

**TMDL FOR DISSOLVED OXYGEN FOR
BIG CREEK NEAR SHERIDAN, AR**

(REACH 08040203-904)

**FINAL
January 16, 2007**

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Prepared for

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EXECUTIVE SUMMARY

Section 303(d) of the Federal Clean Water Act requires states to identify waterbodies that are not meeting water quality standards and to develop total maximum daily pollutant loads for those waterbodies. A total maximum daily load (TMDL) is the amount of a pollutant that a waterbody can assimilate without exceeding the established water quality standard for that pollutant. Through a TMDL, pollutant loads can be allocated to point sources and nonpoint sources discharging to the waterbody.

This report presents a TMDL for dissolved oxygen (DO) for Big Creek near Sheridan in central Arkansas (reach 08040203-904). Both the final 2002 Arkansas 303(d) list and the draft 2004 Arkansas 303(d) list cited Big Creek as not supporting its designated use of aquatic life due to low DO values measured in the stream.

Big Creek is a relatively small stream (drainage area at the mouth is 21.7 square miles) that normally experiences periods of zero flow in the summer. The land use in the watershed is approximately 58% forest, 31% pasture, 10% urban, and 1% water.

The only facility with a permitted point source discharge into Big Creek is the City of Sheridan wastewater treatment plant (WWTP). The treatment system at this facility consists of three large ponds in series. The WWTP currently discharges treated wastewater to Big Creek under a hydrograph controlled release (HCR) scenario. With the HCR, the allowable effluent flow rate can be as much as 32% of the stream flow in Big Creek upstream of the outfall. However, this also means that the facility cannot discharge when Big Creek is not flowing.

The most recent renewal of the City of Sheridan's discharge permit will impose more stringent limits for carbonaceous biochemical oxygen demand (CBOD5) and ammonia nitrogen (NH3-N) starting March 1, 2008. The Arkansas Department of Environmental Quality (ADEQ) made the final permit limits more restrictive because ADEQ's routine monitoring data in Big Creek downstream of the WWTP showed enough low DO values to cause Big Creek to be classified as impaired due to organic enrichment/low DO on the 303(d) list. However, analysis of the ADEQ monitoring data and the WWTP effluent data indicates that the WWTP is not the primary cause of low DO values measured by ADEQ in Big Creek.

The City of Sheridan also disposes of treated wastewater using land application, which allows them to dispose of wastewater during dry times when there is little or no upstream flow in Big Creek.

Allowable loadings of oxygen-demanding materials in Big Creek were established using a water quality model (LA-QUAL) to simulate DO, carbonaceous biochemical oxygen demand (CBOD), and ammonia nitrogen (NH₃-N) in the stream. Model inputs were based on historical water quality data collected by ADEQ and field data that were collected by FTN Associates, Ltd. (FTN) in April 2005, October 2005, and March 2006. The field data that were collected by FTN included cross sections, time of travel measurements, flow measurements, in situ measurements, and water quality sampling. The model was calibrated to conditions measured on October 31, 2005 when the City of Sheridan WWTP was making an emergency discharge with no upstream flow in Big Creek. The field data on that day showed no violations of numeric criteria for DO or NH₃-N in Big Creek downstream of the WWTP. Field data from April 2005 and March 2006 were used to estimate depths, widths, and velocities in the model.

The calibrated model was used to make projection runs to simulate critical conditions for each of the four situations where a different numeric DO criterion is applicable. For the critical season, two projections were made (one with the WWTP discharging and one without the WWTP discharging). These five projection simulations were:

1. Winter season (when water temperature is 10°C or less),
2. Spawning period (when stream flow is 15 cfs or more during March through May),
3. Primary season (when water temperature exceeds 10°C but is not more than 22°C),
4. Critical season (when water temperature exceeds 22°C) with the WWTP discharge, and
5. Critical season (when water temperature exceeds 22°C) without the WWTP discharge.

The applicable DO criteria are 6.5 mg/L for the winter season and spawning period, 5.0 mg/L for the primary season, and 3.0 mg/L for the critical season. The predicted minimum DO values in the projection simulations were 7.3 mg/L for the winter season, 6.8 mg/L for the spawning period, 5.1 mg/L for the primary season, and 3.0 mg/L for both of the critical season projections. In order for the first four projection simulations to show the DO criteria being maintained, minimum upstream flows of 5 cfs to 10 cfs were required.

The results of the projection simulations were used to calculate a seasonal TMDL (Table ES.1). The projections for the spawning period and primary season were combined to develop the TMDL for March through April and November through December. For each season, the TMDL includes a wasteload allocation (WLA) for the City of Sheridan WWTP, a load allocation (LA) for nonpoint sources, and an implicit margin of safety (MOS).

Table ES.1. DO TMDL for Big Creek.

	Oxygen demand (lbs/day) from:			Total oxygen demand (lbs/day)
	CBODu	NH3-N	SOD	
January – February (Winter Season)				
WLA for City of Sheridan WWTP	558	420	--	978
LA for nonpoint sources	400	62	154	616
MOS	incorporated through conservative assumptions			
TMDL	958	482	154	1594
March – April, November – December				
WLA for City of Sheridan WWTP	742	466	--	1208
LA for nonpoint sources	722	97	160	979
MOS	incorporated through conservative assumptions			
TMDL	1464	563	160	2187
May – October (Critical Season) with WWTP discharge				
WLA for City of Sheridan WWTP	742	186	--	928
LA for nonpoint sources	869	124	160	1153
MOS	incorporated through conservative assumptions			
TMDL	1611	310	160	2081
May – October (Critical Season) without WWTP discharge				
WLA for City of Sheridan WWTP	0	0	--	0
LA for nonpoint sources	188	10	154	352
MOS	incorporated through conservative assumptions			
TMDL	188	10	154	352

The results of the first four projection simulations were used to develop recommended permit limits for the City of Sheridan WWTP (Table ES.2). For these first four projection simulations (all of which included discharges from the WWTP), no reductions of nonpoint sources of oxygen demand were necessary. However, the results of the last projection simulation (without the WWTP discharging) indicated that, under 7Q10 conditions during the summer, a 20% reduction of nonpoint sources of oxygen demand is necessary to maintain the applicable DO criterion.

Table ES.2. Recommended permit limits for City of Sheridan WWTP.

	January – February	March, April, November, December	May – October
Minimum upstream flow	5 cfs	10 cfs	10 cfs
Effluent flow (% of upstream)	30%	20%	20%
Effluent CBOD5	30 mg/L	30 mg/L	30 mg/L
Effluent NH3-N	12 mg/L	10 mg/L	4 mg/L
Effluent DO	7 mg/L	6 mg/L	5 mg/L

TABLE OF CONTENTS

1.0	INTRODUCTION	1-1
2.0	BACKGROUND INFORMATION	2-1
2.1	General Information.....	2-1
2.2	Land Use	2-1
2.3	Stream Flow	2-1
2.4	Water Quality Standards.....	2-1
2.5	Nonpoint Sources.....	2-3
2.6	Point Sources	2-3
2.7	Previous Studies.....	2-5
2.8	ADEQ Water Quality Data.....	2-5
3.0	FTN FIELD DATA.....	3-1
4.0	CALIBRATION OF WATER QUALITY MODEL	4-1
4.1	Model Setup and Configuration.....	4-1
4.2	Hydraulics	4-1
4.3	Water Temperatures.....	4-2
4.4	Kinetic Coefficients and Nonpoint Source Loads	4-3
4.5	Inflows	4-4
4.6	Model Calibration Results	4-4
5.0	MODEL PROJECTIONS	5-1
5.1	Critical Conditions and Seasonality.....	5-1
5.2	Winter Projection.....	5-1
5.3	Spawning Period Projection.....	5-3
5.4	Primary Season Projection.....	5-5
5.5	Critical Season Projection With WWTP Discharging.....	5-7
5.6	Critical Season Projection Without WWTP Discharging.....	5-9
5.7	Summary of Projection Simulations	5-11
5.8	Ammonia Toxicity.....	5-13
6.0	TMDL DEVELOPMENT.....	6-1
6.1	Load Calculations	6-1
6.2	Margin of Safety	6-2
6.3	Nonpoint Source Reductions	6-2
6.4	Recommended Permit Limits	6-3

TABLE OF CONTENTS (CONTINUED)

6.5	Future Growth.....	6-4
7.0	FUTURE MONITORING	7-1
8.0	PUBLIC PARTICIPATION	8-1
9.0	REFERENCES	9-1

LIST OF APPENDICES

APPENDIX A:	Maps of Watershed and Land Use
APPENDIX B:	Sheridan DMR Data and ADEQ Ambient DO Data
APPENDIX C:	FTN Field Data for April 2005
APPENDIX D:	FTN Field Data for October 2005
APPENDIX E:	FTN Field Data for March 2006
APPENDIX F:	Model Output for Calibration
APPENDIX G:	Calculation of Model Inputs from ADEQ Water Quality Data
APPENDIX H:	Model Output for Winter Season Projection
APPENDIX I:	Model Output for Spawning Period Projection
APPENDIX J:	Model Output for Primary Season Projection
APPENDIX K:	Model Output for Critical Season Projection With WWTP Discharge
APPENDIX L:	Model Output for Critical Season Projection Without WWTP Discharge
APPENDIX M:	Comparison of Historical and Simulated Temperatures for Each Season
APPENDIX N:	Ammonia Toxicity Calculations
APPENDIX O:	TMDL Calculations

LIST OF TABLES

Table ES.1	DO TMDL for Big Creek	iii
Table ES.2	Recommended permit limits for City of Sheridan WWTP.....	iv
Table 1.1	303(d) listing for the stream reach in this report.....	1-1
Table 2.1	Relevant numeric criteria for Big Creek downstream of City of Sheridan WWTP	2-2
Table 2.2	Summary of permit limits for City of Sheridan WWTP.....	2-4
Table 2.3	Summary of DMR data for City of Sheridan WWTP.....	2-4
Table 3.1	Summary of recent field data collected by FTN.....	3-1
Table 4.1	Values used in model calibration for depth and width	4-2
Table 4.2	Model calibration values for kinetic coefficients and nonpoint source loads.....	4-3
Table 4.3	Model calibration values for inflow rates and quality	4-5
Table 5.1	Model input values for inflows for winter projection.....	5-2
Table 5.2	Model input values for inflows for spawning period projection.....	5-4
Table 5.3	Model input values for widths and depths for spawning period projection.....	5-5
Table 5.4	Model input values for inflows for primary season projection.....	5-6
Table 5.5	Model input values for widths and depths for primary season projection.....	5-7
Table 5.6	Inflow rates and quality for critical season projection with the WWTP discharging.....	5-8
Table 5.7	Widths and depths for critical season projection with the WWTP discharging ..	5-9
Table 5.8	Inflow rates and quality for critical season projection with no WWTP discharge	5-10
Table 5.9	SOD and loads for critical season projection with no WWTP discharge.....	5-11
Table 5.10	Summary of projection simulations.....	5-12
Table 6.1	DO TMDL for Big Creek	6-1
Table 6.2	Recommended permit limits for City of Sheridan WWTP.....	6-3

LIST OF FIGURES

Figure 4.1	Plots of predicted and observed values for calibration simulation	4-6
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1.0 INTRODUCTION

This report presents a total maximum daily load (TMDL) for dissolved oxygen (DO) for Big Creek near Sheridan in central Arkansas (reach 08040203-904). This stream reach was cited as not supporting its designated use of aquatic life according to the final 2002 Arkansas 303(d) list (Environmental Protection Agency (EPA) 2003) and the draft 2004 Arkansas 303(d) list (Arkansas Department of Environmental Quality (ADEQ) 2005a). The sources of contamination and causes of impairment from the draft 2004 303(d) list are shown in Table 1.1. The TMDL in this report addresses the impairment due to organic enrichment/low DO, but not other causes of impairment (siltation/turbidity and lead). The TMDL in this report was developed in accordance with Section 303(d) of the Federal Clean Water Act and EPA's regulations in 40 CFR 130.7.

The purpose of a TMDL is to determine the pollutant loading that a waterbody can assimilate without exceeding the water quality standard for that pollutant and to establish the load reduction that is necessary to meet the standard in a waterbody. The TMDL is the sum of the wasteload allocation (WLA), the load allocation (LA), and a margin of safety (MOS). The WLA is the load allocated to point sources of the pollutant of concern. The LA is the load allocated to nonpoint sources, including natural background. The MOS is a percentage of the TMDL that takes into account any lack of knowledge concerning the relationship between pollutant loadings and water quality.

Table 1.1. 303(d) listing for the stream reach in this report (ADEQ 2005a).

Stream Name and Reach No.	Impaired Use	Sources	Causes ¹	Category ²	Priority
Big Creek 08040203-904	Aquatic life	Municipal point source	Organic enrichment/ low DO	5A	Low
	Aquatic life	Unknown	Siltation/turbidity	5A	Low
	Aquatic life	Municipal point source	Lead	5C	Medium

Notes: 1. The only cause for impairment for this reach in the 2002 final 303(d) list was organic enrichment/low DO.

2. Category 5A means the waterbody is definitely impaired and a TMDL is needed. Category 5C means that the assessment was based on questionable data and needs to be confirmed before a TMDL is developed.

2.0 BACKGROUND INFORMATION

2.1 General Information

The TMDL in this report is for Big Creek near Sheridan in central Arkansas (see Figure A.1 located in Appendix A). Big Creek is assessed by ADEQ as reach 08040203-904. Big Creek drains in a generally southeasterly direction before flowing into Hurricane Creek.

The Big Creek watershed is in the Gulf Coastal Plain ecoregion and is also part of ADEQ Planning Segment 2C. The drainage area of Big Creek is 11.9 square miles upstream of the City of Sheridan wastewater treatment plant (WWTP) and 21.7 square miles at its mouth.

2.2 Land Use

Land use data for the Big Creek watershed were obtained from the GEOSTOR database, which is maintained by the Center for Advanced Spatial Technology (CAST) at the University of Arkansas in Fayetteville. These data were based on satellite imagery from 1999. These data indicate that the Big Creek watershed is approximately 58% forest, 31% pasture, 10% urban, and 1% water. A land use map is shown on Figure A.2 (located in Appendix A).

2.3 Stream Flow

There are no United States Geological Survey (USGS) stream flow gages for Big Creek. The average annual streamflow for watersheds in this area is approximately 16 inches/year, or 1.2 cfs per square mile of drainage area (USGS 1984). Big Creek normally experiences periods of zero flow in the summer. The 7Q10 flow for Big Creek is assumed to be zero (USGS 1983, USGS 1992).

2.4 Water Quality Standards

Water quality standards for Big Creek are given in Arkansas Regulation No. 2 (Arkansas Pollution Control and Ecology Commission (APCEC) 2005). The designated uses for Big Creek downstream of the City of Sheridan WWTP are primary and secondary contact recreation; domestic, industrial, and agricultural water supply; and perennial Gulf Coastal fishery. Relevant

numeric criteria that apply to Big Creek downstream of the City of Sheridan WWTP are shown in Table 2.1.

Table 2.1. Relevant numeric criteria for Big Creek downstream of City of Sheridan WWTP.

Parameter	Numeric Criteria from State Water Quality Standards
Water temperature	30°C
DO	3.0 mg/L* during critical season (when water temperature > 22°C)
	5.0 mg/L during primary season (when water temperature ≤ 22°C)
	6.5 mg/L during March-May when stream flow is at least 15 cfs
	6.5 mg/L when water temperature ≤ 10°C

*Note: "When water temperatures exceed 22°C (71.6°F), a 1 mg/L diurnal depression will be allowed below the applicable critical standard for no more than 8 hours during any 24-hour period." (APCEC 2005)

As specified in EPA's regulations at 40 CFR 130.7(b)(2), applicable water quality standards include antidegradation requirements. Arkansas' antidegradation policy is listed in Sections 2.201 through 2.204 of Regulation No. 2. These sections impose the following requirements:

1. Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
2. Water quality that exceeds standards shall be maintained and protected unless allowing lower water quality is necessary to accommodate important economic or social development, although water quality must still be adequate to fully protect existing uses.
3. For outstanding state or national resource waters, those uses and water quality for which the outstanding waterbody was designated shall be protected.
4. For potential water quality impairments associated with a thermal discharge, the antidegradation policy and implementing method shall be consistent with Section 316 of the Clean Water Act.

2.5 Nonpoint Sources

As shown in Table 1.1, the draft 2004 Arkansas 303(d) list did not identify specific nonpoint sources affecting Big Creek. Based on land use data and first hand observations of the stream, Big Creek is likely affected by nonpoint source runoff from pasture, forestry operations, and urban areas.

2.6 Point Sources

The City of Sheridan WWTP is the only facility with a point source discharge in the Big Creek watershed (see location on Figure A1). The discharge from this facility is regulated by National Pollutant Discharge Elimination System (NPDES) Permit No. AR0034347.

The City of Sheridan's treatment system consists of 3 large ponds in series and has a design flow of 0.676 MGD. The sizes of these ponds are 26 acres, 16 acres, and 14 acres, respectively. These ponds provide a large amount of wastewater storage, which is necessary because the facility currently discharges to Big Creek according to a hydrograph controlled release (HCR). With the HCR, the allowable effluent flow rate can be as much as 32% of the stream flow in Big Creek upstream of the outfall. However, this also means that the facility cannot discharge when Big Creek is not flowing.

The most recent renewal of the City of Sheridan's NPDES permit became effective on March 1, 2005. At the end of the 3-year compliance period (March 1, 2008), the interim permit limits (which allow the HCR) will no longer be effective and the final limits will become effective. With the final limits, the HCR will no longer be allowed and more stringent limits for carbonaceous biochemical oxygen demand (CBOD5) and ammonia nitrogen (NH3-N) will be imposed. ADEQ made the final permit limits more restrictive because ADEQ's routine monitoring data in Big Creek at station OUA18 (downstream of the WWTP; see Figure A1) showed enough low DO values to cause Big Creek to be classified as impaired due to organic enrichment/low DO on the 303(d) list. However, analysis of the ADEQ monitoring data and the City of Sheridan's effluent data indicates that the WWTP is not the primary cause of low DO values measured by ADEQ in Big Creek (see Section 2.8). The interim and final limits in the City of Sheridan's NPDES permit are summarized in Table 2.2.

Table 2.2. Summary of permit limits for City of Sheridan WWTP.

	Flow rate	CBOD5^A	NH3-N^A	DO^B
Interim Limits	32% of upstream flow in Big Creek ^C	30 mg/L	10 mg/L	5 mg/L
Final Limits	Report only ^D	15 mg/L (year round)	4 mg/L (May-Oct) 6 mg/L (Nov-Apr)	5 mg/L (May-Oct) 6 mg/L (Nov-Apr)

Note: A = monthly average limits. B = instantaneous minimum limits. C = seven-day average limit. D = There is not a final permit limit for flow, but flow is effectively controlled by mass limits for CBOD5 and NH3-N.

The City of Sheridan's current treatment system is not capable of meeting the final permit limits. Meeting these final limits would require a mechanical wastewater treatment system, which would be unreasonably expensive for a small municipality such as Sheridan. Historical concentrations of BOD5 and NH3-N in effluent discharged by the City of Sheridan WWTP are summarized in Table 2.3 and listed individually in Table B.1 in Appendix B. These data were downloaded from EPA's Permit Compliance System (PCS) web site (EPA 2006).

Table 2.3. Summary of DMR data for City of Sheridan WWTP.

Parameter	Period of record	Statistics for monthly average values				
		Number of values	Minimum	Median	Average	Maximum
BOD5 ^A	Jan 2000 – Jan 2006	40	6.1	14.5	16.4	44.2 ^B
NH3-N	Jan 2000 – Jan 2006	43	0.16	1.6	3.1	9.5

Notes: A. Two of the 40 values are actually CBOD5 rather than BOD5. B Second highest BOD5 value is 30 mg/L.

The City of Sheridan also utilizes land application in addition to discharging to Big Creek. Treated wastewater is currently applied to a 10-acre land application site along the east side of Big Creek directly across from the WWTP. Future plans include applying treated wastewater to an additional 30 acres of adjacent land. Land application is beneficial because it allows the City of Sheridan to dispose of treated wastewater during dry times when there is little or no upstream flow in Big Creek.

2.7 Previous Studies

In the early 1980's, a wasteload allocation study was conducted for the City of Sheridan by FTN Associates, Ltd. (FTN) as a subcontractor to McClelland Consulting Engineers (McClelland 1982). The wasteload allocation study included collection of field data, calibration of a water quality model for Big Creek, and development of the HCR discharge scenario that is still being used by the City of Sheridan WWTP. Some of the changes that have occurred since that study include the elimination of one the City of Sheridan's outfalls and slight changes in the stream hydraulics due to increased beaver activity in Big Creek downstream of the WWTP.

In 2005, ADEQ developed a desktop (i.e., uncalibrated) model of Big Creek for the purpose of establishing new permit limits for the City of Sheridan WWTP without an HCR discharge scenario (ADEQ 2005b). The water quality model was based on best professional judgment because no recent field data were available for model calibration at that time.

2.8 ADEQ Water Quality Data

Water quality data for DO and other parameters have been collected by ADEQ in Big Creek at station OUA18, which is located approximately 2.0 miles downstream of the City of Sheridan WWTP (see Figure A.1). A tabular listing of these data is included in Table B.2 in Appendix B. The monthly statistics at the end of Table B.2 show that most of the historical violations of the DO criteria in Big Creek have occurred during the summer months.

The ADEQ DO data at station OUA18 were plotted along with monthly average effluent flows from the WWTP for January 2000 through January 2006 (Figure B.1, Appendix B). For this time period, there were a total of 49 DO measurements at station OUA18 and 12 of them (24%) were below the applicable numeric criterion (3.0 mg/L, 5.0 mg/L, or 6.5 mg/L based on stream temperature). However, 10 of the 12 DO values below the criterion occurred during months when the City of Sheridan WWTP did not discharge. This indicates that the WWTP is not the primary cause for most of the low DO values in Big Creek. Because Big Creek normally experiences periods of zero flow in the summer and much of the streambed is dry during those times, it is likely that some of these DO measurements were taken from isolated, stagnant pools of water in the creek.

3.0 FTN FIELD DATA

FTN collected various field data in Big Creek during 2005 and 2006. The types of data collected on each date are summarized in Table 3.1. The purpose of the field data collection was to obtain recent field data for developing a new calibrated water quality model of Big Creek. Most of the water quality data for calibrating the model were collected on October 31, 2005 during an emergency discharge by the City of Sheridan WWTP. Although there was no upstream flow in Big Creek during that time, all of the DO and ammonia measurements downstream of the WWTP were within criteria specified in the State water quality standards.

Table 3.1. Summary of recent field data collected by FTN.

Date	Upstream flow (cfs)	Effluent flow (cfs)	Field data that were collected
04/20/05	Similar to 4/22/05	0	Cross sections and reconnaissance
04/22/05	5.5	0	Time of travel upstream of OUA18, flow measurements
10/31/05	0	7.0	Water quality samples, in situ measurements, flow measurements, continuous in situ monitoring, time of travel downstream of OUA18
03/20/06	144	0	Water quality samples and in situ measurements (upstream and tributary only), flow measurements

Field data that were collected during April 2005 are shown in Appendix C, which includes a map showing the locations of the field data collection sites (Figure C.1), plots of the cross section data (Figures C.2 through C.7), a summary of the cross section data (Table C.1), stream flow measurements (Table C.2), time of travel calculations (Table C.3), and a plot of measured dye concentrations vs. time from the time of travel study (Figure C.8).

Field data that were collected during October 2005 are shown in Appendix D, which includes a tabular listing of water quality sampling data and in situ measurements (Table D.1), plots of the CBOD time series data (Figures D.1 through D.3), stream flow measurements (Tables D.2 through D.5), a plot of continuous DO data (Figure D.4), and results of the time of travel study (Figure D.5).

Field data that were collected during March 2006 are shown in Appendix E, which includes a tabular listing of water quality sampling data and in situ measurements (Table E.1) and stream flow measurements (Table E.2.). Data were only collected for the upstream inflow and one tributary during March 2006 because water quality data along the main stem had already been collected in October 2005. An additional calibration data set was not collected on this date because the upstream flow rate was so large that the data set would have characterized the effects of storm runoff rather than effects of the City of Sheridan's effluent.

4.0 CALIBRATION OF WATER QUALITY MODEL

4.1 Model Setup and Configuration

In order to evaluate the linkage between pollutant sources and water quality, a computer simulation model was used. The model used for this TMDL was LA-QUAL (version 8.00), which was selected because it includes the relevant physical, chemical, and biological processes and it has been used successfully in the past for other DO TMDLs in EPA Region 6. The algorithms in the LA-QUAL model are essentially the same as in the QUAL-TX model. The LA-QUAL model was set up to simulate ultimate CBOD, ammonia nitrogen, and DO.

The model starts in Big Creek at the City of Sheridan WWTP and continues downstream into Hurricane Creek to the Highway 35 Bridge. The model is divided into four reaches:

1. Big Creek from the City of Sheridan WWTP outfall to Town Branch,
2. Big Creek from Town Branch to the mouth,
3. Hurricane Creek from Big Creek to the Grant County Road 67 Bridge, and
4. Hurricane Creek from the Grant County Road 67 Bridge to the Highway 35 Bridge.

Conditions on October 31, 2005 were used for model calibration because the WWTP was discharging and the absence of upstream flow created critical conditions in the stream.

4.2 Hydraulics

Depths and widths for Big Creek were initially specified in the model based on cross section measurements from April 20, 2005. Although these cross sections were measured six months earlier than when the water quality data were collected, the hydraulics were similar for both dates because the amount of flow downstream of the outfall was similar (5.5 cfs on April 20 and 7.0 cfs on October 31). The initial simulations were underpredicting the time of travel; therefore the depths for Big Creek were increased. The widths were not adjusted because the width measurements were considered to be more representative of the stream than the depth measurements. After adjusting the depths, the predicted time of travel from the WWTP outfall to

the OUA18 sampling station (elements 1 through 20 in the model) was 17.4 hours and the measured time of travel from the dye study on April 22 was 18.0 hours (Table C.3). The velocities calculated by the model for reaches 1 through 4 were 0.15 ft/sec, 0.22 ft/sec, 0.23 ft/sec, and 0.23 ft/sec, respectively. The predicted velocity for reach 2 was similar to the measured velocity of 0.22 ft/sec from the dye study downstream of OUA18 on October 31 (Figure D.5). Big Creek is deeper and slower in reach 1 because of beaver dams. The final values of depth and width that were specified as model inputs are shown in Table 4.1.

Table 4.1. Values used in model calibration for depth and width.

Parameter	Reach(es)	Value used in model	Data source/Comment
Width	1	19 ft	Based on widths from cross sections in Big Creek at XS1, XS2, and BC1A (average = 18.6 ft)
	2	19 ft	Based on widths from cross sections in Big Creek at XS3, BC3, and XS4 (average = 19.0 ft)
	3 – 4	45 ft	Based on data from early 1980's wasteload allocation, recent visual observations, and USGS flow data
Depth	1	2.5 ft	Originally set to 1.9 ft (average of depths in Big Creek at XS1, XS2, and BC1A), but adjusted when calibrating time of travel from outfall to OUA18
	2	1.7 ft	Originally set to 1.1 ft (average of depths in Big Creek at XS3, BC3, and XS4), but adjusted when calibrating time of travel downstream of OUA18
	3 – 4	3.0 ft	Based on data from early 1980's wasteload allocation, recent visual observations, and USGS flow data

4.3 Water Temperatures

Temperatures in the stream are specified in the LA-QUAL model as initial conditions (Data Type 11). For Big Creek (reaches 1 and 2), the temperature was set to 15.5°C, which was the average of the temperatures measured on October 31 (excluding the upstream station; see Table D.1). The temperature in Hurricane Creek (reaches 3 and 4) was set to 14.5°C; it was assumed to be slightly cooler than Big Creek because the water in Big Creek was coming from the WWTP ponds, which have no shading. Also, the temperature measured by ADEQ in

Hurricane Creek at Highway 270 a week earlier (October 25) was 10.2°C, which supports the assumption of Hurricane Creek being cooler than 15.5°C.

Other values that are specified in the initial conditions (DO and NH₃-N) are used by the model only as starting values for the iterative solution algorithm; they do not affect the results.

4.4 Kinetic Coefficients and Nonpoint Source Loads

The kinetic coefficients that were specified in the model were reaeration rates, CBOD decay rates, nitrification (NH₃-N decay) rates, sediment oxygen demand (SOD), and non-point source loads of ultimate CBOD and NH₃-N. These values are shown in Table 4.2.

Table 4.2. Model calibration values for kinetic coefficients and nonpoint source loads.

Parameter	Reach(es)	Value used in model ^A	Data source / comment
Reaeration rates ^B	1	1.25/day	Computed by the model using the O'Connor-Dobbins equation.
	2	2.71/day	
	3 – 4	1.19/day	
BOD decay rate	1 – 4	0.15/day	Originally set to 0.11, which is the average of the CBOD decay rates calculated from samples collected on October 31 (excluding the upstream station; see Table D.1). Adjusted to 0.15 to achieve a better calibration.
Nitrification rate	1 – 4	0.45/day	Established by calibrating predicted NH ₃ -N values.
SOD	1 – 2	139.4 mg/ft ² /day	Established by calibrating predicted DO values. Equivalent to 1.50 g/m ² /day.
	3 – 4	79.0 mg/ft ² /day	This is value that maintains a fairly constant DO in Hurricane Creek without inflow from Big Creek. Equivalent to 0.85 g/m ² /day.
Nonpoint source loads of CBOD _u	1	53 lbs/day	Established by calibrating predicted CBOD _u values. Equivalent to 2.15 g/m ² /day of oxygen demand.
	2	111 lbs/day	Established by calibrating predicted CBOD _u values. Equivalent to 1.42 g/m ² /day of oxygen demand.
	3	28 lbs/day	Established by calibrating predicted CBOD _u values. Equivalent to 0.41 g/m ² /day of oxygen demand.
	4	133 lbs/day	
Nonpoint source loads of NH ₃ -N	1 – 4	0.0 mg/ft ² /day	No NH ₃ -N loads were needed to calibrate the NH ₃ -N concentrations in the model.

Notes: A. Values shown in table are at 20°C. The model internally adjusts each rate based on stream temperature.
B. Reaeration values are actually computed by the model based on which equation is specified by the user.

Nonpoint source loads of CBODu and NH₃-N (entered in Data Types 13 and 19 in the LA-QUAL model) represent sources of CBODu and NH₃-N along the length of the stream that are not coming from the inflows specified in the model. In some cases, these nonpoint source loads can be from organic particulate matter (e.g., leaves, debris) that entered the stream during high flow periods and settled out but is dissolving into the water column under low flow conditions. Illegal dumping of miscellaneous items (including animal carcasses) at the bridge at the OUA18 sampling station can also create an additional source of CBODu and NH₃-N at times. Because the nonpoint sources cannot be quantified, the model input values were established through calibration of the instream concentrations of CBODu and NH₃-N.

4.5 Inflows

For the calibration period (October 31), the only inflow to Big Creek was the City WWTP. Although the model was set up to simulate inflows from Town Branch and Hubbard Creek in the projections, the flow rate and water quality for those two tributaries were set to zero for the calibration simulation. The only other inflow that was specified in the model calibration was the flow from Hurricane Creek upstream of Big Creek. The input values used in the calibration simulation for inflow rates and quality are shown in Table 4.3.

4.6 Model Calibration Results

Plots of predicted and observed values of CBODu, NH₃-N, and DO from the calibration simulation are shown in Figure 4.1. Printouts of the LA-QUAL output for the calibration are included in Appendix F.

The model was calibrated to predict a constant CBODu value of 23 mg/L along the entire length of Big Creek because of the variability in the observed CBODu values between stations and the lack of a spatial trend in CBODu concentrations in Big Creek. The observed CBODu concentration at BC1A (44 mg/L) was ignored during calibration because it was considered to be an outlier, especially considering that the last value in the CBOD time series data for that station looks questionable (Figure D.2).

Table 4.3. Model calibration values for inflow rates and quality.

Name of Inflow	Parameter	Value used in model	Data source / comment
Big Creek upstream of WWTP	Flow rate	0.0 cfs	No upstream flow at all in Big Creek on October 31
	DO	--	Input value not needed (no flow)
	CBOD _u	--	Input value not needed (no flow)
	NH ₃ -N	--	Input value not needed (no flow)
City of Sheridan WWTP	Flow rate	7.0 cfs	Measured flow at BC1A on October 31
	DO	9.7 mg/L	Average of values measured at outfall (10.2 mg/L) and BC-1A (9.2 mg/L) on October 31
	CBOD _u	23 mg/L	Value of 22 mg/L was calculated using CBOD time series data from WWTP outfall sample on Oct. 31. This was adjusted to 23 mg/L based on data at other sampling stations and inherent analytical variability.
	NH ₃ -N	0.21 mg/L	Value from WWTP outfall sample on October 31
Town Branch	Flow rate	0.0 cfs	No flow at all in Town Branch on October 31
	DO	--	Input value not needed (no flow)
	CBOD _u	--	Input value not needed (no flow)
	NH ₃ -N	--	Input value not needed (no flow)
Hubbard Creek	Flow rate	0.0 cfs	No flow at all in Hubbard Creek on October 31
	DO	--	Input value not needed (no flow)
	CBOD _u	--	Input value not needed (no flow)
	NH ₃ -N	--	Input value not needed (no flow)
Hurricane Creek upstream of Big Creek	Flow rate	24 cfs	USGS provisional mean daily flow of 31 cfs (for Hurricane Creek at Hwy 35, which is downstream of Big Creek) minus about 7 cfs from Big Creek
	DO	9.1 mg/L	Used DO % saturation that was measured by ADEQ in Hurricane Creek at Hwy 270 on October 25, 2005 (89.5%) and calculated DO in mg/L at 14.5°C.
	CBOD _u	3.9 mg/L	90th percentile of ADEQ's BOD ₅ values for Hurricane Creek at Hwy 270 since September 1990 (1.7 mg/L) multiplied by CBOD _u :BOD ₅ ratio of 2.3.
	NH ₃ -N	0.05 mg/L	Based on value measured by ADEQ in Hurricane Creek at Hwy 270 on Oct. 25, 2005 (< 0.05 mg/L).

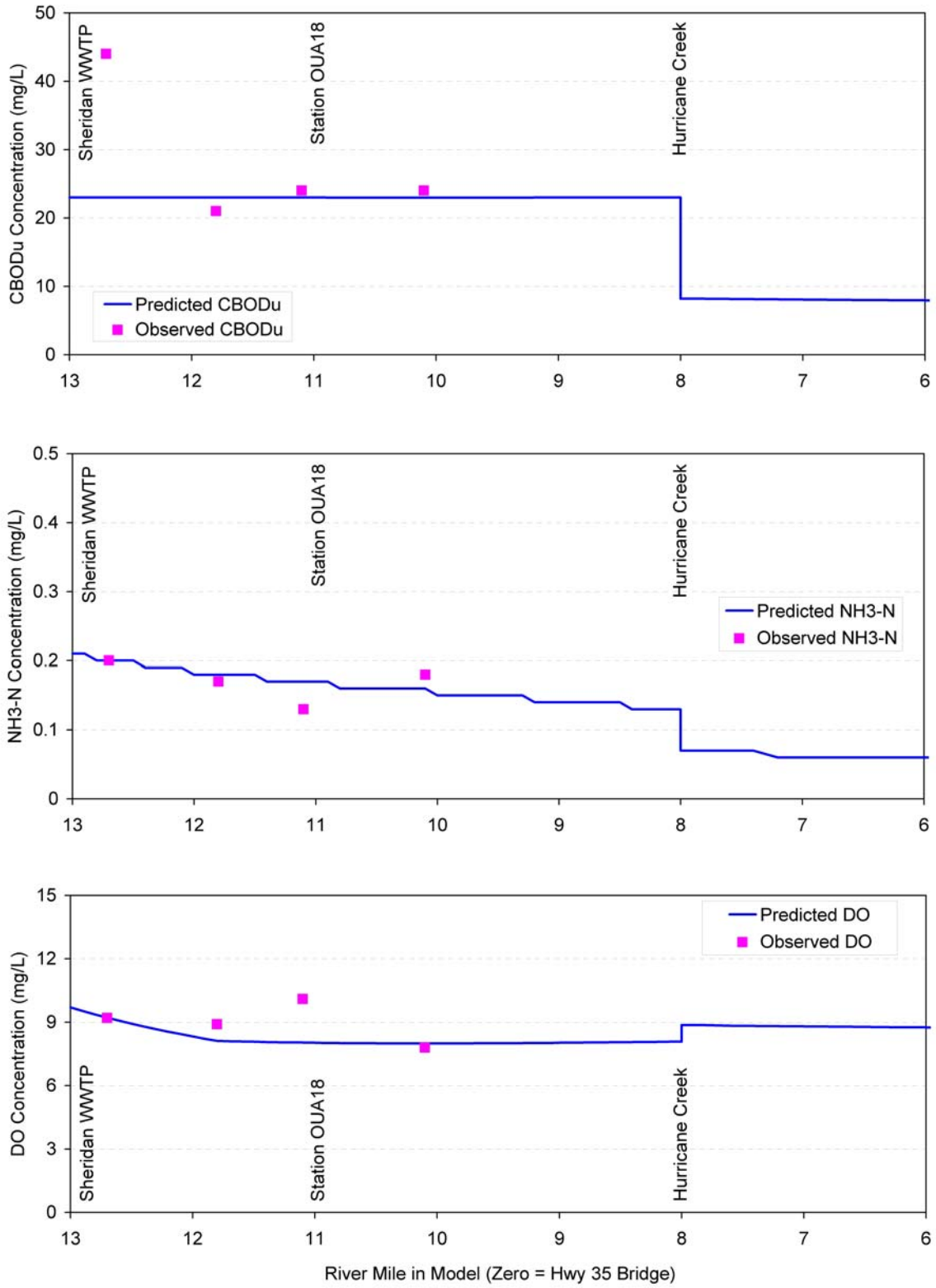


Figure 4.1. Plots of predicted and observed values for calibration simulation.

The predicted NH₃-N values followed the same pattern as the observed values; this pattern was a general decrease in concentration as distance downstream of the outfall increased. The nitrification rate that was required to achieve this calibration was rather high (0.45/day). If the effluent NH₃-N concentrations on the previous day (October 30) were actually lower than 0.21 mg/L (the effluent concentration on October 31), then the decrease in NH₃-N between the outfall and the stations farther downstream (BC3 and BC4) would be due partly to temporal changes in effluent concentrations rather than totally due to nitrification. However, there are no data to investigate whether or not this actually occurred.

For DO, the approach for model calibration was to match the lower observed DO values (i.e., minimize overprediction of DO at all locations). This calibration approach is more conservative than trying to make the predicted values go through the middle of the range of observed values. The only overprediction of DO was at station BC4 (8.0 mg/L vs. 7.8 mg/L). Also, the location of the predicted minimum DO matched the location of the sampling station with the lowest measured DO (BC4).

The model calibration for Big Creek was considered acceptable because reasonable values of model coefficients were used and there was good agreement between predicted and observed values of NH₃-N, CBOD_u, and DO.

5.0 MODEL PROJECTIONS

5.1 Critical Conditions and Seasonality

EPA's regulations at 40 CFR 130.7 require the determination of TMDLs to take into account critical conditions for stream flow, loading, and water quality parameters. Also, both Section 303(d) of the Clean Water Act and regulations at 40 CFR 130.7 require TMDLs to consider seasonal variations for meeting water quality standards.

These requirements were satisfied by establishing projection scenarios to simulate critical conditions for each situation where a different numeric DO criterion is applicable. The four situations where different criteria are applicable for Big Creek are (from Table 2.1):

1. When water temperature $\leq 10^{\circ}\text{C}$ (criterion is 6.5 mg/L),
2. During March-May when stream flow is at least 15 cfs (criterion is 6.5 mg/L),
3. When water temperature $\leq 22^{\circ}\text{C}$ and $> 10^{\circ}\text{C}$ (criterion is 5.0 mg/L), and
4. When water temperature $> 22^{\circ}\text{C}$ (criterion is 3.0 mg/L).

For a stream with an oxygen-demanding point source discharge, critical conditions usually occur during the highest temperatures and when there is the least amount of upstream flow (relative to the amount of effluent flow). Low upstream flows provide less dilution of the effluent and less reaeration in the stream (due to lower velocities). Each projection simulation establishes allowable effluent flow rates and concentrations with the minimum amount of upstream flow that is necessary to maintain the DO criterion that applies to that scenario.

For each projection (except the critical season projection with no WWTP discharge; see Section 5.6), the reaeration option, CBOD decay rates, nitrification rates, SOD, and nonpoint source loads of CBOD_u and NH₃-N were the same as in the calibration simulation.

5.2 Winter Projection

The winter projection was run to show the DO criterion of 6.5 mg/L being maintained when the water temperature is 10°C or less. The input values for inflow rates and quality are summarized in Table 5.1. All water temperatures were set to 10°C.

Table 5.1. Model input values for inflows for winter projection.

Name of Inflow	Parameter	Value used in model	Data source / comment
Big Creek upstream of WWTP	Flow rate	5.0 cfs	Minimum upstream flow in Big Creek needed to maintain DO criterion with this discharge scenario
	DO	8.8 mg/L	Set to 78% saturation at 10°C. 78% is the median of 36 values for ADEQ station OUA18 when the water temperature was 10°C or less (Table G.1).
	CBODu	5.1 mg/L	Median of 34 BOD5 values collected by ADEQ at station OUA18 when water temperature was 10°C or less (2.2 mg/L; Table G.1) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.31 mg/L	Median of 35 values collected by ADEQ at OUA18 when the water temperature was 10°C or less (Table G.1)
City of Sheridan WWTP	Flow rate	1.5 cfs	30% of upstream flow
	DO	7.0 mg/L	Proposed permit limit for winter conditions
	CBODu	69 mg/L	Proposed permit limit for CBOD5 (30 mg/L) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	12 mg/L	Proposed permit limit for winter conditions
Town Branch	Flow rate	1.13 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.42 cfs/mi ²) times drainage area of Town Branch at its mouth (2.7 mi ²)
	DO	8.8 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	5.1 mg/L	
	NH3-N	0.31 mg/L	
Hubbard Creek	Flow rate	2.48 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.42 cfs/mi ²) times drainage area of Hubbard Creek at its mouth (5.9 mi ²)
	DO	8.8 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	5.1 mg/L	
	NH3-N	0.31 mg/L	
Hurricane Creek upstream of Big Creek	Flow rate	42.9 cfs	Half (to be conservative) of the flow per unit area of Big Creek upstream of WWTP (0.42 cfs/mi ² ÷ 2) times drainage area of Hurricane Creek at Highway 270 (204 mi ²)
	DO	9.4 mg/L	Set to 83% saturation at 10°C. 83% is the median of 40 values for ADEQ station OUA116 when the water temperature was 10°C or less (Table G.2).
	CBODu	2.3 mg/L	Median of 36 BOD5 values collected by ADEQ at station OUA116 when water temperature was 10°C or less (1.0 mg/L; Table G.2) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.05 mg/L	The median of 40 values measured by ADEQ at OUA116 when water temperatures were 10°C or less was 0.015 mg/L (Table G.2). The actual input value, though, was not allowed to be less than ADEQ's normal detection limit for NH3-N (0.05 mg/L).

The widths and depths in the winter projection were not changed from the calibration because the total flow rates in Big Creek downstream of the WWTP were similar between the calibration and the winter projection.

Input values for upstream water quality in Big Creek and Hurricane Creek were based on statistics from ADEQ's routine monitoring data collected in Big Creek (station OUA18; see Table G.1 in Appendix G) and in Hurricane Creek at Highway 270 (see Table G.2 in Appendix G). Some of the ADEQ data in Big Creek were collected when the City of Sheridan WWTP was discharging. Therefore, using the OUA18 data to estimate water quality in Big Creek upstream of the WWTP was conservative.

The model predicted a minimum DO of 7.3 mg/L with an upstream flow rate of 5 cfs and the City WWTP discharging at 30% of the upstream flow with effluent concentrations of 30 mg/L CBOD5, 12 mg/L NH3-N, and 7 mg/L DO. Appendix H includes a printout of the model output for the winter projection.

5.3 Spawning Period Projection

The spawning period projection was run to show the DO criterion of 6.5 mg/L being maintained during the months of March through May when the total flow in the stream is at least 15 cfs. The input values for inflow rates and quality are summarized in Table 5.2. The input values for widths and depths are summarized in Table 5.3.

The water temperatures were set to 16.5°C, which is the median of 14 temperatures measured by ADEQ at station OUA18 during the months of March through May on days when the estimated flow in Big Creek upstream of the WWTP was 15 cfs or more (see Table G.1 in Appendix G). In Table G.1, the Big Creek flows on ADEQ sampling days were estimated using the USGS flows for Hurricane Creek near Sheridan and assuming that the flow per unit of drainage area was similar between Big Creek and Hurricane Creek.

The model predicted a minimum DO of 6.8 mg/L with an upstream flow rate of 12.5 cfs and the City of Sheridan WWTP discharging at 20% of the upstream flow with effluent concentrations of 30 mg/L CBOD5, 10 mg/L NH3-N, and 6 mg/L DO. Appendix I includes a printout of the model output for the spawning period projection.

Table 5.2. Model input values for inflows for spawning period projection.

Name of Inflow	Parameter	Value used in model	Data source / comment
Big Creek upstream of WWTP	Flow rate	12.5 cfs	Minimum upstream flow that will yield total flow of 15 cfs downstream of outfall (assuming effluent = 20% of u/s flow)
	DO	7.6 mg/L	Set to 78% saturation at 16.5°C. 78% is the median of 14 values for ADEQ station OUA18 during March – May when estimated flow in Big Creek was 15 cfs or more (Table G.1).
	CBODu	5.1 mg/L	Median of 14 BOD5 values collected by ADEQ at station OUA18 during March – May when the estimated flow in Big Creek was 15 cfs or more (2.2 mg/L; Table G.1) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.16 mg/L	Median of 13 values collected by ADEQ at OUA18 during March – May when the estimated flow in Big Creek was 15 cfs or more (Table G.1)
City of Sheridan WWTP	Flow rate	2.5 cfs	20% of upstream flow
	DO	6.0 mg/L	Proposed permit limit for spawning conditions
	CBODu	69 mg/L	Proposed permit limit for CBOD5 (30 mg/L) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	10 mg/L	Proposed permit limit for spawning conditions
Town Branch	Flow rate	2.84 cfs	Same flow per unit area as Big Creek upstream of WWTP (1.05 cfs/mi ²) times drainage area of Town Branch at its mouth (2.7 mi ²)
	DO	7.6 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	5.1 mg/L	
	NH3-N	0.16 mg/L	
Hubbard Creek	Flow rate	6.20 cfs	Same flow per unit area as Big Creek upstream of WWTP (1.05 cfs/mi ²) times drainage area of Hubbard Creek at its mouth (5.9 mi ²)
	DO	7.6 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	5.1 mg/L	
	NH3-N	0.16 mg/L	
Hurricane Creek upstream of Big Creek	Flow rate	107 cfs	Half (to be conservative) of the flow per unit area of Big Creek upstream of WWTP (1.05 cfs/mi ² ÷ 2) times drainage area of Hurricane Creek at Highway 270 (204 mi ²)
	DO	7.6 mg/L	Set to 78% saturation at 16.5°C. 78% is median of 45 values for ADEQ station OUA116 during March – May (Table G.2).
	CBODu	2.3 mg/L	Median of 43 BOD5 values collected by ADEQ at station OUA116 during March – May (1.0 mg/L; Table G.2) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.05 mg/L	The median of 44 values measured by ADEQ at OUA116 during March – May was “BDL” (Table G.2). The actual input value, though, was not allowed to be less than ADEQ's normal detection limit for NH3-N (0.05 mg/L).

Table 5.3. Model input values for widths and depths for spawning period projection.

Parameter	Reach(es)	Value used in model	Data source / comment
Width	1 – 2	20.1 ft	Linear interpolation between 19 ft width at 7 cfs (calibration scenario) and 37 ft width at 144 cfs (measured at BC-1 on March 20, 2006)
	3 – 4	60 ft	Increased from value used in calibration (45 ft) to yield reasonable velocity (0.44 ft/sec)
Depth	1	2.62 ft	Linear interpolation between 2.5 ft depth at 7 cfs (calibration scenario) and 4.6 ft depth at 144 cfs (measured at BC-1 on March 20, 2006)
	2	2.0 ft	Based on assumption that the difference in depths between reaches 1 and 2 is similar between the calibration and this projection
	3 – 4	5.0 ft	Increased from value used in calibration (3 ft) to yield reasonable velocity (0.44 ft/sec)

5.4 Primary Season Projection

The primary season projection was run to show the DO criterion of 5.0 mg/L being maintained when the water temperature is 22°C or less. The input values for inflow rates and quality are summarized in Table 5.4. The input values for widths and depths are summarized in Table 5.5. All water temperatures were set to 22°C.

The model predicted a minimum DO of 5.1 mg/L with an upstream flow rate of 10 cfs and the City of Sheridan WWTP discharging at 20% of the upstream flow with effluent concentrations of 30 mg/L CBOD₅, 10 mg/L NH₃-N, and 6 mg/L DO. The effluent parameters for the primary season projection were the same as for the spawning period projection because these two seasons overlap chronologically. Appendix J includes a printout of the model output for the primary season projection.

Table 5.4. Model input values for inflows for primary season projection.

Name of Inflow	Parameter	Value used in model	Data source / comment
Big Creek upstream of WWTP	Flow rate	10.0 cfs	Minimum upstream flow in Big Creek needed to maintain DO criterion with this discharge scenario
	DO	6.3 mg/L	Set to 72% saturation at 22°C. 72% is the median of 102 values for ADEQ station OUA18 when the water temperature was 22°C or less (Table G.1).
	CBODu	6.0 mg/L	Median of 98 BOD5 values collected by ADEQ at station OUA18 when water temperature was 22°C or less (2.6 mg/L; Table G.1) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.24 mg/L	Median of 95 values collected by ADEQ at OUA18 when the water temperature was 22°C or less (Table G.1)
City of Sheridan WWTP	Flow rate	2.0 cfs	20% of upstream flow
	DO	6.0 mg/L	Proposed permit limit for primary season
	CBODu	69 mg/L	Proposed permit limit for CBOD5 (30 mg/L) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	10 mg/L	Proposed permit limit for primary season
Town Branch	Flow rate	2.27 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.84 cfs/mi ²) times drainage area of Town Branch at its mouth (2.7 mi ²)
	DO	6.3 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	6.0 mg/L	
	NH3-N	0.24 mg/L	
Hubbard Creek	Flow rate	4.96 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.84 cfs/mi ²) times drainage area of Hubbard Creek at its mouth (5.9 mi ²)
	DO	6.3 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	6.0 mg/L	
	NH3-N	0.24 mg/L	
Hurricane Creek upstream of Big Creek	Flow rate	85.7 cfs	Half (to be conservative) of the flow per unit area of Big Creek upstream of WWTP (0.84 cfs/mi ² ÷ 2) times drainage area of Hurricane Creek at Highway 270 (204 mi ²)
	DO	6.8 mg/L	Set to 78% saturation at 22°C. 78% is the median of 125 values for ADEQ station OUA116 when the water temperature was 22°C or less.
	CBODu	2.1 mg/L	Median of 117 BOD5 values collected by ADEQ at station OUA116 when water temperature was 22°C or less (0.9 mg/L; Table G.2) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.05 mg/L	The median of 122 values measured by ADEQ at OUA116 when water temperature was 22°C or less was “BDL” (Table G.2). The actual input value, though, was not allowed to be less than ADEQ's normal detection limit for NH3-N (0.05 mg/L).

Table 5.5. Model input values for widths and depths for primary season projection.

Parameter	Reach(es)	Value used in model	Data source / comment
Width	1 – 2	19.7 ft	Linear interpolation between 19 ft width at 7 cfs (calibration scenario) and 37 ft width at 144 cfs (measured at BC-1 on March 20, 2006)
	3 – 4	55 ft	Increased from value used in calibration (45 ft) to yield reasonable velocity (0.42 ft/sec)
Depth	1	2.58 ft	Linear interpolation between 2.5 ft depth at 7 cfs (calibration scenario) and 4.6 ft depth at 144 cfs (measured at BC-1 on March 20, 2006)
	2	1.9 ft	Based on assumption that the difference in depths between reaches 1 and 2 is similar between the calibration and this projection
	3 – 4	4.5 ft	Increased from value used in calibration (3 ft) to yield reasonable velocity (0.42 ft/sec)

5.5 Critical Season Projection With WWTP Discharging

Two projection scenarios were simulated for the critical season (with and without the City of Sheridan WWTP discharging). The first critical season projection was run to show the DO criterion of 3.0 mg/L being maintained when the water temperatures exceed 22°C and the WWTP is discharging. For this projection, the input values for inflow rates and quality are summarized in Table 5.6 and the input values for widths and depths are summarized in Table 5.7. All water temperatures were set to 30°C (the numeric criterion for temperature in the water quality standards).

The model predicted a minimum DO of 3.0 mg/L with an upstream flow rate of 10 cfs and the City of Sheridan WWTP discharging at 20% of the upstream flow with effluent concentrations of 30 mg/L CBOD₅, 4 mg/L NH₃-N, and 5 mg/L DO. Appendix K includes a printout of the model output for the critical season projection with the WWTP discharging. It should be noted that during or immediately after a storm is the only time that the flow rate in Big Creek upstream of the WWTP is likely to reach 10 cfs during the critical season.

Table 5.6. Inflow rates and quality for critical season projection with the WWTP discharging.

Name of Inflow	Parameter	Value used in model	Data source / comment
Big Creek upstream of WWTP	Flow rate	10.0 cfs	Minimum upstream flow in Big Creek needed to maintain DO criterion with this discharge scenario
	DO	3.8 mg/L	Set to 50% saturation at 30°C. 25% was the median of 26 values for ADEQ station OUA18 when the water temperature exceeded 22°C (Table G.1), but the model input value was increased to 50% saturation to represent a summer storm.
	CBODu	7.6 mg/L	Median of 26 BOD5 values collected by ADEQ at station OUA18 when water temperature exceeded 22°C (3.3 mg/L; Table G.1) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.31 mg/L	Median of 24 values collected by ADEQ at OUA18 when the water temperature exceeded 22°C (Table G.1)
City of Sheridan WWTP	Flow rate	2.0 cfs	20% of upstream flow
	DO	5.0 mg/L	Proposed permit limit for critical season
	CBODu	69 mg/L	Proposed permit limit for CBOD5 (30 mg/L) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	4 mg/L	Proposed permit limit for critical season
Town Branch	Flow rate	2.27 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.84 cfs/mi ²) times drainage area of Town Branch at its mouth (2.7 mi ²)
	DO	3.8 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	7.6 mg/L	
	NH3-N	0.31 mg/L	
Hubbard Creek	Flow rate	4.96 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.84 cfs/mi ²) times drainage area of Hubbard Creek at its mouth (5.9 mi ²)
	DO	3.8 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	7.6 mg/L	
	NH3-N	0.31 mg/L	
Hurricane Creek upstream of Big Creek	Flow rate	85.7 cfs	Half (to be conservative) of the flow per unit area of Big Creek upstream of WWTP (0.84 cfs/mi ² ÷ 2) times drainage area of Hurricane Creek at Highway 270 (204 mi ²)
	DO	5.1 mg/L	Set to 67% saturation at 30°C. 67% is the median of 47 values for ADEQ station OUA116 when the water temperature exceeded 22°C (Table G.2).
	CBODu	2.1 mg/L	Median of 44 BOD5 values collected by ADEQ at station OUA116 when water temperature exceeded 22°C (0.9 mg/L; Table G.2) times assumed CBODu to CBOD5 ratio of 2.3
	NH3-N	0.05 mg/L	The median of 46 values measured by ADEQ at OUA116 when water temperature > 22°C was 0.016 mg/L; Table G.2). The actual input value, though, was not allowed to be less than ADEQ's normal detection limit for NH3-N (0.05 mg/L).

Table 5.7. Widths and depths for critical season projection with the WWTP discharging.

Parameter	Reach(es)	Value used in model	Data source / comment
Width	1 – 2	19.5 ft	Linear interpolation between 19 ft width at 7 cfs (calibration scenario) and 37 ft width at 144 cfs (measured at BC-1 on March 20, 2006)
	3 – 4	55 ft	Increased from value used in calibration (45 ft) to yield reasonable velocity (0.42 ft/sec)
Depth	1	2.56 ft	Linear interpolation between 2.5 ft depth at 7 cfs (calibration scenario) and 4.6 ft depth at 144 cfs (measured at BC-1 on March 20, 2006)
	2	1.9 ft	Based on assumption that the difference in depths between reaches 1 and 2 is similar between the calibration and this projection
	3 – 4	4.5 ft	Increased from value used in calibration (3 ft) to yield reasonable velocity (0.42 ft/sec)

5.6 Critical Season Projection Without WWTP Discharging

The second critical season projection was run to show the DO criterion of 3.0 mg/L being maintained when the water temperatures exceed 22°C and the WWTP is not discharging. The input values for inflow rates and quality are summarized in Table 5.8. The input values for SOD and nonpoint source loads are summarized in Table 5.9. All water temperatures were set to 30°C (the numeric criterion for temperature in the water quality standards).

The most critical stream flow rate for which numeric DO criteria apply to Big Creek is the 7Q10 flow. The 7Q10 flow for Big Creek is zero, but the model cannot simulate zero flow. Therefore, a nominal upstream flow rate of 1 cfs was specified in the model for this projection.

The widths and depths in this projection were not changed from the calibration because no data were available for extrapolating the widths and depths for a flow rate as small as 1 cfs in Big Creek downstream of the WWTP. The widths and depths from the calibration were considered to be conservative estimates for this projection.

