TMDLS FOR DISSOLVED OXYGEN AND NUTRIENTS FOR BOGGY BAYOU, LA

SUBSEGMENT 100602

DRAFT
OCTOBER 2, 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 pollutant that a waterbody can assimilate without exceeding the established water quality standard for that pollutant. Through a TMDL, pollutant loads can be distributed or allocated to point sources and nonpoint sources discharging to the waterbody. This report presents TMDLs that have been developed for dissolved oxygen (DO) and nutrients for Boggy Bayou (subsegment 100602) in the Red River basin in northwestern Louisiana.

Boggy Bayou flows generally eastward from its headwaters near the Texas state line to its confluence with Cypress Bayou near the upper end of Wallace Lake south of Shreveport. Subsegment 100602 covers 79.4 square miles and the predominant land uses are forest (55.7%), urban/transportation (16.5%), and grassland/herbaceous (12.3%).

Subsegment 100602 was cited as being impaired on the final 2004 303(d) list for Louisiana as not fully supporting the designated use of propagation of fish and wildlife. It was ranked as priority #2 for TMDL development. The causes for impairment cited in the 303(d) List included organic enrichment/low DO and nutrients. The DO criterion specified in the Louisiana water quality standards for this subsegment is 5 mg/L year round.. There are no numeric criteria for nutrients in Louisiana.

A water quality model (LA-QUAL) was set up to simulate DO, carbonaceous biochemical oxygen demand (CBOD), ammonia nitrogen, and organic nitrogen in Boggy Bayou. The model was set up and calibrated using data from a field survey conducted by FTN Associates, Ltd. (FTN) during August and September 2005. The data collected during the field survey included stream flows, depths, widths, and water quality data (both in situ parameters and laboratory analyses of samples).

The summer and winter projection simulations were run at critical flows and temperatures to address seasonality as required by the Clean Water Act. A 46% reduction of existing nonpoint source loads was required for the summer projection simulation to show the

DO criterion of 5 mg/L being maintained. No nonpoint source load reductions were necessary for the winter projection. No point source loads were reduced for either season because the point source discharges were small and appeared to be having no significant impact on DO in Boggy Bayou. In general, the modeling in this study was consistent with guidance in the Louisiana TMDL Technical Procedures Manual.

A TMDL for oxygen demanding substances (CBOD, ammonia nitrogen, organic nitrogen, and sediment oxygen demand) was calculated using the results of the projection simulations. Loads from small, remote point sources with oxygen demanding effluent were included in the TMDL by adding them to the loads simulated in the model. An implicit margin of safety (MOS) was established for the DO TMDL through the use of conservative assumptions in the water quality modeling. Additionally, 10% of the allowable loading was set aside as an explicit MOS and another 10% of the allowable loading was set aside for future growth (FG). Results of the DO TMDL calculations are summarized in Tables ES.1 and ES.2. Point source flows, concentrations, and loads are listed in Table ES.3.

A nutrient TMDL was developed for this subsegment using average nutrient concentrations from ecoregion reference streams as target concentrations. The TMDL was calculated using an average annual mass balance because insufficient data were available to simulate the full nutrient-algal cycle in the LA-QUAL model. The TMDL was calculated as the estimated average annual flow for Boggy Bayou multiplied times target concentrations of total phosphorus and total nitrogen. Point source nutrient loads were calculated based on assumed effluent concentrations that should not be used as permit limits without additional data collection to confirm any impact that point source discharges may be having on the water quality and biology of Boggy Bayou. The nutrient TMDL included an implicit MOS (from conservative assumptions) and an explicit FG allowance (10% of the TMDL). Existing loads of total phosphorus and total nitrogen were estimated and found to be higher than the allowable loads in the nutrient TMDL. The nutrient TMDL is summarized in Table ES.4.

Table ES.1. Summer DO TMDL for subsegment 100602.

	Oxygen Demand (kg/day) from:					Oxygen Demand (lbs/day) from:					Percent Reduction Needed
	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	
Point Sources											
WLA	NA	18.45	15.93	8.75	43.14	NA	40.67	35.12	19.29	95.08	0%
MS4	19.85	2.03	0.72	0.02	22.62	43.76	4.48	1.59	0.04	49.87	46%
MOS	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
FG	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
Nonpoint Sources											
LA	104.24	10.66	3.81	0.11	118.82	229.81	23.50	8.40	0.24	261.95	46%
MOS	15.51	1.59	0.57	0.02	17.68	34.19	3.51	1.26	0.04	39.00	NA
FG	15.51	1.59	0.57	0.02	17.68	34.19	3.51	1.26	0.04	39.00	NA
TMDL	155.11	38.94	25.58	11.10	230.72	341.95	85.85	56.41	24.45	508.66	NA

Table ES.2. Winter DO TMDL for subsegment 100602.

	Oxygen Demand (kg/day) from:					Oxygen Demand (lbs/day) from:					Percent Reduction Needed
	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	
Point Sources											
WLA	NA	18.45	15.93	8.75	43.14	NA	40.67	35.12	19.29	95.08	0%
MS4	20.77	14.42	9.53	0.27	44.99	45.79	31.79	21.01	0.60	99.19	0%
MOS	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
FG	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
Nonpoint Sources											
LA	109.03	75.73	50.02	1.39	236.17	240.37	166.95	110.27	3.06	520.65	0%
MOS	16.23	11.77	7.44	0.21	35.15	35.78	24.85	16.40	0.46	77.49	NA
FG	16.23	11.77	7.44	0.21	35.15	35.78	24.85	16.40	0.46	77.49	NA
TMDL	162.26	136.76	94.34	13.01	405.38	357.72	299.29	207.98	28.67	893.66	NA

Table ES.3. Flows, concentrations, and loads for point sources included in DO TMDL.

Subseg. Number	NPDES Number	Name of discharger	Flow rate (gallons per day)	Concentrations			Loads*		
				BOD5 or CBOD5 (mg/L)	Ammonia nitrogen (mg/L)	Organic nitrogen (mg/L)	BOD5 or CBOD5 (lbs/day)	Ammonia nitrogen (lbs/day)	Organic nitrogen (lbs/day)
100602	LAG480011	LA Lift and Equip. Inc. FKA LA Clarklift Inc	1,800 (Outfall 001 only)	45	10	5	0.68	0.15	0.08
100602	LAG480284	Jack Cooper Transport Co Inc	2,600	45	10	5	0.98	0.22	0.11
100602	LAG530693	KEH Property Ltd., Fud's III Bar and Lounge	675	45	10	5	0.25	0.06	0.03
100602	LAG541012	Grawood Baptist Church	6,000	30	10	5	1.50	0.50	0.25
100602	LAG560089	Wildwood Estates	33,000	20	6.7	3.3	5.51	1.85	0.91
100602	LAG570220	Eagle Water Inc - LaLaurie Lane Oxidation Pond	60,000	10	3.3	1.7	5.01	1.65	0.85
100602	LAG750459	Norwell Equip. Co. Shreveport Facility	5,000	45	10	5	1.88	0.42	0.21
100602	LAG750449	Deep South Equip. Co. Shreveport	5,000	45	10	5	1.88	0.42	0.21
100602 Total Loads:							17.69	5.27	2.65

*Loads of organic nitrogen and ammonia nitrogen in this table represent loads of nitrogen, not oxygen demand.

Table ES.4. Nutrient TMDL for subsegment 100602.

Parameter	Loads, lbs/day				
	WLA	LA	MOS	FG	TMDL
Total Phosphorus	5.70	14.42	Implicit	2.24	22.36
Total Nitrogen	15.24	224.83	Implicit	26.67	266.74

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1.0 INTRODUCTION

This report presents total maximum daily loads (TMDLs) for dissolved oxygen (DO) and nutrients for subsegment 100602 (Boggy Bayou from the headwaters to Wallace Lake). This subsegment was cited as being impaired on the final 2004 303(d) list for Louisiana (Louisiana Department of Environmental Quality (LDEQ) 2005). The priority ranking and the suspected sources and suspected causes for impairment from the 303(d) list are presented in Table 1.1. The TMDL in this report was developed in accordance with Section 303(d) of the Federal Clean Water Act and Environmental Protection Agency (EPA) regulations at 40 CFR 130.7. The impairments for sedimentation/siltation and turbidity in this subsegment have been addressed in a previous TMDL report (FTN 2007).

