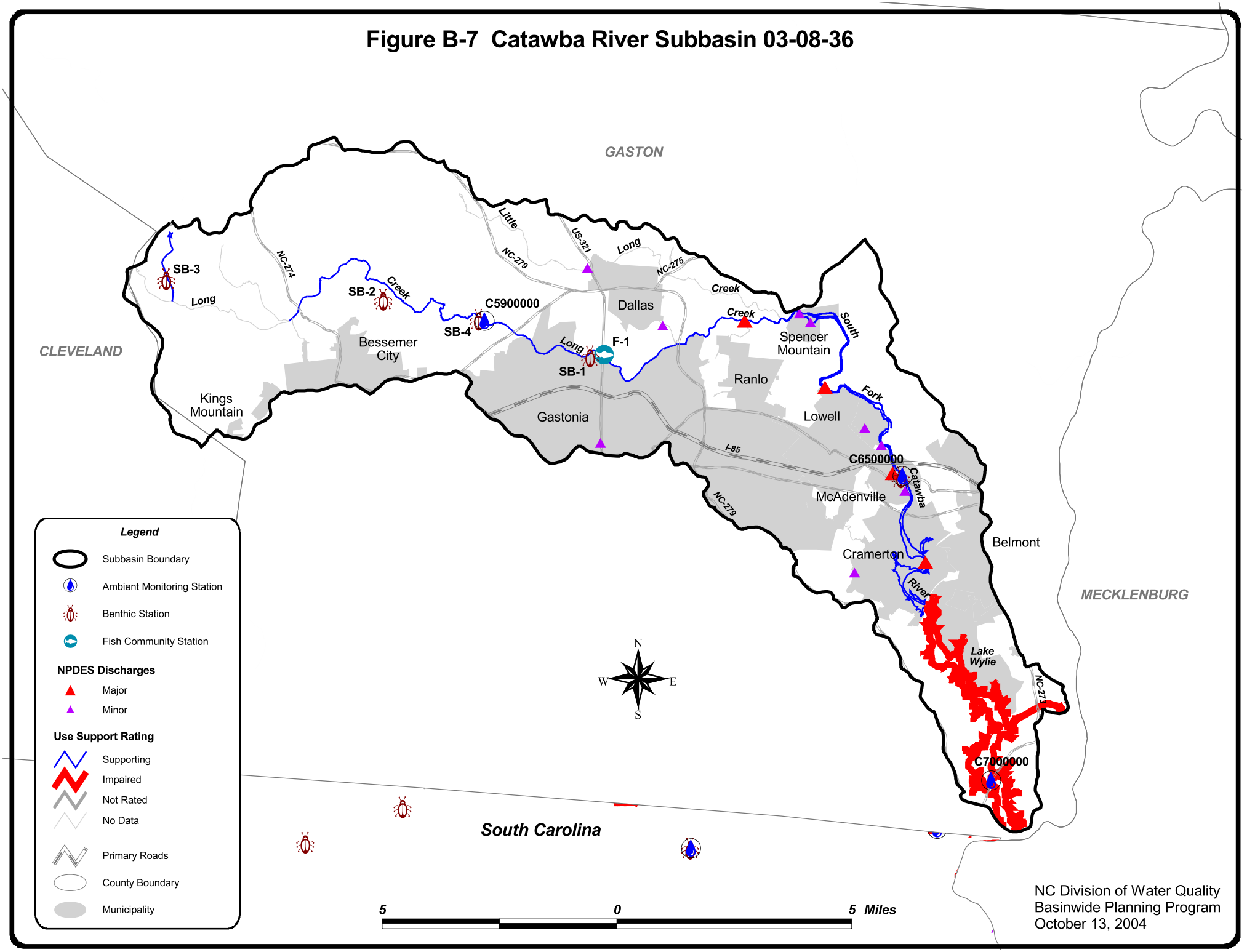

Table B-14 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 03-08-36

Waterbody	Assessment Unit Number	DWQ Classification	Length / Area	Category	Data Type with Map Number and Data Results			Use Support Rating	
					Biological	Ambient	Other	2004	1998
Limekiln Creek	11-129-16-2	WS-II	1.9 mi.	AL	SB-3 G--98 SB-3 E--01			S	FS
Long Creek	11-129-16-(4)	C	15.3 mi.	AL	F-1 F--97 F-1 GF--02 SB-1 NR--98 SB-2 F--98 SB-2 NR--01 SB-4 GF--97	C5900000 nce		S	FS/ST
South Fork Catawba River	11-129-(15.5)	WS-V	18.1 mi.	AL		C6500000 nce		S	ST
South Fork Catawba River	11-129-(15.5)	WS-V	18.1 mi.	REC		C6500000 nce		S	-
Long Creek	11-129-16-(4)	C	15.3 mi.	REC		C5900000 ce		NR	

Assessment Unit Number - Portion of DWQ Classified Index where monitoring is applied to assign a use support rating.