This projection simulation required reductions of nonpoint sources of oxygen demand in the Big Creek watershed to maintain the predicted DO at or above the criterion of 3.0 mg/L. The model inputs for SOD, nonpoint source loads of CBOD_u and NH₃-N, and upstream and tributary concentrations of CBOD_u and NH₃-N were each reduced by 20% from the values in the first critical season projection (with the WWTP discharging). It was also assumed that the Big Creek

upstream DO would improve with reductions of nonpoint sources of oxygen demand. The reaeration option, CBOD decay rates, and nitrification rates were the same as in the calibration and the other projection simulations. No nonpoint source reductions were assumed for Hurricane Creek because it is not impaired for low DO.

Table 5.8. Inflow rates and quality for critical season projection with no WWTP discharge.

Name of Inflow	Parameter	Value used in model	Data source / comment
Big Creek upstream of WWTP	Flow rate	1.0 cfs	Nominal upstream flow in Big Creek (can not simulate 7Q10 flow of zero)
	DO	3.0 mg/L	Set to 40% saturation at 30°C. 40% saturation was estimated to correspond to 20% reduction of nonpoint sources based on linear interpolation between 25% saturation (median of 26 values at OUA18 as shown in Table G.1; associated with zero reduction of nonpoint sources) and 100% saturation (associated with complete reduction of all nonpoint sources).
	CBODu	6.1 mg/L	20% reduction of value from first critical season projection (7.6 mg/L; see Table 5.6)
	NH3-N	0.25 mg/L	20% reduction of value from first critical season projection (0.31 mg/L; see Table 5.6)
City of Sheridan WWTP	Flow rate	0.0 cfs	No discharge
	DO	--	Input value not needed (no flow)
	CBODu	--	Input value not needed (no flow)
	NH3-N	--	Input value not needed (no flow)
Town Branch	Flow rate	0.23 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.084 cfs/mi ²) times drainage area of Town Branch at its mouth (2.7 mi ²)
	DO	3.0 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	6.1 mg/L	
	NH3-N	0.25 mg/L	
Hubbard Creek	Flow rate	0.50 cfs	Same flow per unit area as Big Creek upstream of WWTP (0.084 cfs/mi ²) times drainage area of Hubbard Creek at its mouth (5.9 mi ²)
	DO	3.0 mg/L	Assumed similar to Big Creek upstream of WWTP
	CBODu	6.1 mg/L	
	NH3-N	0.25 mg/L	
Hurricane Creek upstream of Big Creek	Flow rate	8.6 cfs	Half (to be conservative) of the flow per unit area of Big Creek upstream of WWTP (0.084 cfs/mi ² ÷ 2) times drainage area of Hurricane Creek at Highway 270 (204 mi ²)
	DO	5.1 mg/L	Same as values from first critical season projection (Table 5.6) No nonpoint source reductions needed for Hurricane Creek.
	CBODu	2.1 mg/L	
	NH3-N	0.05 mg/L	

Table 5.9. SOD and loads for critical season projection with no WWTP discharge.

Parameter	Reach(es)	Value used in model ^A	Data source / comment
SOD	1 – 2	111.5 mg/ft ² /day	20% reduction of value from calibration. Reduced value is equivalent to 1.20 g/m ² /day.
	3 – 4	79.0 mg/ft ² /day	Same as value from calibration (no nonpoint source reductions were assumed for Hurricane Creek). Equivalent to 0.85 g/m ² /day.
Nonpoint source loads of CBOD _u	1	42.4 lbs/day	20% reduction of value from calibration.
	2	88.8 lbs/day	20% reduction of value from calibration.
	3	28 lbs/day	Same as value from calibration (no nonpoint source reductions were assumed for Hurricane Creek).
	4	133 lbs/day	
Nonpoint source loads of NH ₃ -N	1 – 4	0.0 mg/ft ² /day	No NH ₃ -N loads were included in the projections because none were needed in the calibration.

Note: A. Values shown in table are at 20°C. The model internally adjusts each rate based on stream temperature.

The model predicted a minimum DO of 3.0 mg/L with an upstream flow rate of 1 cfs, a 20% reduction of nonpoint sources of oxygen demand, and no discharge from the City of Sheridan WWTP. Appendix L includes a printout of the model output for the critical season projection with no discharge from the WWTP.

Only one projection simulation was run without the WWTP discharging because the most critical conditions without the WWTP discharge are high temperatures and low flows. This is supported by the fact that most of the historical DO violations in Big Creek occurred during the summer months (see Table B.2, Appendix B).

5.7 Summary of Projection Simulations

The five projection simulations are summarized in Table 5.10. Plots of predicted DO versus river mile for the projection simulations are shown with the printouts of the tabular model output in Appendices H – L.

Table 5.10. Summary of projection simulations.

	Winter Season	Spawning Period	Primary Season	Critical Season with WWTP	Critical Season without WWTP
Water temperature	10°C	16.5°C	22°C	30°C	30°C
Upstream flow	5 cfs	12.5 cfs	10 cfs	10 cfs	1 cfs
Effluent flow (% of upstream)	30%	20%	20%	20%	none
Effluent CBOD5	30 mg/L	30 mg/L	30 mg/L	30 mg/L	--
Effluent NH3-N	12 mg/L	10 mg/L	10 mg/L	4 mg/L	--
Effluent DO	7 mg/L	6 mg/L	6 mg/L	5 mg/L	--
Nonpoint source reductions	none	none	none	none	20%
Predicted minimum DO	7.3 mg/L	6.8 mg/L	5.1 mg/L	3.0 mg/L	3.0 mg/L
DO criterion	6.5 mg/L	6.5 mg/L	5.0 mg/L	3.0 mg/L	3.0 mg/L
Applicable months of the year	Jan – Feb	Mar – Apr, Nov – Dec		May – Oct	

Table 5.10 also shows how each projection simulation was applied to certain months of the year so that a seasonal TMDL and seasonal permit limits could be developed. This was done based primarily on temperatures in the simulations and ADEQ's historical temperatures in Big Creek at station OUA18 (see Figure M.1, Appendix M). The winter simulation was applied to the months of January and February because most (23 out of 28) of the historical temperatures in Big Creek at OUA18 during the months of January and February were equal to or less than 10°C. The spawning period and primary season projections were applied to March through April and November through December because all of the historical temperatures in Big Creek at OUA18 during these four months were below 22°C. The critical season projections were applied to May through October because all of the historical temperatures in Big Creek at OUA18 were below 30°C during these 6 months. Also, May through October is the period that ADEQ normally uses for summer permit limits.

5.8 Ammonia Toxicity

The predicted NH₃-N concentrations in each projection simulation were checked to make sure that they did not exceed numeric criteria for ammonia toxicity in the Arkansas water quality standards (APCEC 2005). All of the predicted NH₃-N concentrations were less than half of the criteria. Calculations to check for ammonia toxicity are shown in Appendix N.

6.0 TMDL DEVELOPMENT

6.1 Load Calculations

The results of the projection simulations presented in Section 5 of this report were used to calculate a seasonal TMDL to address the DO impairment of Big Creek that was cited in the 303(d) list (see Section 1.0). This TMDL, which is shown in Table 6.1, includes a WLA for the City of Sheridan WWTP, a LA for nonpoint sources, and an implicit MOS. This TMDL is expressed as allowable loads of oxygen demand from CBOD₅, NH₃-N, and SOD during critical conditions for each season. Each projection simulation was associated with certain months of the year as discussed in Section 5.7. Details of the TMDL calculations are shown in Appendix O.

Table 6.1. DO TMDL for Big Creek.

	Oxygen demand (lbs/day) from:			Total oxygen demand (lbs/day)
	CBOD _u	NH ₃ -N	SOD	
January – February				
WLA for City of Sheridan WWTP	558	420	--	978
LA for nonpoint sources	400	62	154	616
MOS	incorporated through conservative assumptions			
TMDL	958	482	154	1594
March – April, November – December				
WLA for City of Sheridan WWTP	742	466	--	1208
LA for nonpoint sources	722	97	160	979
MOS	incorporated through conservative assumptions			
TMDL	1464	563	160	2187
May – October (with WWTP discharge)				
WLA for City of Sheridan WWTP	742	186	--	928
LA for nonpoint sources	869	124	160	1153
MOS	incorporated through conservative assumptions			
TMDL	1611	310	160	2081
May – October (without WWTP discharge)				
WLA for City of Sheridan WWTP	0	0	--	0
LA for nonpoint sources	188	10	154	352
MOS	incorporated through conservative assumptions			
TMDL	188	10	154	352

The allowable loads in Table 6.1 are only applicable for the conditions in the projection simulations because the assimilative capacity of Big Creek increases as the amount of stream flow increases. In other words, as the amount of stream flow in Big Creek increases above the values in the projection simulations, the allowable loading can increase above the values in Table 6.1. The projections were designed to simulate critical conditions for each season; any increase in stream flow from critical conditions will increase the reaeration in the stream.

6.2 Margin of Safety

Both Section 303(d) of the Clean Water Act and regulations at 40 CFR 130.7 require TMDLs to include a MOS to account for lack of knowledge concerning the relationship between pollutant loadings and water quality. The MOS may be expressed explicitly as unallocated assimilative capacity or implicitly through conservative assumptions used in establishing the TMDL. For this TMDL, an implicit MOS was established by using conservative assumptions in the modeling. These conservative assumptions include:

1. The temperatures used in the projection simulations exceeded most or all of the historical temperatures at OUA18 during the months for which each projection was applied.
2. For the projections, water quality for Big Creek upstream of the WWTP was estimated using historical data that was collected at OUA18 (downstream of the WWTP).
3. An unusually high nitrification rate (0.45/day) was used in the modeling.
4. The model used background loads of CBOD_u that are not normally used in many “traditional” applications of water quality modeling (i.e., Streeter Phelps models).
5. The projections assumed simultaneous occurrence of critical low flow and maximum water temperature.

6.3 Nonpoint Source Reductions

The results of the critical season projection without the WWTP discharging indicated that nonpoint sources of oxygen demand need to be reduced by 20% to maintain the DO criterion at critical low flows and high temperatures in the summer. No nonpoint source reductions are needed for the scenarios where the WWTP is discharging.

6.4 Recommended Permit Limits

The water quality based permit limits in Table 6.2 are recommended for the City of Sheridan WWTP based on the results of the projection simulations. The CBOD5 and NH3-N limits in Table 6.2 are recommended as monthly average values based on guidance in the Arkansas Continuing Planning Process (CPP) (ADEQ 2000). Page D-5 of the CPP states that model results for BOD and NH3-N should be used as monthly average permit limits for “models in which a MOS is built-in by several conservative inputs and the most conservative limits are used for the entire year or semi-annually”. The projections in this report certainly have conservative inputs (as documented in Section 6.2) and the simulated conditions are the most conservative conditions for each season (the projection simulations represent the lowest flows and highest temperatures for which the WWTP would be discharging).

Table 6.2. Recommended permit limits for City of Sheridan WWTP.

	January – February	March, April, November, December	May – October
Minimum upstream flow	5 cfs	10 cfs	10 cfs
Effluent flow (% of upstream)	30%	20%	20%
Effluent CBOD5	30 mg/L	30 mg/L	30 mg/L
Effluent NH3-N	12 mg/L	10 mg/L	4 mg/L
Effluent DO	7 mg/L	6 mg/L	5 mg/L

It should be noted that the recommended NH3-N permit limit for January and February (12 mg/L) is higher than the current monthly average permit limit of 10 mg/L. This proposed increase is not considered to constitute backsliding because the TMDL represents data and information which was not previously available and which would have justified the less stringent limit.

Except for the recommended NH3-N permit limit for January and February, all other recommended permit limits are at least as stringent as the permit limits that are currently effective. For effluent flow (as a percentage of upstream flow), the current permit limit is 32% for all months of the year, while the recommended permit limits are 30% for 2 months of the year and 20% for the other 10 months of the year. For NH3-N during the summer, the current

permit limit is 10 mg/L and the recommended permit limit is only 4 mg/L. For effluent DO, the current permit is 5 mg/L for all months of the year, while the recommended permit limits range from 5 mg/L to 7 mg/L.

Because these recommended permit limits are not contingent upon nonpoint source reductions actually occurring, there is no requirement in this TMDL for reasonable assurances that the nonpoint source reductions will actually occur.

6.5 Future Growth

Future growth or alternative discharge scenarios will be allowable under this TMDL as long as the calibrated model used for this TMDL shows that the DO criteria will be maintained with the new scenario. The calibrated water quality model provides the framework for determining the allowable loadings for this TMDL.

7.0 FUTURE MONITORING

In accordance with Section 106 of the federal Clean Water Act and under its own authority, ADEQ has established a comprehensive program for monitoring the quality of the State's surface waters. ADEQ collects surface water samples at various locations, utilizing appropriate sampling methods and procedures for ensuring the quality of the data collected. One of the locations where ADEQ will continue to monitor water quality is Big Creek downstream of Sheridan (OUA18). The objectives of the surface water monitoring program are to determine the quality of the state's surface waters, to develop a long-term data base for long term trend analysis, and to monitor the effectiveness of pollution controls. The data obtained through the surface water monitoring program is used to develop the state's biennial 305(b) report and 303(d) list of impaired waters, which was most recently published as the 2004 Integrated Water Quality Monitoring and Assessment Report (ADEQ 2005c).

8.0 PUBLIC PARTICIPATION

Federal regulations at 40 CFR 130.7(c)(1)(ii) specify that TMDLs shall be subject to public review as defined in the state's CPP (ADEQ 2000). The draft version of this TMDL was submitted to ADEQ and EPA in June 2006. In early December 2006, EPA Region 6 prepared a notice seeking comments, information, and data from the general public and affected public concerning this TMDL. No comments, data, or information were submitted during the public comment period. FTN has transmitted the final TMDL to EPA and to ADEQ for implementation and for incorporation into ADEQ's current water quality management plan.

9.0 REFERENCES

- ADEQ. 2000. State of Arkansas Continuing Planning Process. Update and Revisions January 2000. Prepared by Water Division, Arkansas Department of Environmental Quality.
- ADEQ. 2005a. Arkansas 2004 List of Impaired Waterbodies. February 2005. Downloaded from www.adeq.state.ar.us/water/branch_planning/pdfs/303d_list_public_notice.pdf
- ADEQ. 2005b. TMDL Evaluation of Big Creek. Desktop water quality model and associated documentation (9 pages). Prepared by Arkansas Department of Environmental Quality, Water Division. January 5, 2005.
- ADEQ. 2005c. 2004 Integrated Water Quality Monitoring and Assessment Report. Prepared by Arkansas Department of Environmental Quality, Water Division, pursuant to Sections 305(b) and 303(d) of the Federal Water Pollution Control Act. Downloaded from www.adeq.state.ar.us/water/branch_planning/pdfs/WQ05-07-01.pdf
- APCEC. 2005. Regulation No. 2. Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas. Adopted by the Arkansas Pollution Control and Ecology Commission on April 23, 2004. Amended October 12, 2005.
- EPA. 2003. Decision Document for the Approval of Arkansas' 2002 303(d) List. Downloaded from www.epa.gov/earth1r6/6wq/ecopro/artmdl/ar_2002_final_decision.pdf
- EPA. 2006. Data downloaded from EPA Permit Compliance System (PCS) web site (www.epa.gov/enviro/html/pcs/adhoc.html).
- McClelland. 1982. Stream Assimilative Capacity Study of Big Creek and Hurricane Creek downstream of Sheridan, Arkansas. Report submitted by McClelland Consulting Engineers, Inc., Little Rock, AR. March 1982.
- USGS. 1983. Identification and Classification of Perennial Streams of Arkansas. Water-Resources Investigations Report 83-4063. Prepared by R.A. Hunrichs, US Geological Survey, Little Rock, Arkansas.
- USGS. 1984. Average Annual Precipitation and Runoff for Arkansas, 1951-80. Water-Resources Investigations Report 84-4363. Prepared by D.A. Freiwald, US Geological Survey, Little Rock, Arkansas.
- USGS. 1992. Flow Duration and Low-Flow Characteristics of Selected Arkansas Streams. Water-Resources Investigations Report 92-4026. Prepared by A.H. Ludwig, US Geological Survey, Little Rock, Arkansas.

APPENDIX A

Maps of Watershed and Land Use

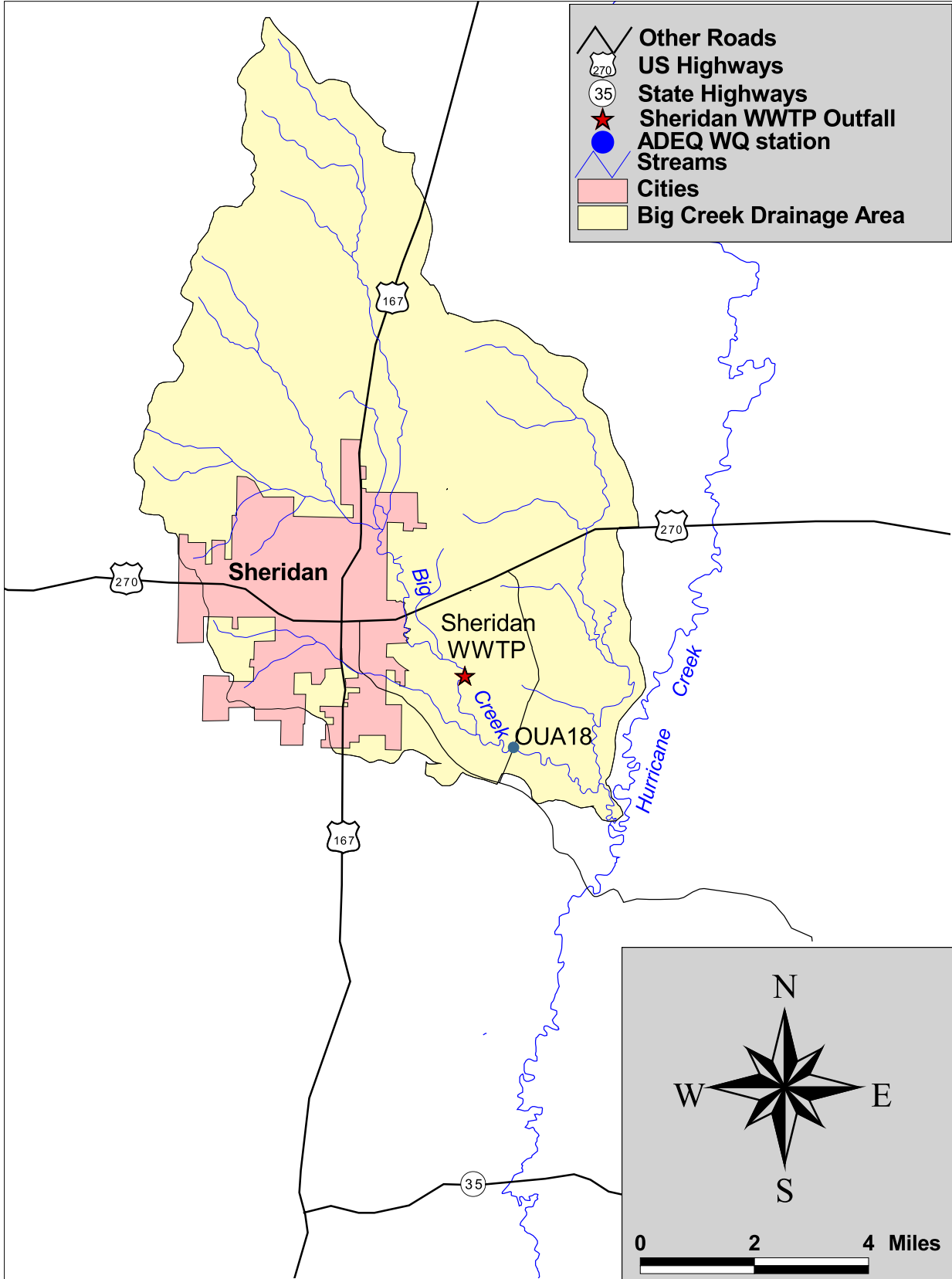


Figure A.1. Watershed Map for Big Creek.

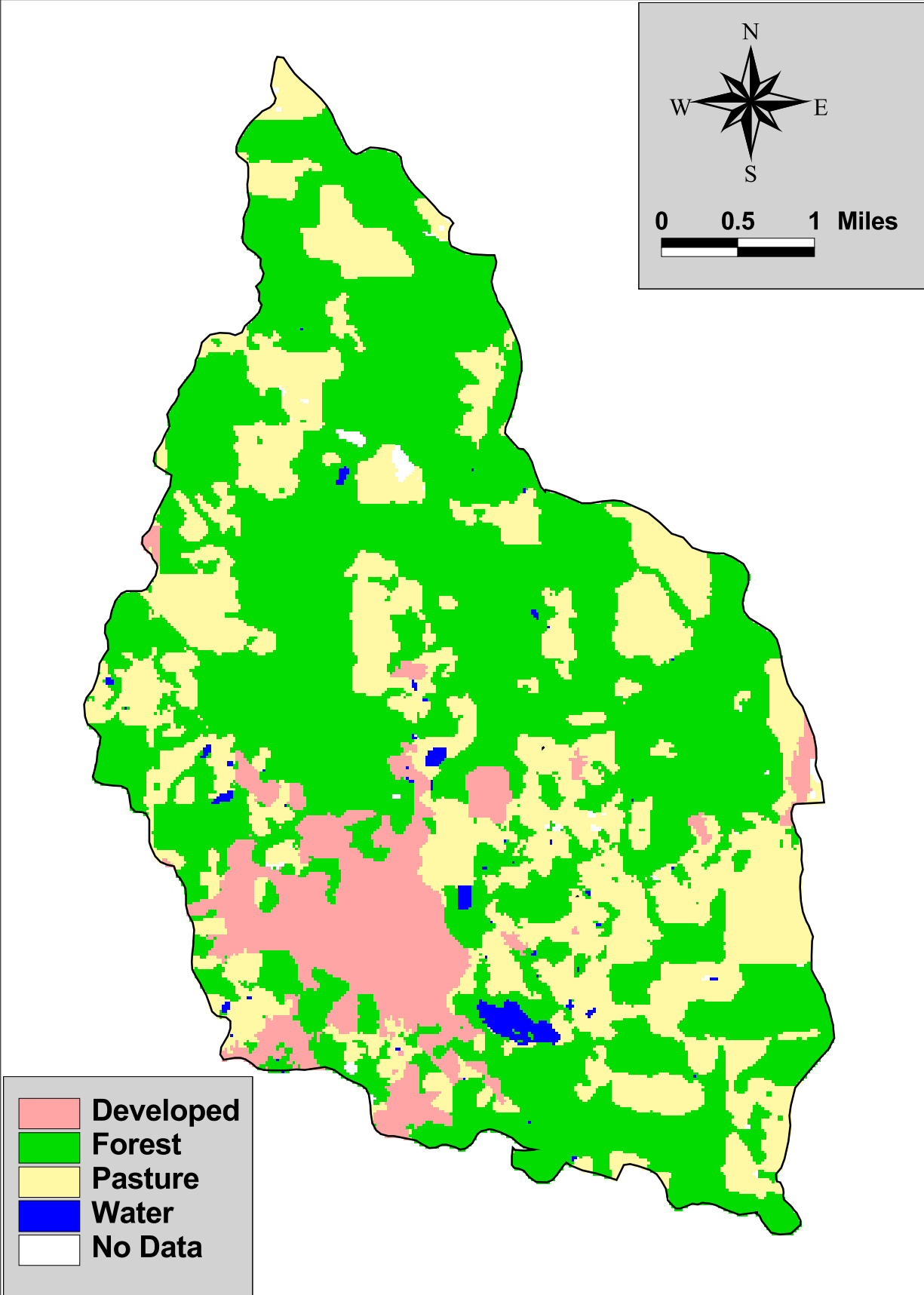


Figure A.2. Land use / land cover for Big Creek watershed.

APPENDIX B

Sheridan DMR Data and ADEQ Ambient DO Data

TABLE B.1. CITY OF SHERIDAN WWTP DMR DATA
 FOR JANUARY 2000 - JANUARY 2006
 FROM EPA PCS WEB SITE

Month	Monthly average values of:		
	Flow (MGD)	BOD5 (mg/L)	NH3-N (mg/L)
Jan-00	no discharge		
Feb-00	no discharge		
Mar-00	1.549	14.9	3.80
Apr-00	0.3683	25.2	0.63
May-00	0.61	13.0	1.19
Jun-00	0.571	19.6	0.16
Jul-00	no discharge		
Aug-00	no discharge		
Sep-00	no discharge		
Oct-00	no discharge		
Nov-00	1.13	19.2	0.75
Dec-00	0.66	6.1	4.50
Jan-01	0.796	16.4	8.15
Feb-01	0.34	44.2	4.50
Mar-01	1.33	15.8	5.80
Apr-01	0.603	25.0	1.07
May-01	0.24	17.6	0.30
Jun-01	0.313	13.3	0.19
Jul-01	no discharge		
Aug-01	no discharge		
Sep-01	no discharge		
Oct-01	0.95	30.0	0.57
Nov-01	no discharge		
Dec-01	1.50	26.0	5.15
Jan-02	no discharge		
Feb-02	1.00	29.0	2.50
Mar-02	1.14	9.2	3.90
Apr-02	0.30	9.0	8.70
May-02	0.68	10.4	0.98
Jun-02	no discharge		
Jul-02	no discharge		
Aug-02	no discharge		
Sep-02	no discharge		
Oct-02	0.30	13.4	0.30
Nov-02	0.53	20.5	0.22
Dec-02	1.10	17.5	3.70
Jan-03	0.26	13.0	7.75
Feb-03	0.74	15.0	8.60
Mar-03	0.71	23.6	2.70
Apr-03	no discharge		
May-03	0.62	12.0	1.70
Jun-03	0.43	20.8	0.50
Jul-03	no discharge		

Month	Monthly average values of:		
	Flow (MGD)	BOD5 (mg/L)	NH3-N (mg/L)
Aug-03	no discharge		
Sep-03	no discharge		
Oct-03	0.30	7.7	0.90
Nov-03	0.788	11.4	0.45
Dec-03	0.518	22.7	0.38
Jan-04	no discharge		
Feb-04	0.94	7.0	7.30
Mar-04	0.76	13.0	9.50
Apr-04	0.808	14.0	1.60
May-04	no discharge		
Jun-04	0.72	20.7	0.70
Jul-04	no discharge		
Aug-04	no discharge		
Sep-04	no discharge		
Oct-04	0.45	11.0	0.50
Nov-04	1.12	12.5	0.60
Dec-04	0.89	10.9	3.40
Jan-05	0.86	6.3	8.80
Feb-05	0.93	10.1	9.00
Mar-05	0.56		5.40
Apr-05	0.54		1.40
May-05	no discharge		
Jun-05	no discharge		
Jul-05	0.14		1.30
Aug-05	no discharge		
Sep-05	no discharge		
Oct-05	0.788	8.9 (CBOD5)	0.70
Nov-05	no discharge		
Dec-05	no discharge		
Jan-06	0.60	19.4 (CBOD5)	3.00

n =	43	40	43
Minimum =	0.14	6.1	0.16
Median =	0.68	14.5	1.60
Average =	0.7089	16.4	3.10
Maximum =	1.549	44.2	9.50

FILE: R:\PROJECTS\4710-020\TECH\NPDES\SHERIDAN_DMR_DATA.XLS

TABLE B.2. ADEQ WATER QUALITY DATA AT STATION OUA18

Observed values			Applicable DO criterion (mg/L)	Observed DO meeting criterion?
Date	DO (mg/L)	Water Temp (°C)		
09/04/90	0.30	25.0	3.0	No
10/02/90		20.0	5.0	
10/30/90	3.10	11.0	5.0	No
11/27/90	2.10	17.0	5.0	No
01/22/91	10.80	5.0	6.5	Yes
02/19/91	9.00	12.0	5.0	Yes
03/26/91	4.00	21.0	5.0	No
04/16/91	7.60	16.0	5.0	Yes
05/07/91	7.20	17.0	5.0	Yes
06/04/91	1.60	26.0	3.0	No
07/02/91	0.60	26.0	3.0	No
07/30/91	2.10	25.0	3.0	No
09/17/91	0.50	24.0	3.0	No
10/08/91	0.30	13.0	5.0	No
11/12/91	4.70	8.0	6.5	No
12/10/91	8.40	11.0	5.0	Yes
01/28/92	10.30	8.0	6.5	Yes
02/25/92	8.00	12.0	5.0	Yes
03/03/92	7.60	15.0	5.0	Yes
04/07/92	7.40	13.0	5.0	Yes
05/19/92	1.20	22.0	5.0	No
06/22/92	3.80	22.0	5.0	No
07/14/92	0.50	26.0	3.0	No
08/11/92	0.90	25.0	3.0	No
11/23/92	5.40	11.0	5.0	Yes
01/05/93	8.60	9.0	6.5	Yes
02/02/93	8.40	6.0	6.5	Yes
03/02/93	8.70	9.0	6.5	Yes
03/30/93	6.80	18.0	5.0	Yes
05/04/93	6.70	17.0	5.0	Yes
06/01/93	1.60	18.0	5.0	No
06/14/93	2.50	24.0	3.0	No
10/12/93	2.60	12.0	5.0	No
11/16/93	1.70	12.0	5.0	No
12/21/93	8.80	5.0	6.5	Yes
01/11/94	10.40	6.0	6.5	Yes
02/22/94	9.50	11.0	5.0	Yes
03/01/94	9.60	9.0	6.5	Yes
04/12/94	6.10	17.0	5.0	Yes
05/17/94	5.30	20.0	5.0	Yes
07/05/94	2.00	27.0	3.0	No
08/02/94	4.60	23.0	3.0	Yes
08/30/94	2.20	23.0	3.0	No
10/11/94	5.60	16.0	5.0	Yes
11/08/94	8.10	14.0	5.0	Yes
12/06/94	7.20	14.0	5.0	Yes
01/17/95	9.20	9.0	6.5	Yes
02/21/95	9.40		5.0 or 6.5 ?	Yes (> 6.5)
03/21/95	7.10	16.0	5.0	Yes

Observed values			Applicable DO criterion (mg/L)	Observed DO meeting criterion?
Date	DO (mg/L)	Water Temp (°C)		
04/11/95	6.90		5.0 or 6.5 ?	Yes (> 6.5)
05/30/95	3.00	21.0	5.0	No
01/16/96	5.10	7.0	6.5	No
02/20/96	8.70	10.0	5.0	Yes
03/26/96	9.10	9.0	6.5	Yes
04/16/96	6.10	13.0	5.0	Yes
04/30/96	4.80	13.0	5.0	No
06/11/96	2.70	20.0	5.0	No
07/09/96	1.60	24.0	3.0	No
09/24/96	6.40	20.0	5.0	Yes
11/19/96	7.10	13.0	5.0	Yes
12/10/96	8.00	12.0	5.0	Yes
01/07/97	8.90	8.0	6.5	Yes
02/04/97	8.70	10.0	5.0	Yes
03/18/97	7.70	17.0	5.0	Yes
04/22/97	2.70	17.0	5.0	No
05/20/97	1.30	19.0	5.0	No
06/10/97	1.10	21.0	5.0	No
07/08/97	2.60	24.0	3.0	No
08/05/97	2.30	26.0	3.0	No
12/09/97	9.80	7.0	6.5	Yes
01/06/98	8.30		5.0 or 6.5 ?	Yes (> 6.5)
02/03/98	8.80	9.0	6.5	Yes
03/03/98	9.80	7.0	6.5	Yes
03/31/98	6.80	18.0	5.0	Yes
05/05/98	1.60	17.0	5.0	No
12/21/98	8.00	14.0	5.0	Yes
01/19/99	7.45	8.0	6.5	Yes
02/09/99	11.83	15.0	5.0	Yes
03/08/99	10.99	10.0	5.0	Yes
04/13/99	4.00	17.0	5.0	No
05/18/99	3.86	21.0	5.0	No
06/08/99	1.50	25.0	3.0	No
12/20/99	8.85	17.0	5.0	Yes
04/11/00	5.74	15.0	5.0	Yes
05/30/00	3.09	24.0	3.0	Yes
06/27/00	1.98	26.0	3.0	No
11/14/00	7.38	9.0	6.5	Yes
01/30/01	8.45	10.0	5.0	Yes
02/20/01	10.40	9.0	6.5	Yes
03/20/01	9.90	11.0	5.0	Yes
04/24/01	5.83	16.0	5.0	Yes
05/22/01	5.36	18.0	5.0	Yes
06/19/01	0.86	23.0	3.0	No
07/17/01	1.88	25.0	3.0	No
09/04/01		24.0	3.0	
11/06/01	0.79	13.0	5.0	No
12/11/01	8.62	9.0	6.5	Yes
01/02/02	12.02	2.0	6.5	Yes
02/12/02	11.31	6.0	6.5	Yes
03/05/02	11.77	5.0	6.5	Yes

Observed values			Applicable DO criterion (mg/L)	Observed DO meeting criterion?
Date	DO (mg/L)	Water Temp (°C)		
04/02/02	8.25	15.0	5.0	Yes
05/07/02	6.64	20.0	5.0	Yes
06/04/02	1.73	23.0	3.0	No
12/10/02	8.80	6.5	6.5	Yes
01/28/03	11.10	3.9	6.5	Yes
02/18/03	10.80	7.0	6.5	Yes
03/18/03	7.04	15.7	5.0	Yes
04/15/03	4.65	15.1	5.0	No
05/20/03	7.00	21.4	5.0	Yes
06/24/03	5.70	25.0	3.0	Yes
07/22/03	2.20	25.1	3.0	No
08/19/03	7.10	29.5	3.0	Yes
10/21/03	5.24	16.3	5.0	Yes
01/20/04	9.81	5.0	6.5	Yes
02/10/04	10.50	6.0	6.5	Yes
03/09/04	8.27	13.0	5.0	Yes
04/13/04	9.11	11.0	5.0	Yes
05/25/04	3.20	22.0	5.0	No
07/06/04	6.03	24.0	3.0	Yes
07/27/04	3.18	20.9	5.0	No
08/10/04	1.58	22.5	3.0	No
08/31/04	1.22	20.0	5.0	No
10/12/04	6.53	19.2	5.0	Yes
11/09/04	6.56	12.5	5.0	Yes
12/14/04	11.00	7.2	6.5	Yes
01/18/05	10.60	3.0	6.5	Yes
02/15/05	8.85	12.0	5.0	Yes
03/22/05	9.07	13.0	5.0	Yes
04/19/05	7.24	19.0	5.0	Yes
05/17/05	1.53	16.2	5.0	No
09/26/05	3.53	23.5	3.0	Yes
01/17/06	7.67	9.5	6.5	Yes
01/31/06	7.20	6.5	6.5	Yes

Statistics for October 1998 - September 2003
(ADEQ assessment period for 2004 303(d) list):

36 = total number of DO values
10 = number of DO values below the criterion
28% = percent of DO values below the criterion

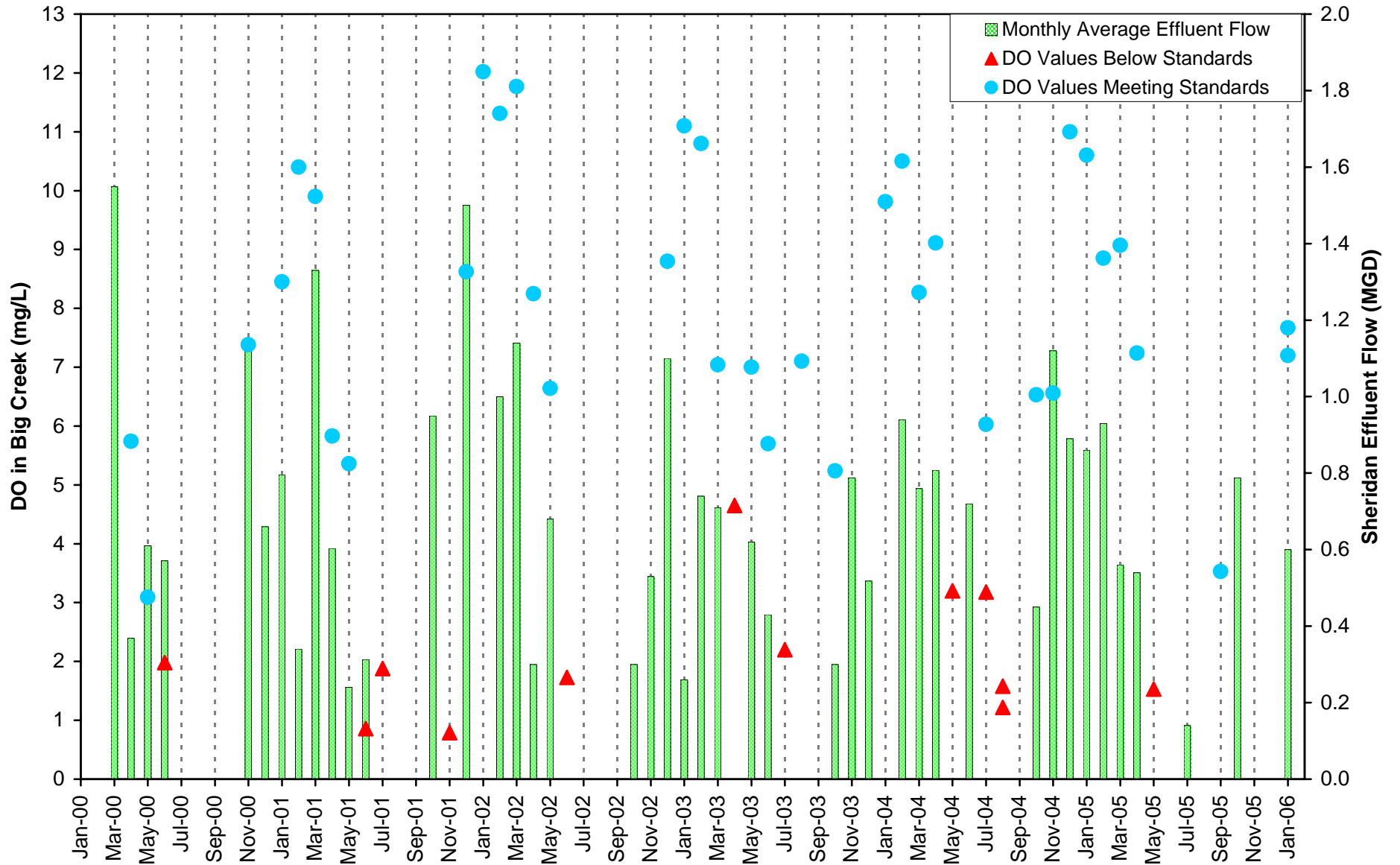
Statistics for January 2000 - January 2006
(period shown on plot with WWTP effluent flows):

49 = total number of DO values
12 = number of DO values below the criterion
24% = percent of DO values below the criterion

Monthly statistics for
September 1990 - January 2006:

Month	Total no. of DO values	Number of DO values below criterion	Percent of DO values below criterion
Jan	16	1	6%
Feb	14	0	0%
Mar	16	1	6%
Apr	14	4	29%
May	14	7	50%
Jun	11	10	91%
Jul	10	9	90%
Aug	7	5	71%
Sep	4	2	50%
Oct	6	3	50%
Nov	9	4	44%
Dec	10	0	0%
Totals:	131	46	

Figure B.1. DO in Big Creek at OUA18 and City of Sheridan Effluent Flow



APPENDIX C

FTN Field Data for April 2005

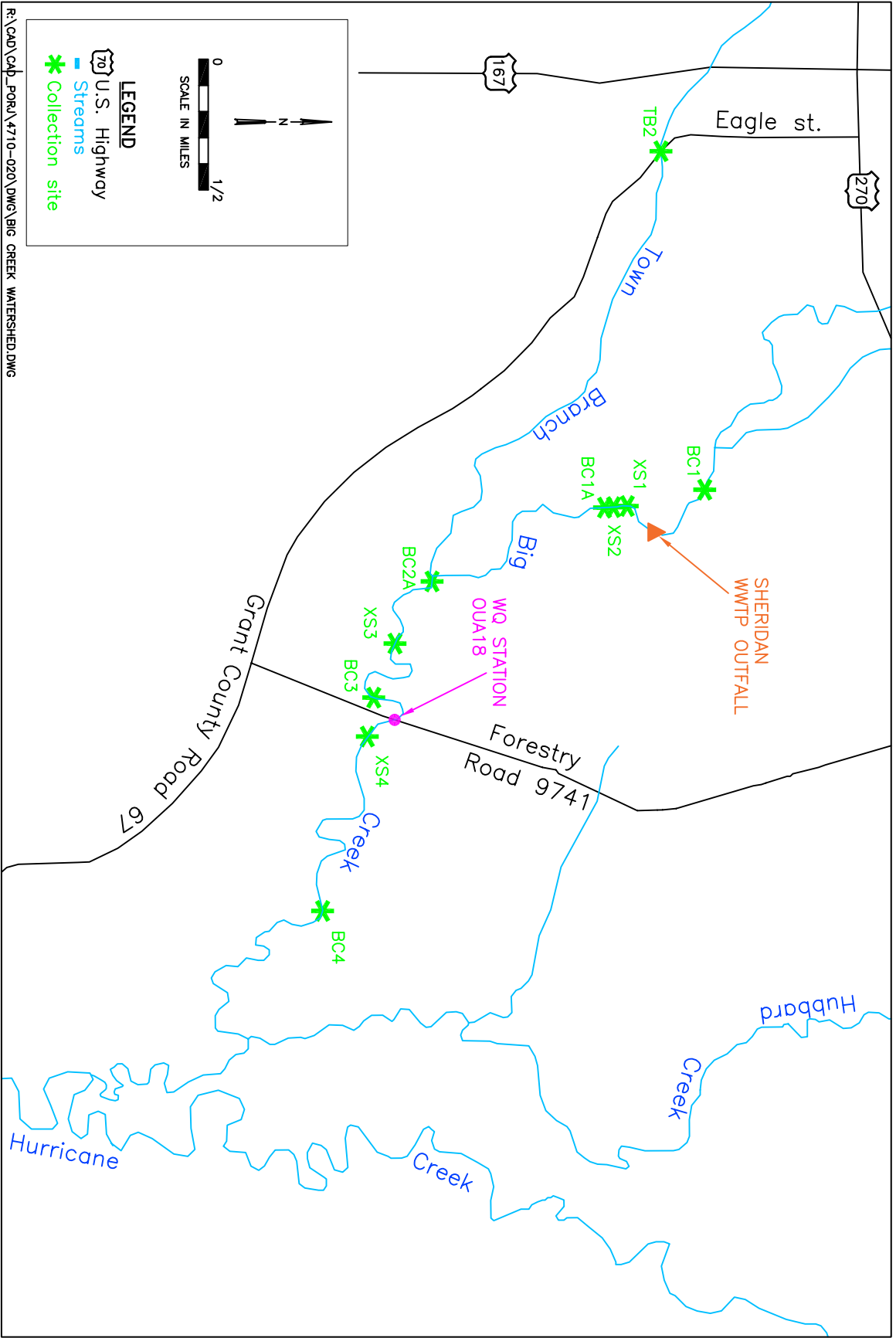


Figure C.1. Map of field data collection sites.

Figure C.2. Cross section of Big Creek at XS1 on April 20, 2005

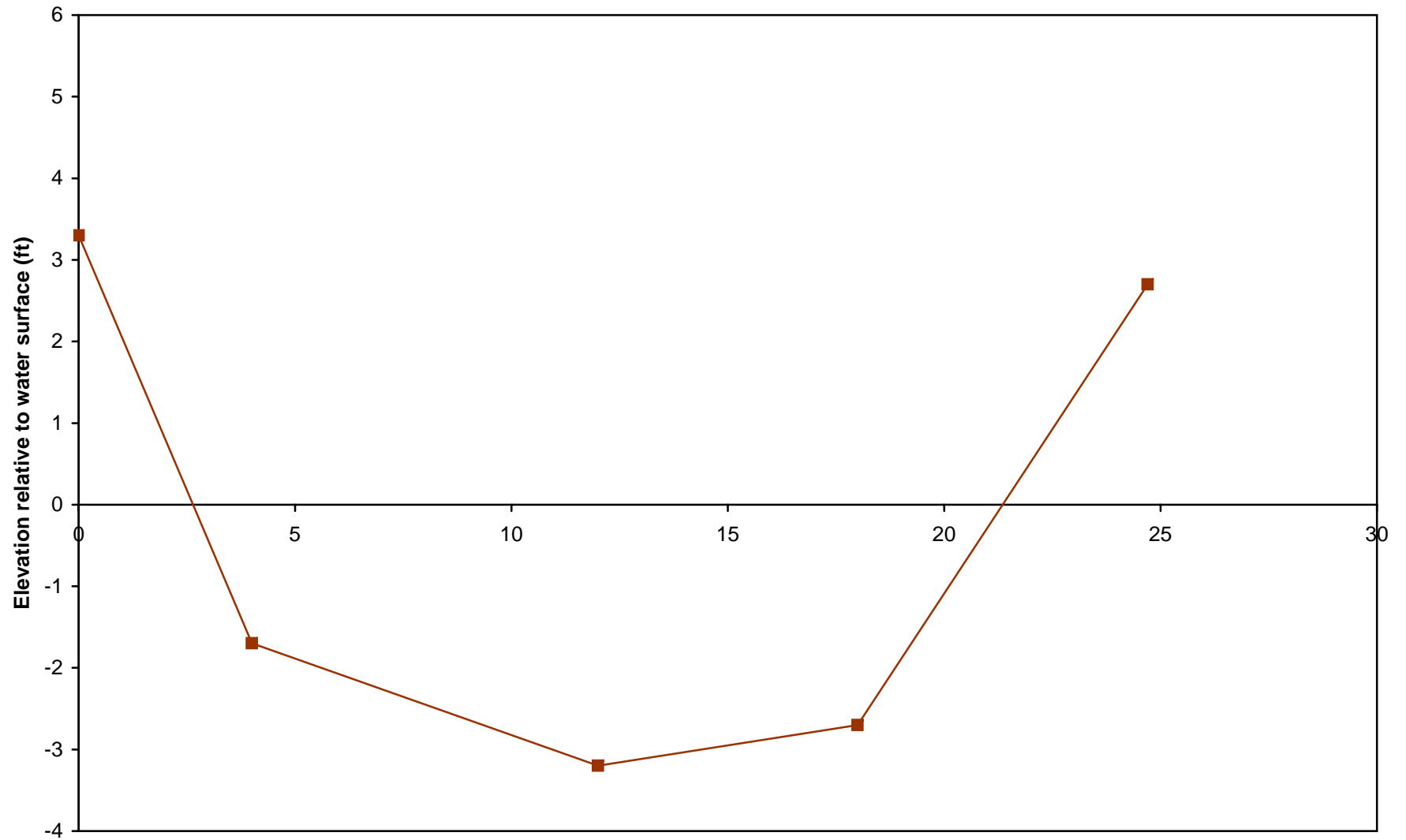


Figure C.3. Cross section of Big Creek at XS2 on April 20, 2005

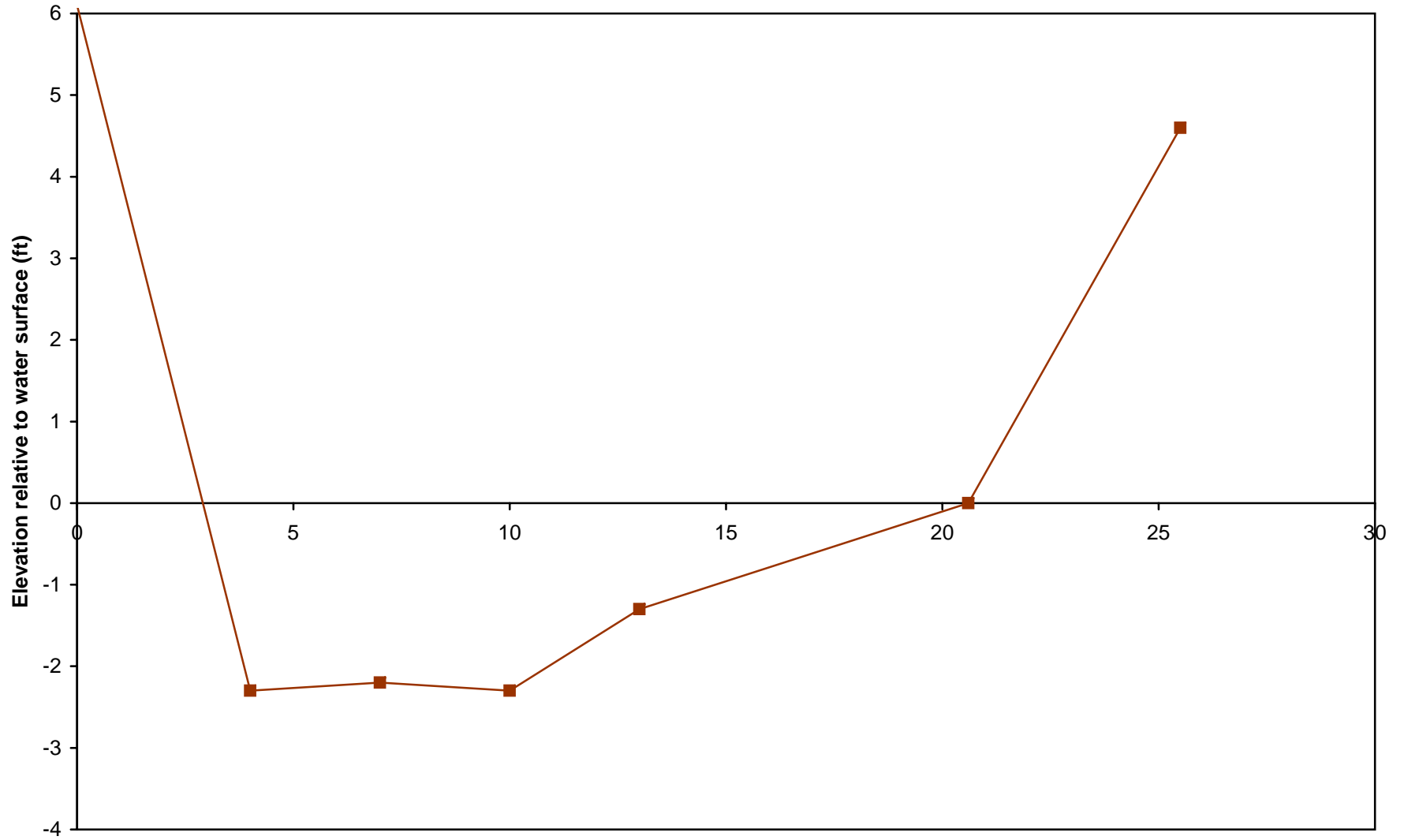


Figure C.4. Cross section of Big Creek at BC1A on April 20, 2005

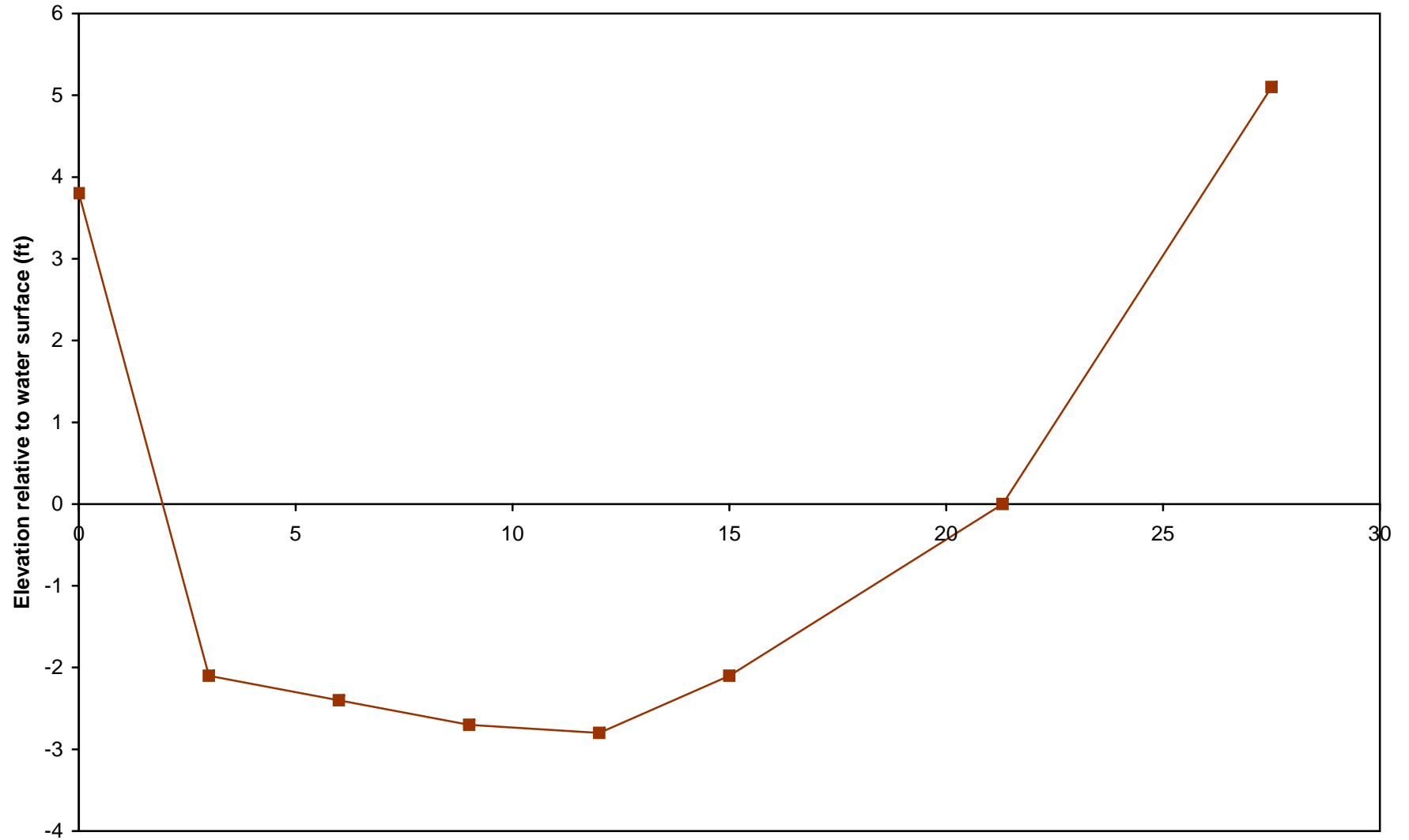


Figure C.5. Cross section of Big Creek at XS3 on April 20, 2005

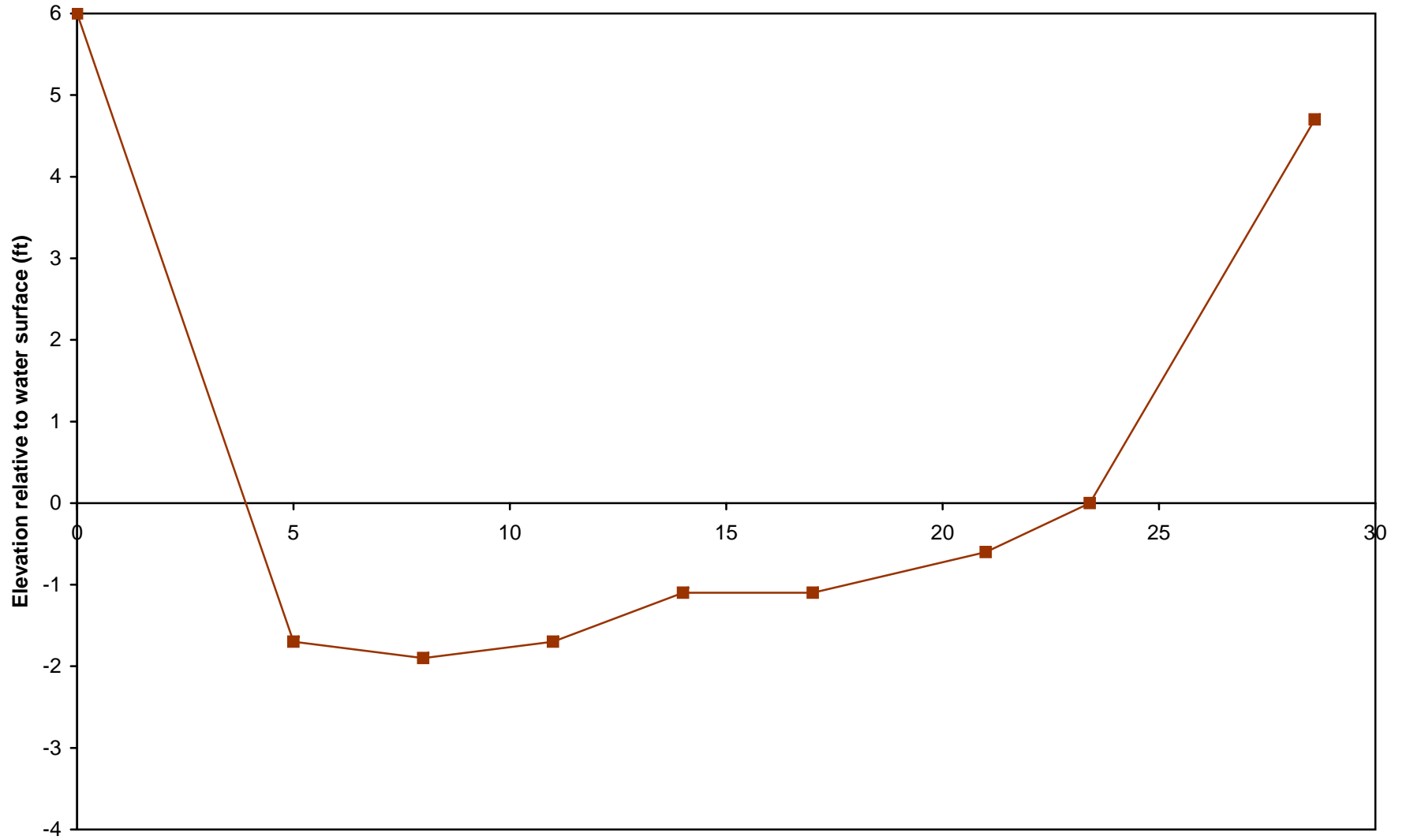


Figure C.6. Cross section of Big Creek at BC3 on April 20, 2005

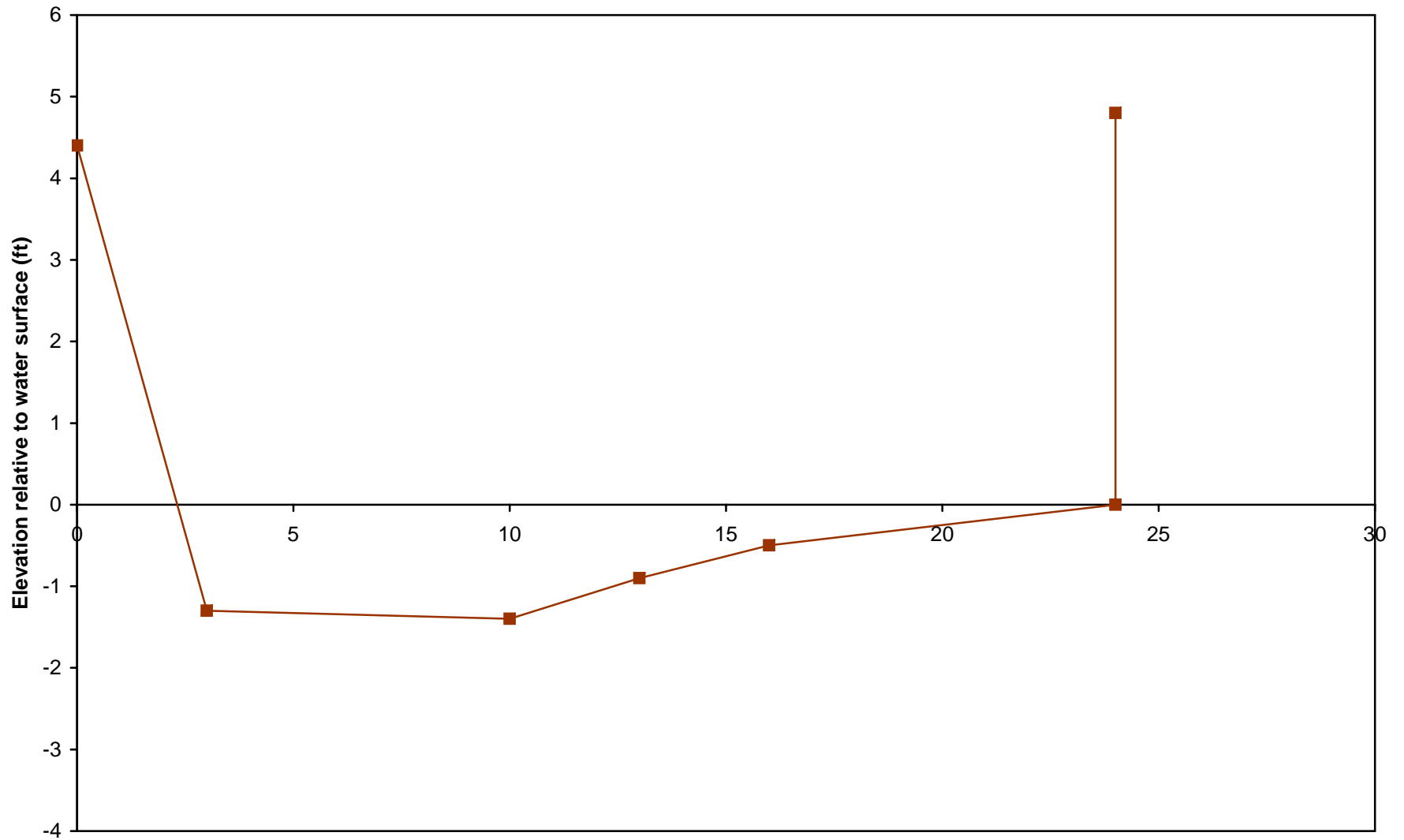


Figure C.7. Cross section of Big Creek at XS4 on April 20, 2005

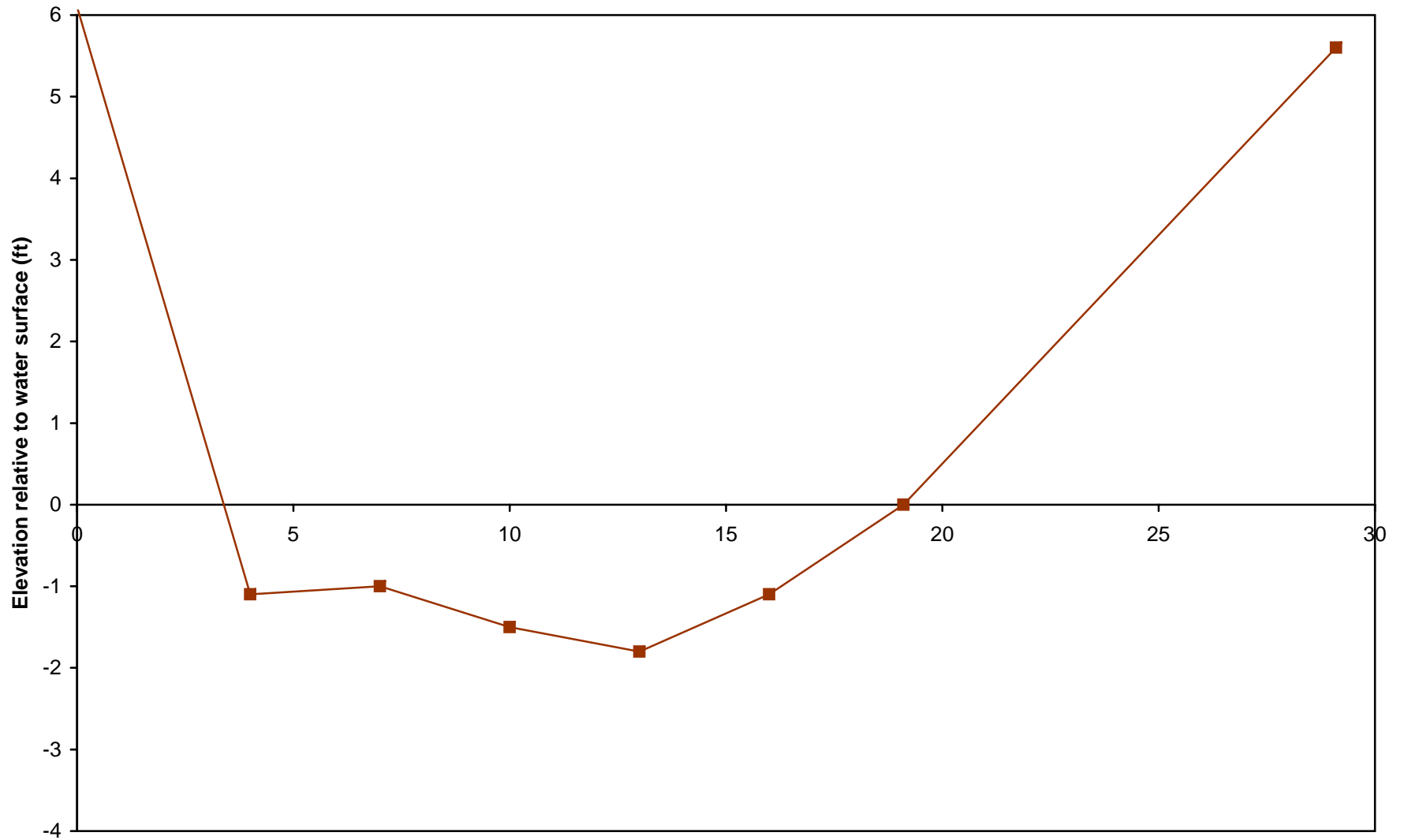


TABLE C.1. SUMMARY OF CROSS SECTIONS
 MEASURED IN BIG CREEK ON APRIL 20, 2005

Station name	Top width of water (ft)	XS area of water (ft ²)	Average depth of water (ft)	
XS1	18.7	43.0	2.3	
XS2	17.7	25.1	1.4	
BC1A	19.4	37.7	1.9	
XS3	19.5	23.4	1.2	
BC3	21.7	17.4	0.8	
XS4	15.7	18.2	1.2	
	18.6		1.9	= averages for XS1, XS2, and BC1A
	19.0		1.1	= averages for XS3, BC3, and XS4