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), future growth (FG), 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 FG is reserved for future increases in loads to the waterbody. The MOS is a percentage of the TMDL that accounts for any lack of knowledge concerning the relationships between pollutant loading and water quality, including uncertainty associated with model assumptions and data inadequacies.

Table 1.1. Summary of 303(d) listing for subsegment 100602.

Subsegment Number	Waterbody Description	Suspected Causes	Suspected Sources	Priority Ranking (1 = highest)
100602	Boggy Bayou – From headwaters to Wallace Lake	Organic enrichment/low DO	Unknown source	2
		Nutrients	Unknown source	2
		Sedimentation/Siltation	Unknown source	1
		Turbidity	Unknown source	1

2.0 STUDY AREA DESCRIPTION

2.1 General Information

Boggy Bayou (subsegment 100602) is located in northwestern Louisiana in the Red River Basin (see Figure A.1 in Appendix A). Boggy Bayou flows generally eastward from its headwaters near the Texas state line to its confluence with Cypress Bayou within the upper end of Wallace Lake south of Shreveport. Subsegment 100602 covers 79.4 square miles and includes Gilmer Bayou and other small tributaries of Boggy Bayou. This subsegment lies entirely within the South Central Plains ecoregion.

2.2 Land Use

Land use characteristics for subsegment 100602 were compiled from the United States Geological Survey (USGS) 2001 National Land Cover Database (USGS 2006). These data are the most recent land use data that are currently available for this area. The spatial distribution of these land uses is shown on Figure A.2 (located in Appendix A) and land use percentages are shown in Table 2.1. These data indicate that over half of this subsegment is forest.

Table 2.1. Land use percentages for subsegment 100602.

Land Use Type	Percent of Total Area
Water	0.6%
Urban/Transportation	16.5%
Barren	0.2%
Forest	55.7%
Grasslands/Herbaceous	12.3%
Pasture/Hay	6.8%
Cultivated Crops	0.1%
Wetlands	7.8%
TOTAL	**100.0%**

2.3 Water Quality Standards

Water quality standards for Louisiana are listed in the Title 33 Environmental Regulatory Code (LDEQ 2007). The designated uses for subsegment 100602 are primary contact recreation, secondary contact recreation, propagation of fish and wildlife, and agriculture. The primary numeric criteria for the DO TMDL presented in this report are the DO criterion of 5 mg/L (year round) and the temperature criterion of 32°C.

The Title 33 Environmental Regulatory Code does not include numeric criteria for nutrients, but it does include the following narrative criteria for nutrients (LAC 33: IX.1113.B.8):

> "The naturally occurring range of nitrogen-phosphorous ratios shall be maintained. This range shall not apply to designated intermittent streams. To establish the appropriate range of ratios and compensate for natural seasonal fluctuations, the administrative authority will use site-specific studies to establish limits for nutrients. Nutrient concentrations that produce aquatic growth to the extent that it creates a public nuisance or interferes with designated water uses shall not be added to any surface waters."

The Louisiana water quality standards also include an antidegradation policy (LAC 33: IX.1109.A). This policy states that waters exhibiting high water quality should be maintained at that high level of water quality. If this is not possible, water quality of a level that supports designated uses of the waterbody should be maintained. Changing the designated uses of a waterbody to allow a lower level of water quality can only be achieved through a use attainability study.

2.4 Point Sources

A list of point sources in selected portions of the Red River basin was developed using data from LDEQ's internal point source databases with additional information obtained from LDEQ's Electronic Document Management System (EDMS). Using this information, 14 point sources were identified within subsegment 100602 (Table 2.2; located at the end of Section 2). Approximate locations of these point sources are shown on Figure A.3 (in Appendix A). All of the discharges that were considered to have oxygen demand above background levels were included in the TMDL. Most of the oxygen demanding discharges are far away from Boggy Bayou such that they are not expected to affect DO concentrations in Boggy Bayou. The only two discharges that were close enough to Boggy Bayou to be included in the LA-QUAL model were Eagle Water (LaLaurie Lane) and Grawood Baptist Church.

Storm runoff from areas within the Shreveport city limits is classified as a point source for this TMDL because the City of Shreveport has a Municipal Separate Storm Sewer System (MS4) permit (permit number LAS000401). The Urbanized Area for Shreveport (EPA 2002) extends into subsegment 100602 and covers approximately 12.7 square miles of the subsegment (16% of the subsegment). This MS4 permit does not set numeric limits for the quality of storm runoff from urban areas, but it does require the City of Shreveport to identify and implement best management practices (BMPs) to minimize pollutants in storm runoff.

2.5 Nonpoint Sources

The 303(d) list did not cite any specific nonpoint sources as suspected sources of the DO and nutrient impairments for subsegment 100602 (Table 1.1).

Individual nonpoint sources are not identified and quantified here because this TMDL focuses on total nonpoint source loading. Individual sources should be identified and quantified by state or local agencies if they develop an implementation plan.

2.6 Historical Water Quality Data Summary

There is one LDEQ routine water quality monitoring station in this subsegment; it is Station 1207 (Boggy Bayou southwest of Shreveport, Louisiana). Its location is shown on Figure A.1 in Appendix A. The DO and nutrient data for this station were obtained from LDEQ. The data are summarized in Table 2.3 (located at the end of Section 2) and the individual data are listed in Table B.1 in Appendix B. During 2002 through 2005, approximately 36% of the DO measurements were below the water quality criterion of 5.0 mg/L. Eight of the 12 values below 5.0 mg/L occurred during May – September 2005, which was a drier than normal period for northwestern Louisiana (Southern Regional Climate Center (SRCC) 2007).

Table 2.2. List of point source discharges in subsegment 100602.

Permit Number and AI Number*	Company and Facility Name	Type of Facility	Receiving Stream	Outfall	Flow (gallons per day)	Relevant Permit Limits	Included in TMDLs
LA0103632 (AI=43329)	SWEPCO Dean Road Tree Trim Debris Landfill	Tree debris landfill	Gilmer Bayou to Boggy Bayou	unable to obtain permit in EDMS			No
LAG110024 (AI=7844)	Builders Supply Brooks Road Plant	Ready mix concrete	Ditch to drainage ditch to Boggy Bayou			none related to DO	No
LAG480011 (AI=24991)	LA Lift and Equip. Inc. FKA LA Clarklift Inc	Forklift dealer / service facility	Gilmer Bayou to Boggy Bayou	001	1,800 avg 2,520 max	45 mg/L BOD5 wk. avg	Yes
				002	12,067	200 mg/L COD mo. avg 300 mg/L COD dly max	No
LAG480284 (AI=41933)	Jack Cooper Transport Co Inc	Auto transport maintenance	Ditch to Gilmer Bayou to Boggy Bayou	001	2,600	45 mg/L BOD5 wk. avg	Yes
LAG530693 (AI=42032)	KEH Property Ltd., Fud's III Bar and Lounge	Restaurant / bar / lounge	Ditch to Gilmer Bayou to Boggy Bayou	001	675	45 mg/L BOD5 wk. avg	Yes
LAG531200 (AI=93686)	Whitt's Barbeque	Restaurant	Socagee Creek in Texas, then to Sabine River	001	3,000	45 mg/L BOD5 wk. avg	No (flows to Texas)
LAG541012 (AI=87657)	Grawood Baptist Church	Church	Ditch to Boggy Bayou	001	6,000	30 mg/L BOD5 mo. avg 45 mg/L BOD5 wk. avg	Yes
LAG560089 (AI=18900)	Wildwood Estates	Manufactured home community	Stream to Lakeland Farm Lake to Boggy Bayou	001	33,000	20 mg/L BOD5 mo. avg 30 mg/L BOD5 wk. avg	Yes
LAG570220 (AI=41326)	Eagle Water Inc - LaLaurie Lane Oxidation Pond	Residential sewage treatment	Boggy Bayou	001	60,000	10 mg/L BOD5 mo. avg 15 mg/L BOD5 wk. avg	Yes
LAG750459 (AI=42680)	Norwell Equip. Co. Shreveport Facility	Heavy equipment sales & service	Ditch to Boggy Bayou	002	< 5,000	45 mg/L BOD5 wk. avg	Yes
LAG750449 (AI=14030)	Deep South Equip. Co. Shreveport	Forklift trucks / sales & service	Ditch to Boggy Bayou	002	< 5,000	45 mg/L BOD5 wk. avg	Yes
LAR05M320 (AI=3349)	General Motors Shreveport Assembly Plant	Motor vehicle assembly plant	Bayou Gilmer to Boggy Bayou			none related to DO	No

Table 2.2. (Continued).