Use Categories:
AL - Aquatic Life
REC - Recreation

Monitoring data type:
F - Fish Community Survey
B - Benthic Community Survey
SB - Special Benthic Community Study

Bioclassifcations:
E - Excellent NR - Not Rated
G - Good
GF - Good-Fair
F - Fair
P - Poor

Ambient Data
nce - no criteria exceeded
ce - criteria exceeded

Use Support Ratings 2004:
S - Supporting, I - Impaired, NR - Not Rated

Use Support Ratings 1998:
FS - fully supporting, ST - supporting but threatened
PS - partially supporting, NS - not supporting

Bessemer City Lake, a small water supply reservoir for Bessemer City, was classified as oligotrophic in 2002. Nutrient concentrations were low with the exception of elevated ammonia levels in June.

Waters in Parts 7.3 and 7.4 are identified by assessment unit number (AU#). This number is used to track defined segments in the water quality assessment database, 303(d) Impaired waters list, and the various tables in this basin plan. The assessment unit number is a subset of the DWQ index number (classification identification number). A letter attached to the end of the AU# indicates that the assessment is smaller than the DWQ index segment. No letter indicates that the assessment unit and the DWQ index segment are the same.

Use support ratings are summarized in Part 7.2 below. Recommendations, current status and future recommendations for waters that were Impaired in 1999 and newly Impaired waters are discussed in Part 7.3 below. Supporting waters with noted water quality impacts are discussed in Part 7.4 below. Refer to Appendix III for use support methods and more information on all monitored waters.

7.2 Use Support Assessment Summary

Use support ratings in subbasin 03-08-36 were assigned for aquatic life, fish consumption, recreation and water supply. All waters in the subbasin are considered Impaired on an Evaluated basis because of a fish consumption advice (Section A, Chapter 4, Part 4.10). All water supply waters are Supporting on an Evaluated basis based on reports from DEH regional water treatment plant consultants. Refer to Table B-15 for a summary of use support ratings by use support category for waters in the subbasin.

Table B-15 Summary of Use Support Ratings by Use Support Category in Subbasin 03-08-36

Use Support Rating	Aquatic Life	Fish Consumption	Recreation	Water Supply
Monitored Waters				
Supporting	17.2 mi	0	0	0
Impaired	0	0	0	0
Not Rated	0	0	15.3 mi	0
Total	**17.2 mi**	**0**	**15.3 mi**	**0**
Unmonitored Waters				
Supporting	0	0	0	19.5 mi
Impaired	0	55.9 mi	0	0
Not Rated	0	0	0	0
No Data	38.7 mi	0	40.6 mi	0
Total	**38.7 mi.**	**55.9 mi**	**40.6 mi**	**19.5 mi**
Totals				
All Waters	**55.9 mi**	**55.9 mi**	**55.9 mi**	**19.5 mi**

Note: All waters include monitored, evaluated and waters that were not assessed.

7.3 Status and Recommendations of Previously and Newly Impaired Waters

The following waters were identified in the 1999 basin plan as Impaired or are newly Impaired based on recent data. The current status and recommendations for addressing these waters are presented below. These waters are identified by assessment unit number (AU#). Refer to the overview above for more information on AUs.

7.3.1 Dallas Branch [AU# 11-129-16-7b]

Current Status and 2004 Recommendations

Dallas Branch is a tributary to Long Creek and the 0.8-mile segment from the Dallas WWTP (NC0068888) to Long Creek was listed as Impaired in the *2002 Integrated 305(b) and 303(d) Report* due to municipal point source discharges. The Dallas WWTP has had compliance issues with quarterly chronic toxicity and weekly fecal coliform limits. Effluent chlorine values are elevated at times. In response, the facility has recently added a dechlorination system. Upon permit renewal in 2005, a total residual chlorine limit will be added. Upon inspection in October 2003, the plant was meeting its permit requirements and appeared to be well maintained. DWQ will resample this stream once the chlorine limit is in place.