FILE: R:\PROJECTS\4710-020\TECH\FIELD\04_20_05\CROSS_SECTIONS_REVISIED.XLS

TABLE C.2. FLOW MEASUREMENTS IN BIG CREEK DOWNSTREAM OF SHERIDAN

LOCATION: BC-1 (Big Creek about 100 yds upstream of City of Sheridan Outfall 001)

DATE: 4/22/05 PERSONNEL: PHM, RRB

BEGINNING TIME: 13:00 GPS N/S COORDINATE: _____

ENDING TIME: _____ GPS E/W COORDINATE: _____

BEGINNING STAGE: 33.2 on creek flow monitor FLOW METER USED: Drogue (1 gallon milk jug)

ENDING STAGE: water level was steady CHANNEL BOTTOM: Firm and sandy

COMMENTS, ACCURACY: Marsh McBirney meter not working; big log on bottom (station 15) oriented parallel to flow

<i>measured</i>	<i>calculated</i>	<i>measured</i>	<i>measured</i>	<i>measured</i>	<i>calculated</i>	<i>calculated</i>	<i>calculated</i>	
DIST. FROM INITIAL POINT (ft)	WIDTH OF SUB-SECTION (ft)	DEPTH OF WATER (ft)	DROGUE MEASUREMENTS			DEPTH AVERAGE VELOCITY (ft/sec)	FLOW (ft3/sec)	COMMENTS
			DISTANCE TRAVELED (ft)	ELAPSED TIME (sec)	SURFACE VELOCITY (ft/sec)			
2	0.25	0.0			0.00	0.00	0.00	
2.5	0.50	1.2			0.04	0.03	0.02	
3	1.25	2.5	2.0	25	0.08	0.07	0.22	
5	2.00	2.9	2.0	20	0.10	0.09	0.50	
7	2.00	2.9	2.0	15	0.13	0.11	0.67	
9	2.00	3.1	2.0	12	0.17	0.14	0.89	
11	1.50	3.0	2.0	12	0.17	0.14	0.65	
12	1.00	3.3	2.0	13	0.15	0.13	0.44	
13	1.00	3.7	2.0	12	0.17	0.14	0.53	
14	1.00	3.5	2.0	14	0.14	0.12	0.43	
15	1.00	1.7	2.0	13	0.15	0.13	0.23	big log
16	1.50	2.9	2.0	17	0.12	0.10	0.44	
18	1.50	2.7	2.0	22	0.09	0.08	0.32	
19	1.00	2.0	2.0	21	0.10	0.08	0.16	
20	0.50	0.0			0.00	0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	

18 ft = TOTAL WIDTH
 18 ft = TOTAL WIDTH (error check)

TOTAL FLOW = 5.5 cfs
 TOTAL XS AREA = 48.6 ft2
 AVERAGE DEPTH = 2.7 ft

Note: Depth averaged velocity = surface velocity / 1.16 (based on information in USGS handbook)

Table C.3. Center of mass calculations for time of travel study on Big Creek

PROJECT: City of Sheridan
 INJECTION LOCATION: at City outfall
 SAMPLING LOCATION: BC-3, 100 yards upstream of bridge

INJECTION DATE AND TIME: 4/22/2005 12:30
 DISTANCE FROM INJEC.: 10484 feet (measured from arcview 3.2 file)

DATE AND TIME	ELAPSED TIME (hours)	MEASUR. DYE CONC (ppb)	ADJUST. DYE CONC (ppb)	AREA UNDER CURVE	HORIZ MOMENT
4/22/2005 23:30	11.0		0.00		
4/23/2005 0:00	11.5	7.85	5.78	0.120	1.38
4/23/2005 0:30	12.0	17.32	15.25	0.318	3.81
4/23/2005 1:00	12.5	30.23	28.16	0.587	7.33
4/23/2005 1:30	13.0	43.12	41.05	0.855	11.12
4/23/2005 2:00	13.5	54.46	52.39	1.091	14.73
4/23/2005 2:30	14.0	61.84	59.77	1.245	17.43
4/23/2005 3:00	14.5	65.65	63.58	1.325	19.21
4/23/2005 3:30	15.0	65.93	63.86	1.330	19.96
4/23/2005 4:00	15.5	63.89	61.82	1.288	19.96
4/23/2005 4:30	16.0	59.97	57.90	1.206	19.30
4/23/2005 5:00	16.5	55.02	52.95	1.103	18.20
4/23/2005 5:30	17.0	49.63	47.56	0.991	16.84
4/23/2005 6:00	17.5	44.10	42.03	0.876	15.32
4/23/2005 6:30	18.0	38.89	36.82	0.767	13.81
4/23/2005 7:00	18.5	34.45	32.38	0.675	12.48
4/23/2005 7:30	19.0	30.23	28.16	0.587	11.15
4/23/2005 8:00	19.5	26.78	24.71	0.515	10.04
4/23/2005 8:30	20.0	23.85	21.78	0.454	9.07
4/23/2005 9:00	20.5	21.24	19.17	0.399	8.19
4/23/2005 9:30	21.0	19.07	17.00	0.354	7.44
4/23/2005 10:00	21.5	17.26	15.19	0.316	6.80
4/23/2005 10:30	22.0	15.62	13.55	0.282	6.21
4/23/2005 11:00	22.5	14.14	12.07	0.251	5.66
4/23/2005 11:30	23.0	13.13	11.06	0.230	5.30
4/23/2005 12:00	23.5	12.07	10.00	0.208	4.90
4/23/2005 12:30	24.0	11.53	9.46	0.197	4.73
4/23/2005 13:00	24.5	10.65	8.58	0.179	4.38
4/23/2005 13:30	25.0	9.93	7.86	0.164	4.09
4/23/2005 14:00	25.5	9.09	7.02	0.146	3.73
4/23/2005 14:30	26.0	8.58	6.51	0.136	3.53
4/23/2005 15:00	26.5	7.61	5.54	0.115	3.06
4/23/2005 15:30	27.0	7.37	5.30	0.110	2.98
4/23/2005 16:00	27.5	7.03	4.96	0.103	2.84
4/23/2005 16:30	28.0	6.61	4.54	0.095	2.65
4/23/2005 17:00	28.5	6.36	4.29	0.089	2.55
4/23/2005 17:30	29.0	6.23	4.16	0.087	2.51
4/23/2005 18:00	29.5	5.94	3.87	0.081	2.38
4/23/2005 18:30	30.0	5.60	3.53	0.074	2.21
4/23/2005 19:00	30.5	5.29	3.22	0.067	2.05
4/23/2005 19:30	31.0	5.06	2.99	0.062	1.93
4/23/2005 20:00	31.5	4.80	2.73	0.057	1.79
4/23/2005 20:30	32.0	4.57	2.50	0.052	1.67
4/23/2005 21:00	32.5	4.36	2.29	0.048	1.55
4/23/2005 21:30	33.0	4.16	2.09	0.044	1.44
4/23/2005 22:00	33.5	3.97	1.90	0.040	1.33
4/23/2005 22:30	34.0	3.86	1.79	0.037	1.27

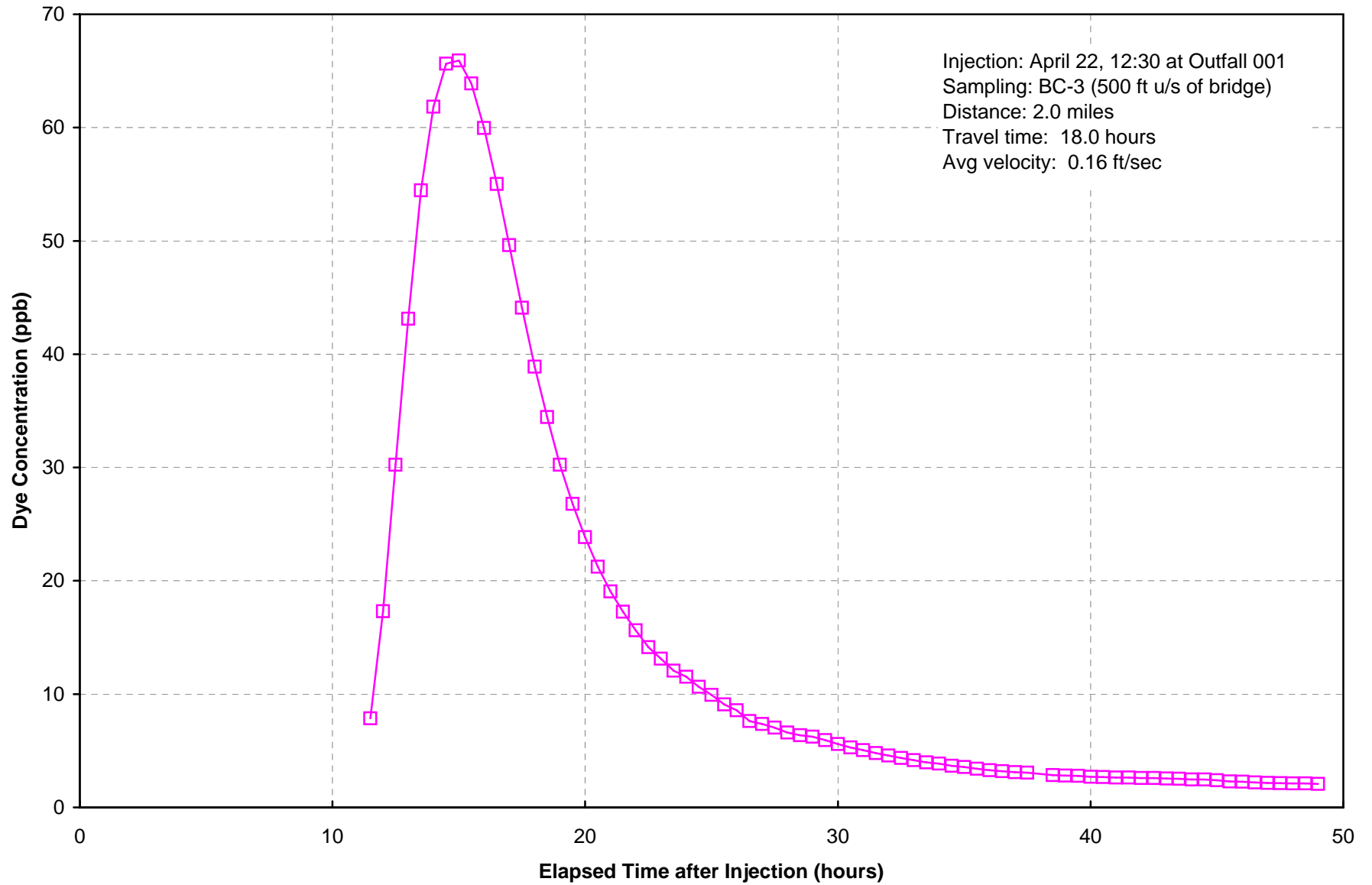
DATE AND TIME	ELAPSED TIME (hours)	MEASUR. DYE CONC (ppb)	ADJUST. DYE CONC (ppb)	AREA UNDER CURVE	HORIZ MOMENT
4/23/2005 23:00	34.5	3.68	1.61	0.034	1.16
4/23/2005 23:30	35.0	3.56	1.49	0.031	1.09
4/24/2005 0:00	35.5	3.41	1.34	0.028	0.99
4/24/2005 0:30	36.0	3.28	1.21	0.025	0.91
4/24/2005 1:00	36.5	3.20	1.13	0.024	0.86
4/24/2005 1:30	37.0	3.11	1.04	0.022	0.80
4/24/2005 2:00	37.5	3.07	1.00	0.021	0.78
4/24/2005 3:00	38.5	2.85	0.78	0.016	0.63
4/24/2005 3:30	39.0	2.81	0.74	0.015	0.60
4/24/2005 4:00	39.5	2.78	0.71	0.015	0.58
4/24/2005 4:30	40.0	2.69	0.62	0.013	0.52
4/24/2005 5:00	40.5	2.67	0.60	0.012	0.51
4/24/2005 5:30	41.0	2.63	0.56	0.012	0.48
4/24/2005 6:00	41.5	2.63	0.56	0.012	0.48
4/24/2005 6:30	42.0	2.60	0.53	0.011	0.46
4/24/2005 7:00	42.5	2.58	0.51	0.011	0.45
4/24/2005 7:30	43.0	2.55	0.48	0.010	0.43
4/24/2005 8:00	43.5	2.52	0.45	0.009	0.41
4/24/2005 8:30	44.0	2.46	0.39	0.008	0.36
4/24/2005 9:00	44.5	2.45	0.38	0.008	0.35
4/24/2005 9:30	45.0	2.40	0.33	0.007	0.31
4/24/2005 10:00	45.5	2.28	0.21	0.004	0.20
4/24/2005 10:30	46.0	2.26	0.19	0.004	0.18
4/24/2005 11:00	46.5	2.21	0.14	0.003	0.14
4/24/2005 11:30	47.0	2.16	0.09	0.002	0.09
4/24/2005 12:00	47.5	2.13	0.06	0.001	0.06
4/24/2005 12:30	48.0	2.12	0.05	0.001	0.05
4/24/2005 13:00	48.5	2.12	0.05	0.001	0.05
4/24/2005 13:30	49.0	2.07	0.00	0.000	0.00
TOTALS =				19.73	354.9
TRAVEL TIME (hours) =					18.0
AVG VELOCITY (ft/sec) =					0.16

Explanation of calculations:

1. Adjusted dye concentration is measured dye concentration minus the background fluorescence, which was assumed to be equal to the lowest measured dye concentration (2.07 ppb).
2. Area under curve is adjusted concentration times sampling interval. Sampling interval is half of the time difference between the subsequent and preceding samples.
3. Horizontal moment is area under curve times elapsed time since injection.
4. Travel time is the sum of the horizontal moment divided by the sum of the area under the curve.
5. Average velocity is travel distance divided by travel time (with unit conversions).

FILE: R:\PROJECTS\4710-020\TECH\FIELD\04_22_05\DYE STUDY\TIME_OF_TRAVEL_CALC.S.XLS

Figure C.8. Measured Dye Concentrations in Big Creek on April 22-24.



APPENDIX D

FTN Field Data for October 2005

TABLE D.1. WATER QUALITY DATA FOR BIG CREEK FOR OCTOBER 31, 2005

Station	Time	DO (mg/L)	Temp. (°C)	Conduc. (µS/cm)	pH (su)	TSS (mg/L)	NH3-N (mg/L)	Flow (cfs)
BC1	09:00	3.6	11.3	170	6.2	15	1.8	0.0
Outfall	08:00	10.2	15.8	500	8.8	63	0.21	--
BC1A	08:30	9.2	15.6	500	8.8	56	0.20	7.0
BC2A	11:00	8.9	15.6	500	8.8	52	0.17	6.9
BC3	11:15	10.1	15.5	500	8.7	58	0.13	--
BC4	10:05	7.8	14.8	500	8.6	56	0.18	7.7

Average temp. (excluding BC-1) = 15.5

Station	Time	CBOD day 2 (mg/L)	CBOD day 5 (mg/L)	CBOD day 9 (mg/L)	CBOD day 14 (mg/L)	CBOD day 20 (mg/L)	Calculated values	
							Ultimate CBOD (mg/L)	CBOD decay rate (1/day)
BC1	09:00	< 2	< 2	< 2	2.1	2.4	3.0	0.08
Outfall	08:00	5.6	11	15	17	21	22	0.14
BC1A	08:30	5.4	8.4	12	16	24	44	0.04
BC2A	11:00	5.2	8.1	13	16	19	21	0.10
BC3	11:15	4.7	8.5	12	15	20	24	0.08
BC4	10:05	5.2	9.2	14	17	21	24	0.10

Average CBOD decay rate (excluding BC-1 and BC-1a) = 0.11

- Notes:
1. BC-1 was excluded from both averages because it is upstream of the outfall and it had only stagnant water that was not moving downstream. Therefore, it is not representative of conditions downstream of the outfall.
 2. BC-1a was excluded from the average decay rate because the last reading (on day 20) appears suspicious and caused the calculations to yield an unreasonably low decay rate.

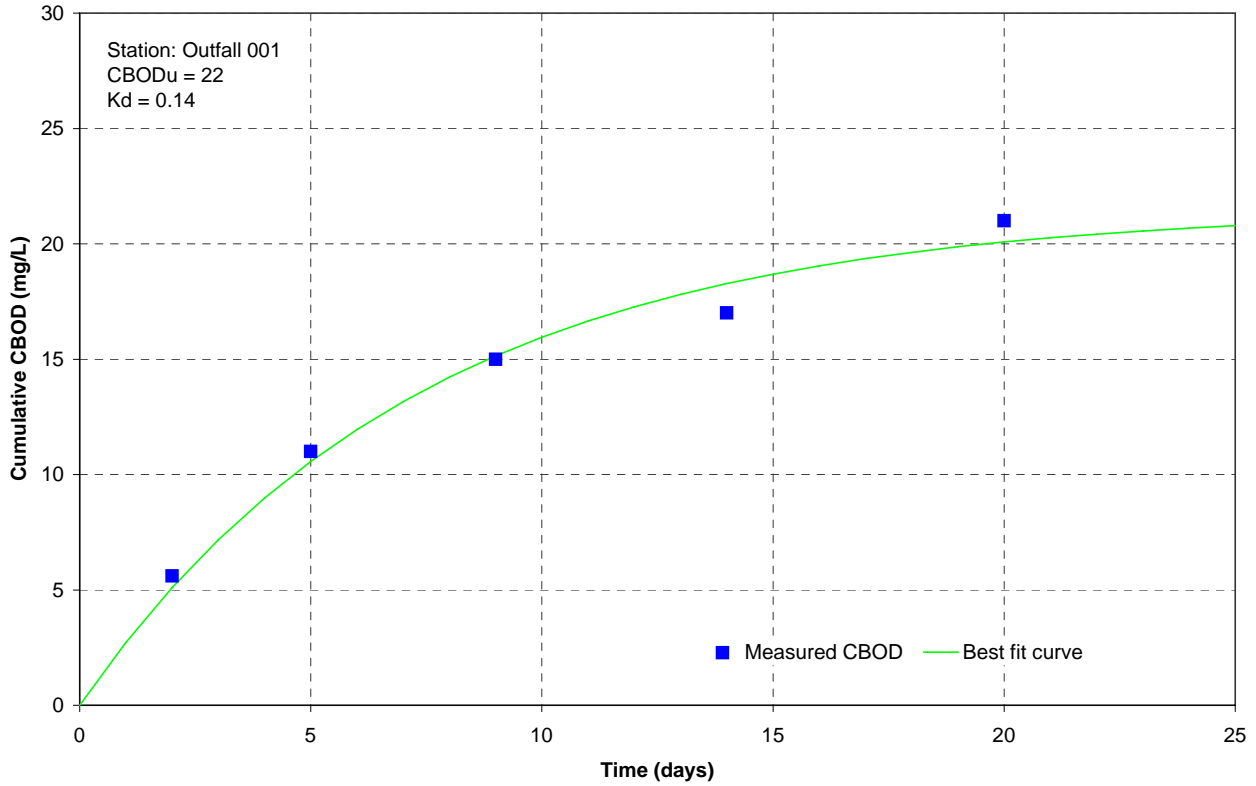
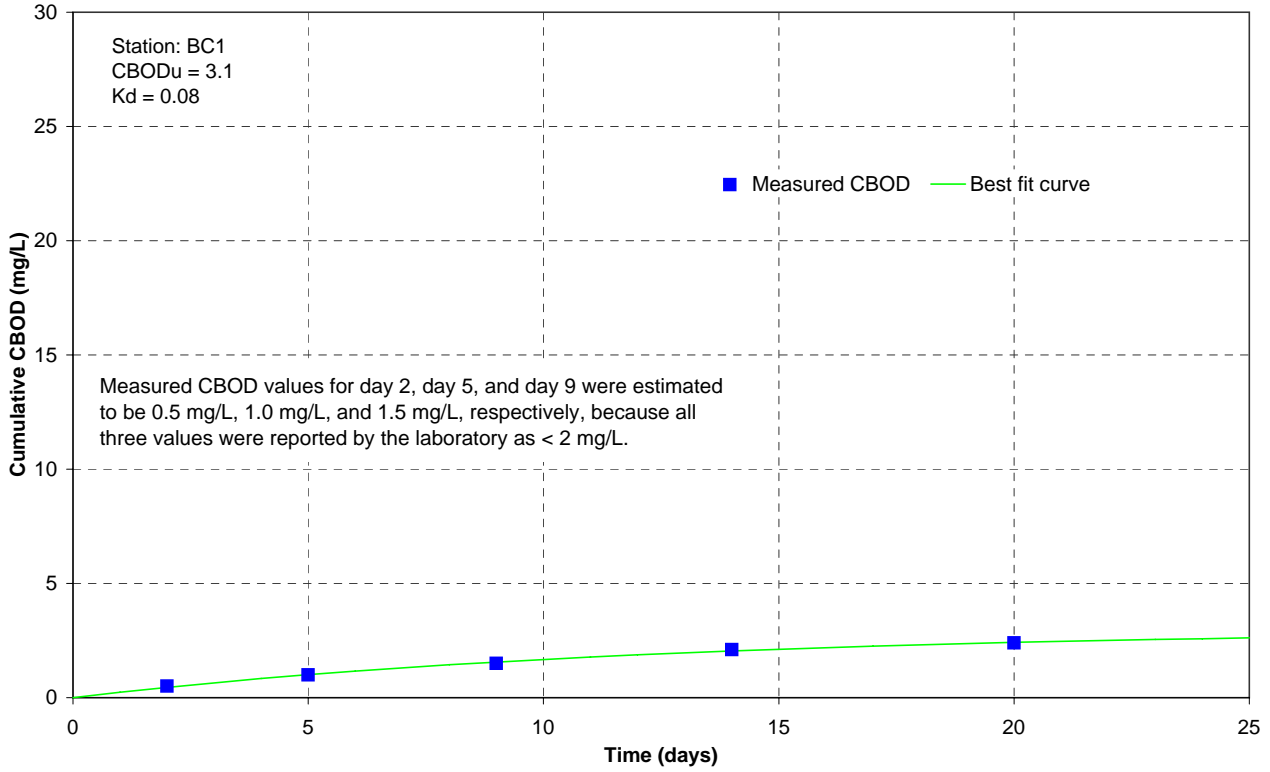


Figure D.1. Plots of CBOD time series data for Big Creek at BC-1 and Outfall 001.

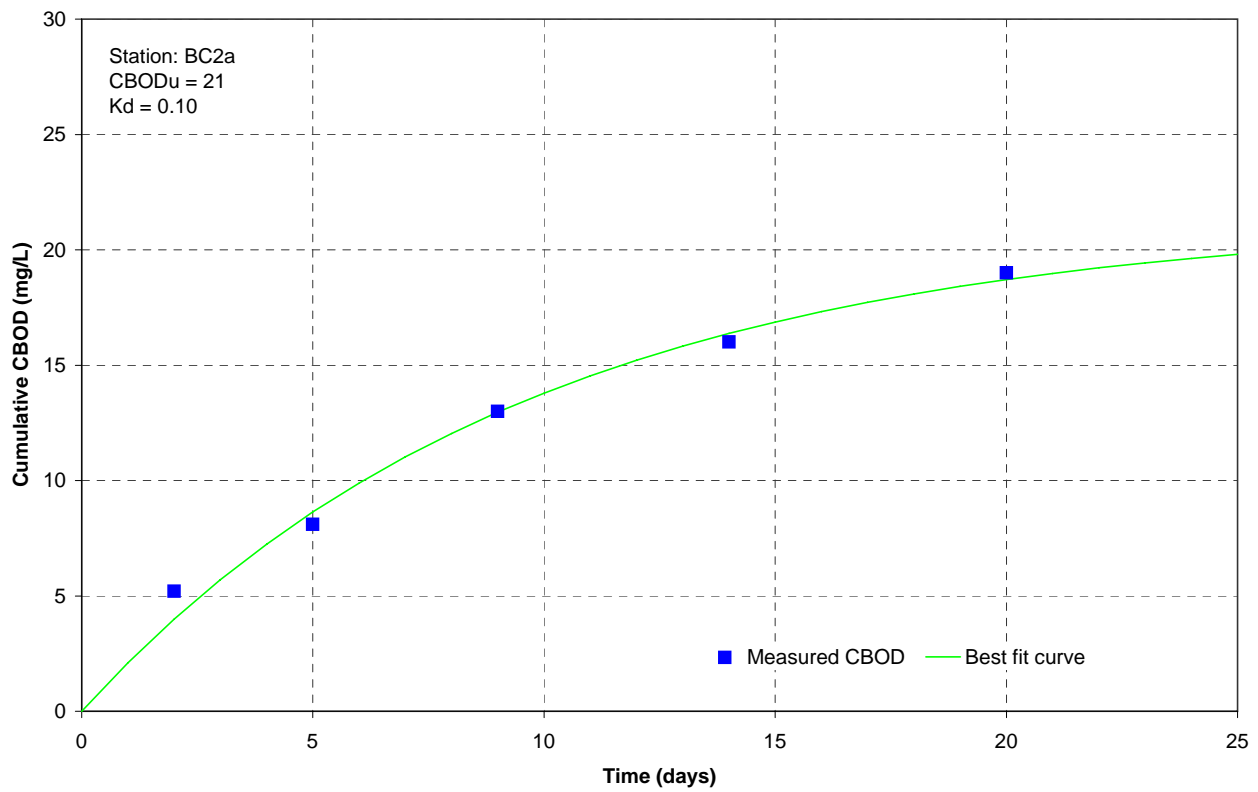
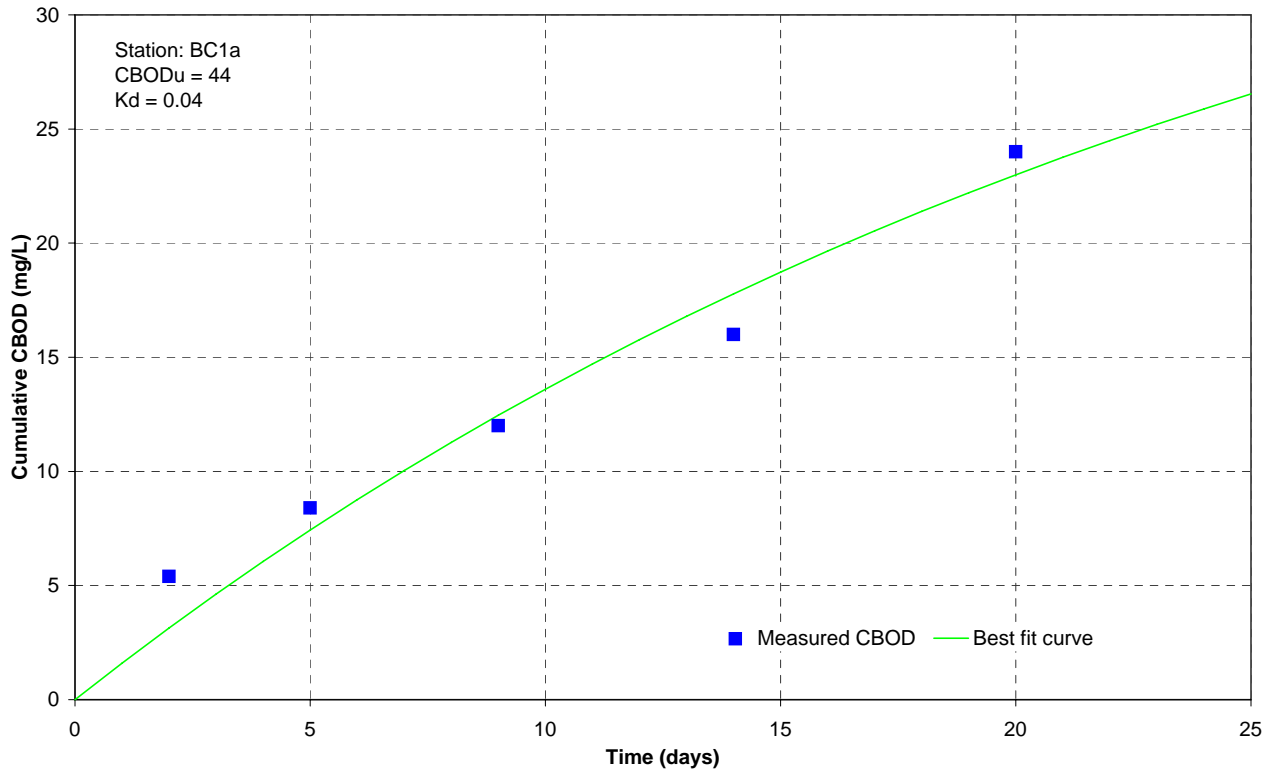


Figure D.2. Plots of CBOD time series data for Big Creek at BC-1a and BC-2a.

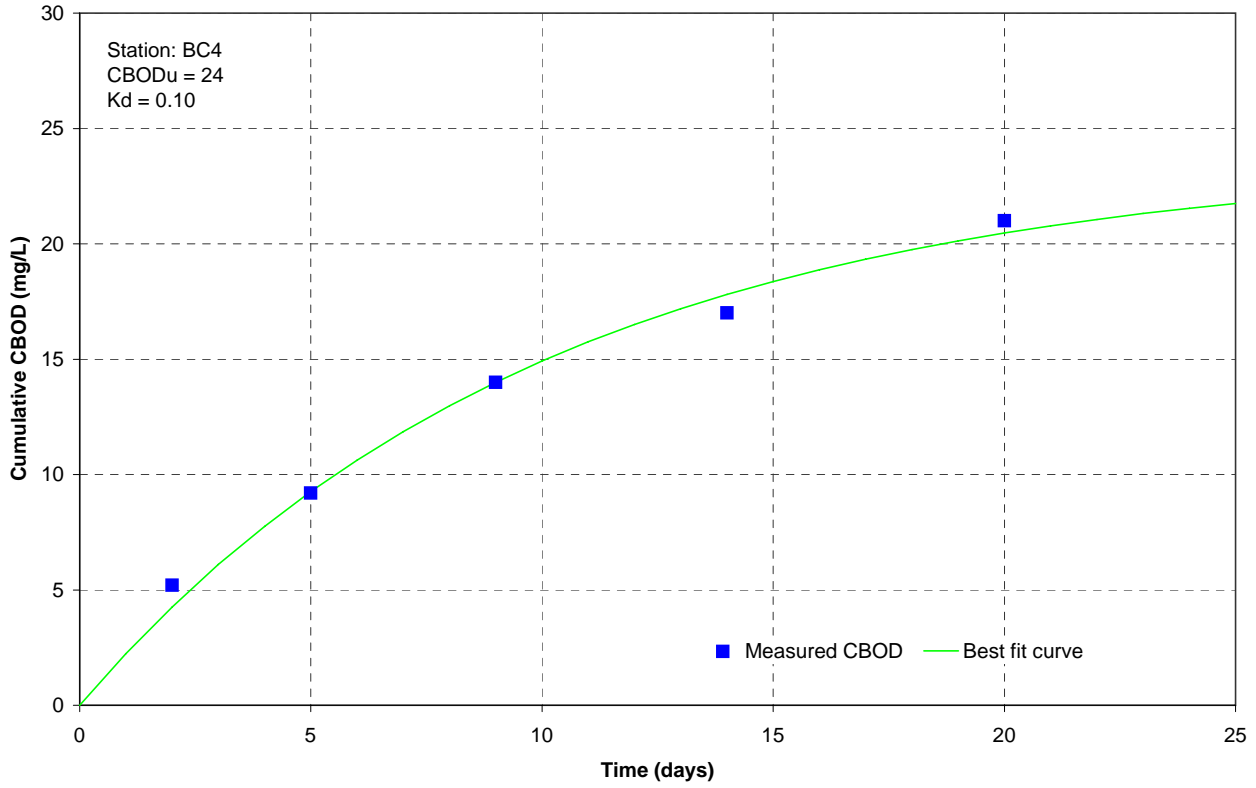
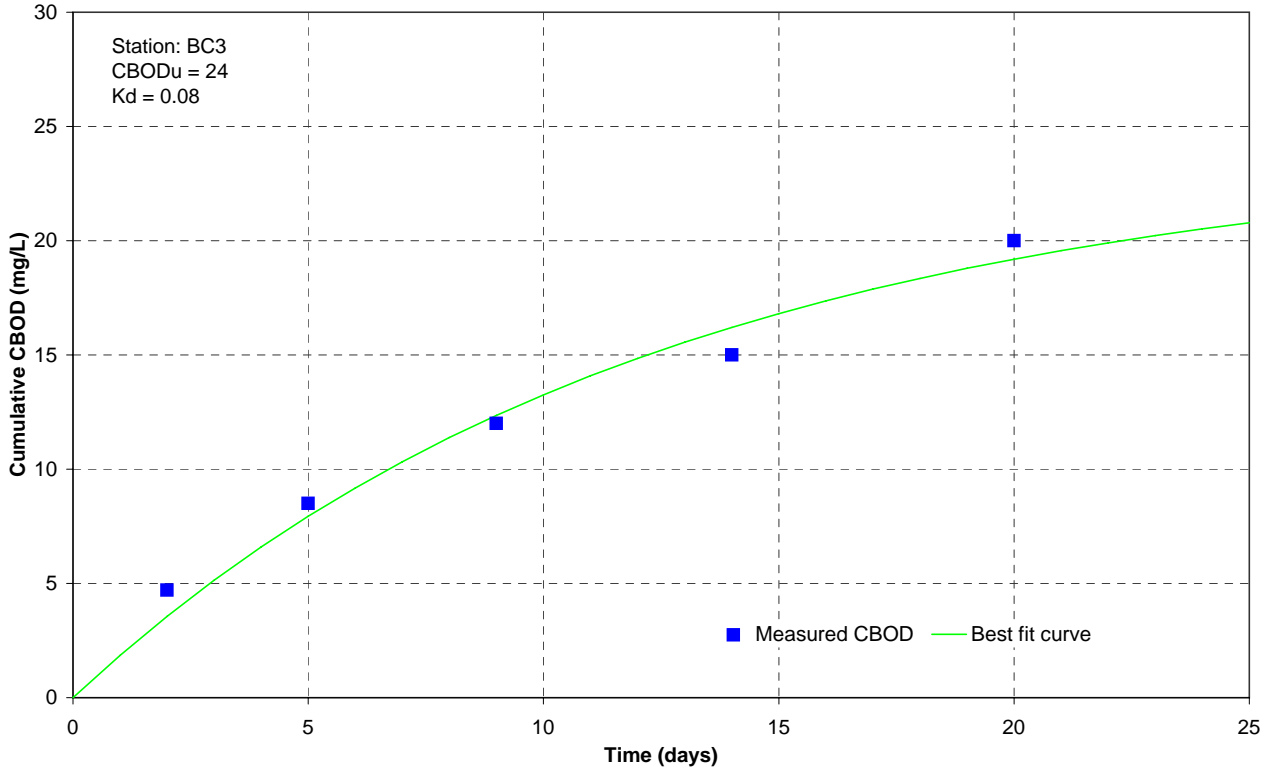


Figure D.3. Plots of CBOD time series data for Big Creek at BC-3 and BC-4.

TABLE D.2. FLOW MEASUREMENT IN BIG CREEK AT BC1

NAME OF STATION: BC1 (upstream of Outfall 001)
 DATE OF MEASUR.: 10/31/05
 FIELD MEASUR. BY: NJS, RPG
 DATA ENTERED BY: NCS
 CALCS CHECKED BY: PHM

RISING OR FALLING: steady
 FLOW METER USED: Flow-Mate
 METHOD USED: wading, 0.6 depth
 TYPE OF CONTROL: natural narrow/riffle

TOTAL FLOW = 0.0 cfs
 TOTAL AREA = 7.1 sq.ft.
 TOTAL WIDTH = 15.2 ft
 MEAN DEPTH = 0.47 ft
 MEAN VELOCITY = 0.00 ft / sec

DIST. FROM INITIAL POINT (ft)	WIDTH (ft)	DEPTH (ft)	MEAN VELOC. (fps)	AREA (ft2)	FLOW (cfs)
6.8	0.05	0.00	0.00	0.00	0.00
6.9	0.10	0.10	0.00	0.01	0.00
7.0	0.55	0.20	0.00	0.11	0.00
8.0	1.00	0.40	0.00	0.40	0.00
9.0	1.00	0.50	0.00	0.50	0.00
10.0	1.00	0.65	0.00	0.65	0.00
11.0	1.00	0.65	0.00	0.65	0.00
12.0	1.00	0.60	0.00	0.60	0.00
13.0	1.00	0.50	0.00	0.50	0.00
14.0	1.00	0.50	0.00	0.50	0.00
15.0	1.00	0.50	0.00	0.50	0.00
16.0	1.00	0.55	0.00	0.55	0.00
17.0	1.00	0.60	0.00	0.60	0.00
18.0	1.00	0.65	0.00	0.65	0.00
19.0	1.00	0.60	0.00	0.60	0.00
20.0	1.50	0.20	0.00	0.30	0.00
22.0	1.00	0.00	0.00	0.00	0.00
	----- 15.2			----- 7.12	----- 0.00

TABLE D.3. FLOW MEASUREMENT IN BIG CREEK AT BC1A

NAME OF STATION: BC1A (downstream of Outfall 001)
 DATE OF MEASUR.: 10/31/05
 FIELD MEASUR. BY: NJS, RPG
 DATA ENTERED BY: NCS
 CALCS CHECKED BY: PHM

RISING OR FALLING: steady
 FLOW METER USED: Flow-Mate
 METHOD USED: wading
 TYPE OF CONTROL: natural narrow/riffle

TOTAL FLOW = 7.0 cfs
 TOTAL AREA = 23.0 sq.ft.
 TOTAL WIDTH = 16.8 ft
 MEAN DEPTH = 1.37 ft
 MEAN VELOCITY = 0.30 ft / sec

DIST. FROM INITIAL POINT (ft)	WIDTH (ft)	DEPTH (ft)	MEAN VELOC. (fps)	AREA (ft ²)	FLOW (cfs)
1.3	0.35	0.05	0.00	0.02	0.00
2.0	0.85	0.15	0.00	0.13	0.00
3.0	1.00	0.60	0.05	0.60	0.03
4.0	1.00	1.25	0.18	1.25	0.23
5.0	1.00	2.65	0.21	2.65	0.56
6.0	1.00	1.85	0.29	1.85	0.54
7.0	1.00	1.85	0.31	1.85	0.57
8.0	1.00	1.80	0.28	1.80	0.50
9.0	1.00	1.80	0.31	1.80	0.56
10.0	1.00	1.90	0.33	1.90	0.63
11.0	1.00	1.70	0.39	1.70	0.66
12.0	1.00	1.65	0.42	1.65	0.69
13.0	1.00	1.60	0.48	1.60	0.77
14.0	1.00	1.60	0.35	1.60	0.56
15.0	1.00	1.40	0.35	1.40	0.49
16.0	1.00	0.80	0.21	0.80	0.17
17.0	1.05	0.40	0.05	0.42	0.02
18.1	0.55	0.00	0.00	0.00	0.00
	----- 16.8			----- 23.02	----- 6.97

TABLE D.4. FLOW MEASUREMENT IN BIG CREEK AT BC2A

NAME OF STATION: BC2A
 DATE OF MEASUR.: 10/31/05
 FIELD MEASUR. BY: NJS, RPG
 DATA ENTERED BY: NCS
 CALCS CHECKED BY: PHM

RISING OR FALLING: steady
 FLOW METER USED: Flow-Mate
 METHOD USED: wading
 TYPE OF CONTROL: natural narrow/riffle

TOTAL FLOW = 6.9 cfs
 TOTAL AREA = 23.8 sq.ft.
 TOTAL WIDTH = 19.1 ft
 MEAN DEPTH = 1.25 ft
 MEAN VELOCITY = 0.29 ft / sec

DIST. FROM INITIAL POINT (ft)	WIDTH (ft)	DEPTH (ft)	MEAN VELOC. (fps)	AREA (ft ²)	FLOW (cfs)
2.4	0.05	0.00	0.00	0.00	0.00
2.5	0.30	0.10	0.00	0.03	0.00
3.0	0.75	0.40	0.00	0.30	0.00
4.0	1.00	0.80	0.00	0.80	0.00
5.0	1.00	1.05	0.00	1.05	0.00
6.0	1.00	1.20	0.06	1.20	0.07
7.0	1.00	1.30	0.06	1.30	0.08
8.0	1.00	1.40	0.05	1.40	0.07
9.0	1.00	1.50	0.11	1.50	0.17
10.0	1.00	1.50	0.25	1.50	0.38
11.0	1.00	1.50	0.28	1.50	0.42
12.0	1.00	1.50	0.40	1.50	0.60
13.0	1.00	1.50	0.45	1.50	0.68
14.0	1.00	1.50	0.75	1.50	1.13
15.0	1.00	1.65	0.60	1.65	0.99
16.0	1.00	1.65	0.65	1.65	1.07
17.0	1.00	1.50	0.39	1.50	0.59
18.0	1.00	1.50	0.24	1.50	0.36
19.0	1.00	1.30	0.24	1.30	0.31
20.0	1.00	1.00	0.01	1.00	0.01
21.0	0.75	0.20	0.00	0.15	0.00
21.5	0.25	0.00	0.00	0.00	0.00
	----- 19.1			----- 23.83	----- 6.91

TABLE D.5. FLOW MEASUREMENT IN BIG CREEK AT BC4

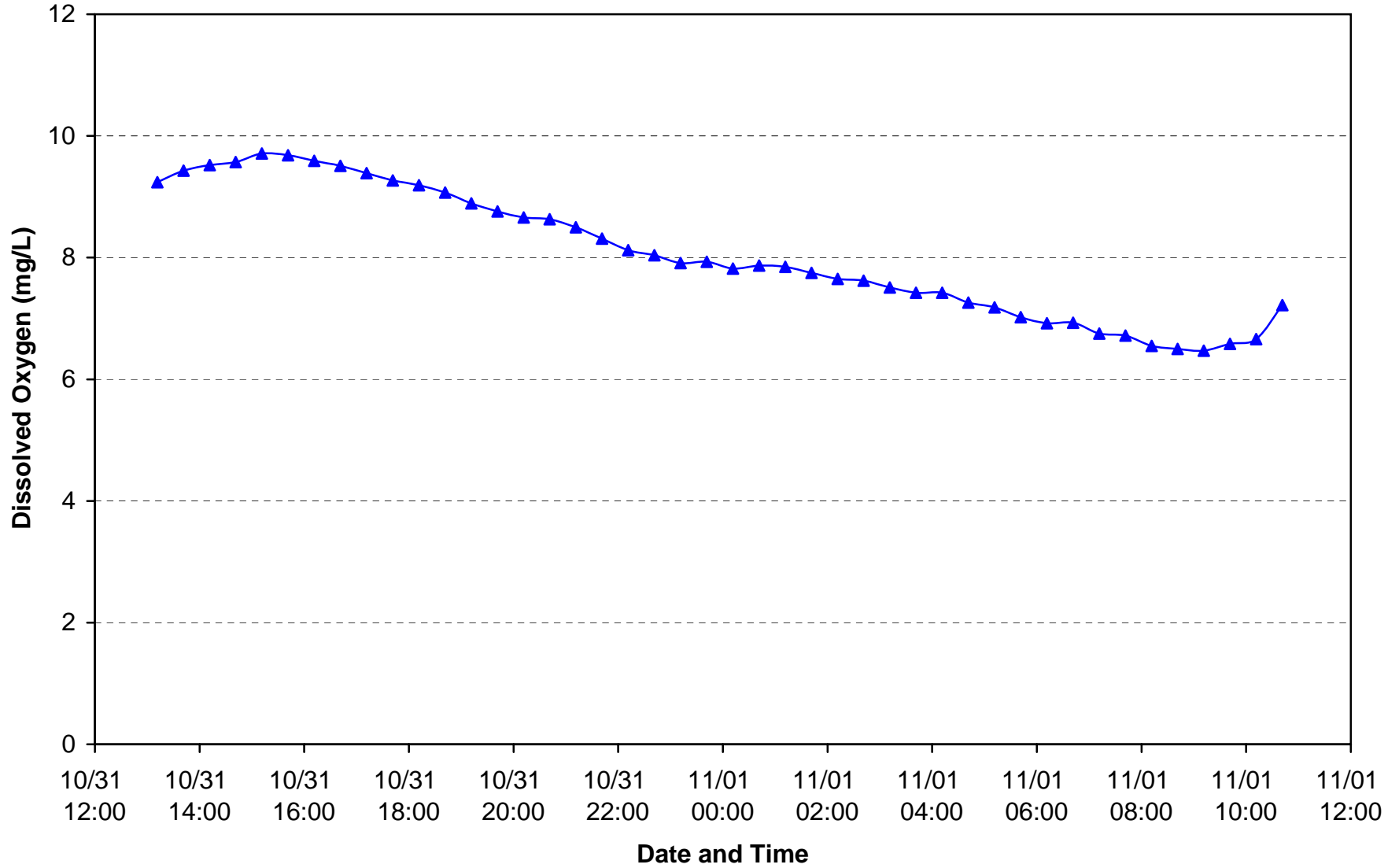
NAME OF STATION: BC4
 DATE OF MEASUR.: 10/31/05
 FIELD MEASUR. BY: NJS, RPG
 DATA ENTERED BY: NCS
 CALCS CHECKED BY: PHM

RISING OR FALLING: steady
 FLOW METER USED: Flow-Mate
 METHOD USED: wading
 TYPE OF CONTROL: natural narrow/riffle

TOTAL FLOW = 7.7 cfs
 TOTAL AREA = 17.4 sq.ft.
 TOTAL WIDTH = 13.1 ft
 MEAN DEPTH = 1.33 ft
 MEAN VELOCITY = 0.44 ft / sec

DIST. FROM INITIAL POINT (ft)	WIDTH (ft)	DEPTH (ft)	MEAN VELOC. (fps)	AREA (ft ²)	FLOW (cfs)
2.0	0.15	0.00	0.00	0.00	0.00
2.3	0.50	0.50	0.00	0.25	0.00
3.0	0.85	0.40	0.00	0.34	0.00
4.0	1.00	1.00	0.20	1.00	0.20
5.0	1.00	1.25	0.21	1.25	0.26
6.0	1.00	1.50	0.35	1.50	0.53
7.0	1.00	1.70	0.37	1.70	0.63
8.0	1.00	1.90	0.41	1.90	0.78
9.0	1.00	2.00	0.57	2.00	1.14
10.0	1.00	2.50	0.64	2.50	1.60
11.0	1.00	1.95	0.53	1.95	1.03
12.0	1.00	1.70	0.60	1.70	1.02
13.0	1.00	1.00	0.47	1.00	0.47
14.0	1.00	0.30	0.29	0.30	0.09
15.0	0.55	0.05	0.00	0.03	0.00
15.1	0.05	0.00	0.00	0.00	0.00
	----- 13.1			----- 17.42	----- 7.75

Figure D.4. Continuous DO Data for Big Creek at BC-3 During 10/31/05 - 11/01/05



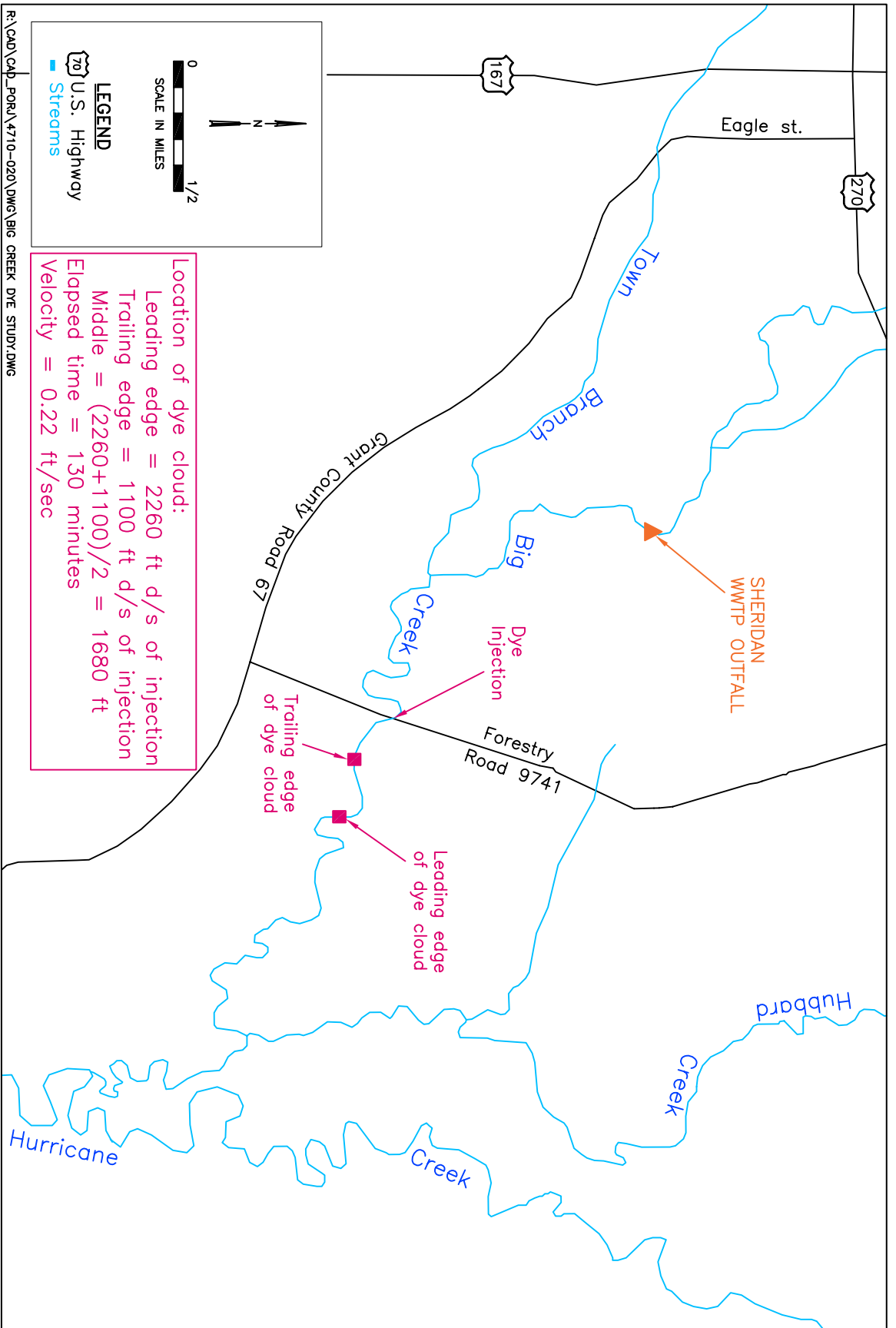


Figure D.5. Results of dye study downstream of OUA18 on October 31.