Permit Number and AI Number*	Company and Facility Name	Type of Facility	Receiving Stream	Outfall	Flow (gallons per day)	Relevant Permit Limits	Included in TMDLs
LAR05N167 (AI=27348)	Industrial Oils Unlimited, AR Inc.	Industrial lubricant supplier	Gilmer Bayou to Boggy Bayou			none related to DO	No
LAR05N401 (AI=11454)	General Electric Shreveport					none related to DO	No

*AI Number = Agency Interest number (assigned by LDEQ and used in LDEQ point source files and databases).

Table 2.3. Summary of LDEQ routine water quality monitoring data for Boggy Bayou.

Station ID and Description	Period of Record	Parameter	Number of Values	Minimum (mg/L)	Average (mg/L)	Maximum (mg/L)	Number of Values Below Criterion	Percent of Values Below Criterion
1207 – Boggy Bayou southwest of Shreveport	1/07/02 thru 9/27/05	DO	33	1.8	6.2	12.6	12	36%
		Nitrate + Nitrite	36	< 0.05	0.11	0.42	NA	NA
		Ammonia Nitrogen	36	< 0.10	0.09	0.56	NA	NA
		Total Kjeldahl Nitrogen (TKN)	36	0.19	0.94	5.89	NA	NA
		Total Phosphorus	36	< 0.05	0.14	0.91	NA	NA

3.0 FTN FIELD DATA

FTN conducted a field survey for 14 subsegments in the Red River and Sabine River basins during August 31 through September 9, 2005. Low flow conditions existed throughout the survey area during this time. The survey was conducted after Hurricane Katrina and before Hurricane Rita. Hurricane Katrina did not cause any noticeable impacts on water quality in the survey area. Field data were collected in the Boggy Bayou subsegment on August 31.

The field survey included water quality sampling and corresponding in situ measurements at various locations; measurements of flow, depth, and width at several locations; and continuous in situ monitoring at several locations. The water quality samples were analyzed for 20-day time series for carbonaceous biochemical oxygen demand (CBOD), total Kjeldahl nitrogen (TKN), ammonia nitrogen, nitrate+nitrite nitrogen, total phosphorus, chlorophyll *a*, total organic carbon (TOC), and total suspended solids (TSS). A list of the survey sites and the type of data collected at each site is presented in Table C.1 (in Appendix C). The in situ measurements and water quality sampling results are summarized in Tables C.2 and C.3, respectively. The calculations of CBOD decay rates and ultimate CBOD (CBODu) concentrations from the time series data are shown in Table C.4.

For the Boggy Bayou subsegment, field data were collected at LDEQ station 1207 and at station 100602-A (location shown on Figure A.1 in Appendix A). The field data collected at these two sites are listed in Table 3.1. The DO concentrations measured in Boggy Bayou were 5.2 mg/L and 4.4 mg/L.

Table 3.1. FTN field data collected for subsegment 100602.

	Station 1207	**Station 100602-A**
Date and time of sample / measurements	8/31/05 2:40 pm	8/31/05 1:45 pm
Depth (m) of sample / measurements	mid-depth	mid-depth
Width of stream (ft)	30.0	13.6
Mean depth of stream (ft)	0.51	0.92
Stream flow rate (cfs)	3.3	too low to measure
Water temperature (°C)	31.5	27.2
DO (mg/L)	5.2	4.4
Conductivity (µmhos/cm)	156	208
pH (su)	7.1	7.1
TSS (mg/L)	19	78
TKN (mg/L)	1.5	1.8
Total phosphorus (mg/L)	0.14	0.15
TOC (mg/L)	6.1	8.1
Chlorophyll *a* (mg/L)	<0.02	<0.02
Ammonia nitrogen (mg/L)	<0.10	<0.10
Nitrate+nitrite nitrogen (mg/L)	<0.05	<0.05
CBOD on day 3 of analysis (mg/L)	< 2	2.7
CBOD on day 5 of analysis (mg/L)	< 2	3.9
CBOD on day 9 of analysis (mg/L)	2.1	5.0
CBOD on day 14 of analysis (mg/L)	3.4	7.8
CBOD on day 20 of analysis (mg/L)	6.0	9.4
Ultimate CBOD (mg/L; calculated)	13.1	12.0
CBOD decay rate (1/day; calculated)	0.04	0.07

4.0 CALIBRATION OF WATER QUALITY MODEL

4.1 Model Setup

In order to evaluate the linkage between pollutant sources and water quality, a computer simulation model was used. The model used for these TMDLs was version 8.11 of LA-QUAL (Wiland and LeBlanc 2007), which was selected because it includes the relevant physical, chemical, and biological processes and it has been used successfully in the past for other TMDLs in Louisiana. The LA-QUAL model was set up to simulate organic nitrogen, ammonia nitrogen, ultimate CBOD (CBODu), and DO.

Figure D.1 in Appendix D shows the model reach/element design and the location of the modeled inflows. Boggy Bayou was divided into two reaches to represent varying depths and widths upstream and downstream of the mouth of Gilmer Bayou. Aerial photos showed that Boggy Bayou is channelized downstream of Gilmer Bayou, but appears to be a natural channel upstream of Gilmer Bayou.

4.2 Calibration Period and Calibration Targets

The two conditions that usually characterize critical periods for DO are high temperatures and low flows. High temperatures decrease DO saturation values and increase rates for oxygen demanding processes (CBOD decay, nitrification, and sediment oxygen demand (SOD)). In most systems, low flow causes low reaeration rates. The purpose of selecting a critical period for calibration is so that the model will be calibrated as accurately as possible for making projection simulations for critical conditions.

The two data sets that were considered for model calibration were the FTN field survey (August 31, 2005) and the LDEQ routine monitoring data at station 1207 (January 2002 – September 2005). The FTN field survey was chosen for the model calibration period because the survey was conducted during hot, dry conditions, field data were collected at multiple locations within the subsegment, and the field data included flow and cross section data that were not available for the LDEQ routine ambient monitoring data.

The calibration targets (i.e., the concentration to which the model was calibrated) for each parameter were set equal to the concentrations measured during the survey. Organic nitrogen was estimated as TKN minus ammonia nitrogen.

4.3 Temperature Correction of Kinetics (Data Type 4)

The temperature correction factors used in the model were consistent with the Louisiana Technical Procedures Manual (the "LTP," LDEQ 2006). These correction factors were:

- Correction for BOD decay: 1.047 (value in LTP is same as model default)
- Correction for SOD: 1.065 (value in LTP is same as model default)
- Correction for ammonia N decay: 1.070 (specified in Data Group 4
- Correction for organic N decay: 1.020 (not specified in LTP; model default used)
- Correction for reaeration: Automatically calculated by the model

4.4 Hydraulics (Data Type 9)

The hydraulics were specified in the input for the LA-QUAL model using the power functions (width = a * Q^b + c and depth = d * Q^e + f). The widths and depths were specified using the constants in these power functions (c and f) because the changes in widths and depths between the calibration and projection were assumed to be negligible. This assumption was made because the FTN field survey was conducted under very low flow conditions. The width and depth of reach 1 (4.1 m and 0.28 m, respectively) were set equal to the values measured at station 100602-A during the field survey. The width and depth of reach 2 (9.1 m and 0.16 m, respectively) were set equal to the values measured at station 1207 during the field survey. The values measured during the field survey are shown in Table 3.1.

4.5 Initial Conditions (Data Type 11)

Because temperature is not being simulated in the model, the temperature for each reach was specified in the initial conditions for LA-QUAL. The temperature for reach 1 was set to 27.2°C, which was the measured temperature at station 100602-A during the FTN field survey. The temperature for reach 2 was set to 31.5°C, which was the measured temperature at station 1207 during the field survey.