7.4 Status and Recommendations for Waters with Noted Impacts

The surface waters discussed in this section are not Impaired. However, notable water quality problems and concerns have been documented for some waters based on this assessment. While these waters are not Impaired, attention and resources should be focused on these waters to prevent additional degradation or facilitate water quality improvement. Waters in the following section are identified by assessment unit number (AU#). See overview for more information on AUs.

7.4.1 South Fork Catawba River [AU# 11-129-(0.5), 11-129-(3.5), 11-129-(3.7)a, 11-129-(3.7)b, 11-129-(9.5), 11-129-(10.5), 11-129-(14.5), 11-129-(15.5)]

The South Fork Catawba River is formed by the confluence of Jacob and Henry Forks in Catawba County. It flows southerly through Lincoln and Gaston counties before joining the mainstem Catawba River at Lake Wylie. The river is used extensively as both a drinking water supply and for the assimilation of municipal and industrial wastewater. Because the South Fork Catawba River flows through two subbasins, further discussion of issues and watersheds related to the South Fork Catawba River is presented in Section A, Chapter 4.

7.4.2 Long Creek [AU# 11-129-16-(4)]

Current Status and 2004 Recommendations
The Long Creek watershed includes the north side of Gastonia and Bessemer City and central Gaston County. Due to a variety of restoration efforts and verification by scientific investigations, Long Creek was removed from the state's 303(d) list in 2000.

An eight-year study and restoration plan concluded in 2002 with the implementation of nonpoint source controls in the upper two-thirds of the watershed. Best management practices, land use changes, closure of mining operations, construction of livestock exclusion fencing, and riparian buffer establishments all led to significant decreases in nutrients, sediment and bacterial concentrations in the stream (Line and Jennings, 2002). The following is a summary of the study's major findings and achievements:

- More than 350 BMPs to treat runoff from 9,000 acres of pasture and cropland were implemented in the watershed. Animal waste management systems were installed to properly handle and apply 5,000,000 gallons of animal waste from four dairy operations.
- The implementation of primarily erosion control practices and the conversion of some land from row crop to tree production in the headwaters of Long Creek resulted in a decrease in the frequency of dredging around the water supply intake for Bessemer City. Prior to 1996, the stream channel required dredging of deposited sediment three to four times per year, but after, the need for dredging decreased to less than once per year.
- The implementation of BMPs and changes in land use in the watershed resulted in 75 and 70 percent decreases in median annual total phosphorus and fecal coliform levels at three downstream monitoring sites on Long Creek.

- The closure of a surface mining operation and subsequent draining of several large tailings ponds in 1997 coincided with decreases in suspended sediment and fecal coliform levels at three monitoring sites on Long Creek.
- The installation of livestock exclusion fencing and riparian buffer establishment in the pasture of a large dairy operation resulted in major reductions in weekly nitrogen, phosphorus and suspended sediment loads to the creek. Fecal coliform bacteria levels decrease following livestock exclusion.
- Monthly sampling of 10 monitoring wells in a dairy pasture documented elevated levels of nitrogen and phosphorus in groundwater beneath heavily use areas of the pasture. Data from monitoring wells in the riparian buffer indicated that the buffer was effective at nitrogen removal from groundwater, but was not effective at phosphorus removal.
- Annual sampling has documented that the abundance and diversity of the macroinvertebrate community at several sites in Long Creek has been increasing, indicating an improving trend in water quality.
- Monitoring of a small wetland, constructed along an urban stream, documented decreases in the concentrations of petroleum-related polycyclic aromatic hydrocarbons (PAHs) as water from the stream passed through the wetland. However, the wetland had little effect on combustion-related PAHs.
- Sampling of cropland soil, streambanks and streambeds indicated that cropland had considerably higher total phosphorus levels than streambank or bed material. Storm sampling of two tributaries and Long Creek showed the phosphorus load in suspended sediment was an order of magnitude greater than for bedload sediment.

At least 1.5 years of background or pretreatment water quality monitoring are required to document the effectiveness of nonpoint source controls; however, the start of a project and the initiation of monitoring often prompt landowners to implement improved management practices. Therefore, a concerted effort to explain the timeline of the study must be made prior to the start of monitoring.