APPENDIX E

FTN Field Data for March 2006

TABLE E.1. WATER QUALITY DATA FOR MARCH 20, 2006

Station	Time	DO (mg/L)	Temp. (°C)	Conduc. (µS/cm)	pH (su)	TSS (mg/L)	NH3-N (mg/L)
BC1	13:30	9.9	8.3	32	5.3	240	< 0.1
TB2	17:30	10.6	9.5	49	5.9	21	< 0.1
BC3	18:00	9.9	8.6	59	6.2	--	--

Station	Time	CBOD day 2 (mg/L)	CBOD day 5 (mg/L)	CBOD day 9 (mg/L)	CBOD day 14 (mg/L)	CBOD day 20 (mg/L)	Flow (cfs)
BC1	13:30	< 2	2.3	2.0	4.7	5.7	144
TB2	17:30	< 2	< 2	< 2	2.3	2.8	--
BC3	18:00	--	--	--	--	--	--

Locations: BC1 = Big Creek upstream of City of Sheridan WWTP Outfall 001
 TB2 = Town Branch at Eagle Street (see Figure C.1)
 BC3 = Big Creek just upstream of bridge where ADEQ collects samples

FILE: R:\PROJECTS\4710-020\TECH\FIELD\03-20-06\WQ_MARCH_06.XLS

TABLE E.2. CALCULATIONS FOR FLOW MEASUREMENTS FOR BIG CREEK AT BC1

LOCATION: Big Creek just upstream of City of Sheridan WWTP Outfall 001

DATE: 3-20-06 PERSONNEL: DMR, PHM

BEGINNING TIME: 12:30 (approx.) GPS N/S COORDINATE: _____

ENDING TIME: 14:00 (approx.) GPS E/W COORDINATE: _____

BEGINNING STAGE: 65.8 inches (readout in control room) FLOW METER USED: Marsh-McBirney

ENDING STAGE: 64.6 inches (readout in control room) CHANNEL BOTTOM: firm, sandy

COMMENTS, ACCURACY: Depth and velocity measurements taken while straddling irrigation water pipe that crosses the stream about 100 ft or less upstream of Outfall 001. Outfall was not discharging. Water level was almost up to the bottom of the I-beam supporting the irrigation water pipe. Did not have long rods for taking deep velocity measurements; we just went as deep as we could in middle of channel.

<i>measured</i>	<i>calculated</i>	<i>measured</i>	<i>measured</i>	<i>measured</i>	<i>calculated</i>	<i>calculated</i>	<i>calculated</i>	
DISTANCE FROM INITIAL POINT (ft)	WIDTH OF SUB-SECTION (ft)	DEPTH OF WATER (ft)	DEPTH OF VELOCITY MEASUR. (ft)	MEASURED VELOCITY (ft/sec)	ADJUST. FOR VERT. AVERAGE VELOCITY (ft/sec)	VERT. AVERAGE VELOCITY (ft/sec)	FLOW (ft3/sec)	COMMENTS
5	1.5	0.0		0.00		0.00	0.00	
8	3	0.8	0.48	0.00	1.02	0.00	0.00	
11	2.5	1.7	1.02	0.15	1.02	0.15	0.63	
13	2	3.2	1.92	0.40	1.02	0.39	2.51	
15	2	5.4	3.20	0.72	1.02	0.70	7.60	
17	2	6.5	3.90	1.14	1.02	1.12	14.53	
19	2	6.9	4.00	1.50	1.03	1.46	20.11	
21	2	6.9	4.00	1.56	1.03	1.52	20.91	
23	2	6.9	4.00	1.15	1.03	1.12	15.41	
25	2	6.8	4.00	1.26	1.03	1.23	16.71	
27	2	7.0	4.00	0.85	1.03	0.82	11.52	
29	2	7.0	4.00	1.16	1.03	1.12	15.71	
31	2	6.5	3.25	0.77	1.07	0.72	9.38	
33	2	6.3	3.00	0.62	1.08	0.58	7.26	
35	2	5.4	3.00	0.14	1.04	0.13	1.45	
37	2	4.8	2.80	0.01	1.03	0.01	0.09	
39	2.5	1.4	0.84	0.00	1.02	0.00	0.00	
42	1.5	0.0		0.00		0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	
	0					0.00	0.00	

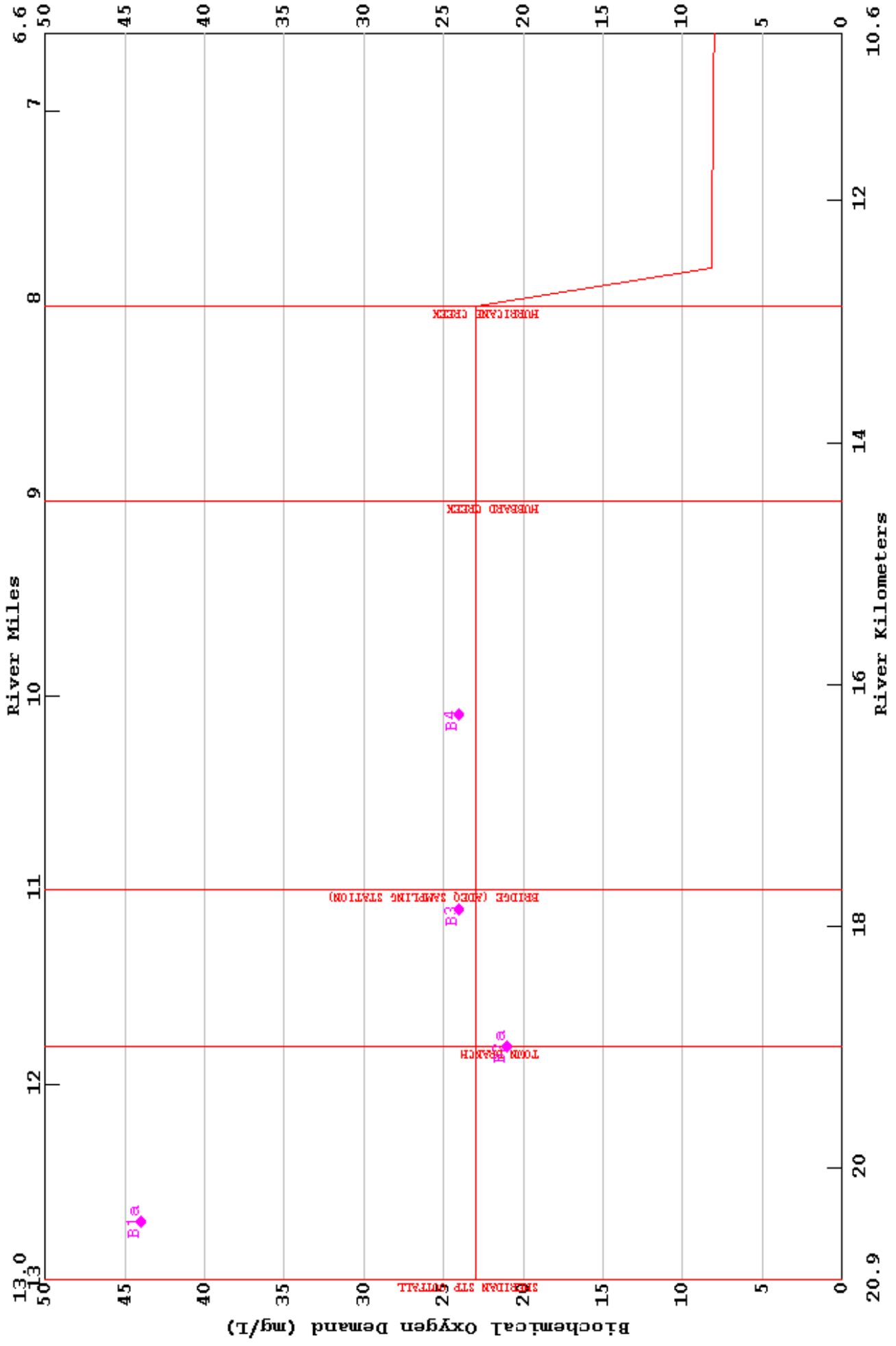
37 ft = TOTAL WIDTH
 37 ft = TOTAL WIDTH (error check)

TOTAL FLOW = 144 cfs
 TOTAL XS AREA = 169 ft2
 AVERAGE DEPTH = 4.6 ft

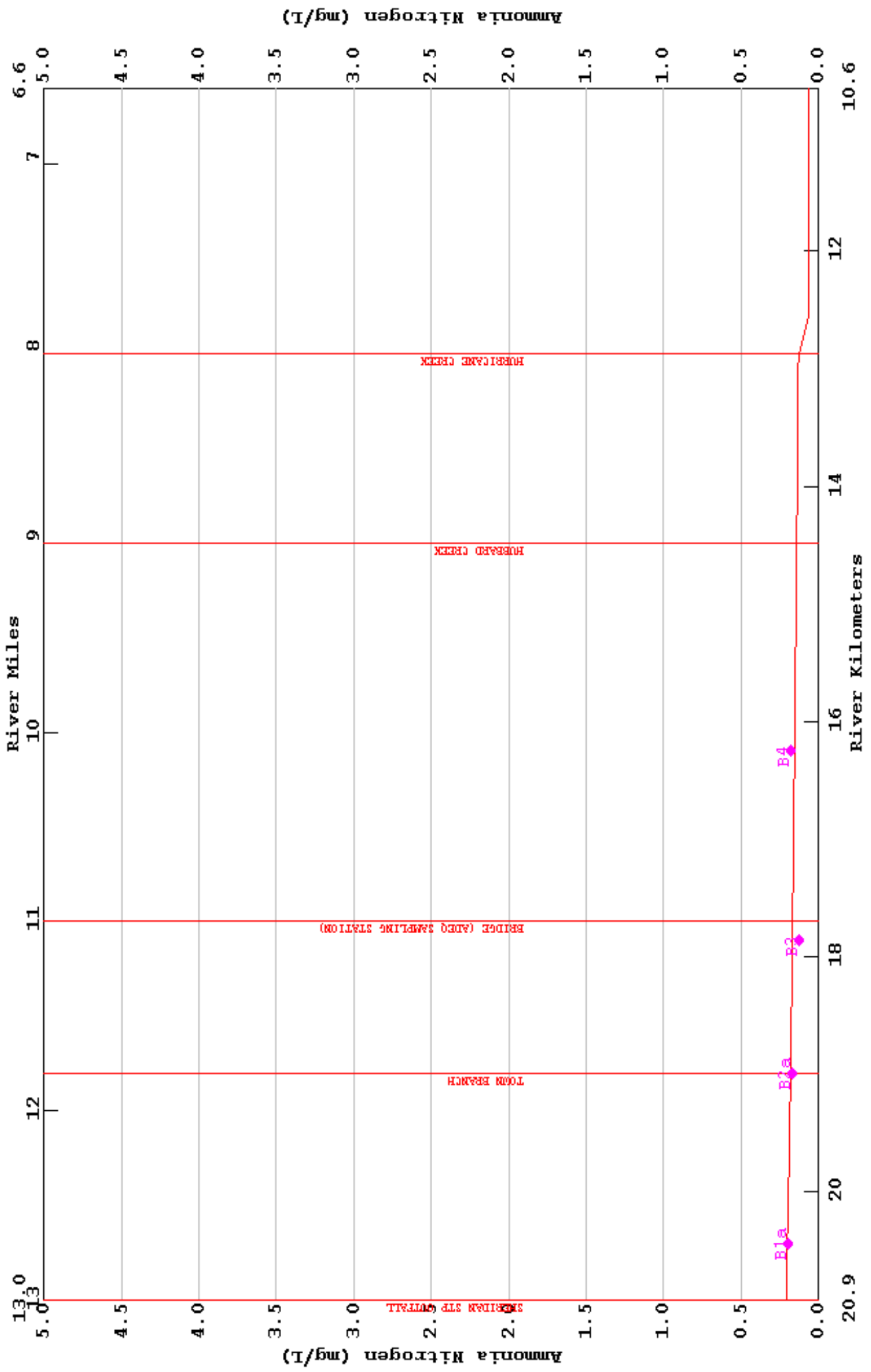
APPENDIX F

Model Output for Calibration

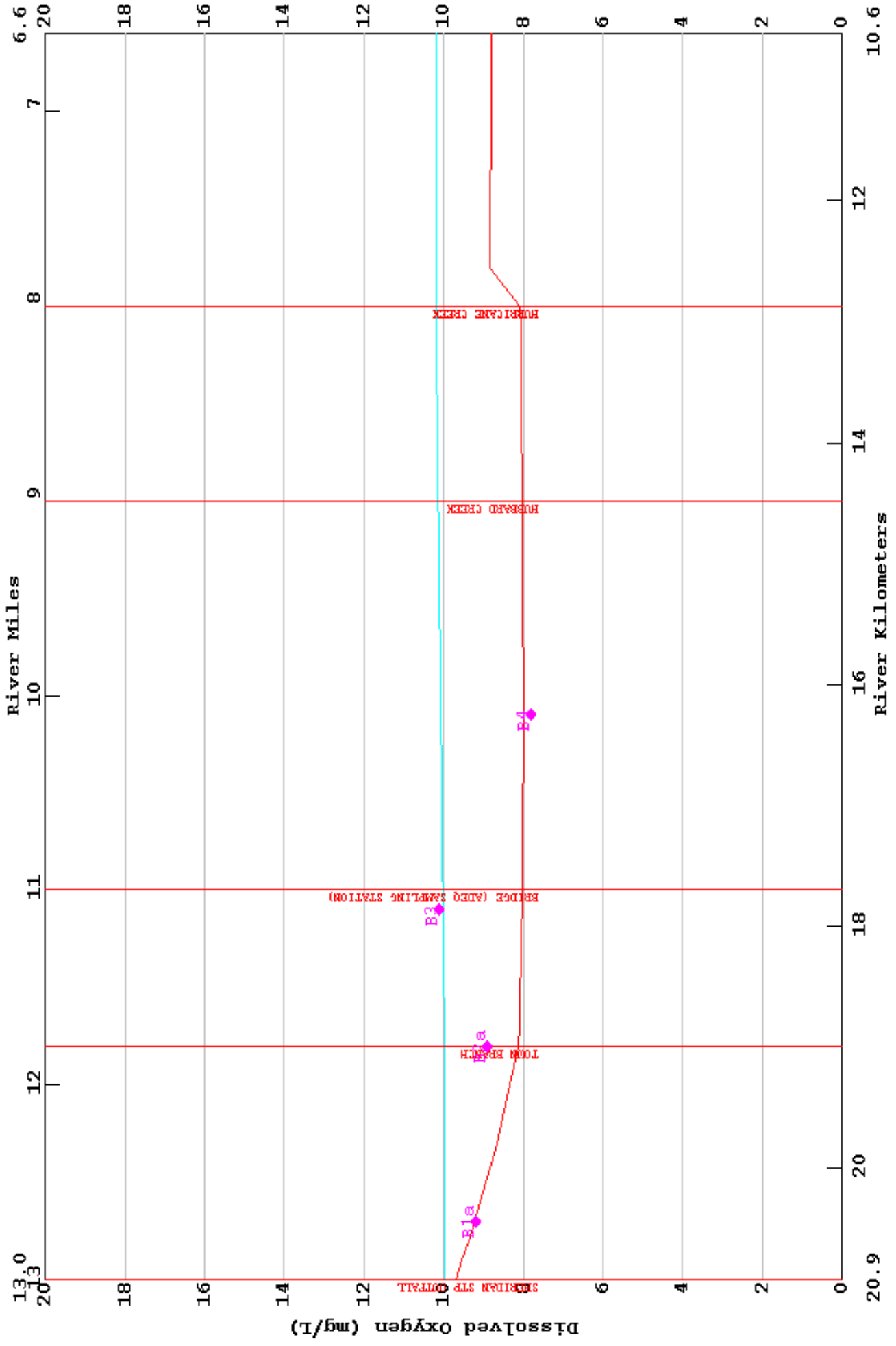
min= 8.03 max= 23.01



min= 0.06 max= 0.21



min= 8.00 max= 9.70



Dissolved Oxygen (mg/L)

Dissolved Oxygen (mg/L)

River Miles

River Kilometers

LA-QUAL Version 8.00
Louisiana Department of Environmental Quality

Input file is C:\WQMODELS\LA-QUAL\BigCal103105.txt
Output produced at 15:52 on 06/12/2006

\$\$\$ DATA TYPE 1 (TITLES AND CONTROL CARDS) \$\$\$

CARD TYPE	CONTROL TITLES
TITLE01	LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
TITLE02	Calibration for 10-31-05 Conditions
CNTROL03	NO SEQU <Warning: legacy control - line ignored>
CNTROL04	NO METR
CNTROL05	YES OXYG <Warning: legacy control - line ignored>

ENDATA01

\$\$\$ DATA TYPE 2 (MODEL OPTIONS) \$\$\$

CARD TYPE	MODEL OPTION
MODOPT01	NO TEMPERATURE
MODOPT02	NO SALINITY
MODOPT03	NO CONSERVATIVE MATERIAL #1 UNITS =
MODOPT04	NO CONSERVATIVE MATERIAL #2 UNITS =
MODOPT05	YES DISSOLVED OXYGEN
MODOPT06	YES BOD1 BIOCHEMICAL OXYGEN DEMAND #1
MODOPT07	NO BOD2 BIOCHEMICAL OXYGEN DEMAND #2
MODOPT08	YES NITROGEN SERIES
MODOPT09	NO PHOSPHORUS
MODOPT10	NO CHLOROPHYLL A
MODOPT11	NO MACROPHYTES
MODOPT12	NO COLIFORMS
MODOPT13	NO NONCONSERVATIVE MATERIAL UNITS =

ENDATA02

\$\$\$ DATA TYPE 3 (PROGRAM CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
PROGRAM	HYDRAULIC CALCULATION METHOD =	2.00000 (widths and depths)

ENDATA03

\$\$\$ DATA TYPE 4 (TEMPERATURE CORRECTION CONSTANTS FOR RATE COEFFICIENTS) \$\$\$

CARD TYPE	RATE CODE	THETA VALUE
-----------	-----------	-------------

ENDATA04

\$\$\$ CONSTANTS TYPE 5 (TEMPERATURE DATA) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
-----------	-------------------------	-------

ENDATA05

\$\$\$ DATA TYPE 6 (ALGAE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
-----------	-------------------------	-------

ENDATA06

\$\$\$ DATA TYPE 7 (MACROPHYTE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
-----------	-------------------------	-------

ENDATA07

\$\$\$ DATA TYPE 8 (REACH IDENTIFICATION DATA) \$\$\$

CARD TYPE	REACH	ID	NAME	BEGIN REACH mi	TO	END REACH mi	ELEM LENGTH mi	REACH LENGTH mi	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Big Crk -- STP to Town Branch	13.00	TO	11.80	0.1000	1.20	12	1	12
REACH ID	2	B2	Big Crk -- Town Branch to mouth	11.80	TO	8.00	0.1000	3.80	38	13	50
REACH ID	3	H1	Hurr Cr -- Big C to County Rd 67	8.00	TO	6.60	0.2000	1.40	7	51	57
REACH ID	4	H2	Hurr Cr -- Cnty Rd 67 to Hwy 35	6.60	TO	0.00	0.3000	6.60	22	58	79

ENDATA08

\$\$\$ DATA TYPE 9 (ADVECTIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	WIDTH "A"	WIDTH "B"	WIDTH "C"	DEPTH "D"	DEPTH "E"	DEPTH "F"	SLOPE	MANNINGS "N"
HYDR-1	1	B1	0.000	0.000	19.000	0.000	0.000	2.500	0.00000	0.000
HYDR-1	2	B2	0.000	0.000	19.000	0.000	0.000	1.700	0.00000	0.000
HYDR-1	3	H1	0.000	0.000	45.000	0.000	0.000	3.000	0.00000	0.000
HYDR-1	4	H2	0.000	0.000	45.000	0.000	0.000	3.000	0.00000	0.000

ENDATA09

\$\$\$ DATA TYPE 10 (DISPERSIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	TIDAL RANGE	DISPERSION "A"	DISPERSION "B"	DISPERSION "C"	DISPERSION "D"
-----------	-------	----	-------------	----------------	----------------	----------------	----------------

ENDATA10

\$\$\$ DATA TYPE 11 (INITIAL CONDITIONS) \$\$\$

CARD TYPE	REACH	ID	TEMP	SALIN	DO	NH3	NO3+2	PHOS	CHL A	MACRO
INITIAL	1	B1	15.50	0.00	9.00	0.20	0.00	0.00	0.00	0.00
INITIAL	2	B2	15.50	0.00	8.00	0.18	0.00	0.00	0.00	0.00
INITIAL	3	H1	14.50	0.00	9.00	0.10	0.00	0.00	0.00	0.00
INITIAL	4	H2	14.50	0.00	9.00	0.10	0.00	0.00	0.00	0.00

ENDATA11

\$\$\$ DATA TYPE 12 (REAERATION, SEDIMENT OXYGEN DEMAND, BOD COEFFICIENTS) \$\$\$

CARD TYPE	RCH NUM	RCH ID	K2 OPT	K2 "A"	K2 "B"	K2 "C"	BKGRND SOD mg/ft ² /d	BOD DECAT per day	BOD SETT ft/d	BOD CONV TO SOD	ANAER BOD2 DECAT per day	BOD2 DECAT per day	BOD2 SETT ft/d	BOD2 CONV TO SOD	ANAER BOD2 DECAT per day
COEFF-1	1	B1	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	3	H1	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	4	H2	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000

ENDATA12

\$\$\$ DATA TYPE 13 (NITROGEN AND PHOSPHORUS COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	ORG-N DECA	ORG-N SETT	ORGN CONV TO NH3 SRCE	NH3 DECA	NH3 SRCE	PHOS SRCE	DENIT RATE
COEFF-2	1	B1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	2	B2	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	3	H1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	4	H2	0.000	0.000	0.000	0.450	0.000	0.000	0.000

ENDATA13

\$\$\$ DATA TYPE 14 (ALGAE AND MACROPHYTE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	SECCHI DEPTH	ALGAE: CHL A	ALGAE SETT	ALG CONV TO SOD	ALGAE GROW	ALGAE RESP	MACRO GROW	MACRO RESP
-----------	-------	----	--------------	--------------	------------	-----------------	------------	------------	------------	------------

ENDATA14

\$\$\$ DATA TYPE 15 (COLIFORM AND NONCONSERVATIVE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECAT	NCM SETT	NCM CONV TO SOD
-----------	-------	----	------------------	-----------	----------	-----------------

ENDATA15

\$\$\$ DATA TYPE 16 (INCREMENTAL DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	OUTFLOW	INFLOW	TEMP	SALIN	CM-I	CM-II	IN/DIST	OUT/DIST
-----------	-------	----	---------	--------	------	-------	------	-------	---------	----------

ENDATA16

\$\$\$ DATA TYPE 17 (INCREMENTAL DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	REACH	ID	DO	BOD	ORG-N	NH3-N	NO3-N	BOD#2
-----------	-------	----	----	-----	-------	-------	-------	-------

ENDATA17

\$\$\$ DATA TYPE 18 (INCREMENTAL DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	PHOS	CHL A	COLI	NCM
-----------	-------	----	------	-------	------	-----

ENDATA18

\$\$\$ DATA TYPE 19 (NONPOINT SOURCE DATA) \$\$\$

CARD TYPE	REACH	ID	BOD#1	ORG-N	COLI	NCM	DO	BOD#2
NONPOINT	1	B1	53.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	2	B2	111.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	3	H1	28.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	4	H2	133.00	0.00	0.00	0.00	0.00	0.00

ENDATA19

\$\$\$ DATA TYPE 20 (HEADWATER FOR FLOW, TEMPERATURE, SALINITY AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	UNIT	FLOW m ³ /s	FLOW cfs	TEMP deg C	SALIN ppt	CM-I	CM-II
HDWTR-1	1	Big Creek U/S of STP	0	0.00000	0.000	15.50	0.00	0.000	0.000

ENDATA20

\$\$\$ DATA TYPE 21 (HEADWATER DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD#1 mg/L	ORG-N mg/L	NH3-N mg/L	NO3-N mg/L	BOD#2 mg/L
HDWTR-2	1	Big Creek U/S of STP	9.70	23.00	0.00	0.21	0.00	0.00

ENDATA21

\$\$\$ DATA TYPE 22 (HEADWATER DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L

ENDATA22

\$\$\$ DATA TYPE 23 (JUNCTION DATA) \$\$\$

CARD TYPE	JUNCTION ELEMENT	UPSTRM ELEMENT	RIVER KILOM	NAME

ENDATA23

\$\$\$ DATA TYPE 24 (WASTELOAD DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	RKILO	NAME	FLOW m ³ /s	FLOW cfs	FLOW MGD	TEMP deg C	SALIN ppt	CM-I	CM-II
WSTLD-1	1	13.00	Sheridan STP	0.19824	7.00000	4.525	15.50	0.00	0.000	0.000
WSTLD-1	13	11.80	Town Branch	0.00000	0.00000	0.000	15.50	0.00	0.000	0.000
WSTLD-1	41	9.00	Hubbard Creek	0.00000	0.00000	0.000	14.50	0.00	0.000	0.000
WSTLD-1	51	8.00	Hurricane Creek	0.67969	24.00000	15.514	14.50	0.00	0.000	0.000

ENDATA24

\$\$\$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD mg/L	% BOD RMVL	ORG-N mg/L	NH3-N mg/L	% NITRIF	NO3-N mg/L	BOD#2 mg/L
WSTLD-2	1	Sheridan STP	9.70	23.00	0.00	0.00	0.21	0.00	0.00	0.00
WSTLD-2	13	Town Branch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WSTLD-2	41	Hubbard Creek	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WSTLD-2	51	Hurricane Creek	9.10	3.90	0.00	0.00	0.05	0.00	0.00	0.00

ENDATA25

\$\$\$ DATA TYPE 26 (WASTELOAD DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
-----------	---------	------	--------------	---------------	--------------	-------------

ENDATA26

\$\$\$ DATA TYPE 27 (LOWER BOUNDARY CONDITIONS) \$\$\$

CARD TYPE	CONSTITUENT	CONCENTRATION
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ENDATA27

\$\$\$ DATA TYPE 28 (DAM DATA) \$\$\$

CARD TYPE	ELEMENT	NAME	EQN	"A"	"B"	"H"
-----------	---------	------	-----	-----	-----	-----

ENDATA28

\$\$\$ DATA TYPE 29 (SENSITIVITY ANALYSIS DATA) \$\$\$

CARD TYPE	PARAMETER	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8
-----------	-----------	-------	-------	-------	-------	-------	-------	-------	-------

ENDATA29

\$\$\$ DATA TYPE 30 (PLOT CONTROL CARDS) \$\$\$

NUMBER OF PLOTS = 1
NUMBER OF REACHES IN PLOT 1 = 3
PLOT RCH 1 2 3
ENDATA30

\$\$\$ DATA TYPE 31 (OVERLAY PLOT DATA) \$\$\$

OVERLAY 1 BigCreek.OVL :Predicted and Observed Values for Big Creek
ENDATA31

.....NO ERRORS DETECTED IN INPUT DATA
.....HYDRAULIC CALCULATIONS COMPLETED

....TRIDIAGONAL MATRIX TERMS INITIALIZED
OXYGEN DEPENDENT RATES CONVERGENT IN 1 ITERATIONS
CONSTITUENT CALCULATIONS COMPLETED
GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

FINAL REPORT Big Creek U/S of STP
 REACH NO. 1 Big Crk -- STP to Town Branch

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Calibration for 10-31-05 Conditions

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM	
1	HDWTR	0.00000	15.50	0.00	0.00	0.00	9.70	23.00	0.00	23.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00
1	WSTLD	7.00000	15.50	0.00	0.00	0.00	9.70	23.00	0.00	23.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
1	13.00	12.90	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
2	12.90	12.80	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
3	12.80	12.70	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
4	12.70	12.60	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
5	12.60	12.50	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
6	12.50	12.40	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
7	12.40	12.30	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
8	12.30	12.20	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
9	12.20	12.10	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
10	12.10	12.00	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
11	12.00	11.90	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
12	11.90	11.80	7.00000	100.0	0.14741	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.147
TOT						0.50			300876.97	120328.83					
AVG					0.1474		2.50	19.00			47.48				
CUM						0.50									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECAT	BOD#1 SETT	ABOD#1 DECAT	BOD#2 DECAT	BOD#2 SETT	ABOD#2 DECAT	BKGD SOD	FULL SOD	CORR SOD	ORGN DECAT	ORGN SETT	NH3 DECAT	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECAT	NCM DECAT	NCM SETT	
1	12.900	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	12.800	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	12.700	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	12.600	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	12.500	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

6	12.400	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	12.300	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	12.200	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	12.100	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	12.000	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	11.900	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	11.800	9.98	1.14	0.12	0.00	0.00	0.00	0.00	0.00105	0.00105	0.00105	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 1.25 0.15 0.00 0.00 0.00 0.00 0.00139.40 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
1	12.900	15.50	0.00	0.00	0.00	9.53	23.00	0.00	23.00	0.00	0.00	0.21	0.00	0.21	0.00	0.00	0.00	0.	0.00
2	12.800	15.50	0.00	0.00	0.00	9.37	23.00	0.00	23.00	0.00	0.00	0.20	0.01	0.21	0.00	0.00	0.00	0.	0.00
3	12.700	15.50	0.00	0.00	0.00	9.22	23.00	0.00	23.00	0.00	0.00	0.20	0.01	0.21	0.00	0.00	0.00	0.	0.00
4	12.600	15.50	0.00	0.00	0.00	9.07	23.00	0.00	23.00	0.00	0.00	0.20	0.01	0.21	0.00	0.00	0.00	0.	0.00
5	12.500	15.50	0.00	0.00	0.00	8.93	23.00	0.00	23.00	0.00	0.00	0.20	0.01	0.21	0.00	0.00	0.00	0.	0.00
6	12.400	15.50	0.00	0.00	0.00	8.80	23.00	0.00	23.00	0.00	0.00	0.19	0.02	0.21	0.00	0.00	0.00	0.	0.00
7	12.300	15.50	0.00	0.00	0.00	8.67	23.00	0.00	23.00	0.00	0.00	0.19	0.02	0.21	0.00	0.00	0.00	0.	0.00
8	12.200	15.50	0.00	0.00	0.00	8.55	23.00	0.00	23.00	0.00	0.00	0.19	0.02	0.21	0.00	0.00	0.00	0.	0.00
9	12.100	15.50	0.00	0.00	0.00	8.44	23.01	0.00	23.01	0.00	0.00	0.19	0.02	0.21	0.00	0.00	0.00	0.	0.00
10	12.000	15.50	0.00	0.00	0.00	8.33	23.01	0.00	23.01	0.00	0.00	0.18	0.03	0.21	0.00	0.00	0.00	0.	0.00
11	11.900	15.50	0.00	0.00	0.00	8.22	23.01	0.00	23.01	0.00	0.00	0.18	0.03	0.21	0.00	0.00	0.00	0.	0.00
12	11.800	15.50	0.00	0.00	0.00	8.12	23.01	0.00	23.01	0.00	0.00	0.18	0.03	0.21	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 REACH NO. 2 Big Crk -- Town Branch to mouth Calibration for 10-31-05 Conditions

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
13	UPR RCH	7.00000	15.50	0.00	0.00	0.00	8.12	23.01	0.00	23.01	0.00	0.00	0.18	0.03	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
13	11.80	11.70	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
14	11.70	11.60	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
15	11.60	11.50	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
16	11.50	11.40	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217

17	11.40	11.30	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
18	11.30	11.20	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
19	11.20	11.10	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
20	11.10	11.00	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
21	11.00	10.90	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
22	10.90	10.80	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
23	10.80	10.70	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
24	10.70	10.60	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
25	10.60	10.50	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
26	10.50	10.40	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
27	10.40	10.30	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
28	10.30	10.20	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
29	10.20	10.10	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
30	10.10	10.00	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
31	10.00	9.90	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
32	9.90	9.80	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
33	9.80	9.70	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
34	9.70	9.60	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
35	9.60	9.50	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
36	9.50	9.40	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
37	9.40	9.30	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
38	9.30	9.20	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
39	9.20	9.10	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
40	9.10	9.00	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
41	9.00	8.90	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
42	8.90	8.80	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
43	8.80	8.70	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
44	8.70	8.60	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
45	8.60	8.50	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
46	8.50	8.40	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
47	8.40	8.30	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
48	8.30	8.20	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
49	8.20	8.10	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
50	8.10	8.00	7.00000	100.0	0.21678	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.217
TOT						1.07			647888.38	381041.19					
AVG					0.2168		1.70	19.00			32.29				
CUM						1.57									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECAy 1/da	BOD#1 SETT 1/da	ABOD#1 DECAy 1/da	BOD#2 DECAy 1/da	BOD#2 SETT 1/da	ABOD#2 DECAy 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECAy 1/da	ORGN SETT 1/da	NH3 DECAy 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECAy 1/da	NCM DECAy 1/da	NCM SETT 1/da
13	11.700	9.98	2.47	0.12	0.00	0.00	0.00	0.00	0.00104.83104.83104.83				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	11.600	9.99	2.47	0.12	0.00	0.00	0.00	0.00	0.00104.65104.65104.65				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	11.500	9.99	2.47	0.12	0.00	0.00	0.00	0.00	0.00104.48104.48104.48				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	11.400	10.00	2.46	0.12	0.00	0.00	0.00	0.00	0.00104.31104.31104.31				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	11.300	10.00	2.46	0.12	0.00	0.00	0.00	0.00	0.00104.13104.13104.13				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	11.200	10.01	2.46	0.12	0.00	0.00	0.00	0.00	0.00103.96103.96103.96				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	11.100	10.02	2.46	0.12	0.00	0.00	0.00	0.00	0.00103.79103.79103.79				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	11.000	10.02	2.46	0.12	0.00	0.00	0.00	0.00	0.00103.62103.62103.62				0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

26	10.400	15.13	0.00	0.00	0.00	8.00	22.99	0.00	22.99	0.00	0.00	0.16	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00
27	10.300	15.11	0.00	0.00	0.00	8.00	22.99	0.00	22.99	0.00	0.00	0.16	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00
28	10.200	15.08	0.00	0.00	0.00	8.00	22.99	0.00	22.99	0.00	0.00	0.16	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00
29	10.100	15.05	0.00	0.00	0.00	8.00	22.99	0.00	22.99	0.00	0.00	0.16	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00
30	10.000	15.03	0.00	0.00	0.00	8.00	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
31	9.900	15.00	0.00	0.00	0.00	8.00	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
32	9.800	14.97	0.00	0.00	0.00	8.00	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
33	9.700	14.95	0.00	0.00	0.00	8.01	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
34	9.600	14.92	0.00	0.00	0.00	8.01	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
35	9.500	14.89	0.00	0.00	0.00	8.01	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
36	9.400	14.87	0.00	0.00	0.00	8.01	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
37	9.300	14.84	0.00	0.00	0.00	8.02	22.99	0.00	22.99	0.00	0.00	0.15	0.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00
38	9.200	14.82	0.00	0.00	0.00	8.02	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
39	9.100	14.79	0.00	0.00	0.00	8.02	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
40	9.000	14.76	0.00	0.00	0.00	8.03	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
41	8.900	14.74	0.00	0.00	0.00	8.03	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
42	8.800	14.71	0.00	0.00	0.00	8.04	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
43	8.700	14.68	0.00	0.00	0.00	8.04	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
44	8.600	14.66	0.00	0.00	0.00	8.05	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
45	8.500	14.63	0.00	0.00	0.00	8.05	23.00	0.00	23.00	0.00	0.00	0.14	0.07	0.21	0.00	0.00	0.00	0.00	0.00	0.00
46	8.400	14.61	0.00	0.00	0.00	8.06	23.00	0.00	23.00	0.00	0.00	0.13	0.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00
47	8.300	14.58	0.00	0.00	0.00	8.06	23.01	0.00	23.01	0.00	0.00	0.13	0.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00
48	8.200	14.55	0.00	0.00	0.00	8.07	23.01	0.00	23.01	0.00	0.00	0.13	0.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00
49	8.100	14.53	0.00	0.00	0.00	8.08	23.01	0.00	23.01	0.00	0.00	0.13	0.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00
50	8.000	14.50	0.00	0.00	0.00	8.08	23.01	0.00	23.01	0.00	0.00	0.13	0.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00

FINAL REPORT Big Creek U/S of STP
REACH NO. 3 Hurr Cr -- Big C to County Rd 67

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Calibration for 10-31-05 Conditions

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM	
51	UPR RCH	7.00000	14.50	0.00	0.00	0.00	8.08	23.01	0.00	23.01	0.00	0.00	0.13	0.08	0.00	0.00	0.00	0.00	0.00
51	WSTLD	24.00000	14.50	0.00	0.00	0.00	9.10	3.90	0.00	3.90	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
51	8.00	7.80	31.00000	100.0	0.22969	0.05	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.230
52	7.80	7.60	31.00000	100.0	0.22969	0.05	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.230
53	7.60	7.40	31.00000	100.0	0.22969	0.05	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.230
54	7.40	7.20	31.00000	100.0	0.22969	0.05	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.230
55	7.20	7.00	31.00000	100.0	0.22969	0.05	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.230
56	7.00	6.80	31.00000	100.0	0.22969	0.05	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.230
57	6.80	6.60	31.00000	100.0	0.22969	0.05	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.230

TOT 0.37 997644.62 332487.53
 AVG 0.2297 3.00 45.00 134.94
 CUM 1.94

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECAY	BOD#1 SETT	ABOD#1 DECAY	BOD#2 DECAY	BOD#2 SETT	ABOD#2 DECAY	BKGD SOD	FULL SOD	CORR SOD	ORGN DECAY	ORGN SETT	NH3 DECAY	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECAY	NCM DECAY	NCM SETT
		mg/L	1/da	1/da	1/da	1/da	1/da	1/da	1/da	*	*	*	1/da	1/da	1/da	*	1/da	*	**	**	1/da	1/da	1/da
51	7.800	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	7.600	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	7.400	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	7.200	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	7.000	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	6.800	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	6.600	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			1.19	0.15	0.00	0.00	0.00	0.00	0.00	79.00			0.00	0.00	0.45	0.00	0.00	0.00			0.00	0.00	0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
51	7.800	14.50	0.00	0.00	0.00	8.86	8.19	0.00	8.19	0.00	0.00	0.07	0.02	0.09	0.00	0.00	0.00	0.	0.00
52	7.600	14.50	0.00	0.00	0.00	8.84	8.16	0.00	8.16	0.00	0.00	0.07	0.02	0.09	0.00	0.00	0.00	0.	0.00
53	7.400	14.50	0.00	0.00	0.00	8.83	8.14	0.00	8.14	0.00	0.00	0.07	0.02	0.09	0.00	0.00	0.00	0.	0.00
54	7.200	14.50	0.00	0.00	0.00	8.82	8.11	0.00	8.11	0.00	0.00	0.06	0.02	0.09	0.00	0.00	0.00	0.	0.00
55	7.000	14.50	0.00	0.00	0.00	8.81	8.08	0.00	8.08	0.00	0.00	0.06	0.02	0.09	0.00	0.00	0.00	0.	0.00
56	6.800	14.50	0.00	0.00	0.00	8.80	8.06	0.00	8.06	0.00	0.00	0.06	0.02	0.09	0.00	0.00	0.00	0.	0.00
57	6.600	14.50	0.00	0.00	0.00	8.79	8.03	0.00	8.03	0.00	0.00	0.06	0.02	0.09	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 4 Hurr Cr -- Cnty Rd 67 to Hwy 35

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Calibration for 10-31-05 Conditions

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
58	UPR RCH	31.00000	14.50	0.00	0.00	0.00	8.79	8.03	0.00	8.03	0.00	0.00	0.06	0.02	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
58	6.60	6.30	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
59	6.30	6.00	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
60	6.00	5.70	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
61	5.70	5.40	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
62	5.40	5.10	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
63	5.10	4.80	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
64	4.80	4.50	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
65	4.50	4.20	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
66	4.20	3.90	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
67	3.90	3.60	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
68	3.60	3.30	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
69	3.30	3.00	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
70	3.00	2.70	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
71	2.70	2.40	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
72	2.40	2.10	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
73	2.10	1.80	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
74	1.80	1.50	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
75	1.50	1.20	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
76	1.20	0.90	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
77	0.90	0.60	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
78	0.60	0.30	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
79	0.30	0.00	31.00000	100.0	0.22969	0.08	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.230
TOT						1.76			4703182.50	1567441.38					
AVG					0.2297		3.00	45.00			134.94				
CUM						3.70									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECA 1/da	BOD#1 SETT 1/da	ABOD#1 DECA 1/da	BOD#2 DECA 1/da	BOD#2 SETT 1/da	ABOD#2 DECA 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECA 1/da	ORGN SETT 1/da	NH3 DECA 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECA 1/da	NCM DECA 1/da	NCM SETT 1/da	
58	6.300	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	6.000	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	5.700	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	5.400	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	5.100	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	4.800	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	4.500	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	4.200	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	3.900	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	3.600	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	3.300	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3.000	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	2.700	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	2.400	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

72	2.100	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	1.800	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	1.500	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	1.200	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	0.900	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	0.600	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.300	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	0.000	10.19	1.06	0.12	0.00	0.00	0.00	0.00	0.00	55.87	55.87	55.87	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			1.19	0.15	0.00	0.00	0.00	0.00	0.00	79.00			0.00	0.00	0.45	0.00	0.00	0.00			0.00	0.00	0.00
* mg/ft ² /d				** mg/L/day																			

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
58	6.300	14.50	0.00	0.00	0.00	8.77	7.99	0.00	7.99	0.00	0.00	0.06	0.03	0.09	0.00	0.00	0.00	0.	0.00
59	6.000	14.50	0.00	0.00	0.00	8.76	7.95	0.00	7.95	0.00	0.00	0.06	0.03	0.09	0.00	0.00	0.00	0.	0.00
60	5.700	14.50	0.00	0.00	0.00	8.75	7.92	0.00	7.92	0.00	0.00	0.06	0.03	0.09	0.00	0.00	0.00	0.	0.00
61	5.400	14.50	0.00	0.00	0.00	8.74	7.88	0.00	7.88	0.00	0.00	0.06	0.03	0.09	0.00	0.00	0.00	0.	0.00
62	5.100	14.50	0.00	0.00	0.00	8.74	7.84	0.00	7.84	0.00	0.00	0.05	0.03	0.09	0.00	0.00	0.00	0.	0.00
63	4.800	14.50	0.00	0.00	0.00	8.73	7.81	0.00	7.81	0.00	0.00	0.05	0.03	0.09	0.00	0.00	0.00	0.	0.00
64	4.500	14.50	0.00	0.00	0.00	8.72	7.77	0.00	7.77	0.00	0.00	0.05	0.03	0.09	0.00	0.00	0.00	0.	0.00
65	4.200	14.50	0.00	0.00	0.00	8.72	7.73	0.00	7.73	0.00	0.00	0.05	0.04	0.09	0.00	0.00	0.00	0.	0.00
66	3.900	14.50	0.00	0.00	0.00	8.72	7.70	0.00	7.70	0.00	0.00	0.05	0.04	0.09	0.00	0.00	0.00	0.	0.00
67	3.600	14.50	0.00	0.00	0.00	8.71	7.66	0.00	7.66	0.00	0.00	0.05	0.04	0.09	0.00	0.00	0.00	0.	0.00
68	3.300	14.50	0.00	0.00	0.00	8.71	7.63	0.00	7.63	0.00	0.00	0.05	0.04	0.09	0.00	0.00	0.00	0.	0.00
69	3.000	14.50	0.00	0.00	0.00	8.71	7.60	0.00	7.60	0.00	0.00	0.05	0.04	0.09	0.00	0.00	0.00	0.	0.00
70	2.700	14.50	0.00	0.00	0.00	8.71	7.56	0.00	7.56	0.00	0.00	0.05	0.04	0.09	0.00	0.00	0.00	0.	0.00
71	2.400	14.50	0.00	0.00	0.00	8.71	7.53	0.00	7.53	0.00	0.00	0.04	0.04	0.09	0.00	0.00	0.00	0.	0.00
72	2.100	14.50	0.00	0.00	0.00	8.71	7.49	0.00	7.49	0.00	0.00	0.04	0.04	0.09	0.00	0.00	0.00	0.	0.00
73	1.800	14.50	0.00	0.00	0.00	8.71	7.46	0.00	7.46	0.00	0.00	0.04	0.04	0.09	0.00	0.00	0.00	0.	0.00
74	1.500	14.50	0.00	0.00	0.00	8.71	7.43	0.00	7.43	0.00	0.00	0.04	0.04	0.09	0.00	0.00	0.00	0.	0.00
75	1.200	14.50	0.00	0.00	0.00	8.71	7.39	0.00	7.39	0.00	0.00	0.04	0.05	0.09	0.00	0.00	0.00	0.	0.00
76	0.900	14.50	0.00	0.00	0.00	8.71	7.36	0.00	7.36	0.00	0.00	0.04	0.05	0.09	0.00	0.00	0.00	0.	0.00
77	0.600	14.50	0.00	0.00	0.00	8.71	7.33	0.00	7.33	0.00	0.00	0.04	0.05	0.09	0.00	0.00	0.00	0.	0.00
78	0.300	14.50	0.00	0.00	0.00	8.71	7.30	0.00	7.30	0.00	0.00	0.04	0.05	0.09	0.00	0.00	0.00	0.	0.00
79	0.000	14.50	0.00	0.00	0.00	8.71	7.27	0.00	7.27	0.00	0.00	0.04	0.05	0.09	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Big Creek U/S of STP

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Calibration for 10-31-05 Conditions

TRAVEL TIME = 3.70 DAYS
 MAXIMUM EFFLUENT = 100.00 PERCENT
 FLOW = 7.00000 TO 31.00000 cfs
 DISPERSION = 0.00000 TO 0.00000 ft²/s
 VELOCITY = 0.14741 TO 0.22969 fps
 DEPTH = 1.70 TO 3.00 ft

WIDTH	=	19.00	TO	45.00	ft
BOD DECAY	=	0.12	TO	0.12	per day
NH3 DECAY	=	0.29	TO	0.31	per day
SOD	=	55.87	TO	105.00	mg/ft ² /d
NH3 SOURCE	=	0.00	TO	0.00	mg/ft ² /d
REAERATION	=	1.06	TO	2.47	per day
BOD SETTLING	=	0.00	TO	0.00	per day
ORG-N DECAY	=	0.00	TO	0.00	per day
ORG-N SETTLING	=	0.00	TO	0.00	per day
TEMPERATURE	=	14.50	TO	15.50	deg C
DISSOLVED OXYGEN	=	8.00	TO	9.53	mg/L

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Calibration for 10-31-05 Conditions

REACH SUMMARY REPORT FOR Big Creek U/S of STP

RCH NO.	REACH NAME	BEGIN DIST km	ENDING DIST km	REACH LENGTH km	TRAVEL TIME days	FLOW AT EOR m3/s	AVERAGE VELO m/s	AVG DEPTH m	AVG WIDTH m	FLOW AT EOR cfs	AVERAGE VELO fps	AVG DEPTH ft	AVG WIDTH ft
1	Big Crk -- STP to Town Branch	20.92	18.99	1.93	0.50	0.19824	0.04493	0.762	5.79	7.000	0.147	2.500	19.00
2	Big Crk -- Town Branch to mouth	18.99	12.87	6.12	1.07	0.19824	0.06607	0.518	5.79	7.000	0.217	1.700	19.00
3	Hurr Cr -- Big C to County Rd 67	12.87	10.62	2.25	0.37	0.87794	0.07001	0.914	13.72	31.000	0.230	3.000	45.00
4	Hurr Cr -- Cnty Rd 67 to Hwy 35	10.62	0.00	10.62	1.76	0.87794	0.07001	0.914	13.72	31.000	0.230	3.000	45.00

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Calibration for 10-31-05 Conditions

INPUT/OUTPUT LOADING SUMMARY

	FLOW cfs	DO lb/d	BOD#1 lb/d	BOD#2 lb/d	ORG-N lb/d	NH3-N lb/d	NO3-N lb/d	PHOS lb/d	CHL A	NCM
HEADWATER FLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL INFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL OUTFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASTELoads	31.000	1544.7	1373.7	0.0	0.0	14.4	0.0	0.0	0.0	0.0
WITHDRAWALS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-31.000	-1457.1	-1215.5	0.0	0.0	-6.2	-8.2	0.0	0.0	0.0
DISPERSION THRU LOWER BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DISPERSION THRU HDWTR BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NON-POINT INPUT		0.0	325.0	0.0	0.0					0.0
NATURAL REAERATION		778.5								
DAM REAERATION		0.0								
BACKGROUND SOD		-347.4								
BOD#1 DECAY		-483.2	-483.2							
BOD#1 SETTLING		0.0	0.0							
ANAEROBIC BOD#1 DECAY			0.0							
BOD#2 DECAY		0.0		0.0						
BOD#2 SETTLING		0.0		0.0						
ANAEROBIC BOD#2 DECAY				0.0						
ORG-N DECAY		0.0			0.0	0.0				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-35.6				-8.2	8.2			
BACKGROUND NH3 SOURCE						0.0				
OTHER DENITRIFICATION							0.0			
PHOSPHORUS SOURCE								0.0		
ALGAE PHOTOSYNTHESIS		0.0				0.0	0.0	0.0	0.0	
ALGAE RESPIRATION		0.0				0.0		0.0	0.0	
ALGAE SETTLING		0.0							0.0	
MACRO PHOTOSYNTHESIS		0.0				0.0	0.0	0.0		
NCM DECAY		0.0								0.0
NCM SETTLING		0.0								0.0
TOTAL INPUTS	31.000	2323.2	1698.7	0.0	0.0	14.4	8.2	0.0	0.0	0.0
TOTAL OUTPUTS	-31.000	-2323.2	-1698.7	0.0	0.0	-14.4	-8.2	0.0	0.0	0.0
NET CONVERGENCE ERROR	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

.....EXECUTION COMPLETED

APPENDIX G

Calculation of Model Inputs from ADEQ Water Quality Data

TABLE G.1. ADEQ DATA FOR BIG CREEK AT OUA18 -- GROUPED BY PROJECTION CONDITIONS

Info used to match sampling conditions with projection conditions				Winter (data collected when temperature is 10 C or less)			Spawning period (data collected during Mar-May when flow is 15 cfs or higher)				Primary season (data collected when temperature is 22 C or less)			Summer (data collected when temperature is more than 22 C)				
Date	Temp at OUA18 (C)	Flow at Hurricane Creek gages (cfs)		Estimated flow in Big Creek u/s of 001 (cfs)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	Temp (C)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	Temp (C)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)
		07363300 (Hwy 270)	07363400 (Hwy 35)															
09/04/90	25.0	1.5		0.1	--	--	--	--	--	--	--	--	--	--	25.0	4%	3.2	0.92
10/02/90	20.0	7.3		0.4	--	--	--	--	--	--	--	missing	7.4	1.54	--	--	--	--
10/30/90	11.0	36.0		2.1	--	--	--	--	--	--	--	28%	1.9	0.17	--	--	--	--
11/27/90	17.0	50.0		2.9	--	--	--	--	--	--	--	22%	1.4	0.07	--	--	--	--
01/22/91	5.0	230.0		13.4	85%	2.0	0.18	--	--	--	--	85%	2.0	0.18	--	--	--	--
02/19/91	12.0	258.0		15.1	--	--	--	--	--	--	--	84%	2.8	0.10	--	--	--	--
03/26/91	21.0	90.0		5.3	--	--	--	--	--	--	--	45%	3.0	0.41	--	--	--	--
04/16/91	16.0	700.0		40.8	--	--	--	16.0	77%	1.8	0.20	77%	1.8	0.20	--	--	--	--
05/07/91	17.0	327.0		19.1	--	--	--	17.0	75%	1.9	0.09	75%	1.9	0.09	--	--	--	--
06/04/91	26.0	35.0		2.0	--	--	--	--	--	--	--	--	--	--	26.0	20%	5.3	1.08
07/02/91	26.0	26.0		1.5	--	--	--	--	--	--	--	--	--	--	26.0	7%	2.3	1.28
07/30/91	25.0	48.0		2.8	--	--	--	--	--	--	--	--	--	--	25.0	25%	4.5	0.06
09/17/91	24.0	20.0		1.2	--	--	--	--	--	--	--	--	--	--	24.0	6%	11.2	--
10/08/91	13.0	7.5		0.4	--	--	--	--	--	--	--	3%	18.4	--	--	--	--	--
11/12/91	8.0	24.0		1.4	40%	6.5	3.12	--	--	--	--	40%	6.5	3.12	--	--	--	--
12/10/91	11.0	586.0		34.2	--	--	--	--	--	--	--	76%	2.0	0.14	--	--	--	--
01/28/92	8.0	115.0		6.7	87%	1.3	0.16	--	--	--	--	87%	1.3	0.16	--	--	--	--
02/25/92	12.0	117.0		6.8	--	--	--	--	--	--	--	74%	1.9	0.14	--	--	--	--
03/03/92	15.0	109.0		6.4	--	--	--	--	--	--	--	75%	1.2	0.11	--	--	--	--
04/07/92	13.0	98.0		5.7	--	--	--	--	--	--	--	70%	VOID	0.08	--	--	--	--
05/19/92	22.0	59.0		3.4	--	--	--	--	--	--	--	14%	3.3	1.39	--	--	--	--
06/22/92	22.0	36.0		2.1	--	--	--	--	--	--	--	44%	2.5	0.21	--	--	--	--
07/14/92	26.0	7.6		0.4	--	--	--	--	--	--	--	--	--	--	26.0	6%	6.0	1.50
08/11/92	25.0	30.0		1.8	--	--	--	--	--	--	--	--	--	--	25.0	11%	4.0	0.15
11/23/92	11.0	108.0		6.3	--	--	--	--	--	--	--	49%	3.6	0.10	--	--	--	--
01/05/93	9.0	331.0		19.3	74%	4.1	0.38	--	--	--	--	74%	4.1	0.38	--	--	--	--
02/02/93	6.0	107.0		6.2	68%	3.4	0.64	--	--	--	--	68%	3.4	0.64	--	--	--	--
03/02/93	9.0	220.0		12.8	75%	3.0	0.08	--	--	--	--	75%	3.0	0.08	--	--	--	--
03/30/93	18.0	103.0		6.0	--	--	--	--	--	--	--	72%	1.9	VOID	--	--	--	--
05/04/93	17.0	1280.0		74.7	--	--	--	17.0	69%	2.0	0.24	69%	2.0	0.24	--	--	--	--
06/01/93	18.0	48.0		2.8	--	--	--	--	--	--	--	17%	2.2	0.48	--	--	--	--
06/14/93	24.0	56.0		3.3	--	--	--	--	--	--	--	--	--	--	24.0	30%	2.4	0.22
10/12/93	12.0	10.0		0.6	--	--	--	--	--	--	--	24%	1.4	0.29	--	--	--	--
11/16/93	12.0	56.0		3.3	--	--	--	--	--	--	--	16%	4.8	(BDL)	--	--	--	--
12/21/93	5.0	137.0		8.0	69%	1.0	1.23	--	--	--	--	69%	1.0	1.23	--	--	--	--
01/11/94	6.0	105.0		6.1	84%	1.3	(BDL)	--	--	--	--	84%	1.3	(BDL)	--	--	--	--
02/22/94	11.0	516.0		30.1	--	--	--	--	--	--	--	86%	3.4	0.06	--	--	--	--
03/01/94	9.0	244.0		14.2	83%	0.8	0.31	--	--	--	--	83%	0.8	0.31	--	--	--	--
04/12/94	17.0	876.0		51.1	--	--	--	17.0	63%	3.6	(BDL)	63%	3.6	(BDL)	--	--	--	--
05/17/94	20.0	96.0		5.6	--	--	--	--	--	--	--	58%	1.8	0.15	--	--	--	--
07/05/94	27.0	30.0		1.8	--	--	--	--	--	--	--	--	--	--	27.0	25%	7.2	(BDL)
08/02/94	23.0	41.0		2.4	--	--	--	--	--	--	--	--	--	--	23.0	54%	0.6	0.22
08/30/94	23.0	15.0		0.9	--	--	--	--	--	--	--	--	--	--	23.0	26%	1.7	0.16
10/11/94	16.0	28.0		1.6	--	--	--	--	--	--	--	57%	VOID	(BDL)	--	--	--	--
11/08/94	14.0	392.0		22.9	--	--	--	--	--	--	--	79%	3.7	0.09	--	--	--	--
12/06/94	14.0	47.0		2.7	--	--	--	--	--	--	--	70%	3.7	0.40	--	--	--	--