Initial concentrations of DO and ammonia nitrogen were also specified in the LA-QUAL input using measured values from the field survey. The initial concentrations of these two parameters do not affect the model output; the model uses them only as starting points for its iterative solution technique.

For constituents not being simulated, the initial concentrations were set to zero. Otherwise the model would have assumed a fixed concentration of those constituents and the model would have included effects of the unmodeled constituents on the modeled constituents. Chlorophyll was not specified in the model because the chlorophyll concentrations at both stations (100602-A and 1207) were below the laboratory detection limit.

4.6 Water Quality Kinetics (Data Types 12 and 13)

Kinetic rates used in LA-QUAL include reaeration rates, CBOD decay rates, nitrification rates, and mineralization rates (organic nitrogen decay).

For reaeration, the Louisiana Equation (option 15) was specified in the model because it was developed specifically for streams in Louisiana and it has been used successfully in the past for other TMDLs in Louisiana.

The CBOD decay rate for both reaches was set to 0.055/day, which was the average of the two laboratory decay rates for stations 100602-A and 1207 shown in Table 3.1. The nitrification rate for both reaches was initially set to 0.08/day, which was the average of 36 nitrogenous BOD (NBOD) decay rates measured by LDEQ in forested subsegments in the Ouachita River and Calcasieu River basins (shown in Table B.2 in Appendix B). During the calibration process, the nitrification rate for reach 1 was increased to 0.18/day, which was the maximum of the 36 NBOD decay rates. This change was made because lower nitrification rates resulted in predicted ammonia concentrations that were significantly higher than the observed concentrations.

The mineralization (organic nitrogen decay) rate was set to 0.02/day for both reaches. This value was similar to the values shown in the “Rates, Constants, and Kinetics” publication (EPA 1985) for dissolved organic nitrogen being transformed to ammonia nitrogen.

4.7 Nonpoint Source Loads (Data Types 12, 13, and 19)

The nonpoint source loads that are specified in the model can be most easily understood as resuspended load from the bottom sediments and are modeled as SOD, benthic ammonia source rates, CBOD loads, and organic nitrogen loads. The SOD (specified in data type 12), the benthic ammonia source rates (specified in data type 13), and the mass loads of organic nitrogen and CBODu (specified in data type 19) were all treated as calibration parameters; their values were adjusted until the model output was similar to the calibration target values. The values used as model input are shown in Table 4.1.

Table 4.1. Nonpoint source loads for model calibration.

Reach	SOD ($g/m^2/day$)	Benthic Ammonia Source ($g/m^2/day$)	CBODu Load (kg/day)	Organic Nitrogen Load (kg/day)
1	1.50	0	20.0	0.80
2	1.90	0	0.0	0.00

4.8 Headwater, Tributary, and Point Source Flows (Data Types 20 and 24)

A flow balance was developed for the Boggy Bayou LA-QUAL model based on the stream flow rates measured at stations 1207 and 100602-A during the FTN field survey and flow rates from discharge monitoring reports (DMRs) for the two point source discharges that were included in the model (Eagle Water LaLaurie Lane oxidation pond and Grawood Baptist Church). The calculations and the resulting flow rates used in the model are summarized in Table 4.2.

Table 4.2. Inflow rates for model calibration.

Name of Inflow	Flow Rate (cfs)	Flow Rate (m^3/sec)	Explanation
Headwater	0.01	0.00028	Flow at 100602-A was too low to measure during FTN field survey. Flow of 0.01 cfs was assumed.
Eagle Water LaLaurie Lane	0	0	“No measurable flow” reported on August 2005 DMR.
Grawood Baptist Church	0.0093	0.00026	Equivalent to 6,000 gallons per day. Quarterly DMR for July – September 2005 reported daily maximum flow of 11,000 gallons per day; monthly average flow was not reported but was assumed to be similar to flow of 6,000 gallons per day in permit application.
Gilmer Bayou	1.94	0.0550	Combined flow for Gilmer Bayou and two unnamed tributaries was calculated as measured flow at station 1207 (3.3 cfs) minus the assumed headwater flow (0.01 cfs) minus the point source flows (0.0093 cfs) = 3.28 cfs. This was divided between the three inflows in proportion to their drainage areas (Gilmer Bayou = 26 mi^2, Unnamed tributary 1 = 13 mi^2, and Unnamed tributary 2 = 5 mi^2).
Unnamed tributary 1	0.97	0.0275	
Unnamed tributary 2	0.37	0.0106	

4.9 Headwater, Tributary, and Point Source Water Quality (Data Types 21 and 25)

Concentrations of DO, CBODu, ammonia nitrogen, and organic nitrogen were specified in the model for the headwater, tributary, and point source flows. Table 4.3 lists the values used in the model and provides explanations of how the input values were developed.

Table 4.3. Inflow quality for model calibration.

Name of Inflow	Parameter	Value used in model	Data source / comment
Boggy Bayou headwater and unnamed tributaries	DO	4.4 mg/L	Observed values at station 100602-A, which was considered representative of unnamed tributaries
	CBODu	12.0 mg/L	
	Ammonia N	0.05 mg/L	Observed value at 100602-A (estimated as half of detection limit)
	Organic N	1.75 mg/L	Observed TKN value at 100602-A (1.8 mg/L) minus estimated ammonia (0.05 mg/L)
Eagle Water LaLaurie Lane	DO	0 mg/L	No flow during field survey
	CBODu	0 mg/L	
	Ammonia N	0 mg/L	
	Organic N	0 mg/L	
Grawood Baptist Church	DO	5.0 mg/L	Assumed to be discharging at instream criterion (DO not reported on DMRs)
	CBODu	8.56 mg/L	BOD5 on DMR for Jul. – Sep. 2005 (3.72 mg/L) times assumed CBODu:BOD5 ratio of 2.3
	Ammonia N	6 mg/L	TKN was assumed to be similar magnitude as CBODu (round up to 9 mg/L). Based on LTP, the TKN for a non-lagoon system was assumed to be 2/3 ammonia and 1/3 organic nitrogen.
	Organic N	3 mg/L	
Gilmer Bayou	DO	5.2 mg/L	Observed values at station 1207, which was considered representative of Gilmer Bayou inflow due to proximity and degree of channelization
	CBODu	13.5 mg/L	
	Ammonia N	0.05 mg/L	Observed value at station 1207 (estimated as half of detection limit)
	Organic N	1.45 mg/L	Observed TKN value at station 1207 (1.5 mg/L) minus estimated ammonia (0.05 mg/L)

4.10 Model Results for Calibration

Plots of predicted and observed water quality for the calibration are presented in Appendix E and a printout of the LA-QUAL output file is included as Appendix F. The calibration was considered to be acceptable based on the amount of data that were available.

5.0 WATER QUALITY MODEL PROJECTION

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. Therefore, the calibrated model was used to project water quality for critical conditions. The identification of critical conditions and the model input data used for critical conditions are discussed below.

5.1 Critical Conditions and Seasonality

Section 303(d) of the Federal Clean Water Act and EPA's regulations at 40 CFR 130.7 both require the consideration of seasonal variation of conditions affecting the constituent of concern and the inclusion of a MOS in the development of a TMDL. For the DO TMDL in this report, analyses of LDEQ long-term ambient data were used to determine critical seasonal conditions. Both an explicit MOS and an implicit MOS were used in developing the projection simulations.

Critical conditions for DO have been determined for Louisiana waterbodies in previous TMDL studies. The analyses concluded that the critical conditions for stream DO concentrations occur during periods with negligible nonpoint runoff, low stream flow, and high water temperature.

When the rainfall runoff (and nonpoint loading) and stream flow are high, turbulence is higher due to the higher flow and the stream temperature is lowered by the cooler precipitation and runoff. In addition, runoff coefficients are higher in cooler weather due to reduced evaporation and evapotranspiration, so that the high flow periods of the year tend to be the cooler periods. DO saturation values are, of course, much higher when water temperatures are cooler, but BOD decay rates are much lower. For these reasons, periods of high loading are periods of higher reaeration and DO but not necessarily periods of high BOD decay.

LDEQ interprets this phenomenon in its TMDL modeling by assuming that the annual nonpoint loading, rather than loading for any particular day, is responsible for the accumulated benthic blanket of the stream, which is, in turn, expressed as SOD and/or resuspended BOD in the model. This accumulated loading has its greatest impact on the stream during periods of higher temperature and lower flow.

According to the LTP (LDEQ 2006), critical summer conditions in DO TMDL projection modeling are simulated by using the annual 7Q10 flow or 0.1 cfs, whichever is higher, for all headwaters, and 90th percentile temperature for the summer season. Critical winter conditions are simulated. Model loading is from perennial tributaries, point sources, SOD, and resuspension of sediments.

In reality, the highest temperatures occur in July and August and the lowest stream flows occur slightly later in the year. The combination of these conditions plus the impact of other conservative assumptions regarding rates and loadings yields an implicit MOS that is not quantified. Over and above this implicit MOS, an explicit MOS of 10% was incorporated into the DO TMDL in this report to account for model uncertainty.

5.2 Temperature Inputs

The LTP specifies that the critical temperature should be determined by calculating the 90th percentile seasonal temperature for the waterbody being modeled. Water temperature data were collected in Boggy Bayou (Station 1207) for only one year, which is not enough data to calculate 90th percentile temperatures. Therefore, long term data from an LDEQ monitoring station on a similar stream (Black Bayou near Rodessa, Station 11) were used to estimate 90th percentile temperatures for Boggy Bayou. First, 90th percentile temperatures for Black Bayou were calculated to be 30.1°C for summer and 21.0°C for winter (see Table G.1 in Appendix G). These 90th percentile temperatures were then adjusted based on differences between seasonal average temperatures in Boggy Bayou (Station 1207) and Black Bayou (Station 11) during their overlapping period of record (see Table G.2). These calculations yielded a value of 32.9°C for the adjusted 90th percentile temperature during summer, but the temperature used in LA-QUAL for the summer projection was 32.0°C because LDEQ does not consider the temperature correction algorithms in LA-QUAL to be valid for temperatures above 32.0°C. The 90th percentile winter temperature was calculated to be 22.9°C, which was used in the LA-QUAL winter projection.

5.3 Headwater, Tributary, and Point Source Inputs

The inputs for the headwaters, tributaries, and point sources for the projection simulations were based on guidance in the LTP (LDEQ 2006), published 7Q10 flows, observed data from the FTN field survey, and information from the point source permits and applications. The inputs for the headwaters, tributaries, and point sources are listed in Tables 5.1 and 5.2.

The flow rate for the headwater and each tributary was set to 0.1 cfs (0.00283 m^3/sec) for summer and 1.0 cfs (0.0283 m^3/sec) for winter because the LTP recommends using these default flows when they are higher than the 7Q10 flows. The annual 7Q10 flow for Boggy Bayou near Keithville (07351000; same location as LDEQ station 1207) is 0 cfs and the seasonal 7Q10 flows are 0 cfs for September – November, 0.11 cfs for December – February, and 1.0 cfs for March – May (USGS 2003).

Flow rates for the two point source discharges being modeled were set to 125% of design flow so that 20% of the simulated point source loading could be set aside for MOS and FG during the TMDL calculations (see Section 6.0). CBODu concentrations for the point sources were set to monthly average permit limits for BOD5 multiplied times an assumed CBODu:BOD5 ratio of 2.3. Organic nitrogen and ammonia nitrogen concentrations were based on guidance in the LTP concerning: a) typical ratios of BOD5 to the sum of organic nitrogen plus ammonia nitrogen, and b) assumed ratios of organic nitrogen to ammonia nitrogen for lagoon treatment systems (2:1) and mechanical treatment systems (1:2).

It was assumed that the quality of the headwater and tributaries would improve with reductions of nonpoint sources in the watershed. For the projection simulations, the headwater and tributary concentrations of CBODu, organic nitrogen, and ammonia nitrogen were reduced from the calibration simulation by the same percentages as the reductions of nonpoint source loads (see Section 5.4 for reductions applied to nonpoint source loads). The headwater and tributary DO concentrations for the projection simulations were estimated assuming that 0% reduction of nonpoint sources in the watershed would correspond to the same DO percent saturation as in the calibration, and 100% reduction of nonpoint sources in the watershed would correspond to 100% DO saturation in the headwater and tributaries. The calculations for headwater and tributary DO for the projection simulations are shown in Appendix H.

Table 5.1. Headwater, tributary, and point source inputs for summer projection.

Name of Inflow	Parameter	Value used in model	Data source / comment
Boggy Bayou headwater and unnamed tributaries	Flow	0.00283 m^3/sec	Equivalent to 0.1 cfs (see Section 5.3)
	DO	5.54 mg/L	Equivalent to 75.9% saturation at 32.0°C. Percent saturation is based on 46% reduction of nonpoint sources in watershed (Appendix H).
	CBODu	6.48 mg/L	Calibration value (12.0 mg/L) reduced by 46%
	Ammonia N	0.027 mg/L	Calibration value (0.05 mg/L) reduced by 46%
	Organic N	0.95 mg/L	Calibration value (1.75 mg/L) reduced by 46%
Eagle Water LaLaurie Lane	Flow	0.00329 m^3/sec	Equivalent to 75,000 gallons per day (design flow of 60,000 gallons per day × 1.25 to incorporate a 20% MOS + FG)
	DO	5.0 mg/L	Assumed to be discharging at instream criterion (DO not included in permit limits)
	CBODu	23 mg/L	Monthly average BOD5 limit (10 mg/L) times assumed CBODu:BOD5 ratio of 2.3
	Ammonia N	1.7 mg/L	Per LTP, typical TKN of 5 mg/L corresponds to 10 mg/L BOD5. For lagoon system, TKN is assumed to be 1/3 ammonia nitrogen and 2/3 organic nitrogen (per LTP).
	Organic N	3.3 mg/L	
Grawood Baptist Church	Flow	0.00033 m^3/sec	Equivalent to 7,500 gallons per day (design flow of 6,000 gallons per day × 1.25 to incorporate a 20% MOS + FG)
	DO	5.0 mg/L	Assumed to be discharging at instream criterion (DO not included in permit limits)
	CBODu	69 mg/L	Monthly average BOD5 limit (30 mg/L) times assumed CBODu:BOD5 ratio of 2.3
	Ammonia N	10 mg/L	Per LTP, typical TKN of 15 mg/L corresponds to 30 mg/L BOD5. For mechanical system, TKN is assumed to be 2/3 ammonia nitrogen and 1/3 organic nitrogen (per LTP).
	Organic N	5 mg/L	
Gilmer Bayou	Flow	0.00283 m^3/sec	Equivalent to 0.1 cfs (see Section 5.3)
	DO	6.14 mg/L	Equivalent to 84.1% saturation at 32.0°C. Percent saturation is based on 46% reduction of nonpoint sources in watershed (Appendix H).
	CBODu	7.29 mg/L	Calibration value (13.5 mg/L) reduced by 46%
	Ammonia N	0.027 mg/L	Calibration value (0.05 mg/L) reduced by 46%
	Organic N	0.78 mg/L	Calibration value (1.45 mg/L) reduced by 46%

Table 5.2. Headwater, tributary, and point source inputs for winter projection.