Info used to match sampling conditions with projection conditions				Winter (data collected when temperature is 10 C or less)			Spawning period (data collected during Mar-May when flow is 15 cfs or higher)				Primary season (data collected when temperature is 22 C or less)			Summer (data collected when temperature is more than 22 C)				
Date	Temp at OUA18 (C)	Flow at Hurricane Creek gages (cfs)		Estimated flow in Big Creek u/s of 001 (cfs)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	Temp (C)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	Temp (C)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)
		07363300 (Hwy 270)	07363400 (Hwy 35)															
01/17/95	9.0	111.0		6.5	80%	1.5	0.29	--	--	--	--	80%	1.5	0.29	--	--	--	--
03/21/95	16.0	210.0		12.3	--	--	--	--	--	--	--	72%	2.8	0.30	--	--	--	--
05/30/95	21.0	103.0		6.0	--	--	--	--	--	--	--	34%	2.8	0.30	--	--	--	--
01/16/96	7.0		15.0	0.7	42%	3.0	0.07	--	--	--	--	42%	3.0	0.07	--	--	--	--
02/20/96	10.0		159.0	7.2	77%	--	0.62	--	--	--	--	77%	--	0.62	--	--	--	--
03/26/96	9.0		69.0	3.1	79%	6.9	0.45	--	--	--	--	79%	6.9	0.45	--	--	--	--
04/16/96	13.0		576.0	26.3	--	--	--	13.0	58%	2.2	0.14	58%	2.2	0.14	--	--	--	--
04/30/96	13.0		59.0	2.7	--	--	--	--	--	--	--	46%	3.6	0.31	--	--	--	--
06/11/96	20.0		69.0	3.1	--	--	--	--	--	--	--	30%	2.4	0.26	--	--	--	--
07/09/96	24.0		19.0	0.9	--	--	--	--	--	--	--	--	--	--	24.0	19%	3.3	1.29
09/24/96	20.0		32.0	1.5	--	--	--	--	--	--	--	70%	2.2	0.18	--	--	--	--
11/19/96	13.0		260.0	11.9	--	--	--	--	--	--	--	67%	2.1	(BDL)	--	--	--	--
12/10/96	12.0		340.0	15.5	--	--	--	--	--	--	--	74%	1.3	0.24	--	--	--	--
01/07/97	8.0		180.0	8.2	75%	0.6	0.07	--	--	--	--	75%	0.6	0.07	--	--	--	--
02/04/97	10.0		1540.0	70.2	77%	2.8	0.12	--	--	--	--	77%	2.8	0.12	--	--	--	--
03/18/97	17.0		1060.0	48.3	--	--	--	17.0	80%	2.2	0.18	80%	2.2	0.18	--	--	--	--
04/22/97	17.0		106.0	4.8	--	--	--	--	--	--	--	28%	5.1	1.51	--	--	--	--
05/20/97	19.0		30.0	1.4	--	--	--	--	--	--	--	14%	3.3	1.33	--	--	--	--
06/10/97	21.0		23.0	1.0	--	--	--	--	--	--	--	12%	3.5	1.13	--	--	--	--
07/08/97	24.0		35.0	1.6	--	--	--	--	--	--	--	--	--	--	24.0	31%	1.8	0.37
08/05/97	26.0		13.0	0.6	--	--	--	--	--	--	--	--	--	--	26.0	28%	2.6	3.07
12/09/97	7.0		242.0	11.0	81%	2.1	0.04	--	--	--	--	81%	2.1	0.04	--	--	--	--
02/03/98	9.0		203.0	9.3	76%	1.9	0.67	--	--	--	--	76%	1.9	0.67	--	--	--	--
03/03/98	7.0		272.0	12.4	81%	3.1	0.33	--	--	--	--	81%	3.1	0.33	--	--	--	--
03/31/98	18.0		192.0	8.8	--	--	--	--	--	--	--	72%	>8.02	0.08	--	--	--	--
05/05/98	17.0		32.0	1.5	--	--	--	--	--	--	--	17%	1.9	0.74	--	--	--	--
12/21/98	14.0		362.0	16.5	--	--	--	--	--	--	--	78%	1.6	0.08	--	--	--	--
01/19/99	8.0		197.0	9.0	63%	--	0.11	--	--	--	--	63%	--	0.11	--	--	--	--
02/09/99	15.0		532.0	24.3	--	--	--	--	--	--	--	117%	3.6	0.47	--	--	--	--
03/08/99	10.0		135.0	6.2	97%	3.6	0.32	--	--	--	--	97%	3.6	0.32	--	--	--	--
04/13/99	17.0		390.0	17.8	--	--	--	17.0	41%	4.7	0.19	41%	4.7	0.19	--	--	--	--
05/18/99	21.0		111.0	5.1	--	--	--	--	--	--	--	43%	6.2	0.45	--	--	--	--
06/08/99	25.0		35.0	1.6	--	--	--	--	--	--	--	--	--	--	25.0	18%	3.6	0.39
12/20/99	17.0		19.0	0.9	--	--	--	--	--	--	--	92%	7.6	2.34	--	--	--	--
04/11/00	15.0		71.0	3.2	--	--	--	--	--	--	--	57%	7.8	0.28	--	--	--	--
05/30/00	24.0		132.0	6.0	--	--	--	--	--	--	--	--	--	--	24.0	37%	4.6	0.07
06/27/00	26.0		101.0	4.6	--	--	--	--	--	--	--	--	--	--	26.0	24%	6.6	0.30
11/14/00	9.0		12.0	0.5	64%	7.7	1.46	--	--	--	--	64%	7.7	1.46	--	--	--	--
01/30/01	10.0		781.0	35.6	75%	4.2	0.21	--	--	--	--	75%	4.2	0.21	--	--	--	--
02/20/01	9.0		2850.0	129.9	90%	2.1	0.51	--	--	--	--	90%	2.1	0.51	--	--	--	--
03/20/01	11.0		899.0	41.0	--	--	--	11.0	90%	3.0	0.07	90%	3.0	0.07	--	--	--	--
04/24/01	16.0		158.0	7.2	--	--	--	--	--	--	--	59%	3.0	0.28	--	--	--	--
05/22/01	18.0		5.3	0.2	--	--	--	--	--	--	--	57%	3.8	0.15	--	--	--	--
06/19/01	23.0		42.0	1.9	--	--	--	--	--	--	--	--	--	--	23.0	10%	3.4	0.92
07/17/01	25.0		28.0	1.3	--	--	--	--	--	--	--	--	--	--	25.0	23%	10.8	0.23
09/04/01	24.0		0.4	0.0	--	--	--	--	--	--	--	--	--	--	24.0	missing	>14.68	0.44
11/06/01	13.0		2.3	0.1	--	--	--	--	--	--	--	8%	4.0	1.80	--	--	--	--
12/11/01	9.0		329.0	15.0	75%	8.0	1.92	--	--	--	--	75%	8.0	1.92	--	--	--	--

Table G.1 -- Page 2 of 3

Info used to match sampling conditions with projection conditions					Winter (data collected when temperature is 10 C or less)			Spawning period (data collected during Mar-May when flow is 15 cfs or higher)				Primary season (data collected when temperature is 22 C or less)			Summer (data collected when temperature is more than 22 C)			
Date	Temp at OUA18 (C)	Flow at Hurricane Creek gages (cfs)		Estimated flow in Big Creek u/s of 001 (cfs)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	Temp (C)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)	Temp (C)	DO % saturation	BOD5 (mg/L)	Ammonia nitrogen (mg/L)
		07363300 (Hwy 270)	07363400 (Hwy 35)															
01/02/02	2.0		120.0	5.5	87%	0.4	0.09	--	--	--	--	87%	0.4	0.09	--	--	--	--
02/12/02	6.0		352.0	16.0	91%	6.6	0.31	--	--	--	--	91%	6.6	0.31	--	--	--	--
03/05/02	5.0		627.0	28.6	92%	1.1	0.03	5.0	92%	1.1	0.03	92%	1.1	0.03	--	--	--	--
04/02/02	15.0		3850.0	175.5	--	--	--	15.0	82%	1.0	0.29	82%	1.0	0.29	--	--	--	--
05/07/02	20.0		610.0	27.8	--	--	--	20.0	73%	1.4	0.11	73%	1.4	0.11	--	--	--	--
06/04/02	23.0		51.0	2.3	--	--	--	--	--	--	--	--	--	--	23.0	20%	3.1	0.36
12/10/02	6.5		123.0	5.6	71%	8.3	2.07	--	--	--	--	71%	8.3	2.07	--	--	--	--
01/28/03	3.9		40.0	1.8	85%	1.1	0.09	--	--	--	--	85%	1.1	0.09	--	--	--	--
02/18/03	7.0		2960.0	135.0	89%	2.3	0.79	--	--	--	--	89%	2.3	0.79	--	--	--	--
03/18/03	15.7		153.0	7.0	--	--	--	--	--	--	--	71%	6.1	0.48	--	--	--	--
04/15/03	15.1		31.0	1.4	--	--	--	--	--	--	--	46%	1.8	0.15	--	--	--	--
05/20/03	21.4		1040.0	47.4	--	--	--	21.4	79%	2.7	0.06	79%	2.7	0.06	--	--	--	--
06/24/03	25.0		224.0	10.2	--	--	--	--	--	--	--	--	--	--	25.0	69%	3.5	0.06
07/22/03	25.1		91.0	4.1	--	--	--	--	--	--	--	--	--	--	25.1	27%	1.7	0.32
08/19/03	29.5		22.0	1.0	--	--	--	--	--	--	--	--	--	--	29.5	94%	0.6	(BDL)
10/21/03	16.3		1.1	0.1	--	--	--	--	--	--	--	53%	7.7	0.43	--	--	--	--
01/20/04	5.0		137.0	6.2	77%	2.0	0.13	--	--	--	--	77%	2.0	0.13	--	--	--	--
02/10/04	6.0		496.0	22.6	84%	2.6	1.73	--	--	--	--	84%	2.6	1.73	--	--	--	--
03/09/04	13.0		1590.0	72.5	--	--	--	13.0	79%	2.6	0.96	79%	2.6	0.96	--	--	--	--
04/13/04	11.0		984.0	44.9	--	--	--	11.0	83%	2.8	0.16	83%	2.8	0.16	--	--	--	--
05/25/04	22.0		27.0	1.2	--	--	--	--	--	--	--	37%	2.5	0.15	--	--	--	--
07/06/04	24.0		382.0	17.4	--	--	--	--	--	--	--	--	--	--	24.0	72%	1.4	0.07
07/27/04	20.9		0.3	0.0	--	--	--	--	--	--	--	36%	1.5	0.12	--	--	--	--
08/10/04	22.5		3.4	0.2	--	--	--	--	--	--	--	--	--	--	22.5	18%	3.7	0.26
08/31/04	20.0		1.4	0.1	--	--	--	--	--	--	--	13%	6.8	0.40	--	--	--	--
10/12/04	19.2		95.0	4.3	--	--	--	--	--	--	--	70%	11.4	(BDL)	--	--	--	--
11/09/04	12.5		216.0	9.8	--	--	--	--	--	--	--	61%	1.3	0.08	--	--	--	--
12/14/04	7.2		343.0	15.6	91%	0.9	0.07	--	--	--	--	91%	0.9	0.07	--	--	--	--
01/18/05	3.0		540.0	24.6	79%	0.7	1.18	--	--	--	--	79%	0.7	1.18	--	--	--	--
02/15/05	12.0		274.0	12.5	--	--	--	--	--	--	--	82%	2.6	0.98	--	--	--	--
03/22/05	13.0		227.0	10.3	--	--	--	--	--	--	--	86%	2.2	0.06	--	--	--	--
04/19/05	19.0		219.0	10.0	--	--	--	--	--	--	--	78%	2.4	0.13	--	--	--	--
05/17/05	16.2		14.0	0.6	--	--	--	--	--	--	--	16%	2.0	0.40	--	--	--	--
09/26/05	23.5		20.0	0.9	--	--	--	--	--	--	--	--	--	--	23.5	42%	2.0	0.04
01/17/06	9.5		#N/A	#N/A	68%	3.9	0.21					68%	3.9	0.21	--	--	--	--
01/31/06	6.5		#N/A	#N/A	58%	1.8	0.13					58%	1.8	0.13	--	--	--	--
Number of values					36	34	35	14	14	14	13	102	98	95	27	26	26	24
Minimum					40%	0.4	0.03	5.0	41%	1.0	0.03	3%	0.4	0.03	22.5	4%	0.6	0.04
25th percentile					73%	1.3	0.12	13.0	70%	1.8	0.09	47%	1.9	0.12	24.0	18%	2.1	0.16
Median					78%	2.2	0.31	16.5	78%	2.2	0.16	72%	2.6	0.24	25.0	25%	3.3	0.31
75th percentile					85%	3.8	0.65	17.0	81%	2.8	0.20	79%	3.7	0.47	25.6	31%	4.6	0.92
Maximum					97%	8.3	3.12	21.4	92%	4.7	0.96	117%	18.4	3.12	29.5	94%	11.2	3.07

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TABLE G.2. ADEQ DATA FOR HURRICANE CREEK AT OUA!116 -- GROUPED BY PROJECTION CONDITIONS

Date Collected	Water Temp (deg C)	Data for winter (temp <= 10 C)			Data for spawning period (Mar-May)			Data for primary season (temp <= 22 C)			Data for critical season (temp > 22 C)		
		DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)
2/19/91	10.0	81%	0.070	1.1	--	--	--	81%	0.070	1.1	--	--	--
3/26/91	20.0	--	--	--	89%	(BDL)	1.2	89%	(BDL)	1.2	--	--	--
4/16/91	17.0	--	--	--	72%	0.080	1.3	72%	0.080	1.3	--	--	--
5/07/91	18.0	--	--	--	69%	(BDL)	0.5	69%	(BDL)	0.5	--	--	--
6/04/91	26.0	--	--	--	--	--	--	--	--	--	76%	0.100	1.9
7/02/91	27.0	--	--	--	--	--	--	--	--	--	75%	(BDL)	1.5
7/30/91	25.0	--	--	--	--	--	--	--	--	--	70%	0.050	0.5
9/17/91	25.0	--	--	--	--	--	--	--	--	--	68%	missing	1.4
10/08/91	14.0	--	--	--	--	--	--	70%	missing	0.3	--	--	--
11/12/91	12.0	--	--	--	--	--	--	100%	0.080	0.6	--	--	--
12/10/91	12.0	--	--	--	--	--	--	76%	(BDL)	1.9	--	--	--
1/28/92	8.0	94%	0.160	0.7	--	--	--	94%	0.160	0.7	--	--	--
2/25/92	11.0	--	--	--	--	--	--	87%	(BDL)	1.3	--	--	--
3/03/92	14.0	--	--	--	88%	(BDL)	0.3	88%	(BDL)	0.3	--	--	--
4/07/92	14.0	--	--	--	78%	0.060	VOID	78%	0.060	VOID	--	--	--
5/19/92	22.0	--	--	--	63%	0.070	0.6	63%	0.070	0.6	--	--	--
6/22/92	22.0	--	--	--	--	--	--	69%	(BDL)	0.4	--	--	--
7/14/92	27.0	--	--	--	--	--	--	--	--	--	58%	0.050	0.9
8/11/92	26.0	--	--	--	--	--	--	--	--	--	67%	(BDL)	1.3
9/08/92	25.0	--	--	--	--	--	--	--	--	--	63%	(BDL)	0.8
10/06/92	16.0	--	--	--	--	--	--	67%	0.057	0.9	--	--	--
11/10/92	11.0	--	--	--	--	--	--	80%	0.081	0.5	--	--	--
11/23/92	12.0	--	--	--	--	--	--	73%	0.063	1.8	--	--	--
1/05/93	9.0	81%	(BDL)	2.1	--	--	--	81%	(BDL)	2.1	--	--	--
2/02/93	6.0	80%	(BDL)	0.4	--	--	--	80%	(BDL)	0.4	--	--	--
3/02/93	9.0	78%	(BDL)	1.0	78%	(BDL)	1.0	78%	(BDL)	1.0	--	--	--
3/30/93	17.0	--	--	--	82%	VOID	1.0	82%	VOID	1.0	--	--	--
5/04/93	17.0	--	--	--	59%	(BDL)	1.6	59%	(BDL)	1.6	--	--	--
6/01/93	20.0	--	--	--	--	--	--	72%	0.057	0.6	--	--	--
6/14/93	24.0	--	--	--	--	--	--	--	--	--	88%	(BDL)	0.5
7/13/93	27.0	--	--	--	--	--	--	--	--	--	48%	0.058	1.1
8/03/93	27.0	--	--	--	--	--	--	--	--	--	31%	(BDL)	1.3
9/21/93	20.0	--	--	--	--	--	--	70%	(BDL)	1.0	--	--	--
10/12/93	9.0	94%	0.156	0.7	--	--	--	94%	0.156	0.7	--	--	--
11/16/93	13.0	--	--	--	--	--	--	73%	(BDL)	2.4	--	--	--
12/21/93	6.0	86%	0.172	0.3	--	--	--	86%	0.172	0.3	--	--	--
1/11/94	5.0	97%	(BDL)	0.8	--	--	--	97%	(BDL)	0.8	--	--	--

Date Collected	Water Temp (deg C)	Data for winter (temp <= 10 C)			Data for spawning period (Mar-May)			Data for primary season (temp <= 22 C)			Data for critical season (temp > 22 C)		
		DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)
2/22/94	11.0	--	--	--	--	--	--	83%	0.058	1.1	--	--	--
3/01/94	8.0	92%	0.090	0.5	92%	0.090	0.5	92%	0.090	0.5	--	--	--
4/12/94	17.0	--	--	--	68%	(BDL)	1.4	68%	(BDL)	1.4	--	--	--
5/17/94	21.0	--	--	--	99%	0.087	1.2	99%	0.087	1.2	--	--	--
7/05/94	26.0	--	--	--	--	--	--	--	--	--	67%	(BDL)	0.6
8/02/94	24.0	--	--	--	--	--	--	--	--	--	82%	0.117	0.6
8/30/94	24.0	--	--	--	--	--	--	--	--	--	69%	(BDL)	0.5
10/11/94	14.0	--	--	--	--	--	--	76%	(BDL)	0.7	--	--	--
11/08/94	14.0	--	--	--	--	--	--	68%	0.095	2.2	--	--	--
12/06/94	14.0	--	--	--	--	--	--	83%	(BDL)	0.7	--	--	--
1/17/95	8.0	84%	(BDL)	0.5	--	--	--	84%	(BDL)	0.5	--	--	--
2/21/95	missing	--	--	--	--	--	--	--	--	--	--	--	--
3/21/95	14.0	--	--	--	76%	(BDL)	1.1	76%	(BDL)	1.1	--	--	--
4/11/95	18.0	--	--	--	72%	(BDL)	missing	72%	(BDL)	missing	--	--	--
5/30/95	23.0	--	--	--	77%	(BDL)	0.7	--	--	--	77%	(BDL)	0.7
6/27/95	missing	--	--	--	--	--	--	--	--	--	--	--	--
7/25/95	27.0	--	--	--	--	--	--	--	--	--	63%	(BDL)	0.4
8/22/95	27.0	--	--	--	--	--	--	--	--	--	41%	0.210	0.4
9/11/95	20.0	--	--	--	--	--	--	35%	0.074	0.7	--	--	--
10/10/95	14.0	--	--	--	--	--	--	44%	0.080	0.9	--	--	--
11/07/95	12.0	--	--	--	--	--	--	67%	missing	0.6	--	--	--
12/12/95	missing	--	--	--	--	--	--	--	--	--	--	--	--
1/16/96	6.0	82%	0.127	1.0	--	--	--	82%	0.127	1.0	--	--	--
2/20/96	9.0	75%	0.050	2.6	--	--	--	75%	0.050	2.6	--	--	--
3/26/96	10.0	82%	0.181	2.1	82%	0.181	2.1	82%	0.181	2.1	--	--	--
4/16/96	13.0	--	--	--	67%	(BDL)	2.1	67%	(BDL)	2.1	--	--	--
4/30/96	15.0	--	--	--	73%	(BDL)	0.8	73%	(BDL)	0.8	--	--	--
6/11/96	20.0	--	--	--	--	--	--	73%	(BDL)	1.2	--	--	--
7/09/96	26.0	--	--	--	--	--	--	--	--	--	44%	(BDL)	0.9
8/27/96	14.0	--	--	--	--	--	--	55%	(BDL)	0.5	--	--	--
9/24/96	20.0	--	--	--	--	--	--	35%	(BDL)	0.5	--	--	--
10/15/96	14.0	--	--	--	--	--	--	54%	(BDL)	0.5	--	--	--
11/19/96	13.0	--	--	--	--	--	--	80%	(BDL)	1.1	--	--	--
12/10/96	11.0	--	--	--	--	--	--	84%	0.080	0.6	--	--	--
1/07/97	10.0	78%	0.053	0.3	--	--	--	78%	0.053	0.3	--	--	--
2/04/97	10.0	78%	(BDL)	1.5	--	--	--	78%	(BDL)	1.5	--	--	--
3/18/97	15.0	--	--	--	79%	(BDL)	0.7	79%	(BDL)	0.7	--	--	--
4/22/97	17.0	--	--	--	78%	(BDL)	0.6	78%	(BDL)	0.6	--	--	--
5/20/97	20.0	--	--	--	66%	(BDL)	0.4	66%	(BDL)	0.4	--	--	--

Table G.2 -- Page 2 of 5

Date Collected	Water Temp (deg C)	Data for winter (temp <= 10 C)			Data for spawning period (Mar-May)			Data for primary season (temp <= 22 C)			Data for critical season (temp > 22 C)		
		DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)
6/10/97	22.0	--	--	--	--	--	--	71%	0.121	0.3	--	--	--
7/08/97	25.0	--	--	--	--	--	--	--	--	--	63%	(BDL)	0.6
8/05/97	25.0	--	--	--	--	--	--	--	--	--	65%	(BDL)	1.3
9/02/97	27.0	--	--	--	--	--	--	--	--	--	43%	0.076	0.5
9/30/97	19.0	--	--	--	--	--	--	63%	0.009	0.6	--	--	--
11/04/97	11.0	--	--	--	--	--	--	76%	(BDL)	0.8	--	--	--
12/09/97	7.0	83%	0.025	1.1	--	--	--	83%	0.025	1.1	--	--	--
1/06/98	missing	--	--	--	--	--	--	--	--	--	--	--	--
2/03/98	9.0	82%	0.040	0.6	--	--	--	82%	0.040	0.6	--	--	--
3/03/98	8.0	84%	0.049	0.9	84%	0.049	0.9	84%	0.049	0.9	--	--	--
3/31/98	18.0	--	--	--	94%	0.006	0.8	94%	0.006	0.8	--	--	--
5/05/98	18.0	--	--	--	95%	0.046	0.5	95%	0.046	0.5	--	--	--
9/29/98	24.0	--	--	--	--	--	--	--	--	--	56%	0.017	0.4
10/20/98	17.0	--	--	--	--	--	--	68%	0.016	0.7	--	--	--
11/17/98	12.0	--	--	--	--	--	--	72%	(BDL)	0.7	--	--	--
12/21/98	13.0	--	--	--	--	--	--	112%	0.055	1.1	--	--	--
1/19/99	8.0	71%	0.206	missing	--	--	--	71%	0.206	missing	--	--	--
2/09/99	15.0	--	--	--	--	--	--	73%	0.007	1.2	--	--	--
3/08/99	10.0	93%	0.026	1.6	93%	0.026	1.6	93%	0.026	1.6	--	--	--
4/13/99	17.0	--	--	--	54%	0.037	1.1	54%	0.037	1.1	--	--	--
5/18/99	22.0	--	--	--	74%	0.037	0.9	74%	0.037	0.9	--	--	--
6/08/99	26.0	--	--	--	--	--	--	--	--	--	64%	0.055	0.7
7/13/99	25.0	--	--	--	--	--	--	--	--	--	73%	0.044	0.9
8/17/99	25.0	--	--	--	--	--	--	--	--	--	25%	0.055	1.5
9/14/99	22.0	--	--	--	--	--	--	27%	0.158	1.4	--	--	--
10/19/99	16.0	--	--	--	--	--	--	29%	0.080	0.7	--	--	--
11/22/99	15.0	--	--	--	--	--	--	40%	0.078	1.5	--	--	--
12/20/99	13.0	--	--	--	--	--	--	115%	0.024	0.5	--	--	--
1/25/00	5.0	90%	0.011	1.8	--	--	--	90%	0.011	1.8	--	--	--
2/15/00	9.0	50%	0.013	0.3	--	--	--	50%	0.013	0.3	--	--	--
3/14/00	11.0	--	--	--	88%	0.011	0.8	88%	0.011	0.8	--	--	--
4/11/00	15.0	--	--	--	83%	0.026	1.7	83%	0.026	1.7	--	--	--
5/30/00	23.0	--	--	--	58%	0.053	1.3	--	--	--	58%	0.053	1.3
6/27/00	26.0	--	--	--	--	--	--	--	--	--	73%	0.047	1.5
7/31/00	26.0	--	--	--	--	--	--	--	--	--	26%	(BDL)	1.6
8/22/00	26.0	--	--	--	--	--	--	--	--	--	16%	0.064	1.9
9/26/00	11.0	--	--	--	--	--	--	20%	0.100	(BDL)	--	--	--
10/03/00	19.0	--	--	--	--	--	--	27%	0.100	1.1	--	--	--
11/14/00	6.0	73%	0.027	1.3	--	--	--	73%	0.027	1.3	--	--	--

Table G.2 -- Page 3 of 5

Date Collected	Water Temp (deg C)	Data for winter (temp <= 10 C)			Data for spawning period (Mar-May)			Data for primary season (temp <= 22 C)			Data for critical season (temp > 22 C)		
		DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)
12/05/00	5.0	86%	(BDL)	1.3	--	--	--	86%	(BDL)	1.3	--	--	--
1/30/01	10.0	84%	0.050	5.0	--	--	--	84%	0.050	5.0	--	--	--
2/20/01	9.0	82%	0.006	0.8	--	--	--	82%	0.006	0.8	--	--	--
3/20/01	11.0	--	--	--	85%	(BDL)	0.9	85%	(BDL)	0.9	--	--	--
4/24/01	17.0	--	--	--	69%	0.070	0.9	69%	0.070	0.9	--	--	--
5/22/01	20.0	--	--	--	61%	0.010	1.1	61%	0.010	1.1	--	--	--
6/19/01	25.0	--	--	--	--	--	--	--	--	--	68%	0.005	0.8
7/17/01	25.0	--	--	--	--	--	--	--	--	--	69%	0.110	1.3
8/07/01	27.0	--	--	--	--	--	--	--	--	--	53%	0.020	1.8
9/04/01	24.0	--	--	--	--	--	--	--	--	--	69%	0.012	0.6
10/02/01	15.0	--	--	--	--	--	--	39%	0.032	0.6	--	--	--
11/06/01	14.0	--	--	--	--	--	--	58%	(BDL)	1.4	--	--	--
12/11/01	9.0	77%	(BDL)	1.1	--	--	--	77%	(BDL)	1.1	--	--	--
1/02/02	2.0	90%	0.188	0.6	--	--	--	90%	0.188	0.6	--	--	--
2/12/02	7.0	91%	0.017	0.6	--	--	--	91%	0.017	0.6	--	--	--
3/05/02	5.0	90%	(BDL)	1.0	90%	(BDL)	1.0	90%	(BDL)	1.0	--	--	--
4/02/02	15.0	--	--	--	76%	(BDL)	1.1	76%	(BDL)	1.1	--	--	--
5/07/02	19.0	--	--	--	76%	0.160	1.6	76%	0.160	1.6	--	--	--
6/04/02	24.0	--	--	--	--	--	--	--	--	--	73%	0.008	2.5
7/09/02	26.0	--	--	--	--	--	--	--	--	--	68%	0.023	0.8
8/06/02	26.0	--	--	--	--	--	--	--	--	--	72%	0.021	0.3
9/03/02	24.0	--	--	--	--	--	--	--	--	--	74%	0.014	1.3
10/08/02	17.4	--	--	--	--	--	--	79%	0.086	0.8	--	--	--
11/12/02	13.0	--	--	--	--	--	--	74%	(BDL)	0.9	--	--	--
12/10/02	5.9	88%	0.045	1.4	--	--	--	88%	0.045	1.4	--	--	--
2/18/03	7.0	80%	(BDL)	1.7	--	--	--	80%	(BDL)	1.7	--	--	--
3/18/03	14.9	--	--	--	83%	(BDL)	0.8	83%	(BDL)	0.8	--	--	--
4/15/03	16.8	--	--	--	96%	(BDL)	0.9	96%	(BDL)	0.9	--	--	--
5/20/03	21.2	--	--	--	72%	(BDL)	1.5	72%	(BDL)	1.5	--	--	--
6/24/03	24.2	--	--	--	--	--	--	--	--	--	89%	0.030	1.3
7/22/03	25.9	--	--	--	--	--	--	--	--	--	72%	0.068	1.1
8/19/03	26.8	--	--	--	--	--	--	--	--	--	63%	(BDL)	0.7
9/30/03	17.1	--	--	--	--	--	--	108%	(BDL)	1.0	--	--	--
10/21/03	16.3	--	--	--	--	--	--	56%	(BDL)	1.0	--	--	--
11/12/03	16.2	--	--	--	--	--	--	77%	(BDL)	1.3	--	--	--
12/09/03	8.5	98%	(BDL)	0.9	--	--	--	98%	(BDL)	0.9	--	--	--
1/20/04	6.0	96%	(BDL)	0.8	--	--	--	96%	(BDL)	0.8	--	--	--
2/10/04	5.0	83%	(BDL)	1.2	--	--	--	83%	(BDL)	1.2	--	--	--
3/09/04	12.0	--	--	--	69%	(BDL)	1.2	69%	(BDL)	1.2	--	--	--

Table G.2 -- Page 4 of 5

Date Collected	Water Temp (deg C)	Data for winter (temp <= 10 C)			Data for spawning period (Mar-May)			Data for primary season (temp <= 22 C)			Data for critical season (temp > 22 C)		
		DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)	DO Percent Saturation	Ammonia Nitrogen (mg/L)	BOD5 (mg/L)
4/13/04	12.0	--	--	--	79%	(BDL)	1.9	79%	(BDL)	1.9	--	--	--
5/25/04	24.0	--	--	--	71%	(BDL)	0.9	--	--	--	71%	(BDL)	0.9
7/06/04	24.0	--	--	--	--	--	--	--	--	--	78%	(BDL)	0.9
7/27/04	22.5	--	--	--	--	--	--	--	--	--	64%	0.047	1.3
8/10/04	24.3	--	--	--	--	--	--	--	--	--	54%	(BDL)	0.5
8/31/04	22.0	--	--	--	--	--	--	72%	(BDL)	0.3	--	--	--
10/12/04	18.5	--	--	--	--	--	--	89%	(BDL)	3.0	--	--	--
11/09/04	13.0	--	--	--	--	--	--	62%	(BDL)	0.8	--	--	--
12/14/04	6.9	92%	(BDL)	0.6	--	--	--	92%	(BDL)	0.6	--	--	--
1/18/05	4.0	81%	(BDL)	0.7	--	--	--	81%	(BDL)	0.7	--	--	--
2/15/05	12.0	--	--	--	--	--	--	87%	(BDL)	0.4	--	--	--
3/22/05	13.0	--	--	--	89%	(BDL)	0.5	89%	(BDL)	0.5	--	--	--
4/19/05	19.0	--	--	--	83%	(BDL)	1.1	83%	(BDL)	1.1	--	--	--
5/17/05	18.5	--	--	--	59%	0.032	0.5	59%	0.032	0.5	--	--	--
6/14/05	26.3	--	--	--	--	--	--	--	--	--	48%	(BDL)	0.5
7/26/05	27.0	--	--	--	--	--	--	--	--	--	57%	(BDL)	missing
8/23/05	27.1	--	--	--	--	--	--	--	--	--	23%	0.046	missing
9/26/05	23.9	--	--	--	--	--	--	--	--	--	74%	0.037	missing
10/25/05	10.2	--	--	--	--	--	--	90%	(BDL)	missing	--	--	--
12/13/05	3.6	82%	(BDL)	missing	--	--	--	82%	(BDL)	missing	--	--	--
1/17/06	9.3	86%	(BDL)	missing	--	--	--	86%	(BDL)	missing	--	--	--
1/31/06	8.5	88%	0.039	missing	--	--	--	88%	0.039	missing	--	--	--
Number of "BDL" values			17			25			62			19	
Total number of values		40	40	36	45	44	43	125	122	117	47	46	44
Minimum		50%	(BDL)	0.3	54%	(BDL)	0.3	20%	(BDL)	0.3	16%	(BDL)	0.3
25th percentile		80%	(BDL)	0.6	69%	(BDL)	0.7	69%	(BDL)	0.6	55%	(BDL)	0.6
Median		83%	0.015	1.0	78%	(BDL)	1.0	78%	(BDL)	0.9	67%	0.016	0.9
75th percentile		90%	0.051	1.3	85%	0.039	1.2	86%	0.057	1.2	73%	0.050	1.3
Maximum		98%	0.206	5.0	99%	0.181	2.1	115%	0.206	5.0	89%	0.210	2.5

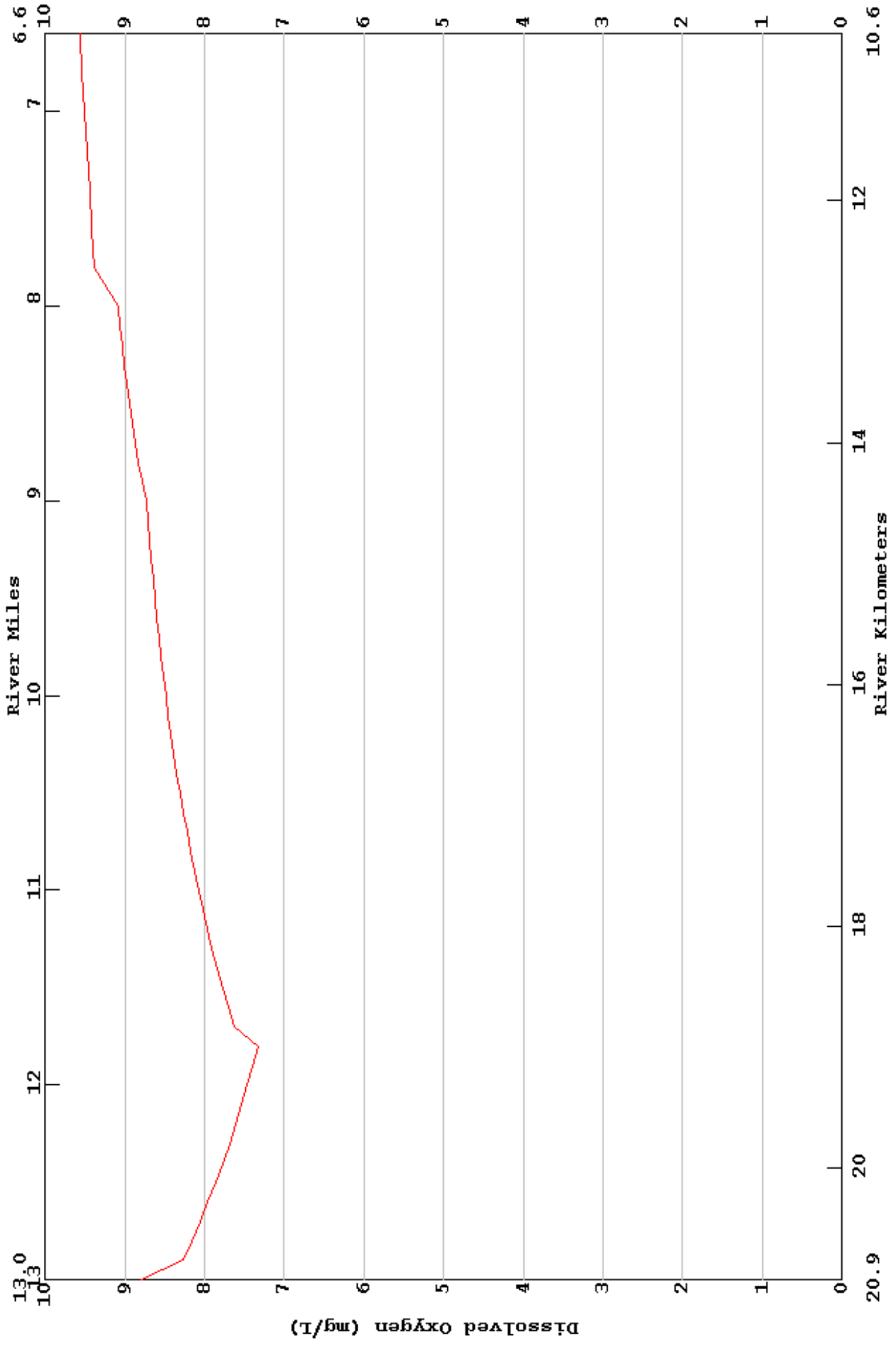
FILE: R:\PROJECTS\4710-020\TECHWQDATA\OUA0116_WQ_DATA.XLS

APPENDIX H

Model Output for Winter Season Projection

LA-QUAL Version 8.00 Run at 15:07 on 06/13/2006 File C:\temp\Winter_30.txt
Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow
LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan

min= 7.33 max= 9.57



Dissolved Oxygen (mg/L)

River Miles

River Kilometers

Dissolved Oxygen (mg/L)

LA-QUAL Version 8.00
Louisiana Department of Environmental Quality

Input file is C:\WQMODELS\LA-QUAL\Winter_30.txt
Output produced at 15:38 on 06/12/2006

\$\$\$ DATA TYPE 1 (TITLES AND CONTROL CARDS) \$\$\$

CARD TYPE	CONTROL TITLES
TITLE01	LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
TITLE02	Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow
CNTROL03	NO SEQU <Warning: legacy control - line ignored>
CNTROL04	NO METR
CNTROL05	YES OXYG <Warning: legacy control - line ignored>
ENDATA01	

\$\$\$ DATA TYPE 2 (MODEL OPTIONS) \$\$\$

CARD TYPE	MODEL OPTION
MODOPT01	NO TEMPERATURE
MODOPT02	NO SALINITY
MODOPT03	NO CONSERVATIVE MATERIAL #1 UNITS =
MODOPT04	NO CONSERVATIVE MATERIAL #2 UNITS =
MODOPT05	YES DISSOLVED OXYGEN
MODOPT06	YES BOD1 BIOCHEMICAL OXYGEN DEMAND #1
MODOPT07	NO BOD2 BIOCHEMICAL OXYGEN DEMAND #2
MODOPT08	YES NITROGEN SERIES
MODOPT09	NO PHOSPHORUS
MODOPT10	NO CHLOROPHYLL A
MODOPT11	NO MACROPHYTES
MODOPT12	NO COLIFORMS
MODOPT13	NO NONCONSERVATIVE MATERIAL UNITS =
ENDATA02	

\$\$\$ DATA TYPE 3 (PROGRAM CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
PROGRAM	HYDRAULIC CALCULATION METHOD =	2.00000 (widths and depths)
ENDATA03		

\$\$\$ DATA TYPE 4 (TEMPERATURE CORRECTION CONSTANTS FOR RATE COEFFICIENTS) \$\$\$

CARD TYPE	RATE CODE	THETA VALUE
ENDATA04		

\$\$\$ CONSTANTS TYPE 5 (TEMPERATURE DATA) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
ENDATA05		

\$\$\$ DATA TYPE 6 (ALGAE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA06

\$\$\$ DATA TYPE 7 (MACROPHYTE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA07

\$\$\$ DATA TYPE 8 (REACH IDENTIFICATION DATA) \$\$\$

CARD TYPE	REACH	ID	NAME	BEGIN REACH mi	TO	END REACH mi	ELEM LENGTH mi	REACH LENGTH mi	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Big Crk -- STP to Town Branch	13.00	TO	11.80	0.1000	1.20	12	1	12
REACH ID	2	B2	Big Crk -- Town Branch to mouth	11.80	TO	8.00	0.1000	3.80	38	13	50
REACH ID	3	H1	Hurr Cr -- Big C to County Rd 67	8.00	TO	6.60	0.2000	1.40	7	51	57
REACH ID	4	H2	Hurr Cr -- Cnty Rd 67 to Hwy 35	6.60	TO	0.00	0.3000	6.60	22	58	79

ENDATA08

\$\$\$ DATA TYPE 9 (ADVECTIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	WIDTH "A"	WIDTH "B"	WIDTH "C"	DEPTH "D"	DEPTH "E"	DEPTH "F"	SLOPE	MANNINGS "N"
HYDR-1	1	B1	0.000	0.000	19.000	0.000	0.000	2.500	0.00000	0.000
HYDR-1	2	B2	0.000	0.000	19.000	0.000	0.000	1.700	0.00000	0.000
HYDR-1	3	H1	0.000	0.000	45.000	0.000	0.000	3.000	0.00000	0.000
HYDR-1	4	H2	0.000	0.000	45.000	0.000	0.000	3.000	0.00000	0.000

ENDATA09

\$\$\$ DATA TYPE 10 (DISPERSIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	TIDAL RANGE	DISPERSION "A"	DISPERSION "B"	DISPERSION "C"	DISPERSION "D"
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ENDATA10

\$\$\$ DATA TYPE 11 (INITIAL CONDITIONS) \$\$\$

CARD TYPE	REACH	ID	TEMP	SALIN	DO	NH3	NO3+2	PHOS	CHL A	MACRO
INITIAL	1	B1	10.00	0.00	6.50	1.00	0.00	0.00	0.00	0.00
INITIAL	2	B2	10.00	0.00	6.50	1.00	0.00	0.00	0.00	0.00
INITIAL	3	H1	10.00	0.00	6.50	0.10	0.00	0.00	0.00	0.00
INITIAL	4	H2	10.00	0.00	6.50	0.10	0.00	0.00	0.00	0.00

ENDATA11

\$\$\$ DATA TYPE 12 (REAERATION, SEDIMENT OXYGEN DEMAND, BOD COEFFICIENTS) \$\$\$

CARD TYPE	RCH NUM	RCH ID	K2 OPT	K2 "A"	K2 "B"	K2 "C"	BKGRND SOD mg/ft ² /d	BOD DECATY per day	BOD SETT ft/d	BOD CONV TO SOD	ANAER BOD2 DECATY per day	BOD2 DECATY per day	BOD2 SETT ft/d	BOD2 CONV TO SOD	ANAER BOD2 DECATY per day
COEFF-1	1	B1	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	3	H1	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	4	H2	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000

ENDATA12

\$\$\$ DATA TYPE 13 (NITROGEN AND PHOSPHORUS COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	ORG-N DECA	ORG-N SETT	ORGN CONV TO NH3 SRCE	NH3 DECA	NH3 SRCE	PHOS SRCE	DENIT RATE
COEFF-2	1	B1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	2	B2	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	3	H1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	4	H2	0.000	0.000	0.000	0.450	0.000	0.000	0.000

ENDATA13

\$\$\$ DATA TYPE 14 (ALGAE AND MACROPHYTE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	SECCHI DEPTH	ALGAE: CHL A	ALGAE SETT	ALG CONV TO SOD	ALGAE GROW	ALGAE RESP	MACRO GROW	MACRO RESP
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ENDATA14

\$\$\$ DATA TYPE 15 (COLIFORM AND NONCONSERVATIVE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECATY	NCM SETT	NCM CONV TO SOD
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ENDATA15

\$\$\$ DATA TYPE 16 (INCREMENTAL DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	OUTFLOW	INFLOW	TEMP	SALIN	CM-I	CM-II	IN/DIST	OUT/DIST
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ENDATA16

\$\$\$ DATA TYPE 17 (INCREMENTAL DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	REACH	ID	DO	BOD	ORG-N	NH3-N	NO3-N	BOD#2
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ENDATA17

\$\$\$ DATA TYPE 18 (INCREMENTAL DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	PHOS	CHL A	COLI	NCM
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ENDATA18

\$\$\$ DATA TYPE 19 (NONPOINT SOURCE DATA) \$\$\$

CARD TYPE	REACH	ID	BOD#1	ORG-N	COLI	NCM	DO	BOD#2
NONPOINT	1	B1	53.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	2	B2	111.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	3	H1	28.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	4	H2	133.00	0.00	0.00	0.00	0.00	0.00

\$\$\$ DATA TYPE 20 (HEADWATER FOR FLOW, TEMPERATURE, SALINITY AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	UNIT	FLOW m ³ /s	FLOW cfs	TEMP deg C	SALIN ppt	CM-I	CM-II
HDWTR-1	1	Big Creek U/S of STP	0	0.14160	5.000	10.00	0.00	0.000	0.000

\$\$\$ DATA TYPE 21 (HEADWATER DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD#1 mg/L	ORG-N mg/L	NH3-N mg/L	NO3-N mg/L	BOD#2 mg/L
HDWTR-2	1	Big Creek U/S of STP	8.80	5.10	0.00	0.31	0.00	0.00

\$\$\$ DATA TYPE 22 (HEADWATER DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
ENDATA22						

\$\$\$ DATA TYPE 23 (JUNCTION DATA) \$\$\$

CARD TYPE	JUNCTION ELEMENT	UPSTRM ELEMENT	RIVER KILOM	NAME
ENDATA23				

\$\$\$ DATA TYPE 24 (WASTELOAD DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	RKILO	NAME	FLOW m ³ /s	FLOW cfs	FLOW MGD	TEMP deg C	SALIN ppt	CM-I	CM-II
WSTLD-1	1	13.00	Sheridan STP	0.04248	1.50000	0.970	10.00	0.00	0.000	0.000
WSTLD-1	13	11.80	Town Branch	0.03200	1.13000	0.730	10.00	0.00	0.000	0.000
WSTLD-1	41	9.00	Hubbard Creek	0.07024	2.48000	1.603	10.00	0.00	0.000	0.000
WSTLD-1	51	8.00	Hurricane Creek	1.21495	42.90000	27.731	10.00	0.00	0.000	0.000

\$\$\$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD mg/L	% BOD RMVL	ORG-N mg/L	NH3-N mg/L	% NITRIF	NO3-N mg/L	BOD#2 mg/L
WSTLD-2	1	Sheridan STP	7.00	69.00	0.00	0.00	12.00	0.00	0.00	0.00
WSTLD-2	13	Town Branch	8.80	5.10	0.00	0.00	0.31	0.00	0.00	0.00
WSTLD-2	41	Hubbard Creek	8.80	5.10	0.00	0.00	0.31	0.00	0.00	0.00
WSTLD-2	51	Hurricane Creek	9.40	2.30	0.00	0.00	0.05	0.00	0.00	0.00

ENDATA25

\$\$\$ DATA TYPE 26 (WASTELOAD DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
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ENDATA26

\$\$\$ DATA TYPE 27 (LOWER BOUNDARY CONDITIONS) \$\$\$

CARD TYPE	CONSTITUENT	CONCENTRATION
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ENDATA27

\$\$\$ DATA TYPE 28 (DAM DATA) \$\$\$

CARD TYPE	ELEMENT	NAME	EQN	"A"	"B"	"H"
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ENDATA28

\$\$\$ DATA TYPE 29 (SENSITIVITY ANALYSIS DATA) \$\$\$

CARD TYPE	PARAMETER	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8
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ENDATA29

\$\$\$ DATA TYPE 30 (PLOT CONTROL CARDS) \$\$\$

NUMBER OF PLOTS = 1
NUMBER OF REACHES IN PLOT 1 = 3
PLOT RCH 1 2 3
ENDATA30

\$\$\$ DATA TYPE 31 (OVERLAY PLOT DATA) \$\$\$

ENDATA31

.....NO ERRORS DETECTED IN INPUT DATA
.....HYDRAULIC CALCULATIONS COMPLETED
.....TRIDIAGONAL MATRIX TERMS INITIALIZED

....OXYGEN DEPENDENT RATES CONVERGENT IN 2 ITERATIONS
CONSTITUENT CALCULATIONS COMPLETED
GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

FINAL REPORT Big Creek U/S of STP
 REACH NO. 1 Big Crk -- STP to Town Branch

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
1	HDWTR	5.00000	10.00	0.00	0.00	0.00	8.80	5.10	0.00	5.10	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00
1	WSTLD	1.50000	10.00	0.00	0.00	0.00	7.00	69.00	0.00	69.00	0.00	0.00	12.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
1	13.00	12.90	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
2	12.90	12.80	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
3	12.80	12.70	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
4	12.70	12.60	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
5	12.60	12.50	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
6	12.50	12.40	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
7	12.40	12.30	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
8	12.30	12.20	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
9	12.20	12.10	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
10	12.10	12.00	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
11	12.00	11.90	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
12	11.90	11.80	6.50000	23.1	0.13688	0.04	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.137
TOT						0.54			300876.97	120328.83					
AVG					0.1369		2.50	19.00			47.48				
CUM						0.54									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECA 1/da	BOD#1 SETT 1/da	ABOD#1 DECA 1/da	BOD#2 DECA 1/da	BOD#2 SETT 1/da	ABOD#2 DECA 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECA 1/da	ORGN SETT 1/da	NH3 DECA 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECA 1/da	NCM DECA 1/da	NCM SETT 1/da
1	12.900	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	12.800	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	12.700	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	12.600	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	12.500	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	12.400	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

7	12.300	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8	12.200	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	12.100	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	12.000	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	11.900	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	11.800	11.29	0.97	0.09	0.00	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			1.21	0.15	0.00	0.00	0.00	0.00	0.00	0.00139	40			0.00	0.00	0.45	0.00	0.00	0.00			0.00	0.00	0.00	0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM	
1	12.900	10.00	0.00	0.00	0.00	8.27	19.89	0.00	19.89	0.00	0.00	2.98	0.03	3.01	0.00	0.00	0.00	0.00	0.00	0.00
2	12.800	10.00	0.00	0.00	0.00	8.16	19.93	0.00	19.93	0.00	0.00	2.95	0.05	3.01	0.00	0.00	0.00	0.00	0.00	0.00
3	12.700	10.00	0.00	0.00	0.00	8.06	19.97	0.00	19.97	0.00	0.00	2.93	0.08	3.01	0.00	0.00	0.00	0.00	0.00	0.00
4	12.600	10.00	0.00	0.00	0.00	7.96	20.01	0.00	20.01	0.00	0.00	2.90	0.10	3.01	0.00	0.00	0.00	0.00	0.00	0.00
5	12.500	10.00	0.00	0.00	0.00	7.86	20.05	0.00	20.05	0.00	0.00	2.88	0.13	3.01	0.00	0.00	0.00	0.00	0.00	0.00
6	12.400	10.00	0.00	0.00	0.00	7.77	20.09	0.00	20.09	0.00	0.00	2.85	0.16	3.01	0.00	0.00	0.00	0.00	0.00	0.00
7	12.300	10.00	0.00	0.00	0.00	7.69	20.14	0.00	20.14	0.00	0.00	2.83	0.18	3.01	0.00	0.00	0.00	0.00	0.00	0.00
8	12.200	10.00	0.00	0.00	0.00	7.61	20.18	0.00	20.18	0.00	0.00	2.80	0.21	3.01	0.00	0.00	0.00	0.00	0.00	0.00
9	12.100	10.00	0.00	0.00	0.00	7.53	20.22	0.00	20.22	0.00	0.00	2.78	0.23	3.01	0.00	0.00	0.00	0.00	0.00	0.00
10	12.000	10.00	0.00	0.00	0.00	7.46	20.26	0.00	20.26	0.00	0.00	2.75	0.25	3.01	0.00	0.00	0.00	0.00	0.00	0.00
11	11.900	10.00	0.00	0.00	0.00	7.39	20.30	0.00	20.30	0.00	0.00	2.73	0.28	3.01	0.00	0.00	0.00	0.00	0.00	0.00
12	11.800	10.00	0.00	0.00	0.00	7.33	20.34	0.00	20.34	0.00	0.00	2.70	0.30	3.01	0.00	0.00	0.00	0.00	0.00	0.00

FINAL REPORT Big Creek U/S of STP
REACH NO. 2 Big Crk -- Town Branch to mouth

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM	
13	UPR RCH	6.50000	10.00	0.00	0.00	0.00	7.33	20.34	0.00	20.34	0.00	0.00	2.70	0.30	0.00	0.00	0.00	0.00	0.00
13	WSTLD	1.13000	10.00	0.00	0.00	0.00	8.80	5.10	0.00	5.10	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00
41	WSTLD	2.48000	10.00	0.00	0.00	0.00	8.80	5.10	0.00	5.10	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
13	11.80	11.70	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
14	11.70	11.60	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
15	11.60	11.50	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236

16	11.50	11.40	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
17	11.40	11.30	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
18	11.30	11.20	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
19	11.20	11.10	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
20	11.10	11.00	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
21	11.00	10.90	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
22	10.90	10.80	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
23	10.80	10.70	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
24	10.70	10.60	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
25	10.60	10.50	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
26	10.50	10.40	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
27	10.40	10.30	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
28	10.30	10.20	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
29	10.20	10.10	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
30	10.10	10.00	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
31	10.00	9.90	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
32	9.90	9.80	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
33	9.80	9.70	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
34	9.70	9.60	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
35	9.60	9.50	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
36	9.50	9.40	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
37	9.40	9.30	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
38	9.30	9.20	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
39	9.20	9.10	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
40	9.10	9.00	7.63000	34.5	0.23629	0.03	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.236
41	9.00	8.90	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
42	8.90	8.80	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
43	8.80	8.70	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
44	8.70	8.60	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
45	8.60	8.50	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
46	8.50	8.40	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
47	8.40	8.30	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
48	8.30	8.20	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
49	8.20	8.10	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313
50	8.10	8.00	10.11000	50.5	0.31309	0.02	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.313

TOT 0.92 647888.38 381041.19
AVG 0.2526 1.70 19.00 32.29
CUM 1.46

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECAy 1/da	BOD#1 SETT 1/da	ABOD#1 DECAy 1/da	BOD#2 DECAy 1/da	BOD#2 SETT 1/da	ABOD#2 DECAy 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECAy 1/da	ORGN SETT 1/da	NH3 DECAy 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECAy 1/da	NCM DECAy 1/da	NCM SETT 1/da
13	11.700	11.29	2.28	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	11.600	11.29	2.28	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	11.500	11.29	2.28	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	11.400	11.29	2.28	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	11.300	11.29	2.28	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	11.200	11.29	2.28	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	11.100	11.29	2.28	0.09	0.00	0.00	0.00	0.00	0.00	74.26	74.26	74.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

25	10.500	10.00	0.00	0.00	0.00	8.31	18.42	0.00	18.42	0.00	0.00	2.20	0.41	2.61	0.00	0.00	0.00	0.00	0.00
26	10.400	10.00	0.00	0.00	0.00	8.35	18.45	0.00	18.45	0.00	0.00	2.19	0.42	2.61	0.00	0.00	0.00	0.00	0.00
27	10.300	10.00	0.00	0.00	0.00	8.38	18.47	0.00	18.47	0.00	0.00	2.18	0.43	2.61	0.00	0.00	0.00	0.00	0.00
28	10.200	10.00	0.00	0.00	0.00	8.42	18.50	0.00	18.50	0.00	0.00	2.16	0.44	2.61	0.00	0.00	0.00	0.00	0.00
29	10.100	10.00	0.00	0.00	0.00	8.45	18.52	0.00	18.52	0.00	0.00	2.15	0.46	2.61	0.00	0.00	0.00	0.00	0.00
30	10.000	10.00	0.00	0.00	0.00	8.48	18.55	0.00	18.55	0.00	0.00	2.14	0.47	2.61	0.00	0.00	0.00	0.00	0.00
31	9.900	10.00	0.00	0.00	0.00	8.52	18.57	0.00	18.57	0.00	0.00	2.13	0.48	2.61	0.00	0.00	0.00	0.00	0.00
32	9.800	10.00	0.00	0.00	0.00	8.54	18.60	0.00	18.60	0.00	0.00	2.12	0.49	2.61	0.00	0.00	0.00	0.00	0.00
33	9.700	10.00	0.00	0.00	0.00	8.57	18.62	0.00	18.62	0.00	0.00	2.11	0.50	2.61	0.00	0.00	0.00	0.00	0.00
34	9.600	10.00	0.00	0.00	0.00	8.60	18.65	0.00	18.65	0.00	0.00	2.10	0.51	2.61	0.00	0.00	0.00	0.00	0.00
35	9.500	10.00	0.00	0.00	0.00	8.62	18.68	0.00	18.68	0.00	0.00	2.09	0.52	2.61	0.00	0.00	0.00	0.00	0.00
36	9.400	10.00	0.00	0.00	0.00	8.65	18.70	0.00	18.70	0.00	0.00	2.08	0.53	2.61	0.00	0.00	0.00	0.00	0.00
37	9.300	10.00	0.00	0.00	0.00	8.67	18.73	0.00	18.73	0.00	0.00	2.07	0.54	2.61	0.00	0.00	0.00	0.00	0.00
38	9.200	10.00	0.00	0.00	0.00	8.69	18.75	0.00	18.75	0.00	0.00	2.06	0.55	2.61	0.00	0.00	0.00	0.00	0.00
39	9.100	10.00	0.00	0.00	0.00	8.71	18.78	0.00	18.78	0.00	0.00	2.05	0.56	2.61	0.00	0.00	0.00	0.00	0.00
40	9.000	10.00	0.00	0.00	0.00	8.73	18.80	0.00	18.80	0.00	0.00	2.03	0.57	2.61	0.00	0.00	0.00	0.00	0.00
41	8.900	10.00	0.00	0.00	0.00	8.79	15.46	0.00	15.46	0.00	0.00	1.61	0.44	2.04	0.00	0.00	0.00	0.00	0.00
42	8.800	10.00	0.00	0.00	0.00	8.83	15.49	0.00	15.49	0.00	0.00	1.60	0.45	2.04	0.00	0.00	0.00	0.00	0.00
43	8.700	10.00	0.00	0.00	0.00	8.87	15.51	0.00	15.51	0.00	0.00	1.59	0.45	2.04	0.00	0.00	0.00	0.00	0.00
44	8.600	10.00	0.00	0.00	0.00	8.90	15.54	0.00	15.54	0.00	0.00	1.59	0.46	2.04	0.00	0.00	0.00	0.00	0.00
45	8.500	10.00	0.00	0.00	0.00	8.94	15.56	0.00	15.56	0.00	0.00	1.58	0.46	2.04	0.00	0.00	0.00	0.00	0.00
46	8.400	10.00	0.00	0.00	0.00	8.97	15.59	0.00	15.59	0.00	0.00	1.57	0.47	2.04	0.00	0.00	0.00	0.00	0.00
47	8.300	10.00	0.00	0.00	0.00	9.00	15.61	0.00	15.61	0.00	0.00	1.57	0.48	2.04	0.00	0.00	0.00	0.00	0.00
48	8.200	10.00	0.00	0.00	0.00	9.03	15.64	0.00	15.64	0.00	0.00	1.56	0.48	2.04	0.00	0.00	0.00	0.00	0.00
49	8.100	10.00	0.00	0.00	0.00	9.06	15.66	0.00	15.66	0.00	0.00	1.56	0.49	2.04	0.00	0.00	0.00	0.00	0.00
50	8.000	10.00	0.00	0.00	0.00	9.09	15.69	0.00	15.69	0.00	0.00	1.55	0.49	2.04	0.00	0.00	0.00	0.00	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 3 Hurr Cr -- Big C to County Rd 67