Name of Inflow	Parameter	Value used in model	Data source / comment
Boggy Bayou headwater and unnamed tributaries	Flow	0.0283 m^3/sec	Equivalent to 1.0 cfs (see Section 5.3)
	DO	4.76 mg/L	Equivalent to 55.4% saturation at 22.9°C. Percent saturation is based on 0% reduction of nonpoint sources in watershed (Appendix H).
	CBODu	12.0 mg/L	Calibration value (12.0 mg/L) reduced by 0%
	Ammonia N	0.05 mg/L	Calibration value (0.05 mg/L) reduced by 0%
	Organic N	1.75 mg/L	Calibration value (1.75 mg/L) reduced by 0%
Eagle Water LaLaurie Lane	Flow	0.00329 m^3/sec	Equivalent to 75,000 gallons per day (design flow of 60,000 gallons per day × 1.25 to incorporate a 20% MOS + FG)
	DO	5.0 mg/L	Assumed to be discharging at instream criterion (DO not included in permit limits)
	CBODu	23 mg/L	Monthly average BOD5 limit (10 mg/L) times assumed CBODu:BOD5 ratio of 2.3
	Ammonia N	1.7 mg/L	Per LTP, typical TKN of 5 mg/L corresponds to 10 mg/L BOD5. For lagoon system, TKN is assumed to be 1/3 ammonia nitrogen and 2/3 organic nitrogen (per LTP).
	Organic N	3.3 mg/L	
Grawood Baptist Church	Flow	0.00033 m^3/sec	Equivalent to 7,500 gallons per day (design flow of 6,000 gallons per day × 1.25 to incorporate a 20% MOS + FG)
	DO	5.0 mg/L	Assumed to be discharging at instream criterion (DO not included in permit limits)
	CBODu	69 mg/L	Monthly average BOD5 limit (30 mg/L) times assumed CBODu:BOD5 ratio of 2.3
	Ammonia N	10 mg/L	Per LTP, typical TKN of 15 mg/L corresponds to 30 mg/L BOD5. For mechanical system, TKN is assumed to be 2/3 ammonia nitrogen and 1/3 organic nitrogen (per LTP).
	Organic N	5 mg/L	
Gilmer Bayou	Flow	0.0283 m^3/sec	Equivalent to 1.0 cfs (see Section 5.3)
	DO	6.07 mg/L	Equivalent to 70.6% saturation at 22.9°C. Percent saturation is based on 0% reduction of nonpoint sources in watershed (Appendix H).
	CBODu	13.5 mg/L	Calibration value (13.5 mg/L) reduced by 0%
	Ammonia N	0.05 mg/L	Calibration value (0.05 mg/L) reduced by 0%
	Organic N	1.45 mg/L	Calibration value (1.45 mg/L) reduced by 0%

5.4 Nonpoint Source Loads

Initial projection simulations were run with no reductions of nonpoint source loads and no improvements in headwater and tributary quality, but the summer simulation predicted DO values below the 5.0 mg/L criterion in the water quality standards. For the summer simulation, the nonpoint source loads (SOD and mass loads of CBODu and organic nitrogen) were reduced and the headwater and tributary quality was improved until all of the predicted DO values were equal to or greater than 5.0 mg/L. The point source loads in the model were not reduced because neither discharge appears to have a significant impact on DO in Boggy Bayou. Nonpoint source load reductions of 46% for summer and 0% for winter were needed for all the predicted DO values to be at least 5.0 mg/L. The values used as model inputs for nonpoint source loads are shown in Table 5.3. The benthic ammonia source loads are not shown in Table 5.3 because they were set to zero in the calibration and the projections.

Table 5.3. Nonpoint source loads for projection simulations.

Parameter	Reach	Calibration	Summer Projection (46% reduction)	Winter Projection (0% reduction)
SOD	1	1.50 g/m^2/day	0.81 g/m^2/day	1.50 g/m^2/day
	2	1.90 g/m^2/day	1.03 g/m^2/day	1.90 g/m^2/day
CBODu mass loads	1	20.0 kg/day	10.8 kg/day	20.0 kg/day
	2	0.0 kg/day	0.0 kg/day	0.0 kg/day
Organic nitrogen mass loads	1	0.80 kg/day	0.43 kg/day	0.80 kg/day
	2	0.0 kg/day	0.0 kg/day	0.0 kg/day

5.5 Other Inputs

The only model inputs that were changed from the calibration to the projection simulations were the inputs discussed above in Sections 5.2 through 5.4. Other model inputs (e.g., hydraulic coefficients, decay rates, reaeration equations, etc.) were unchanged from the calibration simulation. The depths and widths were not changed from the calibration to the projections because the calibration values were based on field measurements under low flow conditions.

5.6 Model Results for Projections

Plots of predicted DO and printouts of the LA-QUAL tabular output are presented in Appendix I for the summer projection and Appendix J for the winter projection.

The minimum predicted DO in the summer projection was 5.02 mg/L, which occurred at the downstream end of the model. The minimum predicted DO in the winter projection was 5.06 mg/L, which occurred at the upstream end of the model (in the first element) because the headwater DO concentration was lower than any of the predicted DO values in the stream.

Nonpoint source load reductions of 46% for summer and 0% for winter were needed for all the predicted DO values in the projections to be at least 5.0 mg/L. These percent reductions for nonpoint source loads represent percentages of the entire nonpoint source loading, not percentages of the manmade nonpoint source loading. The nonpoint source loads in this report were not divided between natural and manmade because it would be difficult to accurately estimate natural nonpoint source loads for the study area.

6.0 DO TMDL DEVELOPMENT

6.1 TMDL Calculations

A TMDL for DO was calculated for the Boggy Bayou subsegment using the results of the summer and winter projection simulations. The DO TMDL is presented as oxygen demand from CBODu, organic nitrogen, ammonia nitrogen, and SOD. Summaries of the TMDL for Boggy Bayou are presented in Tables 6.1 and 6.2.

A one-page summary of the methodology for the TMDL calculations is shown in Appendix K. The TMDL calculations were performed using a FORTRAN program that was written by FTN personnel. This program reads two files; one is the LA-QUAL output file from the projection simulation and the other is a small input file with miscellaneous information needed for the TMDL calculations (shown in Appendix K). The output files from the program are also shown in Appendix K for the summer and winter projections. The source code for the program is shown in Appendix L.

6.2 Point Source Loads

The WLA for point sources for each season was calculated by: 1) summing the loads from point sources in the projection simulation and from oxygen-demanding point sources that were too small and remote to be simulated, and 2) then subtracting 20% of the total load to account for the MOS and FG. The design flows from small, remote point sources were multiplied by 1.25 before the loads were calculated so that 20% of the resulting loads could be reserved for the MOS and FG. Loads from small, remote point sources were calculated using the FORTRAN program described above. Table 6.3 lists the flows, concentrations, and loads for point sources that were included in the DO TMDL. The point sources that were not included in the DO TMDL were shown in the complete listing of all point sources (Table 2.2).

The nonconservative behavior of DO allows many small, remote point source discharges to be assimilated by the receiving waterbodies before they reach the modeled waterbody. These discharges are said to have little to no impact on the modeled waterbody and therefore, they are not included in the model and are not subject to any reductions based on this TMDL. These

Table 6.1. Summer DO TMDL for subsegment 100602.

	Oxygen Demand (kg/day) from:					Oxygen Demand (lbs/day) from:					Percent Reduction Needed
	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	
Point Sources											
WLA	NA	18.45	15.93	8.75	43.14	NA	40.67	35.12	19.29	95.08	0%
MS4	19.85	2.03	0.72	0.02	22.62	43.76	4.48	1.59	0.04	49.87	46%
MOS	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
FG	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
Nonpoint Sources											
LA	104.24	10.66	3.81	0.11	118.82	229.81	23.50	8.40	0.24	261.95	46%
MOS	15.51	1.59	0.57	0.02	17.68	34.19	3.51	1.26	0.04	39.00	NA
FG	15.51	1.59	0.57	0.02	17.68	34.19	3.51	1.26	0.04	39.00	NA
TMDL	155.11	38.94	25.58	11.10	230.72	341.95	85.85	56.41	24.45	508.66	NA

Table 6.2. Winter DO TMDL for subsegment 100602.

	Oxygen Demand (kg/day) from:					Oxygen Demand (lbs/day) from:					Percent Reduction Needed
	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	SOD	CBODu	Organic Nitrogen	Ammonia Nitrogen	Total	
Point Sources											
WLA	NA	18.45	15.93	8.75	43.14	NA	40.67	35.12	19.29	95.08	0%
MS4	20.77	14.42	9.53	0.27	44.99	45.79	31.79	21.01	0.60	99.19	0%
MOS	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
FG	NA	2.31	1.99	1.09	5.39	NA	5.09	4.39	2.40	11.88	NA
Nonpoint Sources											
LA	109.03	75.73	50.02	1.39	236.17	240.37	166.95	110.27	3.06	520.65	0%
MOS	16.23	11.77	7.44	0.21	35.15	35.78	24.85	16.40	0.46	77.49	NA
FG	16.23	11.77	7.44	0.21	35.15	35.78	24.85	16.40	0.46	77.49	NA
TMDL	162.26	136.76	94.34	13.01	405.38	357.72	299.29	207.98	28.67	893.66	NA

Table 6.3. Flows, concentrations, and loads for point sources included in DO TMDL.

Subseg. Number	NPDES Number	Name of discharger	Flow rate (gallons per day)	Concentrations			Loads*		
				BOD5 or CBOD5 (mg/L)	Ammonia nitrogen (mg/L)	Organic nitrogen (mg/L)	BOD5 or CBOD5 (lbs/day)	Ammonia nitrogen (lbs/day)	Organic nitrogen (lbs/day)
100602	LAG480011	LA Lift and Equip. Inc. FKA LA Clarklift Inc	1,800 (Outfall 001 only)	45	10	5	0.68	0.15	0.08
100602	LAG480284	Jack Cooper Transport Co Inc	2,600	45	10	5	0.98	0.22	0.11
100602	LAG530693	KEH Property Ltd., Fud's III Bar and Lounge	675	45	10	5	0.25	0.06	0.03
100602	LAG541012	Grawood Baptist Church	6,000	30	10	5	1.50	0.50	0.25
100602	LAG560089	Wildwood Estates	33,000	20	6.7	3.3	5.51	1.85	0.91
100602	LAG570220	Eagle Water Inc - LaLaurie Lane Oxidation Pond	60,000	10	3.3	1.7	5.01	1.65	0.85
100602	LAG750459	Norwell Equip. Co. Shreveport Facility	5,000	45	10	5	1.88	0.42	0.21
100602	LAG750449	Deep South Equip. Co. Shreveport	5,000	45	10	5	1.88	0.42	0.21
100602 Total Loads:							17.69	5.27	2.65

*Loads of organic nitrogen and ammonia nitrogen in this table represent loads of nitrogen, not oxygen demand.

facilities are permitted in accordance with state regulation and policies that provide adequate protective controls. New similarly insignificant point sources will continue to be issued permits in this manner. Significant existing point source discharges are either included in the model or are determined to be insignificant by other modeling. New significant point source discharges would have to be evaluated individually to determine what impact they have on the impaired waterbody and the appropriate controls.

The point source loading in the TMDL also included the estimated loads originating from urban stormwater regulated by the City of Shreveport MS4 permit. These MS4 loads are simulated in the model as nonpoint source loads due to their nature, but they are included in the TMDL as point source loads. These MS4 loads were estimated as 16% of the LA for Boggy Bayou that was calculated by the FORTRAN program described in Section 6.1. The value of 16% was used because the area within the Shreveport city limits covers 16% of the subsegment (see Section 2.4). The MS4 loads are shown in Tables 6.1 and 6.2.

6.3 Seasonal Variation

As discussed in Section 5.1, critical conditions for DO in Louisiana waterbodies have been determined to be when there is negligible nonpoint runoff and low stream flow combined with high water temperatures. In addition, the model accounts for loadings that occur at higher flows by modeling SOD. Oxygen-demanding pollutants that enter the waterbodies during higher flows settle to the bottom and then exert the greatest oxygen demand during the high temperature seasons.

6.4 MOS and FG

The MOS accounts for any lack of knowledge or uncertainty concerning the relationship between pollutant loading and water quality. This DO TMDL includes an implicit MOS through the use of conservative assumptions. The projection simulations assume that the highest temperatures and lowest flows occur at the same time. This is conservative because the highest temperatures typically occur in July through August and the lowest stream flows typically occur slightly later in the year (as discussed in Section 5.1). The combination of these conditions, in addition to other conservative assumptions regarding rates and loadings, yields an implicit MOS, which is not quantified.

In addition to the implicit MOS, the DO TMDL in this report includes an explicit MOS equal to 10% of the TMDL and an explicit allowance for FG that is also equal to 10% of the TMDL. This combined allowance for the explicit MOS and FG is consistent with LDEQ's typical procedure of setting aside 20% of the TMDL to account for "modeling uncertainty, data inadequacies, and future growth and safety" (LDEQ 2006; p. 7).

6.5 Ammonia Toxicity Calculations

Although subsegment 100602 is not on a 303(d) list for ammonia, the ammonia concentrations predicted in the projection simulations were checked to make sure that they did not exceed EPA criteria for ammonia toxicity (EPA 1999). The EPA criteria are dependent on temperature and pH. The water temperatures used to calculate the ammonia toxicity criteria for summer and winter for Boggy Bayou were the same as the critical temperatures used in the projection simulations (32.0°C for summer and 22.9°C for winter). The pH values used to calculate the ammonia criteria were 7.01 su for summer and 6.83 su for winter; these were seasonal averages of LDEQ ambient monitoring data at station 1207 (Boggy Bayou southwest of Shreveport). The resulting criteria for ammonia nitrogen were 1.91 mg/L for summer and 3.64 mg/L for winter. The highest ammonia nitrogen concentrations predicted by the model (0.49 mg/L for summer and 0.19 mg/L for winter) were well below these criteria. This indicates that the ammonia nitrogen loadings that will maintain the DO standard in Boggy Bayou are low enough that the EPA ammonia toxicity criteria will not be exceeded under critical conditions. The ammonia toxicity calculations are shown in Appendix M.

7.0 NUTRIENT TMDL DEVELOPMENT

7.1 Seasonality and Critical Conditions

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. Aquatic life impairments typically occur as a result of long term exposure to elevated nutrient concentrations rather than short-term fluctuations in nutrient concentrations. This nutrient TMDL was developed for average annual conditions. The most obvious result of nutrients is algal blooms. When the algae die, the resultant biological oxygen demand consumes oxygen, which adversely affects aquatic life. The effect occurs in a short time but the build-up of nutrients and the conditions to start the algal bloom may occur over an extended time.

7.2 Water Quality Targets

Target concentrations for the Boggy Bayou nutrient TMDL were based on LDEQ reference stream data because there are no numeric nutrient criteria in the Louisiana water quality standards. During the mid 1990s, LDEQ collected data under low flow conditions from four reference stream sites that are located in the Red River basin and in the South Central Plain ecoregion (the ecoregion in which Boggy Bayou is located)(Smythe 1999). These data are shown in Table 7.1. Target concentrations of total nitrogen (TKN plus nitrate plus nitrite) and total phosphorus were set to the averages of the values from these four samples (0.058 mg/L total phosphorus and 0.692 mg/L total nitrogen).

Using target concentrations based on ecoregion reference stream data is considered conservative because some streams within the ecoregion may be able to maintain designated uses with nutrient concentrations that are slightly higher than reference stream values. Additional data collection would be necessary to develop site-specific nutrient criteria that would incorporate effects of stream shading, depth, non-algal turbidity, and other site-specific factors that affect a stream's water quality and biological responses to nutrient loads.

Table 7.1. Reference stream data in the Red River basin and South Central Plain ecoregion.

Waterbody	Total Phosphorus (mg/L)	Nitrate + Nitrite (mg/L)	TKN (mg/L)	Total Nitrogen (mg/L)
Saline Bayou near Saline in Beinville Parish	0.040	0.08	0.53	0.61
Kisatchie Bayou in the Red Dirt Management Campground in Natchitoches Parish	0.030	0.68	0.04	0.72
Kisatchie Bayou in the Red Dirt Management Campground in Natchitoches Parish	0.085	<0.02	0.705	0.725
Kisatchie Bayou in the Red Dirt Management Campground in Natchitoches Parish	0.075	<0.02	0.695	0.715
Minimum	0.030	--	--	0.61
Mean	0.058	--	--	0.692
Maximum	0.085	--	--	0.725

7.3 Calculations for TMDL Components

The nutrient TMDL for subsegment 100602 was calculated using a conservative mass balance. The available data are not sufficient to perform accurate simulations of the full nutrient-algal cycle in a model such as LA-QUAL.

The TMDLs for total phosphorus and total nitrogen were estimated as the target concentrations multiplied by the estimated average annual flow for Boggy Bayou at the downstream end of subsegment 100602. The average annual flow for Boggy Bayou was estimated as the drainage area at the downstream end of the subsegment (79.4 square miles) multiplied by 0.9 cfs per square mile, which is the average annual runoff for streams in this area (USGS 1986). This yielded a value of 71.46 cfs, or 46.19 MGD, for the average annual flow. The resulting TMDLs were 22.36 lbs/day of total phosphorus and 266.74 lbs/day of total nitrogen. The nutrient TMDL calculations are shown in Appendix N.