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM	
51	UPR RCH	10.11000	10.00	0.00	0.00	0.00	9.09	15.69	0.00	15.69	0.00	0.00	1.55	0.49	0.00	0.00	0.00	0.00	0.00
51	WSTLD	42.90000	10.00	0.00	0.00	0.00	9.40	2.30	0.00	2.30	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
51	8.00	7.80	53.01000	90.6	0.39278	0.03	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.393
52	7.80	7.60	53.01000	90.6	0.39278	0.03	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.393
53	7.60	7.40	53.01000	90.6	0.39278	0.03	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.393
54	7.40	7.20	53.01000	90.6	0.39278	0.03	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.393
55	7.20	7.00	53.01000	90.6	0.39278	0.03	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.393
56	7.00	6.80	53.01000	90.6	0.39278	0.03	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.393
57	6.80	6.60	53.01000	90.6	0.39278	0.03	3.00	45.00	142520.64	47498.22	134.94	0.00	0.000	0.000	0.393

TOT 0.22 997644.62 332487.53
 AVG 0.3928 3.00 45.00 134.94
 CUM 1.67

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECA	BOD#1 SETT	ABOD#1 DECA	BOD#2 DECA	BOD#2 SETT	ABOD#2 DECA	BKGD SOD	FULL SOD	CORR SOD	ORGN DECA	ORGN SETT	NH3 DECA	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECA	NCM DECA	NCM SETT
		mg/L	1/da	1/da	1/da	1/da	1/da	1/da	1/da	*	*	*	1/da	1/da	1/da	*	1/da	*	**	**	1/da	1/da	1/da
51	7.800	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	7.600	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	7.400	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	7.200	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	7.000	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	6.800	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	6.600	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 1.56 0.15 0.00 0.00 0.00 0.00 0.00 79.00 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
51	7.800	10.00	0.00	0.00	0.00	9.38	4.85	0.00	4.85	0.00	0.00	0.33	0.10	0.43	0.00	0.00	0.00	0.	0.00
52	7.600	10.00	0.00	0.00	0.00	9.41	4.85	0.00	4.85	0.00	0.00	0.33	0.10	0.43	0.00	0.00	0.00	0.	0.00
53	7.400	10.00	0.00	0.00	0.00	9.44	4.85	0.00	4.85	0.00	0.00	0.33	0.10	0.43	0.00	0.00	0.00	0.	0.00
54	7.200	10.00	0.00	0.00	0.00	9.48	4.85	0.00	4.85	0.00	0.00	0.33	0.10	0.43	0.00	0.00	0.00	0.	0.00
55	7.000	10.00	0.00	0.00	0.00	9.51	4.85	0.00	4.85	0.00	0.00	0.33	0.10	0.43	0.00	0.00	0.00	0.	0.00
56	6.800	10.00	0.00	0.00	0.00	9.54	4.85	0.00	4.85	0.00	0.00	0.32	0.11	0.43	0.00	0.00	0.00	0.	0.00
57	6.600	10.00	0.00	0.00	0.00	9.57	4.85	0.00	4.85	0.00	0.00	0.32	0.11	0.43	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 4 Hurr Cr -- Cnty Rd 67 to Hwy 35

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
58	UPR RCH	53.01000	10.00	0.00	0.00	0.00	9.57	4.85	0.00	4.85	0.00	0.00	0.32	0.11	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
58	6.60	6.30	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
59	6.30	6.00	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
60	6.00	5.70	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
61	5.70	5.40	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
62	5.40	5.10	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
63	5.10	4.80	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
64	4.80	4.50	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
65	4.50	4.20	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
66	4.20	3.90	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
67	3.90	3.60	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
68	3.60	3.30	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
69	3.30	3.00	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
70	3.00	2.70	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
71	2.70	2.40	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
72	2.40	2.10	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
73	2.10	1.80	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
74	1.80	1.50	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
75	1.50	1.20	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
76	1.20	0.90	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
77	0.90	0.60	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
78	0.60	0.30	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
79	0.30	0.00	53.01000	90.6	0.39278	0.05	3.00	45.00	213780.97	71247.33	134.94	0.00	0.000	0.000	0.393
TOT						1.03			4703182.50	1567441.38					
AVG					0.3928		3.00	45.00			134.94				
CUM						2.70									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECA	BOD#1 SETT	ABOD#1 DECA	BOD#2 DECA	BOD#2 SETT	ABOD#2 DECA	BKGD SOD	FULL SOD	CORR SOD	ORGN DECA	ORGN SETT	NH3 DECA	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECA	NCM DECA	NCM SETT
		mg/L	1/da	1/da	1/da	1/da	1/da	1/da	1/da	*	*	*	1/da	1/da	1/da	*	1/da	*	**	**	1/da	1/da	1/da
58	6.300	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	6.000	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	5.700	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	5.400	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	5.100	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	4.800	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	4.500	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	4.200	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	3.900	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	3.600	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	3.300	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3.000	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	2.700	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	2.400	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

72	2.100	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	1.800	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	1.500	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	1.200	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	0.900	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	0.600	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.300	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	0.000	11.29	1.25	0.09	0.00	0.00	0.00	0.00	0.00	42.09	42.09	42.09	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 1.56 0.15 0.00 0.00 0.00 0.00 0.00 0.00 0.00 79.00 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
58	6.300	10.00	0.00	0.00	0.00	9.61	4.85	0.00	4.85	0.00	0.00	0.32	0.11	0.43	0.00	0.00	0.00	0.	0.00
59	6.000	10.00	0.00	0.00	0.00	9.65	4.85	0.00	4.85	0.00	0.00	0.32	0.11	0.43	0.00	0.00	0.00	0.	0.00
60	5.700	10.00	0.00	0.00	0.00	9.68	4.85	0.00	4.85	0.00	0.00	0.31	0.12	0.43	0.00	0.00	0.00	0.	0.00
61	5.400	10.00	0.00	0.00	0.00	9.72	4.85	0.00	4.85	0.00	0.00	0.31	0.12	0.43	0.00	0.00	0.00	0.	0.00
62	5.100	10.00	0.00	0.00	0.00	9.75	4.85	0.00	4.85	0.00	0.00	0.31	0.12	0.43	0.00	0.00	0.00	0.	0.00
63	4.800	10.00	0.00	0.00	0.00	9.78	4.85	0.00	4.85	0.00	0.00	0.30	0.13	0.43	0.00	0.00	0.00	0.	0.00
64	4.500	10.00	0.00	0.00	0.00	9.81	4.85	0.00	4.85	0.00	0.00	0.30	0.13	0.43	0.00	0.00	0.00	0.	0.00
65	4.200	10.00	0.00	0.00	0.00	9.84	4.85	0.00	4.85	0.00	0.00	0.30	0.13	0.43	0.00	0.00	0.00	0.	0.00
66	3.900	10.00	0.00	0.00	0.00	9.87	4.85	0.00	4.85	0.00	0.00	0.30	0.13	0.43	0.00	0.00	0.00	0.	0.00
67	3.600	10.00	0.00	0.00	0.00	9.89	4.85	0.00	4.85	0.00	0.00	0.29	0.14	0.43	0.00	0.00	0.00	0.	0.00
68	3.300	10.00	0.00	0.00	0.00	9.92	4.85	0.00	4.85	0.00	0.00	0.29	0.14	0.43	0.00	0.00	0.00	0.	0.00
69	3.000	10.00	0.00	0.00	0.00	9.94	4.85	0.00	4.85	0.00	0.00	0.29	0.14	0.43	0.00	0.00	0.00	0.	0.00
70	2.700	10.00	0.00	0.00	0.00	9.96	4.85	0.00	4.85	0.00	0.00	0.29	0.15	0.43	0.00	0.00	0.00	0.	0.00
71	2.400	10.00	0.00	0.00	0.00	9.98	4.85	0.00	4.85	0.00	0.00	0.28	0.15	0.43	0.00	0.00	0.00	0.	0.00
72	2.100	10.00	0.00	0.00	0.00	10.00	4.85	0.00	4.85	0.00	0.00	0.28	0.15	0.43	0.00	0.00	0.00	0.	0.00
73	1.800	10.00	0.00	0.00	0.00	10.02	4.85	0.00	4.85	0.00	0.00	0.28	0.15	0.43	0.00	0.00	0.00	0.	0.00
74	1.500	10.00	0.00	0.00	0.00	10.04	4.85	0.00	4.85	0.00	0.00	0.27	0.16	0.43	0.00	0.00	0.00	0.	0.00
75	1.200	10.00	0.00	0.00	0.00	10.05	4.85	0.00	4.85	0.00	0.00	0.27	0.16	0.43	0.00	0.00	0.00	0.	0.00
76	0.900	10.00	0.00	0.00	0.00	10.07	4.85	0.00	4.85	0.00	0.00	0.27	0.16	0.43	0.00	0.00	0.00	0.	0.00
77	0.600	10.00	0.00	0.00	0.00	10.08	4.84	0.00	4.84	0.00	0.00	0.27	0.16	0.43	0.00	0.00	0.00	0.	0.00
78	0.300	10.00	0.00	0.00	0.00	10.10	4.84	0.00	4.84	0.00	0.00	0.26	0.17	0.43	0.00	0.00	0.00	0.	0.00
79	0.000	10.00	0.00	0.00	0.00	10.11	4.84	0.00	4.84	0.00	0.00	0.26	0.17	0.43	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Big Creek U/S of STP

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow

TRAVEL TIME = 2.70 DAYS
 MAXIMUM EFFLUENT = 90.57 PERCENT
 FLOW = 6.50000 TO 53.01000 cfs
 DISPERSION = 0.00000 TO 0.00000 ft²/s
 VELOCITY = 0.13688 TO 0.39278 fps
 DEPTH = 1.70 TO 3.00 ft

WIDTH = 19.00 TO 45.00 ft
 BOD DECAY = 0.09 TO 0.09 per day
 NH3 DECAY = 0.20 TO 0.20 per day
 SOD = 42.09 TO 74.26 mg/ft²/d
 NH3 SOURCE = 0.00 TO 0.00 mg/ft²/d
 REAERATION = 0.97 TO 2.62 per day
 BOD SETTLING = 0.00 TO 0.00 per day
 ORG-N DECAY = 0.00 TO 0.00 per day
 ORG-N SETTLING = 0.00 TO 0.00 per day
 TEMPERATURE = 10.00 TO 10.00 deg C
 DISSOLVED OXYGEN = 7.33 TO 10.11 mg/L

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow

REACH SUMMARY REPORT FOR Big Creek U/S of STP

RCH NO.	REACH NAME	BEGIN DIST km	ENDING DIST km	REACH LENGTH km	TRAVEL TIME days	FLOW AT EOR m ³ /s	AVERAGE VELO m/s	AVG DEPTH m	AVG WIDTH m	FLOW AT EOR cfs	AVERAGE VELO fps	AVG DEPTH ft	AVG WIDTH ft
1	Big Crk -- STP to Town Branch	20.92	18.99	1.93	0.54	0.18408	0.04172	0.762	5.79	6.500	0.137	2.500	19.00
2	Big Crk -- Town Branch to mouth	18.99	12.87	6.12	0.92	0.28632	0.07699	0.518	5.79	10.110	0.253	1.700	19.00
3	Hurr Cr -- Big C to County Rd 67	12.87	10.62	2.25	0.22	1.50127	0.11971	0.914	13.72	53.010	0.393	3.000	45.00
4	Hurr Cr -- Cnty Rd 67 to Hwy 35	10.62	0.00	10.62	1.03	1.50127	0.11971	0.914	13.72	53.010	0.393	3.000	45.00

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Winter scenario (Temp <= 10 C); discharge = 30% of upstream flow

INPUT/OUTPUT LOADING SUMMARY

	FLOW cfs	DO lb/d	BOD#1 lb/d	BOD#2 lb/d	ORG-N lb/d	NH3-N lb/d	NO3-N lb/d	PHOS lb/d	CHL A	NCM
HEADWATER FLOW	5.000	237.4	137.6	0.0	0.0	8.4	0.0	0.0	0.0	0.0
INCREMENTAL INFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL OUTFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASTELoads	48.010	2403.8	1190.1	0.0	0.0	114.7	0.0	0.0	0.0	0.0
WITHDRAWALS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-53.010	-2892.0	-1385.5	0.0	0.0	-75.1	-48.0	0.0	0.0	0.0
DISPERSION THRU LOWER BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DISPERSION THRU HDWTR BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NON-POINT INPUT		0.0	325.0	0.0	0.0					0.0
NATURAL REAERATION		984.3								
DAM REAERATION		0.0								
BACKGROUND SOD		-258.4								
BOD#1 DECAY		-267.2	-267.2							
BOD#1 SETTLING		0.0	0.0							
ANAEROBIC BOD#1 DECAY			0.0							
BOD#2 DECAY		0.0		0.0						
BOD#2 SETTLING		0.0		0.0						
ANAEROBIC BOD#2 DECAY				0.0						
ORG-N DECAY		0.0			0.0	0.0				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-208.7				-48.2	48.2			
BACKGROUND NH3 SOURCE						0.0				
OTHER DENITRIFICATION							0.0			
PHOSPHORUS SOURCE								0.0		
ALGAE PHOTOSYNTHESIS		0.0				0.0	0.0	0.0	0.0	
ALGAE RESPIRATION		0.0				0.0		0.0	0.0	
ALGAE SETTLING		0.0							0.0	
MACRO PHOTOSYNTHESIS		0.0				0.0	0.0	0.0		
NCM DECAY		0.0								0.0
NCM SETTLING		0.0								0.0
TOTAL INPUTS	53.010	3625.6	1652.7	0.0	0.0	123.1	48.2	0.0	0.0	0.0
TOTAL OUTPUTS	-53.010	-3626.4	-1652.7	0.0	0.0	-123.3	-48.0	0.0	0.0	0.0
NET CONVERGENCE ERROR	0.000	-0.8	0.0	0.0	0.0	-0.2	0.2	0.0	0.0	0.0

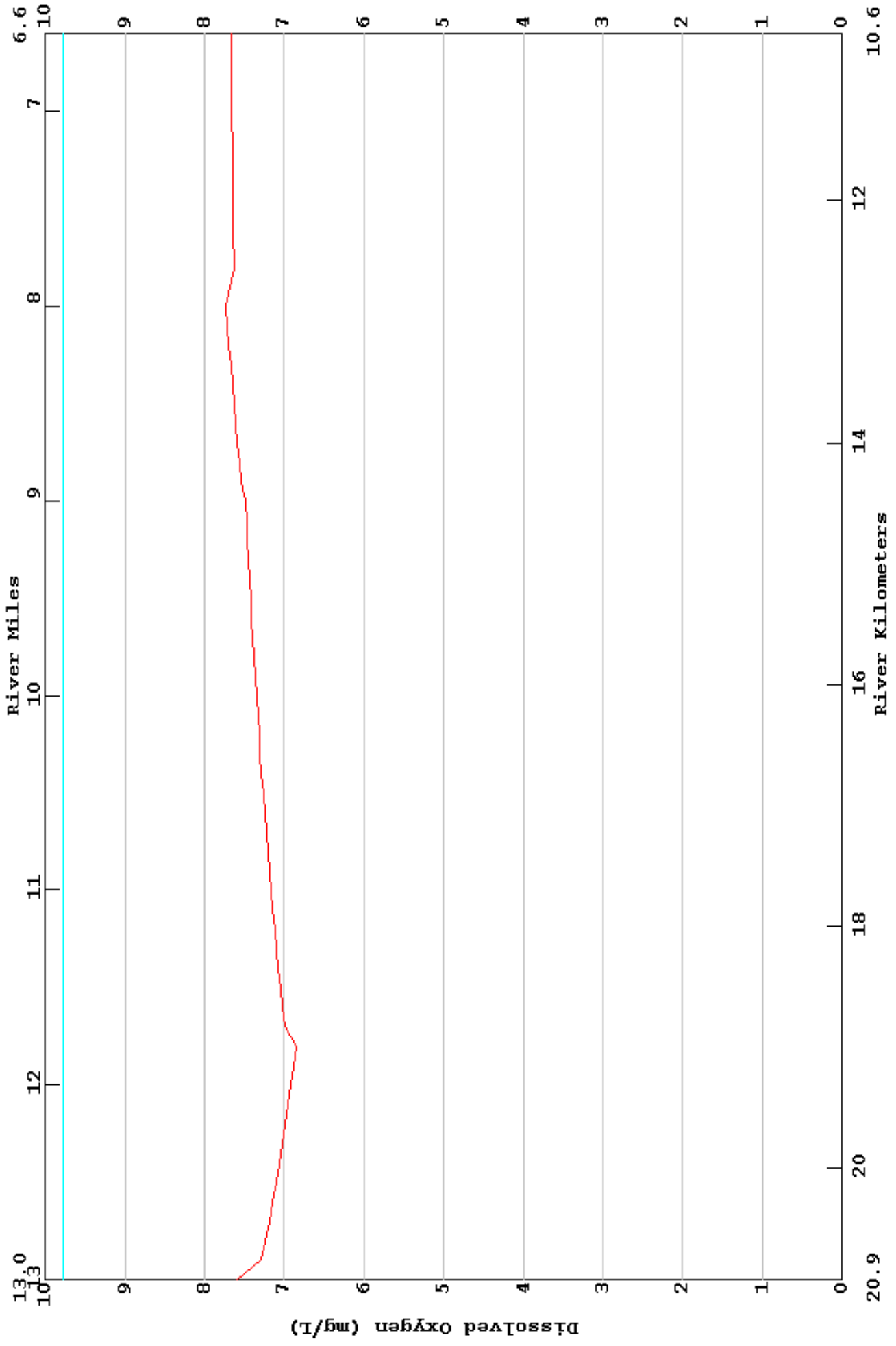
.....EXECUTION COMPLETED

APPENDIX I

Model Output for Spawning Period Projection

LA-QUAL Version 8.00 Run at 15:07 on 06/13/2006 File C:\temp\Spawning_20.txt
Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow
LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan

min= 6.85 max= 7.73



Dissolved Oxygen (mg/L)

River Miles

River Kilometers

Dissolved Oxygen (mg/L)

LA-QUAL Version 8.00
Louisiana Department of Environmental Quality

Input file is C:\WQMODELS\LA-QUAL\Spawning_20.txt
Output produced at 15:45 on 06/12/2006

\$\$\$ DATA TYPE 1 (TITLES AND CONTROL CARDS) \$\$\$

CARD TYPE	CONTROL TITLES
TITLE01	LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
TITLE02	Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow
CNTROL03	NO SEQU <Warning: legacy control - line ignored>
CNTROL04	NO METR
CNTROL05	YES OXYG <Warning: legacy control - line ignored>
ENDATA01	

\$\$\$ DATA TYPE 2 (MODEL OPTIONS) \$\$\$

CARD TYPE	MODEL OPTION
MODOPT01	NO TEMPERATURE
MODOPT02	NO SALINITY
MODOPT03	NO CONSERVATIVE MATERIAL #1 UNITS =
MODOPT04	NO CONSERVATIVE MATERIAL #2 UNITS =
MODOPT05	YES DISSOLVED OXYGEN
MODOPT06	YES BOD1 BIOCHEMICAL OXYGEN DEMAND #1
MODOPT07	NO BOD2 BIOCHEMICAL OXYGEN DEMAND #2
MODOPT08	YES NITROGEN SERIES
MODOPT09	NO PHOSPHORUS
MODOPT10	NO CHLOROPHYLL A
MODOPT11	NO MACROPHYTES
MODOPT12	NO COLIFORMS
MODOPT13	NO NONCONSERVATIVE MATERIAL UNITS =
ENDATA02	

\$\$\$ DATA TYPE 3 (PROGRAM CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
PROGRAM	HYDRAULIC CALCULATION METHOD =	2.00000 (widths and depths)
ENDATA03		

\$\$\$ DATA TYPE 4 (TEMPERATURE CORRECTION CONSTANTS FOR RATE COEFFICIENTS) \$\$\$

CARD TYPE	RATE CODE	THETA VALUE
ENDATA04		

\$\$\$ CONSTANTS TYPE 5 (TEMPERATURE DATA) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
ENDATA05		

\$\$\$ DATA TYPE 6 (ALGAE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA06

\$\$\$ DATA TYPE 7 (MACROPHYTE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA07

\$\$\$ DATA TYPE 8 (REACH IDENTIFICATION DATA) \$\$\$

CARD TYPE	REACH	ID	NAME	BEGIN REACH mi	TO	END REACH mi	ELEM LENGTH mi	REACH LENGTH mi	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Big Crk -- STP to Town Branch	13.00	TO	11.80	0.1000	1.20	12	1	12
REACH ID	2	B2	Big Crk -- Town Branch to mouth	11.80	TO	8.00	0.1000	3.80	38	13	50
REACH ID	3	H1	Hurr Cr -- Big C to County Rd 67	8.00	TO	6.60	0.2000	1.40	7	51	57
REACH ID	4	H2	Hurr Cr -- Cnty Rd 67 to Hwy 35	6.60	TO	0.00	0.3000	6.60	22	58	79

ENDATA08

\$\$\$ DATA TYPE 9 (ADVECTIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	WIDTH "A"	WIDTH "B"	WIDTH "C"	DEPTH "D"	DEPTH "E"	DEPTH "F"	SLOPE	MANNINGS "N"
HYDR-1	1	B1	0.000	0.000	20.100	0.000	0.000	2.620	0.00000	0.000
HYDR-1	2	B2	0.000	0.000	20.100	0.000	0.000	2.000	0.00000	0.000
HYDR-1	3	H1	0.000	0.000	60.000	0.000	0.000	5.000	0.00000	0.000
HYDR-1	4	H2	0.000	0.000	60.000	0.000	0.000	5.000	0.00000	0.000

ENDATA09

\$\$\$ DATA TYPE 10 (DISPERSIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	TIDAL RANGE	DISPERSION "A"	DISPERSION "B"	DISPERSION "C"	DISPERSION "D"
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ENDATA10

\$\$\$ DATA TYPE 11 (INITIAL CONDITIONS) \$\$\$

CARD TYPE	REACH	ID	TEMP	SALIN	DO	NH3	NO3+2	PHOS	CHL A	MACRO
INITIAL	1	B1	16.50	0.00	6.50	1.00	0.00	0.00	0.00	0.00
INITIAL	2	B2	16.50	0.00	6.50	1.00	0.00	0.00	0.00	0.00
INITIAL	3	H1	16.50	0.00	6.50	0.10	0.00	0.00	0.00	0.00
INITIAL	4	H2	16.50	0.00	6.50	0.10	0.00	0.00	0.00	0.00

ENDATA11

\$\$\$ DATA TYPE 12 (REAERATION, SEDIMENT OXYGEN DEMAND, BOD COEFFICIENTS) \$\$\$

CARD TYPE	RCH NUM	RCH ID	K2 OPT	K2 "A"	K2 "B"	K2 "C"	BKGRND SOD mg/ft ² /d	BOD DECAT per day	BOD SETT ft/d	BOD CONV TO SOD	ANAER BOD2 DECAT per day	BOD2 DECAT per day	BOD2 SETT ft/d	BOD2 CONV TO SOD	ANAER BOD2 DECAT per day
COEFF-1	1	B1	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	3	H1	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	4	H2	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000

ENDATA12

\$\$\$ DATA TYPE 13 (NITROGEN AND PHOSPHORUS COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	ORG-N DECA	ORG-N SETT	ORGN CONV TO NH3 SRCE	NH3 DECA	NH3 SRCE	PHOS SRCE	DENIT RATE
COEFF-2	1	B1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	2	B2	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	3	H1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	4	H2	0.000	0.000	0.000	0.450	0.000	0.000	0.000

ENDATA13

\$\$\$ DATA TYPE 14 (ALGAE AND MACROPHYTE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	SECCHI DEPTH	ALGAE: CHL A	ALGAE SETT	ALG CONV TO SOD	ALGAE GROW	ALGAE RESP	MACRO GROW	MACRO RESP
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ENDATA14

\$\$\$ DATA TYPE 15 (COLIFORM AND NONCONSERVATIVE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECAT	NCM SETT	NCM CONV TO SOD
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ENDATA15

\$\$\$ DATA TYPE 16 (INCREMENTAL DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	OUTFLOW	INFLOW	TEMP	SALIN	CM-I	CM-II	IN/DIST	OUT/DIST
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ENDATA16

\$\$\$ DATA TYPE 17 (INCREMENTAL DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	REACH	ID	DO	BOD	ORG-N	NH3-N	NO3-N	BOD#2
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ENDATA17

\$\$\$ DATA TYPE 18 (INCREMENTAL DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	PHOS	CHL A	COLI	NCM
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ENDATA18

\$\$\$ DATA TYPE 19 (NONPOINT SOURCE DATA) \$\$\$

CARD TYPE	REACH	ID	BOD#1	ORG-N	COLI	NCM	DO	BOD#2
NONPOINT	1	B1	53.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	2	B2	111.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	3	H1	28.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	4	H2	133.00	0.00	0.00	0.00	0.00	0.00

ENDATA19

\$\$\$ DATA TYPE 20 (HEADWATER FOR FLOW, TEMPERATURE, SALINITY AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	UNIT	FLOW m ³ /s	FLOW cfs	TEMP deg C	SALIN ppt	CM-I	CM-II
HDWTR-1	1	Big Creek U/S of STP	0	0.35401	12.500	16.50	0.00	0.000	0.000

ENDATA20

\$\$\$ DATA TYPE 21 (HEADWATER DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD#1 mg/L	ORG-N mg/L	NH3-N mg/L	NO3-N mg/L	BOD#2 mg/L
HDWTR-2	1	Big Creek U/S of STP	7.60	5.10	0.00	0.16	0.00	0.00

ENDATA21

\$\$\$ DATA TYPE 22 (HEADWATER DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L

ENDATA22

\$\$\$ DATA TYPE 23 (JUNCTION DATA) \$\$\$

CARD TYPE	JUNCTION ELEMENT	UPSTRM ELEMENT	RIVER KILOM	NAME

ENDATA23

\$\$\$ DATA TYPE 24 (WASTELOAD DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	RKILO	NAME	FLOW m ³ /s	FLOW cfs	FLOW MGD	TEMP deg C	SALIN ppt	CM-I	CM-II
WSTLD-1	1	13.00	Sheridan STP	0.07080	2.50000	1.616	16.50	0.00	0.000	0.000
WSTLD-1	13	11.80	Town Branch	0.08043	2.84000	1.836	16.50	0.00	0.000	0.000
WSTLD-1	41	9.00	Hubbard Creek	0.17559	6.20000	4.008	16.50	0.00	0.000	0.000
WSTLD-1	51	8.00	Hurricane Creek	3.03313	107.10000	69.231	16.50	0.00	0.000	0.000

ENDATA24

\$\$\$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD mg/L	% BOD RMVL	ORG-N mg/L	NH3-N mg/L	% NITRIF	NO3-N mg/L	BOD#2 mg/L
WSTLD-2	1	Sheridan STP	6.00	69.00	0.00	0.00	10.00	0.00	0.00	0.00
WSTLD-2	13	Town Branch	7.60	5.10	0.00	0.00	0.16	0.00	0.00	0.00
WSTLD-2	41	Hubbard Creek	7.60	5.10	0.00	0.00	0.16	0.00	0.00	0.00
WSTLD-2	51	Hurricane Creek	7.60	2.30	0.00	0.00	0.05	0.00	0.00	0.00

ENDATA25

\$\$\$ DATA TYPE 26 (WASTELOAD DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
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ENDATA26

\$\$\$ DATA TYPE 27 (LOWER BOUNDARY CONDITIONS) \$\$\$

CARD TYPE	CONSTITUENT	CONCENTRATION
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ENDATA27

\$\$\$ DATA TYPE 28 (DAM DATA) \$\$\$

CARD TYPE	ELEMENT	NAME	EQN	"A"	"B"	"H"
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ENDATA28

\$\$\$ DATA TYPE 29 (SENSITIVITY ANALYSIS DATA) \$\$\$

CARD TYPE	PARAMETER	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8
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ENDATA29

\$\$\$ DATA TYPE 30 (PLOT CONTROL CARDS) \$\$\$

NUMBER OF PLOTS = 1
NUMBER OF REACHES IN PLOT 1 = 3
PLOT RCH 1 2 3
ENDATA30

\$\$\$ DATA TYPE 31 (OVERLAY PLOT DATA) \$\$\$

ENDATA31

.....NO ERRORS DETECTED IN INPUT DATA
.....HYDRAULIC CALCULATIONS COMPLETED
.....TRIDIAGONAL MATRIX TERMS INITIALIZED

....OXYGEN DEPENDENT RATES CONVERGENT IN 3 ITERATIONS
CONSTITUENT CALCULATIONS COMPLETED
GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

FINAL REPORT Big Creek U/S of STP
 REACH NO. 1 Big Crk -- STP to Town Branch

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
1	HDWTR	12.50000	16.50	0.00	0.00	0.00	7.60	5.10	0.00	5.10	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00
1	WSTLD	2.50000	16.50	0.00	0.00	0.00	6.00	69.00	0.00	69.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
1	13.00	12.90	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
2	12.90	12.80	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
3	12.80	12.70	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
4	12.70	12.60	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
5	12.60	12.50	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
6	12.50	12.40	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
7	12.40	12.30	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
8	12.30	12.20	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
9	12.20	12.10	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
10	12.10	12.00	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
11	12.00	11.90	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
12	11.90	11.80	15.00000	16.7	0.28491	0.02	2.62	20.10	27797.86	10607.94	52.64	0.00	0.000	0.000	0.285
TOT						0.26			333574.38	127295.22					
AVG					0.2849		2.62	20.10			52.64				
CUM						0.26									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECAT 1/da	BOD#1 SETT 1/da	ABOD#1 DECAT 1/da	BOD#2 DECAT 1/da	BOD#2 SETT 1/da	ABOD#2 DECAT 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECAT 1/da	ORGN SETT 1/da	NH3 DECAT 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECAT 1/da	NCM DECAT 1/da	NCM SETT 1/da
1	12.900	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83				0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	12.800	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83				0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	12.700	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83				0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	12.600	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83				0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	12.500	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83				0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	12.400	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83				0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

7	12.300	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	12.200	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	12.100	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	12.000	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	11.900	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	11.800	9.77	1.51	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 1.62 0.15 0.00 0.00 0.00 0.00 0.00139.40 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
1	12.900	16.50	0.00	0.00	0.00	7.28	15.76	0.00	15.76	0.00	0.00	1.79	0.01	1.80	0.00	0.00	0.00	0.	0.00
2	12.800	16.50	0.00	0.00	0.00	7.23	15.77	0.00	15.77	0.00	0.00	1.77	0.03	1.80	0.00	0.00	0.00	0.	0.00
3	12.700	16.50	0.00	0.00	0.00	7.19	15.78	0.00	15.78	0.00	0.00	1.76	0.04	1.80	0.00	0.00	0.00	0.	0.00
4	12.600	16.50	0.00	0.00	0.00	7.14	15.80	0.00	15.80	0.00	0.00	1.75	0.05	1.80	0.00	0.00	0.00	0.	0.00
5	12.500	16.50	0.00	0.00	0.00	7.10	15.81	0.00	15.81	0.00	0.00	1.74	0.06	1.80	0.00	0.00	0.00	0.	0.00
6	12.400	16.50	0.00	0.00	0.00	7.06	15.82	0.00	15.82	0.00	0.00	1.72	0.08	1.80	0.00	0.00	0.00	0.	0.00
7	12.300	16.50	0.00	0.00	0.00	7.02	15.83	0.00	15.83	0.00	0.00	1.71	0.09	1.80	0.00	0.00	0.00	0.	0.00
8	12.200	16.50	0.00	0.00	0.00	6.98	15.84	0.00	15.84	0.00	0.00	1.70	0.10	1.80	0.00	0.00	0.00	0.	0.00
9	12.100	16.50	0.00	0.00	0.00	6.95	15.85	0.00	15.85	0.00	0.00	1.69	0.11	1.80	0.00	0.00	0.00	0.	0.00
10	12.000	16.50	0.00	0.00	0.00	6.91	15.86	0.00	15.86	0.00	0.00	1.68	0.12	1.80	0.00	0.00	0.00	0.	0.00
11	11.900	16.50	0.00	0.00	0.00	6.88	15.87	0.00	15.87	0.00	0.00	1.66	0.14	1.80	0.00	0.00	0.00	0.	0.00
12	11.800	16.50	0.00	0.00	0.00	6.85	15.88	0.00	15.88	0.00	0.00	1.65	0.15	1.80	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 2 Big Crk -- Town Branch to mouth

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
13	UPR RCH	15.00000	16.50	0.00	0.00	0.00	6.85	15.88	0.00	15.88	0.00	0.00	1.65	0.15	0.00	0.00	0.00	0.00
13	WSTLD	2.84000	16.50	0.00	0.00	0.00	7.60	5.10	0.00	5.10	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00
41	WSTLD	6.20000	16.50	0.00	0.00	0.00	7.60	5.10	0.00	5.10	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
13	11.80	11.70	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
14	11.70	11.60	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
15	11.60	11.50	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444

16	11.50	11.40	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
17	11.40	11.30	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
18	11.30	11.20	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
19	11.20	11.10	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
20	11.10	11.00	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
21	11.00	10.90	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
22	10.90	10.80	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
23	10.80	10.70	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
24	10.70	10.60	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
25	10.60	10.50	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
26	10.50	10.40	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
27	10.40	10.30	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
28	10.30	10.20	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
29	10.20	10.10	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
30	10.10	10.00	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
31	10.00	9.90	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
32	9.90	9.80	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
33	9.80	9.70	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
34	9.70	9.60	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
35	9.60	9.50	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
36	9.50	9.40	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
37	9.40	9.30	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
38	9.30	9.20	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
39	9.20	9.10	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
40	9.10	9.00	17.84000	29.9	0.44390	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.444
41	9.00	8.90	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
42	8.90	8.80	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
43	8.80	8.70	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
44	8.70	8.60	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
45	8.60	8.50	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
46	8.50	8.40	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
47	8.40	8.30	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
48	8.30	8.20	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
49	8.20	8.10	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598
50	8.10	8.00	24.04000	48.0	0.59818	0.01	2.00	20.10	21219.74	10607.94	40.18	0.00	0.000	0.000	0.598

TOT 0.49 806349.81 403101.44
AVG 0.4762 2.00 20.10 40.18
CUM 0.75

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECAy 1/da	BOD#1 SETT 1/da	ABOD#1 DECAy 1/da	BOD#2 DECAy 1/da	BOD#2 SETT 1/da	ABOD#2 DECAy 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECAy 1/da	ORGN SETT 1/da	NH3 DECAy 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECAy 1/da	NCM DECAy 1/da	NCM SETT 1/da
13	11.700	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	11.600	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	11.500	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	11.400	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	11.300	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	11.200	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	11.100	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

20	11.000	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	10.900	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	10.800	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	10.700	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	10.600	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	10.500	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	10.400	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	10.300	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	10.200	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	10.100	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	10.000	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	9.900	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	9.800	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	9.700	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	9.600	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	9.500	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	9.400	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	9.300	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	9.200	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	9.100	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	9.000	9.77	2.83	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	8.900	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	8.800	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	8.700	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	8.600	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	8.500	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	8.400	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47	8.300	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	8.200	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	8.100	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	8.000	9.77	3.28	0.13	0.00	0.00	0.00	0.00	0.00111.83111.83111.83	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 3.17 0.15 0.00 0.00 0.00 0.00 0.00139.40 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
13	11.700	16.50	0.00	0.00	0.00	6.99	14.17	0.00	14.17	0.00	0.00	1.41	0.13	1.54	0.00	0.00	0.00	0.	0.00
14	11.600	16.50	0.00	0.00	0.00	7.02	14.18	0.00	14.18	0.00	0.00	1.40	0.14	1.54	0.00	0.00	0.00	0.	0.00
15	11.500	16.50	0.00	0.00	0.00	7.05	14.18	0.00	14.18	0.00	0.00	1.40	0.14	1.54	0.00	0.00	0.00	0.	0.00
16	11.400	16.50	0.00	0.00	0.00	7.07	14.19	0.00	14.19	0.00	0.00	1.39	0.15	1.54	0.00	0.00	0.00	0.	0.00
17	11.300	16.50	0.00	0.00	0.00	7.10	14.19	0.00	14.19	0.00	0.00	1.38	0.16	1.54	0.00	0.00	0.00	0.	0.00
18	11.200	16.50	0.00	0.00	0.00	7.12	14.20	0.00	14.20	0.00	0.00	1.38	0.16	1.54	0.00	0.00	0.00	0.	0.00
19	11.100	16.50	0.00	0.00	0.00	7.14	14.21	0.00	14.21	0.00	0.00	1.37	0.17	1.54	0.00	0.00	0.00	0.	0.00
20	11.000	16.50	0.00	0.00	0.00	7.16	14.21	0.00	14.21	0.00	0.00	1.36	0.17	1.54	0.00	0.00	0.00	0.	0.00
21	10.900	16.50	0.00	0.00	0.00	7.19	14.22	0.00	14.22	0.00	0.00	1.36	0.18	1.54	0.00	0.00	0.00	0.	0.00
22	10.800	16.50	0.00	0.00	0.00	7.21	14.22	0.00	14.22	0.00	0.00	1.35	0.19	1.54	0.00	0.00	0.00	0.	0.00
23	10.700	16.50	0.00	0.00	0.00	7.23	14.23	0.00	14.23	0.00	0.00	1.35	0.19	1.54	0.00	0.00	0.00	0.	0.00
24	10.600	16.50	0.00	0.00	0.00	7.25	14.23	0.00	14.23	0.00	0.00	1.34	0.20	1.54	0.00	0.00	0.00	0.	0.00

25	10.500	16.50	0.00	0.00	0.00	7.26	14.24	0.00	14.24	0.00	0.00	1.33	0.21	1.54	0.00	0.00	0.00	0.00	0.00
26	10.400	16.50	0.00	0.00	0.00	7.28	14.24	0.00	14.24	0.00	0.00	1.33	0.21	1.54	0.00	0.00	0.00	0.00	0.00
27	10.300	16.50	0.00	0.00	0.00	7.30	14.25	0.00	14.25	0.00	0.00	1.32	0.22	1.54	0.00	0.00	0.00	0.00	0.00
28	10.200	16.50	0.00	0.00	0.00	7.32	14.25	0.00	14.25	0.00	0.00	1.32	0.22	1.54	0.00	0.00	0.00	0.00	0.00
29	10.100	16.50	0.00	0.00	0.00	7.33	14.26	0.00	14.26	0.00	0.00	1.31	0.23	1.54	0.00	0.00	0.00	0.00	0.00
30	10.000	16.50	0.00	0.00	0.00	7.35	14.26	0.00	14.26	0.00	0.00	1.30	0.24	1.54	0.00	0.00	0.00	0.00	0.00
31	9.900	16.50	0.00	0.00	0.00	7.36	14.27	0.00	14.27	0.00	0.00	1.30	0.24	1.54	0.00	0.00	0.00	0.00	0.00
32	9.800	16.50	0.00	0.00	0.00	7.38	14.27	0.00	14.27	0.00	0.00	1.29	0.25	1.54	0.00	0.00	0.00	0.00	0.00
33	9.700	16.50	0.00	0.00	0.00	7.39	14.28	0.00	14.28	0.00	0.00	1.29	0.25	1.54	0.00	0.00	0.00	0.00	0.00
34	9.600	16.50	0.00	0.00	0.00	7.41	14.29	0.00	14.29	0.00	0.00	1.28	0.26	1.54	0.00	0.00	0.00	0.00	0.00
35	9.500	16.50	0.00	0.00	0.00	7.42	14.29	0.00	14.29	0.00	0.00	1.27	0.27	1.54	0.00	0.00	0.00	0.00	0.00
36	9.400	16.50	0.00	0.00	0.00	7.44	14.30	0.00	14.30	0.00	0.00	1.27	0.27	1.54	0.00	0.00	0.00	0.00	0.00
37	9.300	16.50	0.00	0.00	0.00	7.45	14.30	0.00	14.30	0.00	0.00	1.26	0.28	1.54	0.00	0.00	0.00	0.00	0.00
38	9.200	16.50	0.00	0.00	0.00	7.46	14.31	0.00	14.31	0.00	0.00	1.26	0.28	1.54	0.00	0.00	0.00	0.00	0.00
39	9.100	16.50	0.00	0.00	0.00	7.47	14.31	0.00	14.31	0.00	0.00	1.25	0.29	1.54	0.00	0.00	0.00	0.00	0.00
40	9.000	16.50	0.00	0.00	0.00	7.48	14.32	0.00	14.32	0.00	0.00	1.24	0.29	1.54	0.00	0.00	0.00	0.00	0.00
41	8.900	16.50	0.00	0.00	0.00	7.54	11.95	0.00	11.95	0.00	0.00	0.96	0.22	1.18	0.00	0.00	0.00	0.00	0.00
42	8.800	16.50	0.00	0.00	0.00	7.56	11.95	0.00	11.95	0.00	0.00	0.96	0.22	1.18	0.00	0.00	0.00	0.00	0.00
43	8.700	16.50	0.00	0.00	0.00	7.59	11.96	0.00	11.96	0.00	0.00	0.96	0.23	1.18	0.00	0.00	0.00	0.00	0.00
44	8.600	16.50	0.00	0.00	0.00	7.61	11.97	0.00	11.97	0.00	0.00	0.95	0.23	1.18	0.00	0.00	0.00	0.00	0.00
45	8.500	16.50	0.00	0.00	0.00	7.63	11.97	0.00	11.97	0.00	0.00	0.95	0.23	1.18	0.00	0.00	0.00	0.00	0.00
46	8.400	16.50	0.00	0.00	0.00	7.65	11.98	0.00	11.98	0.00	0.00	0.95	0.24	1.18	0.00	0.00	0.00	0.00	0.00
47	8.300	16.50	0.00	0.00	0.00	7.67	11.99	0.00	11.99	0.00	0.00	0.94	0.24	1.18	0.00	0.00	0.00	0.00	0.00
48	8.200	16.50	0.00	0.00	0.00	7.69	11.99	0.00	11.99	0.00	0.00	0.94	0.24	1.18	0.00	0.00	0.00	0.00	0.00
49	8.100	16.50	0.00	0.00	0.00	7.71	12.00	0.00	12.00	0.00	0.00	0.94	0.25	1.18	0.00	0.00	0.00	0.00	0.00
50	8.000	16.50	0.00	0.00	0.00	7.73	12.01	0.00	12.01	0.00	0.00	0.93	0.25	1.18	0.00	0.00	0.00	0.00	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 3 Hurr Cr -- Big C to County Rd 67

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM	
51	UPR RCH	24.04000	16.50	0.00	0.00	0.00	7.73	12.01	0.00	12.01	0.00	0.00	0.93	0.25	0.00	0.00	0.00	0.00	0.00
51	WSTLD	107.10000	16.50	0.00	0.00	0.00	7.60	2.30	0.00	2.30	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
51	8.00	7.80	131.14000	90.5	0.43726	0.03	5.00	60.00	316712.56	63330.95	299.86	0.00	0.000	0.000	0.437
52	7.80	7.60	131.14000	90.5	0.43726	0.03	5.00	60.00	316712.56	63330.95	299.86	0.00	0.000	0.000	0.437
53	7.60	7.40	131.14000	90.5	0.43726	0.03	5.00	60.00	316712.56	63330.95	299.86	0.00	0.000	0.000	0.437
54	7.40	7.20	131.14000	90.5	0.43726	0.03	5.00	60.00	316712.56	63330.95	299.86	0.00	0.000	0.000	0.437
55	7.20	7.00	131.14000	90.5	0.43726	0.03	5.00	60.00	316712.56	63330.95	299.86	0.00	0.000	0.000	0.437
56	7.00	6.80	131.14000	90.5	0.43726	0.03	5.00	60.00	316712.56	63330.95	299.86	0.00	0.000	0.000	0.437
57	6.80	6.60	131.14000	90.5	0.43726	0.03	5.00	60.00	316712.56	63330.95	299.86	0.00	0.000	0.000	0.437

TOT 0.20 2216987.75 443316.72
 AVG 0.4373 5.00 60.00 299.86
 CUM 0.94

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECAT	BOD#1 SETT	ABOD#1 DECAT	BOD#2 DECAT	BOD#2 SETT	ABOD#2 DECAT	BKGD SOD	FULL SOD	CORR SOD	ORGN DECAT	ORGN SETT	NH3 DECAT	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECAT	NCM DECAT	NCM SETT
		mg/L	1/da	1/da	1/da	1/da	1/da	1/da	1/da	*	*	*	1/da	1/da	1/da	*	1/da	*	**	**	1/da	1/da	1/da
51	7.800	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	7.600	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	7.400	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	7.200	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	7.000	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	6.800	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	6.600	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 0.76 0.15 0.00 0.00 0.00 0.00 0.00 79.00 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
51	7.800	16.50	0.00	0.00	0.00	7.63	4.07	0.00	4.07	0.00	0.00	0.21	0.05	0.26	0.00	0.00	0.00	0.	0.00
52	7.600	16.50	0.00	0.00	0.00	7.64	4.06	0.00	4.06	0.00	0.00	0.21	0.05	0.26	0.00	0.00	0.00	0.	0.00
53	7.400	16.50	0.00	0.00	0.00	7.64	4.05	0.00	4.05	0.00	0.00	0.21	0.05	0.26	0.00	0.00	0.00	0.	0.00
54	7.200	16.50	0.00	0.00	0.00	7.65	4.04	0.00	4.04	0.00	0.00	0.20	0.05	0.26	0.00	0.00	0.00	0.	0.00
55	7.000	16.50	0.00	0.00	0.00	7.66	4.04	0.00	4.04	0.00	0.00	0.20	0.06	0.26	0.00	0.00	0.00	0.	0.00
56	6.800	16.50	0.00	0.00	0.00	7.66	4.03	0.00	4.03	0.00	0.00	0.20	0.06	0.26	0.00	0.00	0.00	0.	0.00
57	6.600	16.50	0.00	0.00	0.00	7.67	4.02	0.00	4.02	0.00	0.00	0.20	0.06	0.26	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 4 Hurr Cr -- Cnty Rd 67 to Hwy 35

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
58	UPR RCH	131.14000	16.50	0.00	0.00	0.00	7.67	4.02	0.00	4.02	0.00	0.00	0.20	0.06	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
58	6.60	6.30	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
59	6.30	6.00	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
60	6.00	5.70	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
61	5.70	5.40	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
62	5.40	5.10	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
63	5.10	4.80	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
64	4.80	4.50	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
65	4.50	4.20	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
66	4.20	3.90	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
67	3.90	3.60	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
68	3.60	3.30	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
69	3.30	3.00	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
70	3.00	2.70	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
71	2.70	2.40	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
72	2.40	2.10	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
73	2.10	1.80	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
74	1.80	1.50	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
75	1.50	1.20	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
76	1.20	0.90	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
77	0.90	0.60	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
78	0.60	0.30	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
79	0.30	0.00	131.14000	90.5	0.43726	0.04	5.00	60.00	475068.81	94996.44	299.86	0.00	0.000	0.000	0.437
TOT						0.92			10451515.00	2089922.12					
AVG					0.4373		5.00	60.00			299.86				
CUM						1.86									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECAY	BOD#1 SETT	ABOD#1 DECAY	BOD#2 DECAY	BOD#2 SETT	ABOD#2 DECAY	BKGD SOD	FULL SOD	CORR SOD	ORGN DECAY	ORGN SETT	NH3 DECAY	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECAY	NCM DECAY	NCM SETT	
58	6.300	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	6.000	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	5.700	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	5.400	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	5.100	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	4.800	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	4.500	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	4.200	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	3.900	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	3.600	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	3.300	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3.000	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	2.700	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	2.400	9.77	0.71	0.13	0.00	0.00	0.00	0.00	0.00	63.37	63.37	63.37	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

WIDTH = 20.10 TO 60.00 ft
 BOD DECAY = 0.13 TO 0.13 per day
 NH3 DECAY = 0.33 TO 0.34 per day
 SOD = 63.37 TO 111.83 mg/ft²/d
 NH3 SOURCE = 0.00 TO 0.00 mg/ft²/d
 REAERATION = 0.71 TO 3.28 per day
 BOD SETTLING = 0.00 TO 0.00 per day
 ORG-N DECAY = 0.00 TO 0.00 per day
 ORG-N SETTLING = 0.00 TO 0.00 per day
 TEMPERATURE = 16.50 TO 16.50 deg C
 DISSOLVED OXYGEN = 6.85 TO 7.88 mg/L

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow

REACH SUMMARY REPORT FOR Big Creek U/S of STP

RCH NO.	REACH NAME	BEGIN DIST km	ENDING DIST km	REACH LENGTH km	TRAVEL TIME days	FLOW AT EOR m3/s	AVERAGE VELO m/s	AVG DEPTH m	AVG WIDTH m	FLOW AT EOR cfs	AVERAGE VELO fps	AVG DEPTH ft	AVG WIDTH ft
1	Big Crk -- STP to Town Branch	20.92	18.99	1.93	0.26	0.42481	0.08684	0.799	6.13	15.000	0.285	2.620	20.10
2	Big Crk -- Town Branch to mouth	18.99	12.87	6.12	0.49	0.68083	0.14515	0.610	6.13	24.040	0.476	2.000	20.10
3	Hurr Cr -- Big C to County Rd 67	12.87	10.62	2.25	0.20	3.71396	0.13327	1.524	18.29	131.140	0.437	5.000	60.00
4	Hurr Cr -- Cnty Rd 67 to Hwy 35	10.62	0.00	10.62	0.92	3.71396	0.13327	1.524	18.29	131.140	0.437	5.000	60.00

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Spawning period (Mar-May & 15 cfs); discharge = 20% of u/s flow

INPUT/OUTPUT LOADING SUMMARY

	FLOW cfs	DO lb/d	BOD#1 lb/d	BOD#2 lb/d	ORG-N lb/d	NH3-N lb/d	NO3-N lb/d	PHOS lb/d	CHL A	NCM
HEADWATER FLOW	12.500	512.6	344.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0
INCREMENTAL INFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL OUTFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASTELoads	118.640	4843.3	2508.5	0.0	0.0	171.6	0.0	0.0	0.0	0.0
WITHDRAWALS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-131.140	-5572.2	-2653.0	0.0	0.0	-103.2	-79.2	0.0	0.0	0.0
DISPERSION THRU LOWER BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DISPERSION THRU HDWTR BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NON-POINT INPUT		0.0	325.0	0.0	0.0					0.0
NATURAL REAERATION		1568.5								
DAM REAERATION		0.0								
BACKGROUND SOD		-484.8								
BOD#1 DECAY		-524.4	-524.4							
BOD#1 SETTLING		0.0	0.0							
ANAEROBIC BOD#1 DECAY			0.0							
BOD#2 DECAY		0.0		0.0						
BOD#2 SETTLING		0.0		0.0						
ANAEROBIC BOD#2 DECAY				0.0						
ORG-N DECAY		0.0			0.0	0.0				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-343.8				-79.4	79.4			
BACKGROUND NH3 SOURCE						0.0				
OTHER DENITRIFICATION							0.0			
PHOSPHORUS SOURCE								0.0		
ALGAE PHOTOSYNTHESIS		0.0				0.0	0.0	0.0	0.0	
ALGAE RESPIRATION		0.0				0.0		0.0	0.0	
ALGAE SETTLING		0.0							0.0	
MACRO PHOTOSYNTHESIS		0.0				0.0	0.0	0.0		
NCM DECAY		0.0								0.0
NCM SETTLING		0.0								0.0
TOTAL INPUTS	131.140	6924.4	3177.5	0.0	0.0	182.4	79.4	0.0	0.0	0.0
TOTAL OUTPUTS	-131.140	-6925.2	-3177.5	0.0	0.0	-182.6	-79.2	0.0	0.0	0.0
NET CONVERGENCE ERROR	0.000	-0.8	0.0	0.0	0.0	-0.2	0.2	0.0	0.0	0.0

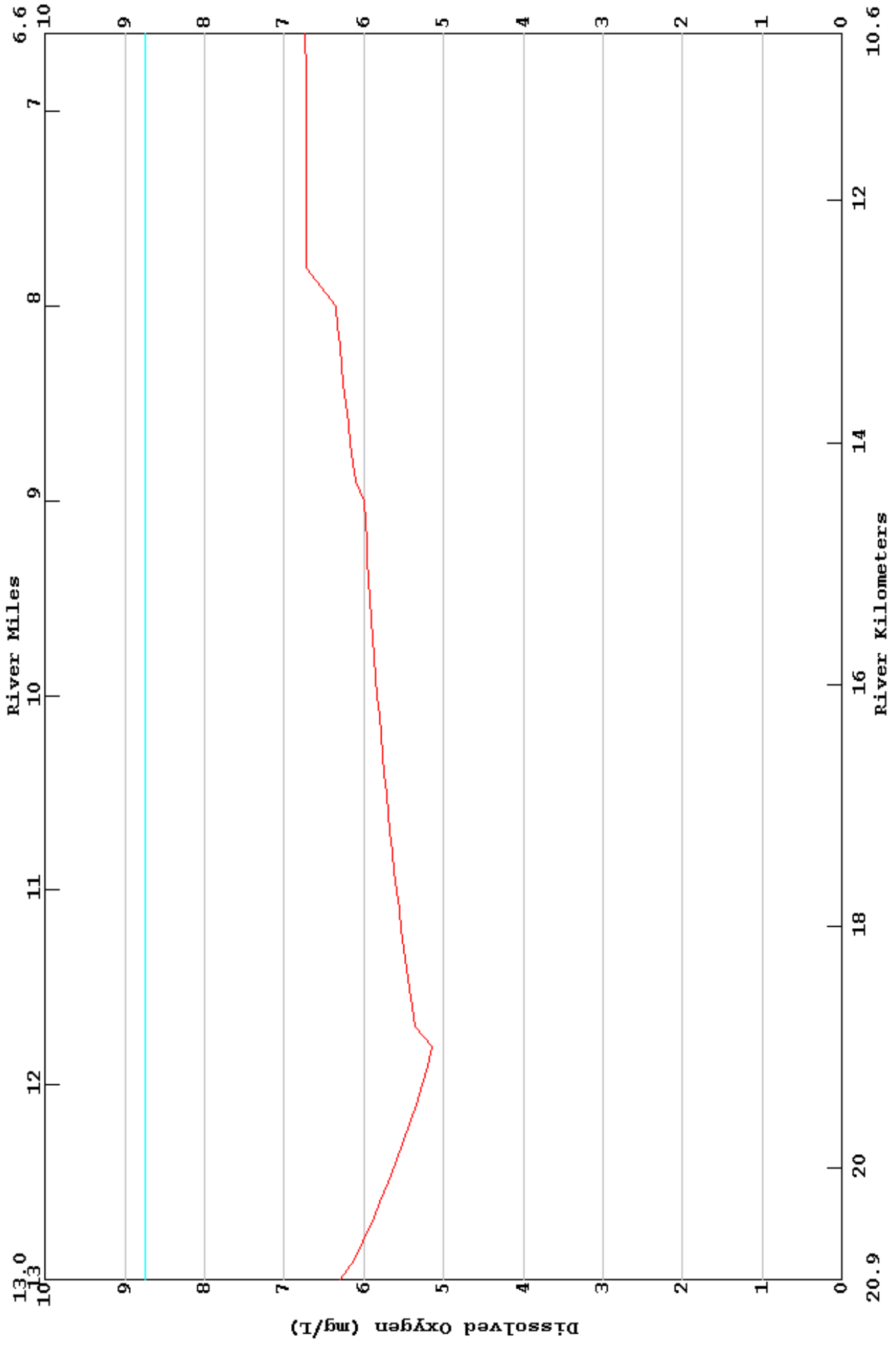
.....EXECUTION COMPLETED

APPENDIX J

Model Output for Primary Season Projection

LA-QUAL Version 8.00 Run at 15:07 on 06/13/2006 File C:\temp\Primary_20.txt
Primary season (temp <= 22 C); discharge = 20% of upstream flow
LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan

min= 5.14 max= 6.74



Dissolved Oxygen (mg/L)

River Miles

River Kilometers

Dissolved Oxygen (mg/L)

LA-QUAL Version 8.00
Louisiana Department of Environmental Quality

Input file is C:\WQMODELS\LA-QUAL\Primary_20.txt
Output produced at 15:50 on 06/12/2006

\$\$\$ DATA TYPE 1 (TITLES AND CONTROL CARDS) \$\$\$

CARD TYPE	CONTROL TITLES
TITLE01	LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
TITLE02	Primary season (temp <= 22 C); discharge = 20% of upstream flow
CNTROL03	NO SEQU <Warning: legacy control - line ignored>
CNTROL04	NO METR
CNTROL05	YES OXYG <Warning: legacy control - line ignored>
ENDATA01	

\$\$\$ DATA TYPE 2 (MODEL OPTIONS) \$\$\$

CARD TYPE	MODEL OPTION
MODOPT01	NO TEMPERATURE
MODOPT02	NO SALINITY
MODOPT03	NO CONSERVATIVE MATERIAL #1 UNITS =
MODOPT04	NO CONSERVATIVE MATERIAL #2 UNITS =
MODOPT05	YES DISSOLVED OXYGEN
MODOPT06	YES BOD1 BIOCHEMICAL OXYGEN DEMAND #1
MODOPT07	NO BOD2 BIOCHEMICAL OXYGEN DEMAND #2
MODOPT08	YES NITROGEN SERIES
MODOPT09	NO PHOSPHORUS
MODOPT10	NO CHLOROPHYLL A
MODOPT11	NO MACROPHYTES
MODOPT12	NO COLIFORMS
MODOPT13	NO NONCONSERVATIVE MATERIAL UNITS =
ENDATA02	

\$\$\$ DATA TYPE 3 (PROGRAM CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
PROGRAM	HYDRAULIC CALCULATION METHOD =	2.00000 (widths and depths)
ENDATA03		

\$\$\$ DATA TYPE 4 (TEMPERATURE CORRECTION CONSTANTS FOR RATE COEFFICIENTS) \$\$\$

CARD TYPE	RATE CODE	THETA VALUE
ENDATA04		

\$\$\$ CONSTANTS TYPE 5 (TEMPERATURE DATA) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
ENDATA05		

\$\$\$ DATA TYPE 6 (ALGAE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA06

\$\$\$ DATA TYPE 7 (MACROPHYTE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA07

\$\$\$ DATA TYPE 8 (REACH IDENTIFICATION DATA) \$\$\$

CARD TYPE	REACH	ID	NAME	BEGIN REACH mi	TO	END REACH mi	ELEM LENGTH mi	REACH LENGTH mi	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Big Crk -- STP to Town Branch	13.00	TO	11.80	0.1000	1.20	12	1	12
REACH ID	2	B2	Big Crk -- Town Branch to mouth	11.80	TO	8.00	0.1000	3.80	38	13	50
REACH ID	3	H1	Hurr Cr -- Big C to County Rd 67	8.00	TO	6.60	0.2000	1.40	7	51	57
REACH ID	4	H2	Hurr Cr -- Cnty Rd 67 to Hwy 35	6.60	TO	0.00	0.3000	6.60	22	58	79

ENDATA08

\$\$\$ DATA TYPE 9 (ADVECTIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	WIDTH "A"	WIDTH "B"	WIDTH "C"	DEPTH "D"	DEPTH "E"	DEPTH "F"	SLOPE	MANNINGS "N"
HYDR-1	1	B1	0.000	0.000	19.700	0.000	0.000	2.580	0.00000	0.000
HYDR-1	2	B2	0.000	0.000	19.700	0.000	0.000	1.900	0.00000	0.000
HYDR-1	3	H1	0.000	0.000	55.000	0.000	0.000	4.500	0.00000	0.000
HYDR-1	4	H2	0.000	0.000	55.000	0.000	0.000	4.500	0.00000	0.000

ENDATA09

\$\$\$ DATA TYPE 10 (DISPERSIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	TIDAL RANGE	DISPERSION "A"	DISPERSION "B"	DISPERSION "C"	DISPERSION "D"
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ENDATA10

\$\$\$ DATA TYPE 11 (INITIAL CONDITIONS) \$\$\$

CARD TYPE	REACH	ID	TEMP	SALIN	DO	NH3	NO3+2	PHOS	CHL A	MACRO
INITIAL	1	B1	22.00	0.00	5.00	1.00	0.00	0.00	0.00	0.00
INITIAL	2	B2	22.00	0.00	5.00	1.00	0.00	0.00	0.00	0.00
INITIAL	3	H1	22.00	0.00	5.00	0.10	0.00	0.00	0.00	0.00
INITIAL	4	H2	22.00	0.00	5.00	0.10	0.00	0.00	0.00	0.00

ENDATA11

\$\$\$ DATA TYPE 12 (REAERATION, SEDIMENT OXYGEN DEMAND, BOD COEFFICIENTS) \$\$\$

CARD TYPE	RCH NUM	RCH ID	K2 OPT	K2 "A"	K2 "B"	K2 "C"	BKGRND SOD mg/ft ² /d	BOD DECA per day	BOD SETT ft/d	BOD CONV TO SOD	ANAER BOD2 DECA per day	BOD2 DECA per day	BOD2 SETT ft/d	BOD2 CONV TO SOD	ANAER BOD2 DECA per day
COEFF-1	1	B1	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	3	H1	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	4	H2	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000

ENDATA12

\$\$\$ DATA TYPE 13 (NITROGEN AND PHOSPHORUS COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	ORG-N DECA	ORG-N SETT	ORGN CONV TO NH3 SRCE	NH3 DECA	NH3 SRCE	PHOS SRCE	DENIT RATE
COEFF-2	1	B1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	2	B2	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	3	H1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	4	H2	0.000	0.000	0.000	0.450	0.000	0.000	0.000

ENDATA13

\$\$\$ DATA TYPE 14 (ALGAE AND MACROPHYTE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	SECCHI DEPTH	ALGAE: CHL A	ALGAE SETT	ALG CONV TO SOD	ALGAE GROW	ALGAE RESP	MACRO GROW	MACRO RESP
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ENDATA14

\$\$\$ DATA TYPE 15 (COLIFORM AND NONCONSERVATIVE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECA	NCM SETT	NCM CONV TO SOD
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ENDATA15

\$\$\$ DATA TYPE 16 (INCREMENTAL DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	OUTFLOW	INFLOW	TEMP	SALIN	CM-I	CM-II	IN/DIST	OUT/DIST
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ENDATA16

\$\$\$ DATA TYPE 17 (INCREMENTAL DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	REACH	ID	DO	BOD	ORG-N	NH3-N	NO3-N	BOD#2
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ENDATA17

\$\$\$ DATA TYPE 18 (INCREMENTAL DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	PHOS	CHL A	COLI	NCM
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ENDATA18

\$\$\$ DATA TYPE 19 (NONPOINT SOURCE DATA) \$\$\$

CARD TYPE	REACH	ID	BOD#1	ORG-N	COLI	NCM	DO	BOD#2
NONPOINT	1	B1	53.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	2	B2	111.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	3	H1	28.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	4	H2	133.00	0.00	0.00	0.00	0.00	0.00

ENDATA19

\$\$\$ DATA TYPE 20 (HEADWATER FOR FLOW, TEMPERATURE, SALINITY AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	UNIT	FLOW m ³ /s	FLOW cfs	TEMP deg C	SALIN ppt	CM-I	CM-II
HDWTR-1	1	Big Creek U/S of STP	0	0.28321	10.000	22.00	0.00	0.000	0.000

ENDATA20

\$\$\$ DATA TYPE 21 (HEADWATER DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD#1 mg/L	ORG-N mg/L	NH3-N mg/L	NO3-N mg/L	BOD#2 mg/L
HDWTR-2	1	Big Creek U/S of STP	6.30	6.00	0.00	0.24	0.00	0.00

ENDATA21

\$\$\$ DATA TYPE 22 (HEADWATER DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L

ENDATA22

\$\$\$ DATA TYPE 23 (JUNCTION DATA) \$\$\$

CARD TYPE	JUNCTION ELEMENT	UPSTRM ELEMENT	RIVER KILOM	NAME

ENDATA23

\$\$\$ DATA TYPE 24 (WASTELOAD DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	RKILO	NAME	FLOW m ³ /s	FLOW cfs	FLOW MGD	TEMP deg C	SALIN ppt	CM-I	CM-II
WSTLD-1	1	13.00	Sheridan STP	0.05664	2.00000	1.293	22.00	0.00	0.000	0.000
WSTLD-1	13	11.80	Town Branch	0.06429	2.27000	1.467	22.00	0.00	0.000	0.000
WSTLD-1	41	9.00	Hubbard Creek	0.14047	4.96000	3.206	22.00	0.00	0.000	0.000
WSTLD-1	51	8.00	Hurricane Creek	2.42707	85.70000	55.398	22.00	0.00	0.000	0.000

ENDATA24

\$\$\$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD mg/L	% BOD RMVL	ORG-N mg/L	NH3-N mg/L	% NITRIF	NO3-N mg/L	BOD#2 mg/L
WSTLD-2	1	Sheridan STP	6.00	69.00	0.00	0.00	10.00	0.00	0.00	0.00
WSTLD-2	13	Town Branch	6.30	6.00	0.00	0.00	0.24	0.00	0.00	0.00
WSTLD-2	41	Hubbard Creek	6.30	6.00	0.00	0.00	0.24	0.00	0.00	0.00
WSTLD-2	51	Hurricane Creek	6.80	2.10	0.00	0.00	0.05	0.00	0.00	0.00

ENDATA25

\$\$\$ DATA TYPE 26 (WASTELOAD DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
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ENDATA26

\$\$\$ DATA TYPE 27 (LOWER BOUNDARY CONDITIONS) \$\$\$

CARD TYPE	CONSTITUENT	CONCENTRATION
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ENDATA27

\$\$\$ DATA TYPE 28 (DAM DATA) \$\$\$

CARD TYPE	ELEMENT	NAME	EQN	"A"	"B"	"H"
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ENDATA28

\$\$\$ DATA TYPE 29 (SENSITIVITY ANALYSIS DATA) \$\$\$

CARD TYPE	PARAMETER	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8
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ENDATA29

\$\$\$ DATA TYPE 30 (PLOT CONTROL CARDS) \$\$\$

NUMBER OF PLOTS = 1
NUMBER OF REACHES IN PLOT 1 = 3
PLOT RCH 1 2 3
ENDATA30

\$\$\$ DATA TYPE 31 (OVERLAY PLOT DATA) \$\$\$

ENDATA31

.....NO ERRORS DETECTED IN INPUT DATA
.....HYDRAULIC CALCULATIONS COMPLETED
.....TRIDIAGONAL MATRIX TERMS INITIALIZED

....OXYGEN DEPENDENT RATES CONVERGENT IN 7 ITERATIONS
CONSTITUENT CALCULATIONS COMPLETED
GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

FINAL REPORT Big Creek U/S of STP
 REACH NO. 1 Big Crk -- STP to Town Branch

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Primary season (temp <= 22 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
1	HDWTR	10.00000	22.00	0.00	0.00	0.00	6.30	6.00	0.00	6.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00
1	WSTLD	2.00000	22.00	0.00	0.00	0.00	6.00	69.00	0.00	69.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
1	13.00	12.90	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
2	12.90	12.80	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
3	12.80	12.70	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
4	12.70	12.60	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
5	12.60	12.50	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
6	12.50	12.40	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
7	12.40	12.30	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
8	12.30	12.20	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
9	12.20	12.10	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
10	12.10	12.00	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
11	12.00	11.90	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
12	11.90	11.80	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
TOT						0.31			321944.66	124761.98					
AVG					0.2362		2.58	19.70			50.80				
CUM						0.31									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECA 1/da	BOD#1 SETT 1/da	ABOD#1 DECA 1/da	BOD#2 DECA 1/da	BOD#2 SETT 1/da	ABOD#2 DECA 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECA 1/da	ORGN SETT 1/da	NH3 DECA 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECA 1/da	NCM DECA 1/da	NCM SETT 1/da
1	12.900	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11				0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	12.800	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11				0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	12.700	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11				0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	12.600	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11				0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	12.500	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11				0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	12.400	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11				0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

7	12.300	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	12.200	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	12.100	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	12.000	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	11.900	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	11.800	8.74	1.57	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 1.51 0.15 0.00 0.00 0.00 0.00 0.00139.40 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
1	12.900	22.00	0.00	0.00	0.00	6.13	16.50	0.00	16.50	0.00	0.00	1.84	0.02	1.87	0.00	0.00	0.00	0.	0.00
2	12.800	22.00	0.00	0.00	0.00	6.01	16.50	0.00	16.50	0.00	0.00	1.82	0.05	1.87	0.00	0.00	0.00	0.	0.00
3	12.700	22.00	0.00	0.00	0.00	5.90	16.49	0.00	16.49	0.00	0.00	1.80	0.07	1.87	0.00	0.00	0.00	0.	0.00
4	12.600	22.00	0.00	0.00	0.00	5.79	16.49	0.00	16.49	0.00	0.00	1.77	0.09	1.87	0.00	0.00	0.00	0.	0.00
5	12.500	22.00	0.00	0.00	0.00	5.69	16.49	0.00	16.49	0.00	0.00	1.75	0.12	1.87	0.00	0.00	0.00	0.	0.00
6	12.400	22.00	0.00	0.00	0.00	5.60	16.49	0.00	16.49	0.00	0.00	1.73	0.14	1.87	0.00	0.00	0.00	0.	0.00
7	12.300	22.00	0.00	0.00	0.00	5.51	16.49	0.00	16.49	0.00	0.00	1.71	0.16	1.87	0.00	0.00	0.00	0.	0.00
8	12.200	22.00	0.00	0.00	0.00	5.43	16.48	0.00	16.48	0.00	0.00	1.69	0.18	1.87	0.00	0.00	0.00	0.	0.00
9	12.100	22.00	0.00	0.00	0.00	5.35	16.48	0.00	16.48	0.00	0.00	1.66	0.20	1.87	0.00	0.00	0.00	0.	0.00
10	12.000	22.00	0.00	0.00	0.00	5.27	16.48	0.00	16.48	0.00	0.00	1.64	0.22	1.87	0.00	0.00	0.00	0.	0.00
11	11.900	22.00	0.00	0.00	0.00	5.20	16.48	0.00	16.48	0.00	0.00	1.62	0.24	1.87	0.00	0.00	0.00	0.	0.00
12	11.800	22.00	0.00	0.00	0.00	5.14	16.48	0.00	16.48	0.00	0.00	1.60	0.26	1.87	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 2 Big Crk -- Town Branch to mouth

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Primary season (temp <= 22 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
13	UPR RCH	12.00000	22.00	0.00	0.00	0.00	5.14	16.48	0.00	16.48	0.00	0.00	1.60	0.26	0.00	0.00	0.00	0.00
13	WSTLD	2.27000	22.00	0.00	0.00	0.00	6.30	6.00	0.00	6.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00
41	WSTLD	4.96000	22.00	0.00	0.00	0.00	6.30	6.00	0.00	6.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
13	11.80	11.70	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
14	11.70	11.60	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
15	11.60	11.50	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381

16	11.50	11.40	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
17	11.40	11.30	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
18	11.30	11.20	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
19	11.20	11.10	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
20	11.10	11.00	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
21	11.00	10.90	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
22	10.90	10.80	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
23	10.80	10.70	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
24	10.70	10.60	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
25	10.60	10.50	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
26	10.50	10.40	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
27	10.40	10.30	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
28	10.30	10.20	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
29	10.20	10.10	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
30	10.10	10.00	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
31	10.00	9.90	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
32	9.90	9.80	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
33	9.80	9.70	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
34	9.70	9.60	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
35	9.60	9.50	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
36	9.50	9.40	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
37	9.40	9.30	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
38	9.30	9.20	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
39	9.20	9.10	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
40	9.10	9.00	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
41	9.00	8.90	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
42	8.90	8.80	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
43	8.80	8.70	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
44	8.70	8.60	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
45	8.60	8.50	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
46	8.50	8.40	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
47	8.40	8.30	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
48	8.30	8.20	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
49	8.20	8.10	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
50	8.10	8.00	19.23000	48.0	0.51390	0.01	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.514
TOT						0.57			750788.56	395079.62					
AVG					0.4091		1.90	19.70			37.41				
CUM						0.88									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECAy 1/da	BOD#1 SETT 1/da	ABOD#1 DECAy 1/da	BOD#2 DECAy 1/da	BOD#2 SETT 1/da	ABOD#2 DECAy 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECAy 1/da	ORGN SETT 1/da	NH3 DECAy 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECAy 1/da	NCM DECAy 1/da	NCM SETT 1/da
13	11.700	8.74	3.16	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	11.600	8.74	3.16	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	11.500	8.74	3.16	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	11.400	8.74	3.16	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	11.300	8.74	3.16	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	11.200	8.74	3.16	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	11.100	8.74	3.16	0.16	0.00	0.00	0.00	0.00	0.00158.11158.11158.11	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

25	10.500	22.00	0.00	0.00	0.00	5.72	14.80	0.00	14.80	0.00	0.00	1.25	0.36	1.61	0.00	0.00	0.00	0.00	0.00
26	10.400	22.00	0.00	0.00	0.00	5.74	14.80	0.00	14.80	0.00	0.00	1.24	0.37	1.61	0.00	0.00	0.00	0.00	0.00
27	10.300	22.00	0.00	0.00	0.00	5.77	14.79	0.00	14.79	0.00	0.00	1.23	0.38	1.61	0.00	0.00	0.00	0.00	0.00
28	10.200	22.00	0.00	0.00	0.00	5.79	14.79	0.00	14.79	0.00	0.00	1.22	0.39	1.61	0.00	0.00	0.00	0.00	0.00
29	10.100	22.00	0.00	0.00	0.00	5.81	14.79	0.00	14.79	0.00	0.00	1.21	0.40	1.61	0.00	0.00	0.00	0.00	0.00
30	10.000	22.00	0.00	0.00	0.00	5.83	14.79	0.00	14.79	0.00	0.00	1.20	0.41	1.61	0.00	0.00	0.00	0.00	0.00
31	9.900	22.00	0.00	0.00	0.00	5.85	14.79	0.00	14.79	0.00	0.00	1.19	0.41	1.61	0.00	0.00	0.00	0.00	0.00
32	9.800	22.00	0.00	0.00	0.00	5.87	14.79	0.00	14.79	0.00	0.00	1.18	0.42	1.61	0.00	0.00	0.00	0.00	0.00
33	9.700	22.00	0.00	0.00	0.00	5.89	14.79	0.00	14.79	0.00	0.00	1.17	0.43	1.61	0.00	0.00	0.00	0.00	0.00
34	9.600	22.00	0.00	0.00	0.00	5.90	14.79	0.00	14.79	0.00	0.00	1.17	0.44	1.61	0.00	0.00	0.00	0.00	0.00
35	9.500	22.00	0.00	0.00	0.00	5.92	14.79	0.00	14.79	0.00	0.00	1.16	0.45	1.61	0.00	0.00	0.00	0.00	0.00
36	9.400	22.00	0.00	0.00	0.00	5.94	14.78	0.00	14.78	0.00	0.00	1.15	0.46	1.61	0.00	0.00	0.00	0.00	0.00
37	9.300	22.00	0.00	0.00	0.00	5.95	14.78	0.00	14.78	0.00	0.00	1.14	0.47	1.61	0.00	0.00	0.00	0.00	0.00
38	9.200	22.00	0.00	0.00	0.00	5.97	14.78	0.00	14.78	0.00	0.00	1.13	0.48	1.61	0.00	0.00	0.00	0.00	0.00
39	9.100	22.00	0.00	0.00	0.00	5.98	14.78	0.00	14.78	0.00	0.00	1.12	0.49	1.61	0.00	0.00	0.00	0.00	0.00
40	9.000	22.00	0.00	0.00	0.00	6.00	14.78	0.00	14.78	0.00	0.00	1.11	0.50	1.61	0.00	0.00	0.00	0.00	0.00
41	8.900	22.00	0.00	0.00	0.00	6.11	12.52	0.00	12.52	0.00	0.00	0.88	0.37	1.26	0.00	0.00	0.00	0.00	0.00
42	8.800	22.00	0.00	0.00	0.00	6.14	12.52	0.00	12.52	0.00	0.00	0.88	0.38	1.26	0.00	0.00	0.00	0.00	0.00
43	8.700	22.00	0.00	0.00	0.00	6.17	12.53	0.00	12.53	0.00	0.00	0.87	0.38	1.26	0.00	0.00	0.00	0.00	0.00
44	8.600	22.00	0.00	0.00	0.00	6.20	12.53	0.00	12.53	0.00	0.00	0.87	0.39	1.26	0.00	0.00	0.00	0.00	0.00
45	8.500	22.00	0.00	0.00	0.00	6.23	12.53	0.00	12.53	0.00	0.00	0.86	0.40	1.26	0.00	0.00	0.00	0.00	0.00
46	8.400	22.00	0.00	0.00	0.00	6.26	12.54	0.00	12.54	0.00	0.00	0.85	0.40	1.26	0.00	0.00	0.00	0.00	0.00
47	8.300	22.00	0.00	0.00	0.00	6.28	12.54	0.00	12.54	0.00	0.00	0.85	0.41	1.26	0.00	0.00	0.00	0.00	0.00
48	8.200	22.00	0.00	0.00	0.00	6.31	12.55	0.00	12.55	0.00	0.00	0.84	0.41	1.26	0.00	0.00	0.00	0.00	0.00
49	8.100	22.00	0.00	0.00	0.00	6.33	12.55	0.00	12.55	0.00	0.00	0.84	0.42	1.26	0.00	0.00	0.00	0.00	0.00
50	8.000	22.00	0.00	0.00	0.00	6.35	12.55	0.00	12.55	0.00	0.00	0.83	0.42	1.26	0.00	0.00	0.00	0.00	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 3 Hurr Cr -- Big C to County Rd 67

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Primary season (temp <= 22 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM	
51	UPR RCH	19.23000	22.00	0.00	0.00	0.00	6.35	12.55	0.00	12.55	0.00	0.00	0.83	0.42	0.00	0.00	0.00	0.00	0.00
51	WSTLD	85.69999	22.00	0.00	0.00	0.00	6.80	2.10	0.00	2.10	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
51	8.00	7.80	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
52	7.80	7.60	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
53	7.60	7.40	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
54	7.40	7.20	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
55	7.20	7.00	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
56	7.00	6.80	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
57	6.80	6.60	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424

TOT 0.20 1829014.88 406373.59
 AVG 0.4241 4.50 55.00 247.39
 CUM 1.08

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECAT	BOD#1 SETT	ABOD#1 DECAT	BOD#2 DECAT	BOD#2 SETT	ABOD#2 DECAT	BKGD SOD	FULL SOD	CORR SOD	ORGN DECAT	ORGN SETT	NH3 DECAT	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECAT	NCM DECAT	NCM SETT	
		mg/L	1/da	1/da	1/da	1/da	1/da	1/da	1/da	*	*	*	1/da	1/da	1/da	*	1/da	*	**	**	1/da	1/da	1/da	
51	7.800	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	7.600	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	7.400	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	7.200	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	7.000	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	6.800	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	6.600	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20	DEG C	RATE	0.88	0.15	0.00	0.00	0.00	0.00	0.00	79.00			0.00	0.00	0.45	0.00	0.00	0.00			0.00	0.00	0.00	
*	mg/ft ² /d		**	mg/L/day																				

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
51	7.800	22.00	0.00	0.00	0.00	6.72	4.00	0.00	4.00	0.00	0.00	0.19	0.08	0.27	0.00	0.00	0.00	0.	0.00
52	7.600	22.00	0.00	0.00	0.00	6.72	3.99	0.00	3.99	0.00	0.00	0.19	0.08	0.27	0.00	0.00	0.00	0.	0.00
53	7.400	22.00	0.00	0.00	0.00	6.72	3.98	0.00	3.98	0.00	0.00	0.19	0.09	0.27	0.00	0.00	0.00	0.	0.00
54	7.200	22.00	0.00	0.00	0.00	6.73	3.97	0.00	3.97	0.00	0.00	0.18	0.09	0.27	0.00	0.00	0.00	0.	0.00
55	7.000	22.00	0.00	0.00	0.00	6.73	3.96	0.00	3.96	0.00	0.00	0.18	0.09	0.27	0.00	0.00	0.00	0.	0.00
56	6.800	22.00	0.00	0.00	0.00	6.73	3.94	0.00	3.94	0.00	0.00	0.18	0.09	0.27	0.00	0.00	0.00	0.	0.00
57	6.600	22.00	0.00	0.00	0.00	6.74	3.93	0.00	3.93	0.00	0.00	0.17	0.10	0.27	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 4 Hurr Cr -- Cnty Rd 67 to Hwy 35

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Primary season (temp <= 22 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
58	UPR RCH	104.93000	22.00	0.00	0.00	0.00	6.74	3.93	0.00	3.93	0.00	0.00	0.17	0.10	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
58	6.60	6.30	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
59	6.30	6.00	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
60	6.00	5.70	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
61	5.70	5.40	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
62	5.40	5.10	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
63	5.10	4.80	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
64	4.80	4.50	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
65	4.50	4.20	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
66	4.20	3.90	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
67	3.90	3.60	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
68	3.60	3.30	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
69	3.30	3.00	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
70	3.00	2.70	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
71	2.70	2.40	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
72	2.40	2.10	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
73	2.10	1.80	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
74	1.80	1.50	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
75	1.50	1.20	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
76	1.20	0.90	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
77	0.90	0.60	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
78	0.60	0.30	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
79	0.30	0.00	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
TOT						0.95			8622497.00	1915761.38					
AVG					0.4241		4.50	55.00			247.39				
CUM						2.03									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECAY	BOD#1 SETT	ABOD#1 DECAY	BOD#2 DECAY	BOD#2 SETT	ABOD#2 DECAY	BKGD SOD	FULL SOD	CORR SOD	ORGN DECAY	ORGN SETT	NH3 DECAY	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECAY	NCM DECAY	NCM SETT	
58	6.300	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	6.000	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	5.700	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	5.400	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	5.100	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	4.800	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	4.500	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	4.200	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	3.900	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	3.600	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	3.300	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3.000	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	2.700	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	2.400	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

72	2.100	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	1.800	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	1.500	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	1.200	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	0.900	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	0.600	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.300	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	0.000	8.74	0.92	0.16	0.00	0.00	0.00	0.00	0.00	89.60	89.60	89.60	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 0.88 0.15 0.00 0.00 0.00 0.00 0.00 0.00 0.00 79.00 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
58	6.300	22.00	0.00	0.00	0.00	6.74	3.92	0.00	3.92	0.00	0.00	0.17	0.10	0.27	0.00	0.00	0.00	0.	0.00
59	6.000	22.00	0.00	0.00	0.00	6.74	3.90	0.00	3.90	0.00	0.00	0.17	0.10	0.27	0.00	0.00	0.00	0.	0.00
60	5.700	22.00	0.00	0.00	0.00	6.75	3.88	0.00	3.88	0.00	0.00	0.16	0.11	0.27	0.00	0.00	0.00	0.	0.00
61	5.400	22.00	0.00	0.00	0.00	6.76	3.87	0.00	3.87	0.00	0.00	0.16	0.11	0.27	0.00	0.00	0.00	0.	0.00
62	5.100	22.00	0.00	0.00	0.00	6.76	3.85	0.00	3.85	0.00	0.00	0.16	0.11	0.27	0.00	0.00	0.00	0.	0.00
63	4.800	22.00	0.00	0.00	0.00	6.77	3.83	0.00	3.83	0.00	0.00	0.15	0.12	0.27	0.00	0.00	0.00	0.	0.00
64	4.500	22.00	0.00	0.00	0.00	6.77	3.82	0.00	3.82	0.00	0.00	0.15	0.12	0.27	0.00	0.00	0.00	0.	0.00
65	4.200	22.00	0.00	0.00	0.00	6.78	3.80	0.00	3.80	0.00	0.00	0.15	0.12	0.27	0.00	0.00	0.00	0.	0.00
66	3.900	22.00	0.00	0.00	0.00	6.79	3.78	0.00	3.78	0.00	0.00	0.14	0.13	0.27	0.00	0.00	0.00	0.	0.00
67	3.600	22.00	0.00	0.00	0.00	6.79	3.77	0.00	3.77	0.00	0.00	0.14	0.13	0.27	0.00	0.00	0.00	0.	0.00
68	3.300	22.00	0.00	0.00	0.00	6.80	3.75	0.00	3.75	0.00	0.00	0.14	0.13	0.27	0.00	0.00	0.00	0.	0.00
69	3.000	22.00	0.00	0.00	0.00	6.81	3.74	0.00	3.74	0.00	0.00	0.13	0.14	0.27	0.00	0.00	0.00	0.	0.00
70	2.700	22.00	0.00	0.00	0.00	6.81	3.72	0.00	3.72	0.00	0.00	0.13	0.14	0.27	0.00	0.00	0.00	0.	0.00
71	2.400	22.00	0.00	0.00	0.00	6.82	3.70	0.00	3.70	0.00	0.00	0.13	0.14	0.27	0.00	0.00	0.00	0.	0.00
72	2.100	22.00	0.00	0.00	0.00	6.83	3.69	0.00	3.69	0.00	0.00	0.13	0.14	0.27	0.00	0.00	0.00	0.	0.00
73	1.800	22.00	0.00	0.00	0.00	6.83	3.67	0.00	3.67	0.00	0.00	0.12	0.15	0.27	0.00	0.00	0.00	0.	0.00
74	1.500	22.00	0.00	0.00	0.00	6.84	3.66	0.00	3.66	0.00	0.00	0.12	0.15	0.27	0.00	0.00	0.00	0.	0.00
75	1.200	22.00	0.00	0.00	0.00	6.85	3.64	0.00	3.64	0.00	0.00	0.12	0.15	0.27	0.00	0.00	0.00	0.	0.00
76	0.900	22.00	0.00	0.00	0.00	6.86	3.63	0.00	3.63	0.00	0.00	0.12	0.16	0.27	0.00	0.00	0.00	0.	0.00
77	0.600	22.00	0.00	0.00	0.00	6.86	3.61	0.00	3.61	0.00	0.00	0.11	0.16	0.27	0.00	0.00	0.00	0.	0.00
78	0.300	22.00	0.00	0.00	0.00	6.87	3.60	0.00	3.60	0.00	0.00	0.11	0.16	0.27	0.00	0.00	0.00	0.	0.00
79	0.000	22.00	0.00	0.00	0.00	6.88	3.58	0.00	3.58	0.00	0.00	0.11	0.16	0.27	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Big Creek U/S of STP

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Primary season (temp <= 22 C); discharge = 20% of upstream flow

TRAVEL TIME = 2.03 DAYS

MAXIMUM EFFLUENT = 90.47 PERCENT

FLOW = 12.00000 TO 104.93000 cfs
DISPERSION = 0.00000 TO 0.00000 ft²/s
VELOCITY = 0.23617 TO 0.51390 fps
DEPTH = 1.90 TO 4.50 ft

WIDTH	=	19.70	TO	55.00	ft
BOD DECAY	=	0.16	TO	0.16	per day
NH3 DECAY	=	0.49	TO	0.51	per day
SOD	=	89.60	TO	158.11	mg/ft ² /d
NH3 SOURCE	=	0.00	TO	0.00	mg/ft ² /d
REAERATION	=	0.92	TO	3.67	per day
BOD SETTLING	=	0.00	TO	0.00	per day
ORG-N DECAY	=	0.00	TO	0.00	per day
ORG-N SETTLING	=	0.00	TO	0.00	per day
TEMPERATURE	=	22.00	TO	22.00	deg C
DISSOLVED OXYGEN	=	5.14	TO	6.88	mg/L

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Primary season (temp <= 22 C); discharge = 20% of upstream flow

REACH SUMMARY REPORT FOR Big Creek U/S of STP

RCH NO.	REACH NAME	BEGIN DIST km	ENDING DIST km	REACH LENGTH km	TRAVEL TIME days	FLOW AT EOR m3/s	AVERAGE VELO m/s	AVG DEPTH m	AVG WIDTH m	FLOW AT EOR cfs	AVERAGE VELO fps	AVG DEPTH ft	AVG WIDTH ft
1	Big Crk -- STP to Town Branch	20.92	18.99	1.93	0.31	0.33985	0.07198	0.786	6.00	12.000	0.236	2.580	19.70
2	Big Crk -- Town Branch to mouth	18.99	12.87	6.12	0.57	0.54460	0.12469	0.579	6.00	19.230	0.409	1.900	19.70
3	Hurr Cr -- Big C to County Rd 67	12.87	10.62	2.25	0.20	2.97168	0.12925	1.372	16.76	104.930	0.424	4.500	55.00
4	Hurr Cr -- Cnty Rd 67 to Hwy 35	10.62	0.00	10.62	0.95	2.97168	0.12925	1.372	16.76	104.930	0.424	4.500	55.00

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Primary season (temp <= 22 C); discharge = 20% of upstream flow

INPUT/OUTPUT LOADING SUMMARY

	FLOW cfs	DO lb/d	BOD#1 lb/d	BOD#2 lb/d	ORG-N lb/d	NH3-N lb/d	NO3-N lb/d	PHOS lb/d	CHL A	NCM
HEADWATER FLOW	10.000	339.9	323.7	0.0	0.0	12.9	0.0	0.0	0.0	0.0
INCREMENTAL INFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL OUTFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASTELoads	94.930	3454.7	1949.6	0.0	0.0	140.4	0.0	0.0	0.0	0.0
WITHDRAWALS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-104.930	-3894.4	-2028.2	0.0	0.0	-61.2	-92.1	0.0	0.0	0.0
DISPERSION THRU LOWER BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DISPERSION THRU HDWTR BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NON-POINT INPUT		0.0	325.0	0.0	0.0					0.0
NATURAL REAERATION		1708.8								
DAM REAERATION		0.0								
BACKGROUND SOD		-640.0								
BOD#1 DECAY		-570.1	-570.1							
BOD#1 SETTLING		0.0	0.0							
ANAEROBIC BOD#1 DECAY			0.0							
BOD#2 DECAY		0.0		0.0						
BOD#2 SETTLING		0.0		0.0						
ANAEROBIC BOD#2 DECAY				0.0						
ORG-N DECAY		0.0			0.0	0.0				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-399.4				-92.2	92.2			
BACKGROUND NH3 SOURCE						0.0				
OTHER DENITRIFICATION							0.0			
PHOSPHORUS SOURCE								0.0		
ALGAE PHOTOSYNTHESIS		0.0				0.0	0.0	0.0	0.0	
ALGAE RESPIRATION		0.0				0.0		0.0	0.0	
ALGAE SETTLING		0.0							0.0	
MACRO PHOTOSYNTHESIS		0.0				0.0	0.0	0.0		
NCM DECAY		0.0								0.0
NCM SETTLING		0.0								0.0
TOTAL INPUTS	104.930	5503.4	2598.4	0.0	0.0	153.3	92.2	0.0	0.0	0.0
TOTAL OUTPUTS	-104.930	-5504.0	-2598.4	0.0	0.0	-153.5	-92.1	0.0	0.0	0.0
NET CONVERGENCE ERROR	0.000	-0.6	0.0	0.0	0.0	-0.1	0.1	0.0	0.0	0.0

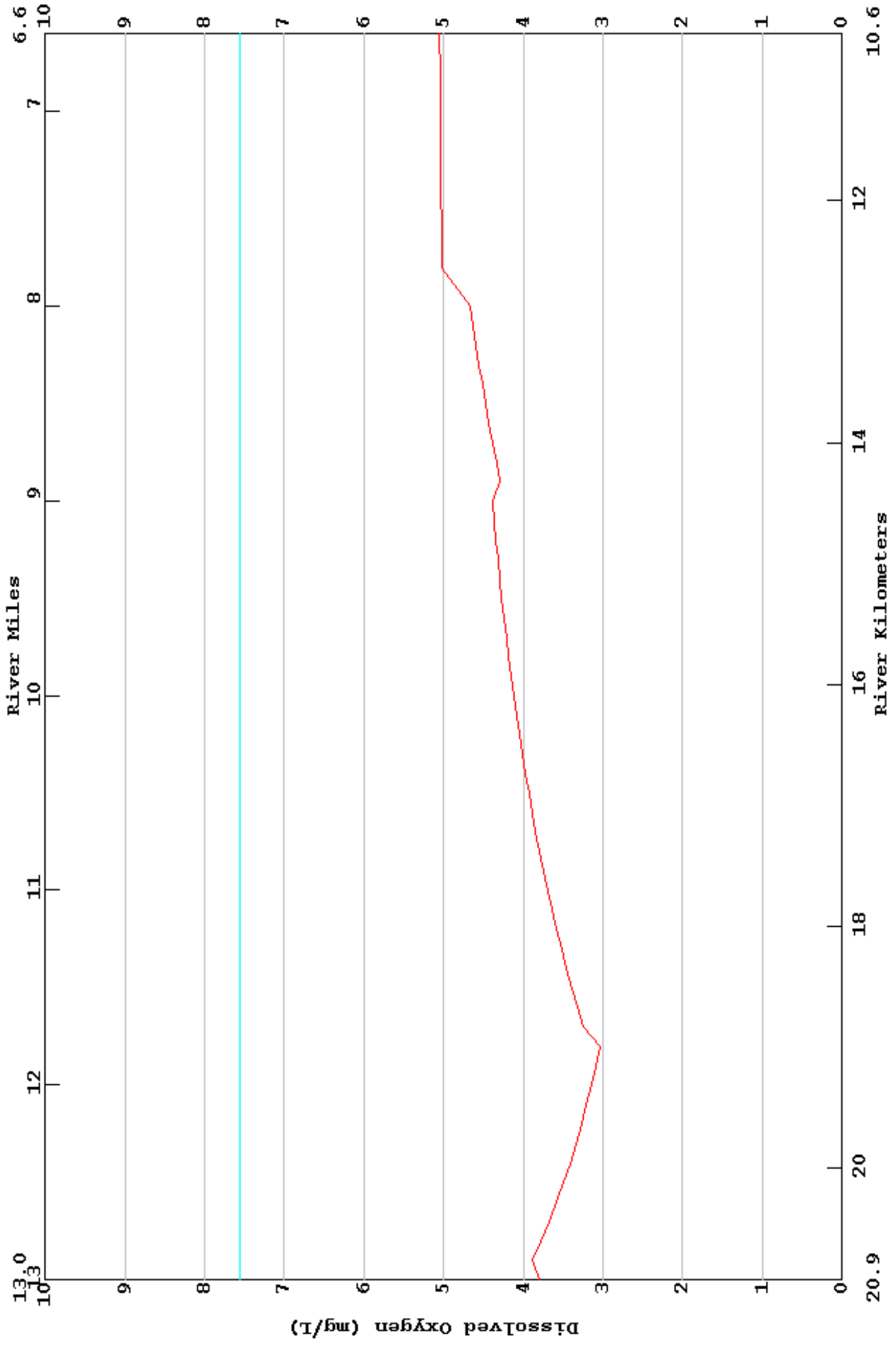
.....EXECUTION COMPLETED

APPENDIX K

Model Output for Critical Season Projection With WWTP Discharge

LA-QUAL Version 8.00 Run at 14:59 on 06/13/2006 File C:\temp\Critical_20.txt
Critical season (temp = 30 C); discharge = 20% of upstream flow
LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan

min= 3.04 max= 5.05



LA-QUAL Version 8.00
Louisiana Department of Environmental Quality

Input file is C:\WQMODELS\LA-QUAL\Critical_20.txt
Output produced at 15:50 on 06/12/2006

\$\$\$ DATA TYPE 1 (TITLES AND CONTROL CARDS) \$\$\$

CARD TYPE	CONTROL TITLES
TITLE01	LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
TITLE02	Critical season (temp = 30 C); discharge = 20% of upstream flow
CNTROL03	NO SEQU <Warning: legacy control - line ignored>
CNTROL04	NO METR
CNTROL05	YES OXYG <Warning: legacy control - line ignored>
ENDATA01	

\$\$\$ DATA TYPE 2 (MODEL OPTIONS) \$\$\$

CARD TYPE	MODEL OPTION
MODOPT01	NO TEMPERATURE
MODOPT02	NO SALINITY
MODOPT03	NO CONSERVATIVE MATERIAL #1 UNITS =
MODOPT04	NO CONSERVATIVE MATERIAL #2 UNITS =
MODOPT05	YES DISSOLVED OXYGEN
MODOPT06	YES BOD1 BIOCHEMICAL OXYGEN DEMAND #1
MODOPT07	NO BOD2 BIOCHEMICAL OXYGEN DEMAND #2
MODOPT08	YES NITROGEN SERIES
MODOPT09	NO PHOSPHORUS
MODOPT10	NO CHLOROPHYLL A
MODOPT11	NO MACROPHYTES
MODOPT12	NO COLIFORMS
MODOPT13	NO NONCONSERVATIVE MATERIAL UNITS =
ENDATA02	

\$\$\$ DATA TYPE 3 (PROGRAM CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
PROGRAM	HYDRAULIC CALCULATION METHOD =	2.00000 (widths and depths)
ENDATA03		

\$\$\$ DATA TYPE 4 (TEMPERATURE CORRECTION CONSTANTS FOR RATE COEFFICIENTS) \$\$\$

CARD TYPE	RATE CODE	THETA VALUE
ENDATA04		

\$\$\$ CONSTANTS TYPE 5 (TEMPERATURE DATA) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
ENDATA05		

\$\$\$ DATA TYPE 6 (ALGAE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA06

\$\$\$ DATA TYPE 7 (MACROPHYTE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA07

\$\$\$ DATA TYPE 8 (REACH IDENTIFICATION DATA) \$\$\$

CARD TYPE	REACH	ID	NAME	BEGIN REACH mi	TO	END REACH mi	ELEM LENGTH mi	REACH LENGTH mi	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Big Crk -- STP to Town Branch	13.00	TO	11.80	0.1000	1.20	12	1	12
REACH ID	2	B2	Big Crk -- Town Branch to mouth	11.80	TO	8.00	0.1000	3.80	38	13	50
REACH ID	3	H1	Hurr Cr -- Big C to County Rd 67	8.00	TO	6.60	0.2000	1.40	7	51	57
REACH ID	4	H2	Hurr Cr -- Cnty Rd 67 to Hwy 35	6.60	TO	0.00	0.3000	6.60	22	58	79

ENDATA08

\$\$\$ DATA TYPE 9 (ADVECTIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	WIDTH "A"	WIDTH "B"	WIDTH "C"	DEPTH "D"	DEPTH "E"	DEPTH "F"	SLOPE	MANNINGS "N"
HYDR-1	1	B1	0.000	0.000	19.700	0.000	0.000	2.580	0.00000	0.000
HYDR-1	2	B2	0.000	0.000	19.700	0.000	0.000	1.900	0.00000	0.000
HYDR-1	3	H1	0.000	0.000	55.000	0.000	0.000	4.500	0.00000	0.000
HYDR-1	4	H2	0.000	0.000	55.000	0.000	0.000	4.500	0.00000	0.000

ENDATA09

\$\$\$ DATA TYPE 10 (DISPERSIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	TIDAL RANGE	DISPERSION "A"	DISPERSION "B"	DISPERSION "C"	DISPERSION "D"
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ENDATA10

\$\$\$ DATA TYPE 11 (INITIAL CONDITIONS) \$\$\$

CARD TYPE	REACH	ID	TEMP	SALIN	DO	NH3	NO3+2	PHOS	CHL A	MACRO
INITIAL	1	B1	30.00	0.00	3.00	1.00	0.00	0.00	0.00	0.00
INITIAL	2	B2	30.00	0.00	3.00	1.00	0.00	0.00	0.00	0.00
INITIAL	3	H1	30.00	0.00	5.00	0.10	0.00	0.00	0.00	0.00
INITIAL	4	H2	30.00	0.00	5.00	0.10	0.00	0.00	0.00	0.00

ENDATA11

\$\$\$ DATA TYPE 12 (REAERATION, SEDIMENT OXYGEN DEMAND, BOD COEFFICIENTS) \$\$\$

CARD TYPE	RCH NUM	RCH ID	K2 OPT	K2 "A"	K2 "B"	K2 "C"	BKGRND SOD mg/ft ² /d	BOD DECA per day	BOD SETT ft/d	BOD CONV TO SOD	ANAER BOD2 DECA per day	BOD2 DECA per day	BOD2 SETT ft/d	BOD2 CONV TO SOD	ANAER BOD2 DECA per day
COEFF-1	1	B1	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	3	OCONNER-DOBB	0.000	0.000	0.000	139.400	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	3	H1	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	4	H2	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000

ENDATA12

\$\$\$ DATA TYPE 13 (NITROGEN AND PHOSPHORUS COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	ORG-N DECA	ORG-N SETT	ORGN CONV TO NH3 SRCE	NH3 DECA	NH3 SRCE	PHOS SRCE	DENIT RATE
COEFF-2	1	B1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	2	B2	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	3	H1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	4	H2	0.000	0.000	0.000	0.450	0.000	0.000	0.000

ENDATA13

\$\$\$ DATA TYPE 14 (ALGAE AND MACROPHYTE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	SECCHI DEPTH	ALGAE: CHL A	ALGAE SETT	ALG CONV TO SOD	ALGAE GROW	ALGAE RESP	MACRO GROW	MACRO RESP
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ENDATA14

\$\$\$ DATA TYPE 15 (COLIFORM AND NONCONSERVATIVE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECA	NCM SETT	NCM CONV TO SOD
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ENDATA15

\$\$\$ DATA TYPE 16 (INCREMENTAL DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	OUTFLOW	INFLOW	TEMP	SALIN	CM-I	CM-II	IN/DIST	OUT/DIST
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ENDATA16

\$\$\$ DATA TYPE 17 (INCREMENTAL DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	REACH	ID	DO	BOD	ORG-N	NH3-N	NO3-N	BOD#2
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ENDATA17

\$\$\$ DATA TYPE 18 (INCREMENTAL DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	PHOS	CHL A	COLI	NCM
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ENDATA18

\$\$\$ DATA TYPE 19 (NONPOINT SOURCE DATA) \$\$\$

CARD TYPE	REACH	ID	BOD#1	ORG-N	COLI	NCM	DO	BOD#2
NONPOINT	1	B1	53.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	2	B2	111.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	3	H1	28.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	4	H2	133.00	0.00	0.00	0.00	0.00	0.00

\$\$\$ DATA TYPE 20 (HEADWATER FOR FLOW, TEMPERATURE, SALINITY AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	UNIT	FLOW m ³ /s	FLOW cfs	TEMP deg C	SALIN ppt	CM-I	CM-II
HDWTR-1	1	Big Creek U/S of STP	0	0.28321	10.000	30.00	0.00	0.000	0.000

\$\$\$ DATA TYPE 21 (HEADWATER DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD#1 mg/L	ORG-N mg/L	NH3-N mg/L	NO3-N mg/L	BOD#2 mg/L
HDWTR-2	1	Big Creek U/S of STP	3.80	7.60	0.00	0.31	0.00	0.00

\$\$\$ DATA TYPE 22 (HEADWATER DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
ENDATA22						

\$\$\$ DATA TYPE 23 (JUNCTION DATA) \$\$\$

CARD TYPE	JUNCTION ELEMENT	UPSTRM ELEMENT	RIVER KILOM	NAME
ENDATA23				

\$\$\$ DATA TYPE 24 (WASTELOAD DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	RKILO	NAME	FLOW m ³ /s	FLOW cfs	FLOW MGD	TEMP deg C	SALIN ppt	CM-I	CM-II
WSTLD-1	1	13.00	Sheridan STP	0.05664	2.00000	1.293	30.00	0.00	0.000	0.000
WSTLD-1	13	11.80	Town Branch	0.06429	2.27000	1.467	30.00	0.00	0.000	0.000
WSTLD-1	41	9.00	Hubbard Creek	0.14047	4.96000	3.206	30.00	0.00	0.000	0.000
WSTLD-1	51	8.00	Hurricane Creek	2.42707	85.70000	55.398	30.00	0.00	0.000	0.000

\$\$\$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD mg/L	% BOD RMVL	ORG-N mg/L	NH3-N mg/L	% NITRIF	NO3-N mg/L	BOD#2 mg/L
WSTLD-2	1	Sheridan STP	5.00	69.00	0.00	0.00	4.00	0.00	0.00	0.00
WSTLD-2	13	Town Branch	3.80	7.60	0.00	0.00	0.31	0.00	0.00	0.00
WSTLD-2	41	Hubbard Creek	3.80	7.60	0.00	0.00	0.31	0.00	0.00	0.00
WSTLD-2	51	Hurricane Creek	5.10	2.10	0.00	0.00	0.05	0.00	0.00	0.00

ENDATA25

\$\$\$ DATA TYPE 26 (WASTELOAD DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
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ENDATA26

\$\$\$ DATA TYPE 27 (LOWER BOUNDARY CONDITIONS) \$\$\$

CARD TYPE	CONSTITUENT	CONCENTRATION
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ENDATA27

\$\$\$ DATA TYPE 28 (DAM DATA) \$\$\$

CARD TYPE	ELEMENT	NAME	EQN	"A"	"B"	"H"
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ENDATA28

\$\$\$ DATA TYPE 29 (SENSITIVITY ANALYSIS DATA) \$\$\$

CARD TYPE	PARAMETER	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8
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ENDATA29

\$\$\$ DATA TYPE 30 (PLOT CONTROL CARDS) \$\$\$

NUMBER OF PLOTS = 1
NUMBER OF REACHES IN PLOT 1 = 3
PLOT RCH 1 2 3
ENDATA30

\$\$\$ DATA TYPE 31 (OVERLAY PLOT DATA) \$\$\$

ENDATA31

.....NO ERRORS DETECTED IN INPUT DATA
.....HYDRAULIC CALCULATIONS COMPLETED
.....TRIDIAGONAL MATRIX TERMS INITIALIZED

....OXYGEN DEPENDENT RATES CONVERGENT IN 9 ITERATIONS
CONSTITUENT CALCULATIONS COMPLETED
GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

FINAL REPORT Big Creek U/S of STP
 REACH NO. 1 Big Crk -- STP to Town Branch

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
1	HDWTR	10.00000	30.00	0.00	0.00	0.00	3.80	7.60	0.00	7.60	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00
1	WSTLD	2.00000	30.00	0.00	0.00	0.00	5.00	69.00	0.00	69.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
1	13.00	12.90	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
2	12.90	12.80	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
3	12.80	12.70	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
4	12.70	12.60	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
5	12.60	12.50	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
6	12.50	12.40	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
7	12.40	12.30	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
8	12.30	12.20	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
9	12.20	12.10	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
10	12.10	12.00	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
11	12.00	11.90	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
12	11.90	11.80	12.00000	16.7	0.23617	0.03	2.58	19.70	26828.72	10396.83	50.80	0.00	0.000	0.000	0.236
TOT						0.31			321944.66	124761.98					
AVG					0.2362		2.58	19.70			50.80				
CUM						0.31									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECAT 1/da	BOD#1 SETT 1/da	ABOD#1 DECAT 1/da	BOD#2 DECAT 1/da	BOD#2 SETT 1/da	ABOD#2 DECAT 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECAT 1/da	ORGN SETT 1/da	NH3 DECAT 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECAT 1/da	NCM DECAT 1/da	NCM SETT 1/da
1	12.900	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00261.67261.67261.67				0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	12.800	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00261.67261.67261.67				0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	12.700	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00261.67261.67261.67				0.00	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	12.600	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00261.67261.67261.67				0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	12.500	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00261.67261.67261.67				0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	12.400	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00261.67261.67261.67				0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

7	12.300	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00	0.00261.67261.67261.67	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	12.200	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00	0.00261.67261.67261.67	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	12.100	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00	0.00261.67261.67261.67	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	12.000	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00	0.00261.67261.67261.67	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	11.900	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00	0.00261.67261.67261.67	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	11.800	7.56	1.82	0.24	0.00	0.00	0.00	0.00	0.00	0.00261.67261.67261.67	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 1.51 0.15 0.00 0.00 0.00 0.00 0.00139.40 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
1	12.900	30.00	0.00	0.00	0.00	3.88	17.79	0.00	17.79	0.00	0.00	0.91	0.02	0.93	0.00	0.00	0.00	0.00	0.00
2	12.800	30.00	0.00	0.00	0.00	3.78	17.75	0.00	17.75	0.00	0.00	0.89	0.04	0.93	0.00	0.00	0.00	0.00	0.00
3	12.700	30.00	0.00	0.00	0.00	3.68	17.71	0.00	17.71	0.00	0.00	0.87	0.06	0.93	0.00	0.00	0.00	0.00	0.00
4	12.600	30.00	0.00	0.00	0.00	3.58	17.67	0.00	17.67	0.00	0.00	0.85	0.08	0.93	0.00	0.00	0.00	0.00	0.00
5	12.500	30.00	0.00	0.00	0.00	3.50	17.63	0.00	17.63	0.00	0.00	0.83	0.09	0.93	0.00	0.00	0.00	0.00	0.00
6	12.400	30.00	0.00	0.00	0.00	3.42	17.59	0.00	17.59	0.00	0.00	0.81	0.11	0.93	0.00	0.00	0.00	0.00	0.00
7	12.300	30.00	0.00	0.00	0.00	3.34	17.55	0.00	17.55	0.00	0.00	0.80	0.13	0.93	0.00	0.00	0.00	0.00	0.00
8	12.200	30.00	0.00	0.00	0.00	3.27	17.51	0.00	17.51	0.00	0.00	0.78	0.14	0.93	0.00	0.00	0.00	0.00	0.00
9	12.100	30.00	0.00	0.00	0.00	3.21	17.47	0.00	17.47	0.00	0.00	0.76	0.16	0.93	0.00	0.00	0.00	0.00	0.00
10	12.000	30.00	0.00	0.00	0.00	3.15	17.43	0.00	17.43	0.00	0.00	0.75	0.18	0.93	0.00	0.00	0.00	0.00	0.00
11	11.900	30.00	0.00	0.00	0.00	3.09	17.39	0.00	17.39	0.00	0.00	0.73	0.19	0.93	0.00	0.00	0.00	0.00	0.00
12	11.800	30.00	0.00	0.00	0.00	3.04	17.36	0.00	17.36	0.00	0.00	0.72	0.21	0.93	0.00	0.00	0.00	0.00	0.00

FINAL REPORT Big Creek U/S of STP
REACH NO. 2 Big Crk -- Town Branch to mouth

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Critical season (temp = 30 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
13	UPR RCH	12.00000	30.00	0.00	0.00	0.00	3.04	17.36	0.00	17.36	0.00	0.00	0.72	0.21	0.00	0.00	0.00	0.00
13	WSTLD	2.27000	30.00	0.00	0.00	0.00	3.80	7.60	0.00	7.60	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00
41	WSTLD	4.96000	30.00	0.00	0.00	0.00	3.80	7.60	0.00	7.60	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
13	11.80	11.70	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
14	11.70	11.60	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381
15	11.60	11.50	14.27000	29.9	0.38135	0.02	1.90	19.70	19757.59	10396.83	37.41	0.00	0.000	0.000	0.381

25	10.500	30.00	0.00	0.00	0.00	3.93	15.52	0.00	15.52	0.00	0.00	0.55	0.28	0.83	0.00	0.00	0.00	0.00	0.00
26	10.400	30.00	0.00	0.00	0.00	3.97	15.50	0.00	15.50	0.00	0.00	0.54	0.28	0.83	0.00	0.00	0.00	0.00	0.00
27	10.300	30.00	0.00	0.00	0.00	4.01	15.48	0.00	15.48	0.00	0.00	0.54	0.29	0.83	0.00	0.00	0.00	0.00	0.00
28	10.200	30.00	0.00	0.00	0.00	4.05	15.46	0.00	15.46	0.00	0.00	0.53	0.30	0.83	0.00	0.00	0.00	0.00	0.00
29	10.100	30.00	0.00	0.00	0.00	4.08	15.44	0.00	15.44	0.00	0.00	0.52	0.31	0.83	0.00	0.00	0.00	0.00	0.00
30	10.000	30.00	0.00	0.00	0.00	4.12	15.42	0.00	15.42	0.00	0.00	0.51	0.31	0.83	0.00	0.00	0.00	0.00	0.00
31	9.900	30.00	0.00	0.00	0.00	4.15	15.40	0.00	15.40	0.00	0.00	0.51	0.32	0.83	0.00	0.00	0.00	0.00	0.00
32	9.800	30.00	0.00	0.00	0.00	4.18	15.38	0.00	15.38	0.00	0.00	0.50	0.33	0.83	0.00	0.00	0.00	0.00	0.00
33	9.700	30.00	0.00	0.00	0.00	4.21	15.36	0.00	15.36	0.00	0.00	0.49	0.33	0.83	0.00	0.00	0.00	0.00	0.00
34	9.600	30.00	0.00	0.00	0.00	4.24	15.34	0.00	15.34	0.00	0.00	0.49	0.34	0.83	0.00	0.00	0.00	0.00	0.00
35	9.500	30.00	0.00	0.00	0.00	4.27	15.32	0.00	15.32	0.00	0.00	0.48	0.35	0.83	0.00	0.00	0.00	0.00	0.00
36	9.400	30.00	0.00	0.00	0.00	4.29	15.30	0.00	15.30	0.00	0.00	0.47	0.35	0.83	0.00	0.00	0.00	0.00	0.00
37	9.300	30.00	0.00	0.00	0.00	4.32	15.28	0.00	15.28	0.00	0.00	0.47	0.36	0.83	0.00	0.00	0.00	0.00	0.00
38	9.200	30.00	0.00	0.00	0.00	4.34	15.26	0.00	15.26	0.00	0.00	0.46	0.37	0.83	0.00	0.00	0.00	0.00	0.00
39	9.100	30.00	0.00	0.00	0.00	4.37	15.24	0.00	15.24	0.00	0.00	0.45	0.37	0.83	0.00	0.00	0.00	0.00	0.00
40	9.000	30.00	0.00	0.00	0.00	4.39	15.22	0.00	15.22	0.00	0.00	0.45	0.38	0.83	0.00	0.00	0.00	0.00	0.00
41	8.900	30.00	0.00	0.00	0.00	4.29	13.24	0.00	13.24	0.00	0.00	0.41	0.29	0.69	0.00	0.00	0.00	0.00	0.00
42	8.800	30.00	0.00	0.00	0.00	4.34	13.23	0.00	13.23	0.00	0.00	0.40	0.29	0.69	0.00	0.00	0.00	0.00	0.00
43	8.700	30.00	0.00	0.00	0.00	4.39	13.22	0.00	13.22	0.00	0.00	0.40	0.30	0.69	0.00	0.00	0.00	0.00	0.00
44	8.600	30.00	0.00	0.00	0.00	4.43	13.21	0.00	13.21	0.00	0.00	0.39	0.30	0.69	0.00	0.00	0.00	0.00	0.00
45	8.500	30.00	0.00	0.00	0.00	4.47	13.21	0.00	13.21	0.00	0.00	0.39	0.30	0.69	0.00	0.00	0.00	0.00	0.00
46	8.400	30.00	0.00	0.00	0.00	4.51	13.20	0.00	13.20	0.00	0.00	0.39	0.31	0.69	0.00	0.00	0.00	0.00	0.00
47	8.300	30.00	0.00	0.00	0.00	4.55	13.19	0.00	13.19	0.00	0.00	0.38	0.31	0.69	0.00	0.00	0.00	0.00	0.00
48	8.200	30.00	0.00	0.00	0.00	4.59	13.18	0.00	13.18	0.00	0.00	0.38	0.32	0.69	0.00	0.00	0.00	0.00	0.00
49	8.100	30.00	0.00	0.00	0.00	4.63	13.17	0.00	13.17	0.00	0.00	0.37	0.32	0.69	0.00	0.00	0.00	0.00	0.00
50	8.000	30.00	0.00	0.00	0.00	4.66	13.16	0.00	13.16	0.00	0.00	0.37	0.32	0.69	0.00	0.00	0.00	0.00	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 3 Hurr Cr -- Big C to County Rd 67

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM	
51	UPR RCH	19.23000	30.00	0.00	0.00	0.00	4.66	13.16	0.00	13.16	0.00	0.00	0.37	0.32	0.00	0.00	0.00	0.00	0.00
51	WSTLD	85.69999	30.00	0.00	0.00	0.00	5.10	2.10	0.00	2.10	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
51	8.00	7.80	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
52	7.80	7.60	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
53	7.60	7.40	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
54	7.40	7.20	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
55	7.20	7.00	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
56	7.00	6.80	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424
57	6.80	6.60	104.93000	90.5	0.42408	0.03	4.50	55.00	261287.86	58053.38	247.39	0.00	0.000	0.000	0.424

TOT 0.20 1829014.88 406373.59
 AVG 0.4241 4.50 55.00 247.39
 CUM 1.08

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECA	BOD#1 SETT	ABOD#1 DECA	BOD#2 DECA	BOD#2 SETT	ABOD#2 DECA	BKGD SOD	FULL SOD	CORR SOD	ORGN DECA	ORGN SETT	NH3 DECA	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECA	NCM DECA	NCM SETT	
		mg/L	1/da	1/da	1/da	1/da	1/da	1/da	1/da	*	*	*	1/da	1/da	1/da	*	1/da	*	**	**	1/da	1/da	1/da	
51	7.800	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29148	29148.29	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	7.600	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29148	29148.29	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	7.400	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29148	29148.29	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	7.200	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29148	29148.29	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	7.000	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29148	29148.29	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	6.800	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29148	29148.29	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	6.600	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29148	29148.29	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 0.88 0.15 0.00 0.00 0.00 0.00 0.00 79.00 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
51	7.800	30.00	0.00	0.00	0.00	5.02	4.11	0.00	4.11	0.00	0.00	0.11	0.06	0.17	0.00	0.00	0.00	0.	0.00
52	7.600	30.00	0.00	0.00	0.00	5.03	4.09	0.00	4.09	0.00	0.00	0.10	0.06	0.17	0.00	0.00	0.00	0.	0.00
53	7.400	30.00	0.00	0.00	0.00	5.03	4.06	0.00	4.06	0.00	0.00	0.10	0.07	0.17	0.00	0.00	0.00	0.	0.00
54	7.200	30.00	0.00	0.00	0.00	5.04	4.04	0.00	4.04	0.00	0.00	0.10	0.07	0.17	0.00	0.00	0.00	0.	0.00
55	7.000	30.00	0.00	0.00	0.00	5.04	4.02	0.00	4.02	0.00	0.00	0.10	0.07	0.17	0.00	0.00	0.00	0.	0.00
56	6.800	30.00	0.00	0.00	0.00	5.05	4.00	0.00	4.00	0.00	0.00	0.09	0.08	0.17	0.00	0.00	0.00	0.	0.00
57	6.600	30.00	0.00	0.00	0.00	5.05	3.98	0.00	3.98	0.00	0.00	0.09	0.08	0.17	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 4 Hurr Cr -- Cnty Rd 67 to Hwy 35

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); discharge = 20% of upstream flow

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
58	UPR RCH	104.93000	30.00	0.00	0.00	0.00	5.05	3.98	0.00	3.98	0.00	0.00	0.09	0.08	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
58	6.60	6.30	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
59	6.30	6.00	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
60	6.00	5.70	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
61	5.70	5.40	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
62	5.40	5.10	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
63	5.10	4.80	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
64	4.80	4.50	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
65	4.50	4.20	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
66	4.20	3.90	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
67	3.90	3.60	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
68	3.60	3.30	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
69	3.30	3.00	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
70	3.00	2.70	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
71	2.70	2.40	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
72	2.40	2.10	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
73	2.10	1.80	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
74	1.80	1.50	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
75	1.50	1.20	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
76	1.20	0.90	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
77	0.90	0.60	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
78	0.60	0.30	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
79	0.30	0.00	104.93000	90.5	0.42408	0.04	4.50	55.00	391931.78	87080.07	247.39	0.00	0.000	0.000	0.424
TOT						0.95			8622497.00	1915761.38					
AVG					0.4241		4.50	55.00			247.39				
CUM						2.03									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O.	REAER RATE	BOD#1 DECAY	BOD#1 SETT	ABOD#1 DECAY	BOD#2 DECAY	BOD#2 SETT	ABOD#2 DECAY	BKGD SOD	FULL SOD	CORR SOD	ORGN DECAY	ORGN SETT	NH3 DECAY	NH3 SRCE	DENIT RATE	PO4 SRCE	ALG PROD	MAC PROD	COLI DECAY	NCM DECAY	NCM SETT	
58	6.300	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	6.000	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	5.700	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	5.400	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	5.100	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	4.800	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	4.500	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	4.200	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	3.900	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	3.600	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	3.300	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3.000	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	2.700	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	2.400	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148	29148	29148	29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

72	2.100	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	1.800	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	1.500	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	1.200	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	0.900	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	0.600	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.300	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	0.000	7.56	1.06	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 0.88 0.15 0.00 0.00 0.00 0.00 0.00 0.00 0.00 79.00 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
58	6.300	30.00	0.00	0.00	0.00	5.06	3.95	0.00	3.95	0.00	0.00	0.09	0.08	0.17	0.00	0.00	0.00	0.	0.00
59	6.000	30.00	0.00	0.00	0.00	5.07	3.92	0.00	3.92	0.00	0.00	0.08	0.08	0.17	0.00	0.00	0.00	0.	0.00
60	5.700	30.00	0.00	0.00	0.00	5.08	3.89	0.00	3.89	0.00	0.00	0.08	0.09	0.17	0.00	0.00	0.00	0.	0.00
61	5.400	30.00	0.00	0.00	0.00	5.09	3.86	0.00	3.86	0.00	0.00	0.08	0.09	0.17	0.00	0.00	0.00	0.	0.00
62	5.100	30.00	0.00	0.00	0.00	5.10	3.84	0.00	3.84	0.00	0.00	0.07	0.09	0.17	0.00	0.00	0.00	0.	0.00
63	4.800	30.00	0.00	0.00	0.00	5.11	3.81	0.00	3.81	0.00	0.00	0.07	0.10	0.17	0.00	0.00	0.00	0.	0.00
64	4.500	30.00	0.00	0.00	0.00	5.12	3.78	0.00	3.78	0.00	0.00	0.07	0.10	0.17	0.00	0.00	0.00	0.	0.00
65	4.200	30.00	0.00	0.00	0.00	5.13	3.75	0.00	3.75	0.00	0.00	0.07	0.10	0.17	0.00	0.00	0.00	0.	0.00
66	3.900	30.00	0.00	0.00	0.00	5.14	3.72	0.00	3.72	0.00	0.00	0.06	0.10	0.17	0.00	0.00	0.00	0.	0.00
67	3.600	30.00	0.00	0.00	0.00	5.15	3.70	0.00	3.70	0.00	0.00	0.06	0.11	0.17	0.00	0.00	0.00	0.	0.00
68	3.300	30.00	0.00	0.00	0.00	5.16	3.67	0.00	3.67	0.00	0.00	0.06	0.11	0.17	0.00	0.00	0.00	0.	0.00
69	3.000	30.00	0.00	0.00	0.00	5.18	3.64	0.00	3.64	0.00	0.00	0.06	0.11	0.17	0.00	0.00	0.00	0.	0.00
70	2.700	30.00	0.00	0.00	0.00	5.19	3.62	0.00	3.62	0.00	0.00	0.05	0.11	0.17	0.00	0.00	0.00	0.	0.00
71	2.400	30.00	0.00	0.00	0.00	5.20	3.59	0.00	3.59	0.00	0.00	0.05	0.12	0.17	0.00	0.00	0.00	0.	0.00
72	2.100	30.00	0.00	0.00	0.00	5.21	3.56	0.00	3.56	0.00	0.00	0.05	0.12	0.17	0.00	0.00	0.00	0.	0.00
73	1.800	30.00	0.00	0.00	0.00	5.22	3.54	0.00	3.54	0.00	0.00	0.05	0.12	0.17	0.00	0.00	0.00	0.	0.00
74	1.500	30.00	0.00	0.00	0.00	5.23	3.51	0.00	3.51	0.00	0.00	0.05	0.12	0.17	0.00	0.00	0.00	0.	0.00
75	1.200	30.00	0.00	0.00	0.00	5.25	3.49	0.00	3.49	0.00	0.00	0.04	0.12	0.17	0.00	0.00	0.00	0.	0.00
76	0.900	30.00	0.00	0.00	0.00	5.26	3.46	0.00	3.46	0.00	0.00	0.04	0.12	0.17	0.00	0.00	0.00	0.	0.00
77	0.600	30.00	0.00	0.00	0.00	5.27	3.44	0.00	3.44	0.00	0.00	0.04	0.13	0.17	0.00	0.00	0.00	0.	0.00
78	0.300	30.00	0.00	0.00	0.00	5.28	3.41	0.00	3.41	0.00	0.00	0.04	0.13	0.17	0.00	0.00	0.00	0.	0.00
79	0.000	30.00	0.00	0.00	0.00	5.29	3.39	0.00	3.39	0.00	0.00	0.04	0.13	0.17	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Big Creek U/S of STP

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Critical season (temp = 30 C); discharge = 20% of upstream flow

- TRAVEL TIME = 2.03 DAYS
- MAXIMUM EFFLUENT = 90.47 PERCENT
- FLOW = 12.00000 TO 104.93000 cfs
- DISPERSION = 0.00000 TO 0.00000 ft²/s
- VELOCITY = 0.23617 TO 0.51390 fps
- DEPTH = 1.90 TO 4.50 ft

WIDTH = 19.70 TO 55.00 ft
 BOD DECAY = 0.24 TO 0.24 per day
 NH3 DECAY = 0.79 TO 0.93 per day
 SOD = 148.29 TO 261.67 mg/ft²/d
 NH3 SOURCE = 0.00 TO 0.00 mg/ft²/d
 REAERATION = 1.06 TO 4.25 per day
 BOD SETTLING = 0.00 TO 0.00 per day
 ORG-N DECAY = 0.00 TO 0.00 per day
 ORG-N SETTLING = 0.00 TO 0.00 per day
 TEMPERATURE = 30.00 TO 30.00 deg C
 DISSOLVED OXYGEN = 3.04 TO 5.29 mg/L

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); discharge = 20% of upstream flow

REACH SUMMARY REPORT FOR Big Creek U/S of STP

RCH NO.	REACH NAME	BEGIN DIST km	ENDING DIST km	REACH LENGTH km	TRAVEL TIME days	FLOW AT EOR m ³ /s	AVERAGE VELO m/s	AVG DEPTH m	AVG WIDTH m	FLOW AT EOR cfs	AVERAGE VELO fps	AVG DEPTH ft	AVG WIDTH ft
1	Big Crk -- STP to Town Branch	20.92	18.99	1.93	0.31	0.33985	0.07198	0.786	6.00	12.000	0.236	2.580	19.70
2	Big Crk -- Town Branch to mouth	18.99	12.87	6.12	0.57	0.54460	0.12469	0.579	6.00	19.230	0.409	1.900	19.70
3	Hurr Cr -- Big C to County Rd 67	12.87	10.62	2.25	0.20	2.97168	0.12925	1.372	16.76	104.930	0.424	4.500	55.00
4	Hurr Cr -- Cnty Rd 67 to Hwy 35	10.62	0.00	10.62	0.95	2.97168	0.12925	1.372	16.76	104.930	0.424	4.500	55.00

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); discharge = 20% of upstream flow

INPUT/OUTPUT LOADING SUMMARY

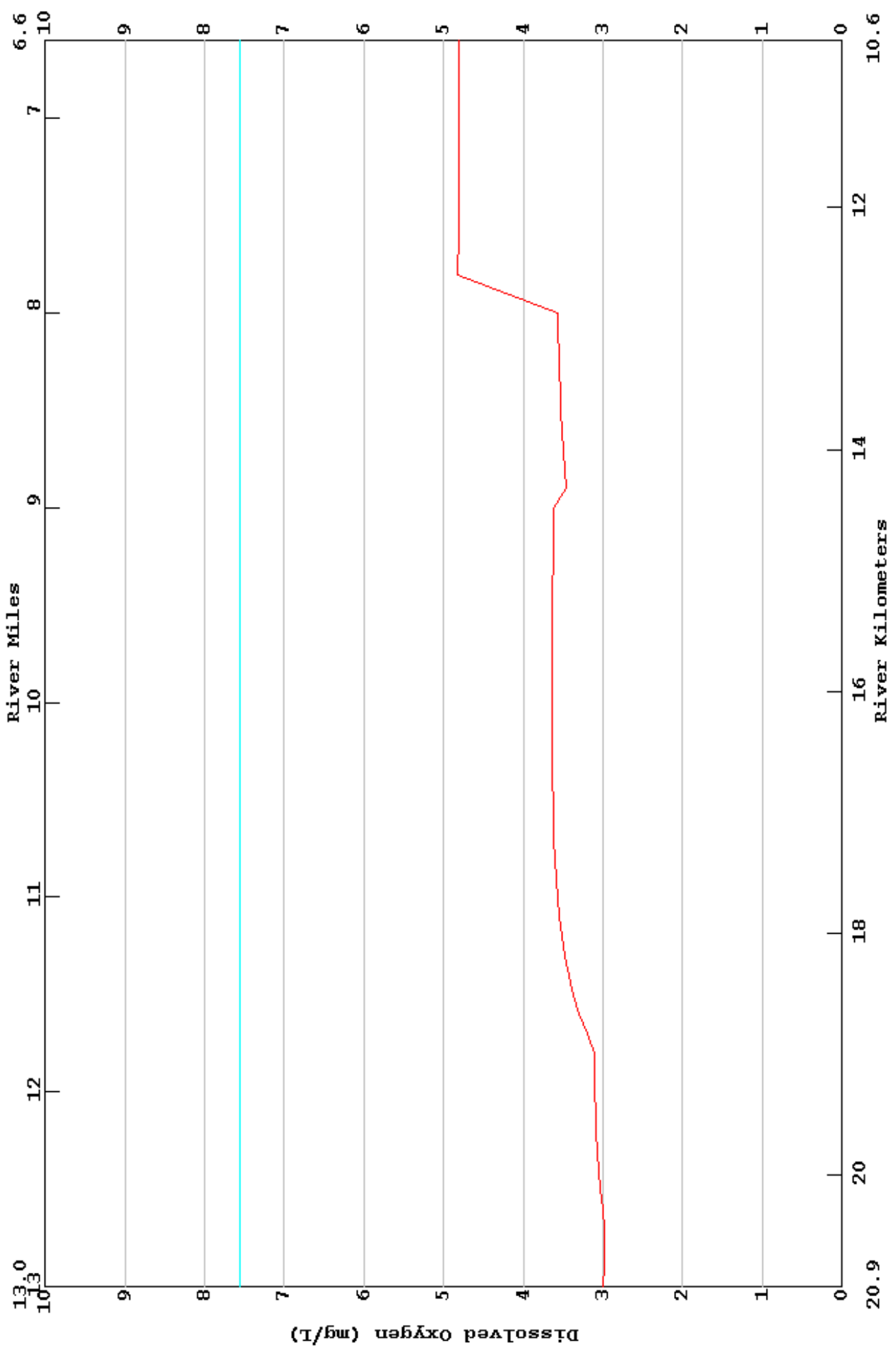
	FLOW cfs	DO lb/d	BOD#1 lb/d	BOD#2 lb/d	ORG-N lb/d	NH3-N lb/d	NO3-N lb/d	PHOS lb/d	CHL A	NCM
HEADWATER FLOW	10.000	205.0	410.1	0.0	0.0	16.7	0.0	0.0	0.0	0.0
INCREMENTAL INFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL OUTFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASTELoads	94.930	2560.4	2012.0	0.0	0.0	78.4	0.0	0.0	0.0	0.0
WITHDRAWALS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-104.930	-2997.3	-1919.6	0.0	0.0	-21.7	-73.4	0.0	0.0	0.0
DISPERSION THRU LOWER BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DISPERSION THRU HDWTR BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NON-POINT INPUT		0.0	325.0	0.0	0.0					0.0
NATURAL REAERATION		2436.4								
DAM REAERATION		0.0								
BACKGROUND SOD		-1059.3								
BOD#1 DECAY		-827.5	-827.5							
BOD#1 SETTLING		0.0	0.0							
ANAEROBIC BOD#1 DECAY			0.0							
BOD#2 DECAY		0.0		0.0						
BOD#2 SETTLING		0.0		0.0						
ANAEROBIC BOD#2 DECAY				0.0						
ORG-N DECAY		0.0			0.0	0.0				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-317.7				-73.4	73.4			
BACKGROUND NH3 SOURCE						0.0				
OTHER DENITRIFICATION							0.0			
PHOSPHORUS SOURCE								0.0		
ALGAE PHOTOSYNTHESIS		0.0				0.0	0.0	0.0	0.0	
ALGAE RESPIRATION		0.0				0.0		0.0	0.0	
ALGAE SETTLING		0.0							0.0	
MACRO PHOTOSYNTHESIS		0.0				0.0	0.0	0.0		
NCM DECAY		0.0								0.0
NCM SETTLING		0.0								0.0
TOTAL INPUTS	104.930	5201.8	2747.1	0.0	0.0	95.1	73.4	0.0	0.0	0.0
TOTAL OUTPUTS	-104.930	-5201.8	-2747.1	0.0	0.0	-95.1	-73.4	0.0	0.0	0.0
NET CONVERGENCE ERROR	0.000	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

.....EXECUTION COMPLETED

APPENDIX L

Model Output for Critical Season Projection Without WWTP Discharge

LA-QUAL Version 8.00 Run at 15:06 on 06/13/2006 File C:\temp\Critical_No_Discharge.txt
Critical season (temp = 30 C); no discharge; 20% NPS reduction min= 2.98 max= 4.83
LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan



LA-QUAL Version 8.00
Louisiana Department of Environmental Quality

Input file is C:\WQMODELS\LA-QUAL\Critical_No_Discharge.txt
Output produced at 15:51 on 06/12/2006

\$\$\$ DATA TYPE 1 (TITLES AND CONTROL CARDS) \$\$\$

CARD TYPE	CONTROL TITLES
TITLE01	LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
TITLE02	Critical season (temp = 30 C); no discharge; 20% NPS reduction
CNTROL03	NO SEQU <Warning: legacy control - line ignored>
CNTROL04	NO METR
CNTROL05	YES OXYG <Warning: legacy control - line ignored>
ENDATA01	

\$\$\$ DATA TYPE 2 (MODEL OPTIONS) \$\$\$

CARD TYPE	MODEL OPTION
MODOPT01	NO TEMPERATURE
MODOPT02	NO SALINITY
MODOPT03	NO CONSERVATIVE MATERIAL #1 UNITS =
MODOPT04	NO CONSERVATIVE MATERIAL #2 UNITS =
MODOPT05	YES DISSOLVED OXYGEN
MODOPT06	YES BOD1 BIOCHEMICAL OXYGEN DEMAND #1
MODOPT07	NO BOD2 BIOCHEMICAL OXYGEN DEMAND #2
MODOPT08	YES NITROGEN SERIES
MODOPT09	NO PHOSPHORUS
MODOPT10	NO CHLOROPHYLL A
MODOPT11	NO MACROPHYTES
MODOPT12	NO COLIFORMS
MODOPT13	NO NONCONSERVATIVE MATERIAL UNITS =
ENDATA02	

\$\$\$ DATA TYPE 3 (PROGRAM CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
PROGRAM	HYDRAULIC CALCULATION METHOD =	2.00000 (widths and depths)
ENDATA03		

\$\$\$ DATA TYPE 4 (TEMPERATURE CORRECTION CONSTANTS FOR RATE COEFFICIENTS) \$\$\$

CARD TYPE	RATE CODE	THETA VALUE
ENDATA04		

\$\$\$ CONSTANTS TYPE 5 (TEMPERATURE DATA) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
ENDATA05		

\$\$\$ DATA TYPE 6 (ALGAE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA06

\$\$\$ DATA TYPE 7 (MACROPHYTE CONSTANTS) \$\$\$

CARD TYPE	DESCRIPTION OF CONSTANT	VALUE
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ENDATA07

\$\$\$ DATA TYPE 8 (REACH IDENTIFICATION DATA) \$\$\$

CARD TYPE	REACH	ID	NAME	BEGIN REACH mi	TO	END REACH mi	ELEM LENGTH mi	REACH LENGTH mi	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Big Crk -- STP to Town Branch	13.00	TO	11.80	0.1000	1.20	12	1	12
REACH ID	2	B2	Big Crk -- Town Branch to mouth	11.80	TO	8.00	0.1000	3.80	38	13	50
REACH ID	3	H1	Hurr Cr -- Big C to County Rd 67	8.00	TO	6.60	0.2000	1.40	7	51	57
REACH ID	4	H2	Hurr Cr -- Cnty Rd 67 to Hwy 35	6.60	TO	0.00	0.3000	6.60	22	58	79

ENDATA08

\$\$\$ DATA TYPE 9 (ADVECTIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	WIDTH "A"	WIDTH "B"	WIDTH "C"	DEPTH "D"	DEPTH "E"	DEPTH "F"	SLOPE	MANNINGS "N"
HYDR-1	1	B1	0.000	0.000	19.000	0.000	0.000	2.500	0.00000	0.000
HYDR-1	2	B2	0.000	0.000	19.000	0.000	0.000	1.700	0.00000	0.000
HYDR-1	3	H1	0.000	0.000	45.000	0.000	0.000	3.000	0.00000	0.000
HYDR-1	4	H2	0.000	0.000	45.000	0.000	0.000	3.000	0.00000	0.000

ENDATA09

\$\$\$ DATA TYPE 10 (DISPERSIVE HYDRAULIC COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	TIDAL RANGE	DISPERSION "A"	DISPERSION "B"	DISPERSION "C"	DISPERSION "D"
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ENDATA10

\$\$\$ DATA TYPE 11 (INITIAL CONDITIONS) \$\$\$

CARD TYPE	REACH	ID	TEMP	SALIN	DO	NH3	NO3+2	PHOS	CHL A	MACRO
INITIAL	1	B1	30.00	0.00	3.00	1.00	0.00	0.00	0.00	0.00
INITIAL	2	B2	30.00	0.00	3.00	1.00	0.00	0.00	0.00	0.00
INITIAL	3	H1	30.00	0.00	5.00	0.10	0.00	0.00	0.00	0.00
INITIAL	4	H2	30.00	0.00	5.00	0.10	0.00	0.00	0.00	0.00

ENDATA11

\$\$\$ DATA TYPE 12 (REAERATION, SEDIMENT OXYGEN DEMAND, BOD COEFFICIENTS) \$\$\$

CARD TYPE	RCH NUM	RCH ID	K2 OPT	K2 "A"	K2 "B"	K2 "C"	BKGRND SOD mg/ft ² /d	BOD DECA per day	BOD SETT ft/d	BOD CONV TO SOD	ANAER BOD2 DECA per day	BOD2 DECA per day	BOD2 SETT ft/d	BOD2 CONV TO SOD	ANAER BOD2 DECA per day
COEFF-1	1	B1	3	OCONNER-DOBB	0.000	0.000	0.000	111.500	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	3	OCONNER-DOBB	0.000	0.000	0.000	111.500	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	3	H1	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	4	H2	3	OCONNER-DOBB	0.000	0.000	0.000	79.000	0.150	0.000	0.000	0.000	0.000	0.000	0.000

ENDATA12

\$\$\$ DATA TYPE 13 (NITROGEN AND PHOSPHORUS COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	ORG-N DECA	ORG-N SETT	ORGN CONV TO NH3 SRCE	NH3 DECA	NH3 SRCE	PHOS SRCE	DENIT RATE
COEFF-2	1	B1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	2	B2	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	3	H1	0.000	0.000	0.000	0.450	0.000	0.000	0.000
COEFF-2	4	H2	0.000	0.000	0.000	0.450	0.000	0.000	0.000

ENDATA13

\$\$\$ DATA TYPE 14 (ALGAE AND MACROPHYTE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	SECCHI DEPTH	ALGAE: CHL A	ALGAE SETT	ALG CONV TO SOD	ALGAE GROW	ALGAE RESP	MACRO GROW	MACRO RESP
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ENDATA14

\$\$\$ DATA TYPE 15 (COLIFORM AND NONCONSERVATIVE COEFFICIENTS) \$\$\$

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECA	NCM SETT	NCM CONV TO SOD
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ENDATA15

\$\$\$ DATA TYPE 16 (INCREMENTAL DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	OUTFLOW	INFLOW	TEMP	SALIN	CM-I	CM-II	IN/DIST	OUT/DIST
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ENDATA16

\$\$\$ DATA TYPE 17 (INCREMENTAL DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	REACH	ID	DO	BOD	ORG-N	NH3-N	NO3-N	BOD#2
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ENDATA17

\$\$\$ DATA TYPE 18 (INCREMENTAL DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	REACH	ID	PHOS	CHL A	COLI	NCM
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ENDATA18

\$\$\$ DATA TYPE 19 (NONPOINT SOURCE DATA) \$\$\$

CARD TYPE	REACH	ID	BOD#1	ORG-N	COLI	NCM	DO	BOD#2
NONPOINT	1	B1	42.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	2	B2	89.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	3	H1	28.00	0.00	0.00	0.00	0.00	0.00
NONPOINT	4	H2	133.00	0.00	0.00	0.00	0.00	0.00

ENDATA19

\$\$\$ DATA TYPE 20 (HEADWATER FOR FLOW, TEMPERATURE, SALINITY AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	UNIT	FLOW m ³ /s	FLOW cfs	TEMP deg C	SALIN ppt	CM-I	CM-II
HDWTR-1	1	Big Creek U/S of STP	0	0.02832	1.000	30.00	0.00	0.000	0.000

ENDATA20

\$\$\$ DATA TYPE 21 (HEADWATER DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD#1 mg/L	ORG-N mg/L	NH3-N mg/L	NO3-N mg/L	BOD#2 mg/L
HDWTR-2	1	Big Creek U/S of STP	3.00	6.10	0.00	0.25	0.00	0.00

ENDATA21

\$\$\$ DATA TYPE 22 (HEADWATER DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L

ENDATA22

\$\$\$ DATA TYPE 23 (JUNCTION DATA) \$\$\$

CARD TYPE	JUNCTION ELEMENT	UPSTRM ELEMENT	RIVER KILOM	NAME

ENDATA23

\$\$\$ DATA TYPE 24 (WASTELOAD DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	RKILO	NAME	FLOW m ³ /s	FLOW cfs	FLOW MGD	TEMP deg C	SALIN ppt	CM-I	CM-II
WSTLD-1	1	13.00	Sheridan STP	0.00000	0.00000	0.000	30.00	0.00	0.000	0.000
WSTLD-1	13	11.80	Town Branch	0.00651	0.23000	0.149	30.00	0.00	0.000	0.000
WSTLD-1	41	9.00	Hubbard Creek	0.01416	0.50000	0.323	30.00	0.00	0.000	0.000
WSTLD-1	51	8.00	Hurricane Creek	0.24356	8.60000	5.559	30.00	0.00	0.000	0.000

ENDATA24

\$\$\$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) \$\$\$

CARD TYPE	ELEMENT	NAME	DO mg/L	BOD mg/L	% BOD RMVL	ORG-N mg/L	NH3-N mg/L	% NITRIF	NO3-N mg/L	BOD#2 mg/L
WSTLD-2	1	Sheridan STP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WSTLD-2	13	Town Branch	3.00	6.10	0.00	0.00	0.25	0.00	0.00	0.00
WSTLD-2	41	Hubbard Creek	3.00	6.10	0.00	0.00	0.25	0.00	0.00	0.00
WSTLD-2	51	Hurricane Creek	5.10	2.10	0.00	0.00	0.05	0.00	0.00	0.00

ENDATA25

\$\$\$ DATA TYPE 26 (WASTELOAD DATA FOR PHOSPHORUS, CHLOROPHYLL, COLIFORM, AND NONCONSERVATIVES) \$\$\$

CARD TYPE	ELEMENT	NAME	PHOS mg/L	CHL A mg/L	COLI mg/L	NCM mg/L
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ENDATA26

\$\$\$ DATA TYPE 27 (LOWER BOUNDARY CONDITIONS) \$\$\$

CARD TYPE	CONSTITUENT	CONCENTRATION
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ENDATA27

\$\$\$ DATA TYPE 28 (DAM DATA) \$\$\$

CARD TYPE	ELEMENT	NAME	EQN	"A"	"B"	"H"
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ENDATA28

\$\$\$ DATA TYPE 29 (SENSITIVITY ANALYSIS DATA) \$\$\$

CARD TYPE	PARAMETER	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8
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ENDATA29

\$\$\$ DATA TYPE 30 (PLOT CONTROL CARDS) \$\$\$

NUMBER OF PLOTS = 1
NUMBER OF REACHES IN PLOT 1 = 3
PLOT RCH 1 2 3
ENDATA30

\$\$\$ DATA TYPE 31 (OVERLAY PLOT DATA) \$\$\$

ENDATA31

.....NO ERRORS DETECTED IN INPUT DATA
.....HYDRAULIC CALCULATIONS COMPLETED
.....TRIDIAGONAL MATRIX TERMS INITIALIZED

....OXYGEN DEPENDENT RATES CONVERGENT IN 10 ITERATIONS
CONSTITUENT CALCULATIONS COMPLETED
GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

FINAL REPORT Big Creek U/S of STP
 REACH NO. 1 Big Crk -- STP to Town Branch

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); no discharge; 20% NPS reduction

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
1	HDWTR	1.00000	30.00	0.00	0.00	0.00	3.00	6.10	0.00	6.10	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft³	SURFACE AREA ft²	X-SECT AREA ft²	TIDAL PRISM ft³	TIDAL VELO fps	DISPRSN ft²/s	MEAN VELO fps
1	13.00	12.90	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
2	12.90	12.80	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
3	12.80	12.70	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
4	12.70	12.60	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
5	12.60	12.50	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
6	12.50	12.40	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
7	12.40	12.30	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
8	12.30	12.20	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
9	12.20	12.10	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
10	12.10	12.00	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
11	12.00	11.90	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
12	11.90	11.80	1.00000	0.0	0.02106	0.29	2.50	19.00	25073.08	10027.40	47.48	0.00	0.000	0.000	0.021
TOT						3.48			300876.97	120328.83					
AVG					0.0211		2.50	19.00			47.48				
CUM						3.48									

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECAY 1/da	BOD#1 SETT 1/da	ABOD#1 DECAY 1/da	BOD#2 DECAY 1/da	BOD#2 SETT 1/da	ABOD#2 DECAY 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECAY 1/da	ORGN SETT 1/da	NH3 DECAY 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECAY 1/da	NCM DECAY 1/da	NCM SETT 1/da
1	12.900	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00209.30209.30209.30				0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	12.800	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00209.30209.30209.30				0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	12.700	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00209.30209.30209.30				0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	12.600	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00209.30209.30209.30				0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	12.500	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00209.30209.30209.30				0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	12.400	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00209.30209.30209.30				0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	12.300	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00209.30209.30209.30				0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

8	12.200	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00	0.00209.30209.30209.30	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	12.100	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00	0.00209.30209.30209.30	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	12.000	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00	0.00209.30209.30209.30	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	11.900	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00	0.00209.30209.30209.30	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	11.800	7.56	1.11	0.24	0.00	0.00	0.00	0.00	0.00	0.00209.30209.30209.30	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 0.92 0.15 0.00 0.00 0.00 0.00 0.00 0.00 0.00111.50 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
1	12.900	30.00	0.00	0.00	0.00	2.98	6.31	0.00	6.31	0.00	0.00	0.20	0.05	0.25	0.00	0.00	0.00	0.	0.00
2	12.800	30.00	0.00	0.00	0.00	2.98	6.51	0.00	6.51	0.00	0.00	0.17	0.08	0.25	0.00	0.00	0.00	0.	0.00
3	12.700	30.00	0.00	0.00	0.00	2.99	6.70	0.00	6.70	0.00	0.00	0.13	0.12	0.25	0.00	0.00	0.00	0.	0.00
4	12.600	30.00	0.00	0.00	0.00	3.01	6.88	0.00	6.88	0.00	0.00	0.11	0.14	0.25	0.00	0.00	0.00	0.	0.00
5	12.500	30.00	0.00	0.00	0.00	3.03	7.04	0.00	7.04	0.00	0.00	0.09	0.16	0.25	0.00	0.00	0.00	0.	0.00
6	12.400	30.00	0.00	0.00	0.00	3.05	7.19	0.00	7.19	0.00	0.00	0.07	0.18	0.25	0.00	0.00	0.00	0.	0.00
7	12.300	30.00	0.00	0.00	0.00	3.07	7.34	0.00	7.34	0.00	0.00	0.06	0.19	0.25	0.00	0.00	0.00	0.	0.00
8	12.200	30.00	0.00	0.00	0.00	3.08	7.47	0.00	7.47	0.00	0.00	0.05	0.20	0.25	0.00	0.00	0.00	0.	0.00
9	12.100	30.00	0.00	0.00	0.00	3.09	7.59	0.00	7.59	0.00	0.00	0.04	0.21	0.25	0.00	0.00	0.00	0.	0.00
10	12.000	30.00	0.00	0.00	0.00	3.10	7.71	0.00	7.71	0.00	0.00	0.03	0.22	0.25	0.00	0.00	0.00	0.	0.00
11	11.900	30.00	0.00	0.00	0.00	3.11	7.82	0.00	7.82	0.00	0.00	0.03	0.22	0.25	0.00	0.00	0.00	0.	0.00
12	11.800	30.00	0.00	0.00	0.00	3.11	7.92	0.00	7.92	0.00	0.00	0.02	0.23	0.25	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
REACH NO. 2 Big Crk -- Town Branch to mouth

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Critical season (temp = 30 C); no discharge; 20% NPS reduction

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
13	UPR RCH	1.00000	30.00	0.00	0.00	0.00	3.11	7.92	0.00	7.92	0.00	0.00	0.02	0.23	0.00	0.00	0.00	0.00
13	WSTLD	0.23000	30.00	0.00	0.00	0.00	3.00	6.10	0.00	6.10	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
41	WSTLD	0.50000	30.00	0.00	0.00	0.00	3.00	6.10	0.00	6.10	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00

***** HYDRAULIC PARAMETER VALUES *****

ELEM NO.	BEGIN DIST mi	ENDING DIST mi	FLOW cfs	PCT EFF	ADVCTV VELO fps	TRAVEL TIME days	DEPTH ft	WIDTH ft	VOLUME ft ³	SURFACE AREA ft ²	X-SECT AREA ft ²	TIDAL PRISM ft ³	TIDAL VELO fps	DISPRSN ft ² /s	MEAN VELO fps
13	11.80	11.70	1.23000	18.7	0.03809	0.16	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.038
14	11.70	11.60	1.23000	18.7	0.03809	0.16	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.038
15	11.60	11.50	1.23000	18.7	0.03809	0.16	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.038
16	11.50	11.40	1.23000	18.7	0.03809	0.16	1.70	19.00	17049.69	10027.40	32.29	0.00	0.000	0.000	0.038

TOT 1.12 997644.62 332487.53
 AVG 0.0765 3.00 45.00 134.94
 CUM 10.23

***** BIOLOGICAL AND PHYSICAL COEFFICIENTS *****

ELEM NO.	ENDING DIST	SAT D.O. mg/L	REAER RATE 1/da	BOD#1 DECA 1/da	BOD#1 SETT 1/da	ABOD#1 DECA 1/da	BOD#2 DECA 1/da	BOD#2 SETT 1/da	ABOD#2 DECA 1/da	BKGD SOD *	FULL SOD *	CORR SOD *	ORGN DECA 1/da	ORGN SETT 1/da	NH3 DECA 1/da	NH3 SRCE *	DENIT RATE 1/da	PO4 SRCE *	ALG PROD **	MAC PROD **	COLI DECA 1/da	NCM DECA 1/da	NCM SETT 1/da	
51	7.800	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29	29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	7.600	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29	29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	7.400	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29	29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	7.200	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29	29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	7.000	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29	29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	6.800	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29	29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	6.600	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148	29148.29	29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			0.77	0.15	0.00	0.00	0.00	0.00	0.00	79.00		0.00	0.00	0.45	0.00	0.00	0.00				0.00	0.00	0.00	

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
51	7.800	30.00	0.00	0.00	0.00	4.83	3.08	0.00	3.08	0.00	0.00	0.04	0.04	0.08	0.00	0.00	0.00	0.	0.00
52	7.600	30.00	0.00	0.00	0.00	4.81	3.04	0.00	3.04	0.00	0.00	0.04	0.05	0.08	0.00	0.00	0.00	0.	0.00
53	7.400	30.00	0.00	0.00	0.00	4.81	3.00	0.00	3.00	0.00	0.00	0.03	0.05	0.08	0.00	0.00	0.00	0.	0.00
54	7.200	30.00	0.00	0.00	0.00	4.80	2.96	0.00	2.96	0.00	0.00	0.03	0.06	0.08	0.00	0.00	0.00	0.	0.00
55	7.000	30.00	0.00	0.00	0.00	4.80	2.92	0.00	2.92	0.00	0.00	0.02	0.06	0.08	0.00	0.00	0.00	0.	0.00
56	6.800	30.00	0.00	0.00	0.00	4.81	2.88	0.00	2.88	0.00	0.00	0.02	0.06	0.08	0.00	0.00	0.00	0.	0.00
57	6.600	30.00	0.00	0.00	0.00	4.81	2.85	0.00	2.85	0.00	0.00	0.02	0.07	0.08	0.00	0.00	0.00	0.	0.00

FINAL REPORT Big Creek U/S of STP
 REACH NO. 4 Hurr Cr -- Cnty Rd 67 to Hwy 35

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); no discharge; 20% NPS reduction

***** REACH INPUTS *****

ELEM NO.	TYPE	FLOW	TEMP deg C	SALN ppt	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	PHOS mg/L	CHL A µg/L	COLI #/100mL	NCM
58	UPR RCH	10.33000	30.00	0.00	0.00	0.00	4.81	2.85	0.00	2.85	0.00	0.00	0.02	0.07	0.00	0.00	0.00	0.00

72	2.100	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	1.800	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	1.500	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	1.200	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	0.900	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	0.600	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.300	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	0.000	7.56	0.92	0.24	0.00	0.00	0.00	0.00	0.00148.29148.29148.29	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVG 20 DEG C RATE 0.77 0.15 0.00 0.00 0.00 0.00 0.00 0.00 0.00 79.00 0.00 0.00 0.45 0.00 0.00 0.00 0.00 0.00 0.00

* mg/ft²/d ** mg/L/day

***** WATER QUALITY CONSTITUENT VALUES *****

ELEM NO.	ENDING DIST	TEMP DEG C	SALN PPT	CM-I	CM-II	DO mg/L	BOD#1 mg/L	BOD#2 mg/L	EBOD#1 mg/L	EBOD#2 mg/L	ORGN mg/L	NH3 mg/L	NO3+2 mg/L	TOTN mg/L	PHOS mg/L	CHL A µg/L	MACRO mg/ft ³	COLI #/100mL	NCM
58	6.300	30.00	0.00	0.00	0.00	4.83	2.79	0.00	2.79	0.00	0.00	0.01	0.07	0.08	0.00	0.00	0.00	0.	0.00
59	6.000	30.00	0.00	0.00	0.00	4.84	2.75	0.00	2.75	0.00	0.00	0.01	0.07	0.08	0.00	0.00	0.00	0.	0.00
60	5.700	30.00	0.00	0.00	0.00	4.85	2.70	0.00	2.70	0.00	0.00	0.01	0.07	0.08	0.00	0.00	0.00	0.	0.00
61	5.400	30.00	0.00	0.00	0.00	4.87	2.66	0.00	2.66	0.00	0.00	0.01	0.08	0.08	0.00	0.00	0.00	0.	0.00
62	5.100	30.00	0.00	0.00	0.00	4.89	2.62	0.00	2.62	0.00	0.00	0.01	0.08	0.08	0.00	0.00	0.00	0.	0.00
63	4.800	30.00	0.00	0.00	0.00	4.90	2.58	0.00	2.58	0.00	0.00	0.01	0.08	0.08	0.00	0.00	0.00	0.	0.00
64	4.500	30.00	0.00	0.00	0.00	4.92	2.54	0.00	2.54	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
65	4.200	30.00	0.00	0.00	0.00	4.93	2.51	0.00	2.51	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
66	3.900	30.00	0.00	0.00	0.00	4.95	2.48	0.00	2.48	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
67	3.600	30.00	0.00	0.00	0.00	4.96	2.45	0.00	2.45	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
68	3.300	30.00	0.00	0.00	0.00	4.97	2.42	0.00	2.42	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
69	3.000	30.00	0.00	0.00	0.00	4.99	2.39	0.00	2.39	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
70	2.700	30.00	0.00	0.00	0.00	5.00	2.36	0.00	2.36	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
71	2.400	30.00	0.00	0.00	0.00	5.01	2.34	0.00	2.34	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
72	2.100	30.00	0.00	0.00	0.00	5.02	2.32	0.00	2.32	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
73	1.800	30.00	0.00	0.00	0.00	5.03	2.29	0.00	2.29	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
74	1.500	30.00	0.00	0.00	0.00	5.04	2.27	0.00	2.27	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
75	1.200	30.00	0.00	0.00	0.00	5.04	2.25	0.00	2.25	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
76	0.900	30.00	0.00	0.00	0.00	5.05	2.24	0.00	2.24	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
77	0.600	30.00	0.00	0.00	0.00	5.06	2.22	0.00	2.22	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
78	0.300	30.00	0.00	0.00	0.00	5.06	2.20	0.00	2.20	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00
79	0.000	30.00	0.00	0.00	0.00	5.07	2.19	0.00	2.19	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Big Creek U/S of STP

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
Critical season (temp = 30 C); no discharge; 20% NPS reduction

TRAVEL TIME = 15.50 DAYS

MAXIMUM EFFLUENT = 90.32 PERCENT

FLOW = 1.00000 TO 10.33000 cfs
DISPERSION = 0.00000 TO 0.00000 ft²/s
VELOCITY = 0.02106 TO 0.07654 fps
DEPTH = 1.70 TO 3.00 ft

WIDTH = 19.00 TO 45.00 ft
 BOD DECAY = 0.24 TO 0.24 per day
 NH3 DECAY = 0.79 TO 0.92 per day
 SOD = 148.29 TO 209.30 mg/ft²/d
 NH3 SOURCE = 0.00 TO 0.00 mg/ft²/d
 REAERATION = 0.92 TO 1.63 per day
 BOD SETTLING = 0.00 TO 0.00 per day
 ORG-N DECAY = 0.00 TO 0.00 per day
 ORG-N SETTLING = 0.00 TO 0.00 per day
 TEMPERATURE = 30.00 TO 30.00 deg C
 DISSOLVED OXYGEN = 2.98 TO 5.07 mg/L

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); no discharge; 20% NPS reduction

REACH SUMMARY REPORT FOR Big Creek U/S of STP

RCH NO.	REACH NAME	BEGIN DIST km	ENDING DIST km	REACH LENGTH km	TRAVEL TIME days	FLOW AT EOR m ³ /s	AVERAGE VELO m/s	AVG DEPTH m	AVG WIDTH m	FLOW AT EOR cfs	AVERAGE VELO fps	AVG DEPTH ft	AVG WIDTH ft
1	Big Crk -- STP to Town Branch	20.92	18.99	1.93	3.48	0.02832	0.00642	0.762	5.79	1.000	0.021	2.500	19.00
2	Big Crk -- Town Branch to mouth	18.99	12.87	6.12	5.63	0.04899	0.01257	0.518	5.79	1.730	0.041	1.700	19.00
3	Hurr Cr -- Big C to County Rd 67	12.87	10.62	2.25	1.12	0.29255	0.02333	0.914	13.72	10.330	0.077	3.000	45.00
4	Hurr Cr -- Cnty Rd 67 to Hwy 35	10.62	0.00	10.62	5.27	0.29255	0.02333	0.914	13.72	10.330	0.077	3.000	45.00

LA-QUAL Model for Big Creek and Hurricane Creek Near Sheridan
 Critical season (temp = 30 C); no discharge; 20% NPS reduction

INPUT/OUTPUT LOADING SUMMARY

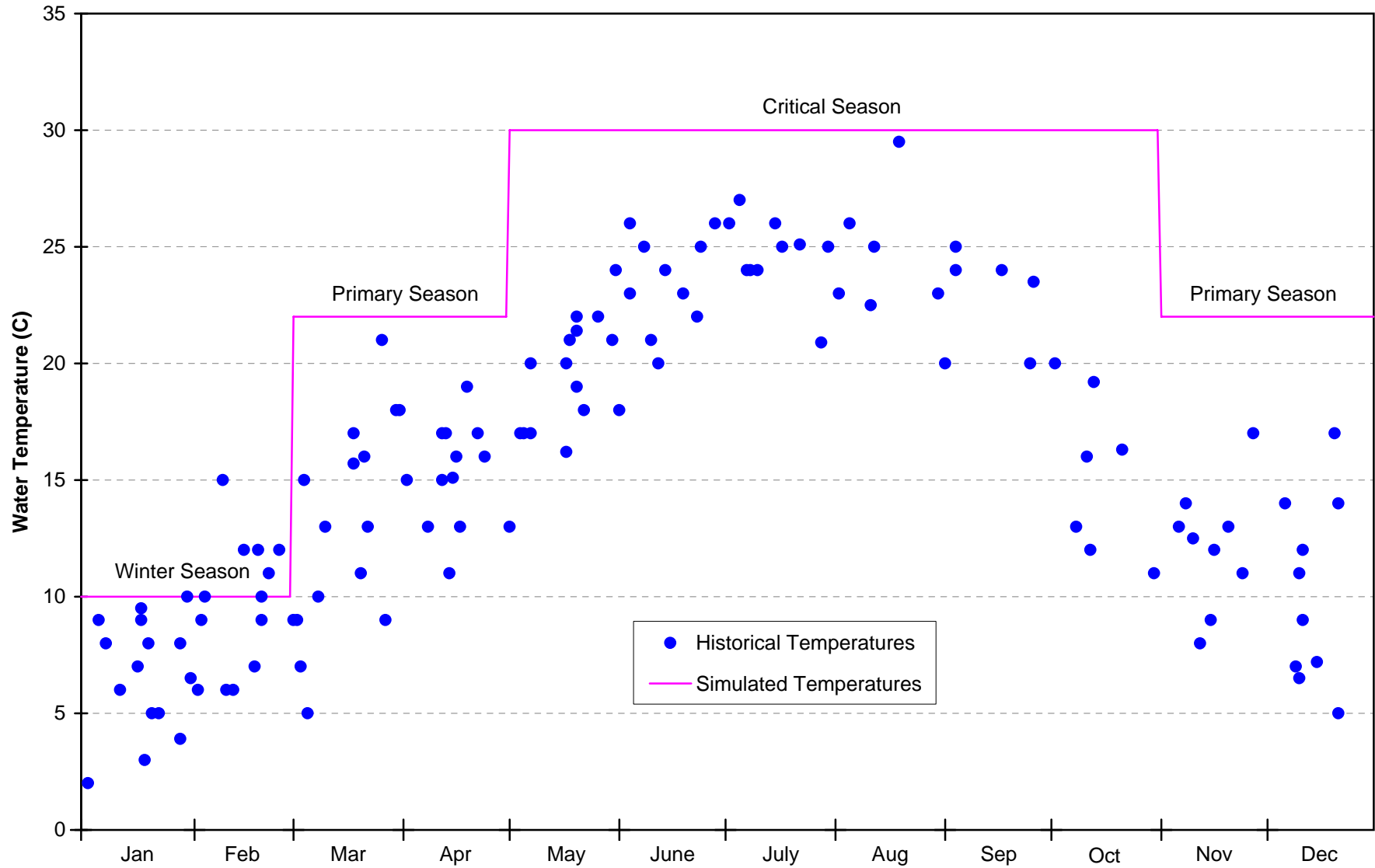
	FLOW cfs	DO lb/d	BOD#1 lb/d	BOD#2 lb/d	ORG-N lb/d	NH3-N lb/d	NO3-N lb/d	PHOS lb/d	CHL A	NCM
HEADWATER FLOW	1.000	16.2	32.9	0.0	0.0	1.3	0.0	0.0	0.0	0.0
INCREMENTAL INFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL OUTFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASTELoads	9.330	248.5	121.5	0.0	0.0	3.3	0.0	0.0	0.0	0.0
WITHDRAWALS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-10.330	-282.6	-121.8	0.0	0.0	0.0	-4.6	0.0	0.0	0.0
DISPERSION THRU LOWER BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DISPERSION THRU HDWTR BNDRY		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NON-POINT INPUT		0.0	292.0	0.0	0.0					0.0
NATURAL REAERATION		1215.3								
DAM REAERATION		0.0								
BACKGROUND SOD		-852.6								
BOD#1 DECAY		-324.6	-324.6							
BOD#1 SETTLING		0.0	0.0							
ANAEROBIC BOD#1 DECAY			0.0							
BOD#2 DECAY		0.0		0.0						
BOD#2 SETTLING		0.0		0.0						
ANAEROBIC BOD#2 DECAY				0.0						
ORG-N DECAY		0.0			0.0	0.0				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-20.1				-4.6	4.6			
BACKGROUND NH3 SOURCE						0.0				
OTHER DENITRIFICATION							0.0			
PHOSPHORUS SOURCE								0.0		
ALGAE PHOTOSYNTHESIS		0.0				0.0	0.0	0.0	0.0	
ALGAE RESPIRATION		0.0				0.0		0.0	0.0	
ALGAE SETTLING		0.0							0.0	
MACRO PHOTOSYNTHESIS		0.0				0.0	0.0	0.0		
NCM DECAY		0.0								0.0
NCM SETTLING		0.0								0.0
TOTAL INPUTS	10.330	1480.0	446.4	0.0	0.0	4.7	4.6	0.0	0.0	0.0
TOTAL OUTPUTS	-10.330	-1480.0	-446.4	0.0	0.0	-4.7	-4.6	0.0	0.0	0.0
NET CONVERGENCE ERROR	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

.....EXECUTION COMPLETED

APPENDIX M

Comparison of Historical and Simulated Temperatures for Each Season

Figure M.1. Historical and Simulated Temperatures for Big Creek at OUA18



APPENDIX N

Ammonia Toxicity Calculations

AMMONIA TOXICITY CALCULATIONS FOR BIG CREEK DOWNSTREAM OF SHERIDAN

Equation for CCC is from 1999 Update of Ambient Water Quality Criteria for Ammonia, EPA-822-R-99-014, Dec. 1999. This methodology is consistent with ammonia toxicity standards in Section 2.512 of Regulation No. 2 (APCEC 2005).

Use chronic criterion when fish early life stages are present (as mentioned on page 88, this is the same as CCC for early life stages absent when temp > 15°C)

$$\text{CCC, in mg N/L} = [0.0577 / (1 + 10^{7.688 - \text{pH}}) + 2.487 / (1 + 10^{\text{pH} - 7.688})] * \text{MIN} [2.85, 1.45 * 10^{0.028 * (25 - T)}]$$

Note: CCC is the Chronic Criterion Concentration

pH value below is the average value for Big Creek at station OUA18 from Table A-42 in the 2004 305(b) report. Temperature values below are the same temperatures used in the water quality modeling.

Projection Scenario	Average pH (su)	Temperature (°C)	Calculated CCC (mg N/L)	Max. predicted NH3-N conc. (mg N/L)	Toxic ?
Winter Season	6.51	10.0	6.66	2.98	No
Spawning Period	6.51	16.5	5.86	1.79	No
Primary Season	6.51	22.0	4.11	1.84	No
Critical Season (w/ WWTP)	6.51	30.0	2.45	0.91	No
Critical Season (w/o WWTP)	6.51	30.0	2.45	0.25	No

APPENDIX O

TMDL Calculations

OXYGEN DEMAND TMDL CALCULATIONS FOR BIG CREEK

Length of Big Creek in model = 5 miles = 26400 feet

	<u>Flow rate in model</u>		<u>Conc's in model</u>		<u>Constituent loads</u>		<u>Oxygen demand</u>		<u>Width of Big Creek in model (feet)</u>	<u>SOD in model (mg/ft²/day)</u>	<u>SOD as "load" (lbs/day)</u>	<u>Total oxygen demand (CBODu + NH3 + SOD) (lbs/day)</u>
	<u>(cfs)</u>	<u>(MGD)</u>	<u>CBODu (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>CBODu (lbs/day)</u>	<u>NH3-N (lbs/day)</u>	<u>CBODu (lbs/day)</u>	<u>NH3-N (lbs/day)</u>				
<u>Winter Season</u>												
Big Creek upstream of WWTP	5.00	3.23	5.1	0.31	137	8.4	137	36	--	--	--	
Town Branch	1.13	0.73	5.1	0.31	31	1.9	31	8	--	--	--	
Hubbard Creek	2.48	1.60	5.1	0.31	68	4.1	68	18	--	--	--	
NPS loads (Data Type 19)	--	--	--	--	164	--	164	--	--	--	--	
Sediment oxygen demand	--	--	--	--	--	--	--	--	19.0	139.4	154	
Total for nonpoint sources =							400	62			154	616
City of Sheridan WWTP	1.50	0.97	69	12	558	97.1	558	420	--	--	--	978
<u>Primary Season</u>												
Big Creek upstream of WWTP	10.00	6.46	6.0	0.24	323	12.9	323	56	--	--	--	
Town Branch	2.27	1.47	6.0	0.24	74	2.9	74	13	--	--	--	
Hubbard Creek	4.96	3.21	6.0	0.24	161	6.4	161	28	--	--	--	
NPS loads (Data Type 19)	--	--	--	--	164	--	164	--	--	--	--	
Sediment oxygen demand	--	--	--	--	--	--	--	--	19.7	139.4	160	
Total for nonpoint sources =							722	97			160	979
City of Sheridan WWTP	2.00	1.29	69	10	742	107.6	742	466	--	--	--	1208
<u>Critical Season with WWTP</u>												
Big Creek upstream of WWTP	10.00	6.46	7.6	0.31	409	16.7	409	72	--	--	--	
Town Branch	2.27	1.47	7.6	0.31	93	3.8	93	16	--	--	--	
Hubbard Creek	4.96	3.21	7.6	0.31	203	8.3	203	36	--	--	--	
NPS loads (Data Type 19)	--	--	--	--	164	--	164	--	--	--	--	
Sediment oxygen demand	--	--	--	--	--	--	--	--	19.7	139.4	160	
Total for nonpoint sources =							869	124			160	1153
City of Sheridan WWTP	2.00	1.29	69	4	742	43.0	742	186	--	--	--	928
<u>Critical Season without WWTP</u>												
Big Creek upstream of WWTP	1.00	0.65	6.1	0.25	33	1.4	33	6	--	--	--	
Town Branch	0.23	0.15	6.1	0.25	8	0.3	8	1	--	--	--	
Hubbard Creek	0.50	0.32	6.1	0.25	16	0.7	16	3	--	--	--	
NPS loads (Data Type 19)	--	--	--	--	131	--	131	--	--	--	--	
Sediment oxygen demand	--	--	--	--	--	--	--	--	19.0	139.4	154	
Total for nonpoint sources =							188	10			154	352
City of Sheridan WWTP	0.00	0.00			0	0.0	0	0	--	--	--	0

See explanations on next page

Explanations for TMDL Calculations:

1. Because the spawning period and the primary season overlap chronologically, the TMDL for that season was calculated using the primary season simulation because it was more critical (i.e., it yields lower allowable loads for the TMDL).
2. For inflows to the model, "Constituent loads" were calculated as flow in MGD x concentration in mg/L x 8.34.
3. For NPS loads (Data Type 19 in the model), "Constituent loads" represents the sum of the simulated CBODu loads in reaches 1 and 2 of the model.
4. Oxygen demand from NH₃-N was calculated as lbs/day of actual NH₃-N times 4.33 (the oxygen demand that is simulated by QUAL-TX and LA-QUAL for each unit of ammonia nitrogen).
5. SOD as a "load" was calculated as SOD in mg/ft²/day x 26400 ft (simulated length of Big Creek) x width of stream in ft x 2.205E-6 (conversion factor).

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