An implicit MOS was established for this nutrient TMDL through the use of conservative assumptions, including the use of ecoregion reference stream data for target concentrations, and the use of a conservative mass balance (i.e., neglecting nutrient losses due to settling, uptake by algae and macrophytes, etc.). No explicit MOS was used for this nutrient TMDL. Ten percent of the TMDL was set aside for a FG component.

The WLA for point sources was calculated as estimated effluent concentrations of total phosphorus and total nitrogen multiplied by the design flow of each point source discharge that was included in the DO TMDL. None of the point sources that were excluded from the DO TMDL were considered to have sources of nutrients above background levels. All of the point source discharges that were included in the DO TMDL consisted of sanitary wastewater. The assumed effluent concentrations for sanitary wastewater were 6 mg/L of total phosphorus and 16 mg/L of total nitrogen. These concentrations were based on median values for various types of wastewater treatment systems reported in an EPA technical guidance manual (EPA 1997; Table A-17). These values were used as rough estimates of effluent concentrations; they should not be used as permit limits without additional data collection to determine actual effluent concentrations and their impact on the water quality and biology of the receiving streams.

The LA for nonpoint sources was calculated as the TMDL minus the FG and WLA. The nutrient TMDL is summarized in Table 7.2 and the calculations for the nutrient TMDL are shown in Appendix N.

Table 7.2. Nutrient TMDL for subsegment 100602.

Parameter	**Loads, lbs/day**				
	WLA	**LA**	**MOS**	**FG**	**TMDL**
Total Phosphorus	5.70	14.42	Implicit	2.24	22.36
Total Nitrogen	15.24	224.83	Implicit	26.67	266.74

7.4 Comparison of TMDL and Existing Nutrient Loads

Existing nutrient loads were estimated for comparison with allowable loads from the TMDL. This comparison was performed for informational purposes only; the results do not affect the allowable loads in the nutrient TMDL. Existing loads were estimated as median concentrations in Boggy Bayou at station 1207 multiplied by the average annual flow used in the TMDL calculations (46.19 MGD). Median concentrations in Boggy Bayou were 0.11 mg/L total phosphorus and 0.87 mg/L total nitrogen (see Table B.1 in Appendix B). The existing loads that were calculated using these concentrations were 42.4 lbs/day of total phosphorus and 335 lbs/day of total nitrogen. The existing loads are about 1.90 and 1.26 times the allowable loads of total phosphorus and total nitrogen, respectively, in the TMDL. This indicates that reductions of nutrient loads to Boggy Bayou are necessary. Additional field data collection is recommended before pursuing reductions of nutrients from either point sources or nonpoint sources.

8.0 SENSITIVITY ANALYSES

All modeling studies necessarily involve uncertainty and some degree of approximation. Therefore it is of value to consider the sensitivity of the model output to changes in model coefficients, and in the hypothesized relationships among the parameters of the model. The sensitivity analyses were performed by allowing the LA-QUAL model to vary one input parameter at a time while holding all other parameters to their original value. The calibration simulation was used as the baseline for the sensitivity analysis. The percent change of the model's minimum DO projections to each parameter is presented in Table 8.1. Each parameter was varied by ±30%, except for temperature, which was varied ±2ºC.

Values reported in Table 8.1 are sorted by percentage variation of minimum DO from largest percentage variation to smallest. The model output was most sensitive to reaeration, SOD, wasteload DO (decrease only), and temperature. The model output was least sensitive to headwater parameters, wasteload parameters (excluding a decrease in DO), and the decay rates.

Table 8.1. Summary of results of sensitivity analysis.

Input Parameter	Change in Parameter	Predicted Minimum DO (mg/L)	Percent Change in Predicted DO (%)
Baseline	--	4.37	N/A
Reaeration	-30%	2.90	-33.6%
SOD	+30%	3.44	-21.3%
Wasteload DO	-30%	3.48	-20.4%
Temperature	+2ºC	3.82	-12.6%
Reaeration	+30%	4.73	+8.2%
SOD	-30%	4.68	+7.1%
Temperature	-2ºC	4.65	+6.4%
Stream Velocity	+30%	4.26	-2.5%
Stream Velocity	-30%	4.47	+2.3%
Wasteload DO	+30%	4.37	0%
Stream Depth	-30%	4.37	0%
Stream Depth	+30%	4.37	0%
BOD Decay Rate	-30%	4.37	0%
BOD Decay Rate	+30%	4.37	0%
Ammonia Nitrogen Decay Rate	-30%	4.37	0%
Ammonia Nitrogen Decay Rate	+30%	4.37	0%
Organic Nitrogen Decay Rate	-30%	4.37	0%
Organic Nitrogen Decay Rate	+30%	4.37	0%
Headwater Flow	-30%	4.37	0%
Headwater Flow	+30%	4.37	0%
Headwater DO	-30%	4.37	0%
Headwater DO	+30%	4.37	0%
Headwater BOD	-30%	4.37	0%
Headwater BOD	+30%	4.37	0%
Headwater Ammonia Nitrogen	-30%	4.37	0%
Headwater Ammonia Nitrogen	+30%	4.37	0%
Headwater Organic Nitrogen	-30%	4.37	0%
Headwater Organic Nitrogen	+30%	4.37	0%
Wasteload Flow	-30%	4.37	0%
Wasteload Flow	+30%	4.37	0%
Wasteload BOD	-30%	4.37	0%
Wasteload BOD	+30%	4.37	0%
Wasteload Ammonia Nitrogen	-30%	4.37	0%
Wasteload Ammonia Nitrogen	+30%	4.37	0%
Wasteload Organic Nitrogen	-30%	4.37	0%
Wasteload Organic Nitrogen	+30%	4.37	0%

9.0 OTHER RELEVANT INFORMATION

This TMDL has been developed to be consistent with the State antidegradation policy (LAC 33:IX.1109.A).

This TMDL report does not include an implementation plan. Implementation plans are not required for TMDLs under current federal regulations. Implementation plans can be developed most effectively and efficiently on the state and local level.

LDEQ will work with other agencies such as local Soil Conservation Districts to implement nonpoint source best management practices in the watershed through the 319 programs. LDEQ will also continue to monitor the waters to determine whether standards are being attained.

In accordance with Section 106 of the federal Clean Water Act, and under the authority of the Louisiana Environmental Quality Act, the LDEQ has established a comprehensive program for monitoring the quality of the State's surface waters. The LDEQ Surveillance Section collects surface water samples at various locations, utilizing appropriate sampling methods and procedures for ensuring the quality of the data collected. 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 water quality 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 (Water Quality Inventory) and the 303(d) list of impaired waters. This information is also utilized in establishing priorities for the LDEQ nonpoint source program.

The LDEQ has implemented a watershed approach to surface water quality monitoring. Through this approach, the entire state is sampled over a 4-year cycle. Long-term trend monitoring sites at various locations on the larger rivers and Lake Pontchartrain are sampled throughout the 4-year cycle. Sampling is conducted on a monthly basis to yield approximately 12 samples per site each year the site is monitored. Sampling sites are located where they are considered to be representative of the waterbody. Under the current monitoring schedule, approximately one half of the State's waters are newly assessed for each 305(b) and 303(d) listing biennial cycle, with sampling occurring statewide each year. The 4-year cycle follows an initial 5-year rotation that covered all basins in the state according to the TMDL priorities. This will allow the LDEQ to determine whether there has been any improvement in water quality following implementation of the TMDLs. As the monitoring results are evaluated at the end of each year, waterbodies may be added to or removed from the 303(d) list.

10.0 PUBLIC PARTICIPATION

When EPA establishes a TMDL, federal regulations require EPA to publicly notice and seek comment concerning the TMDL. The TMDL in this report was prepared under contract to EPA. EPA is seeking comments, information, and data from the general and affected public concerning this draft TMDL. If comments, data, or information are submitted during the public comment period, EPA will address the comments and revise this TMDL accordingly. EPA will then transmit the final TMDL to LDEQ for implementation and for incorporation into LDEQ's current water quality management plan.

11.0 REFERENCES

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APPENDIX A

Maps of the Study Area

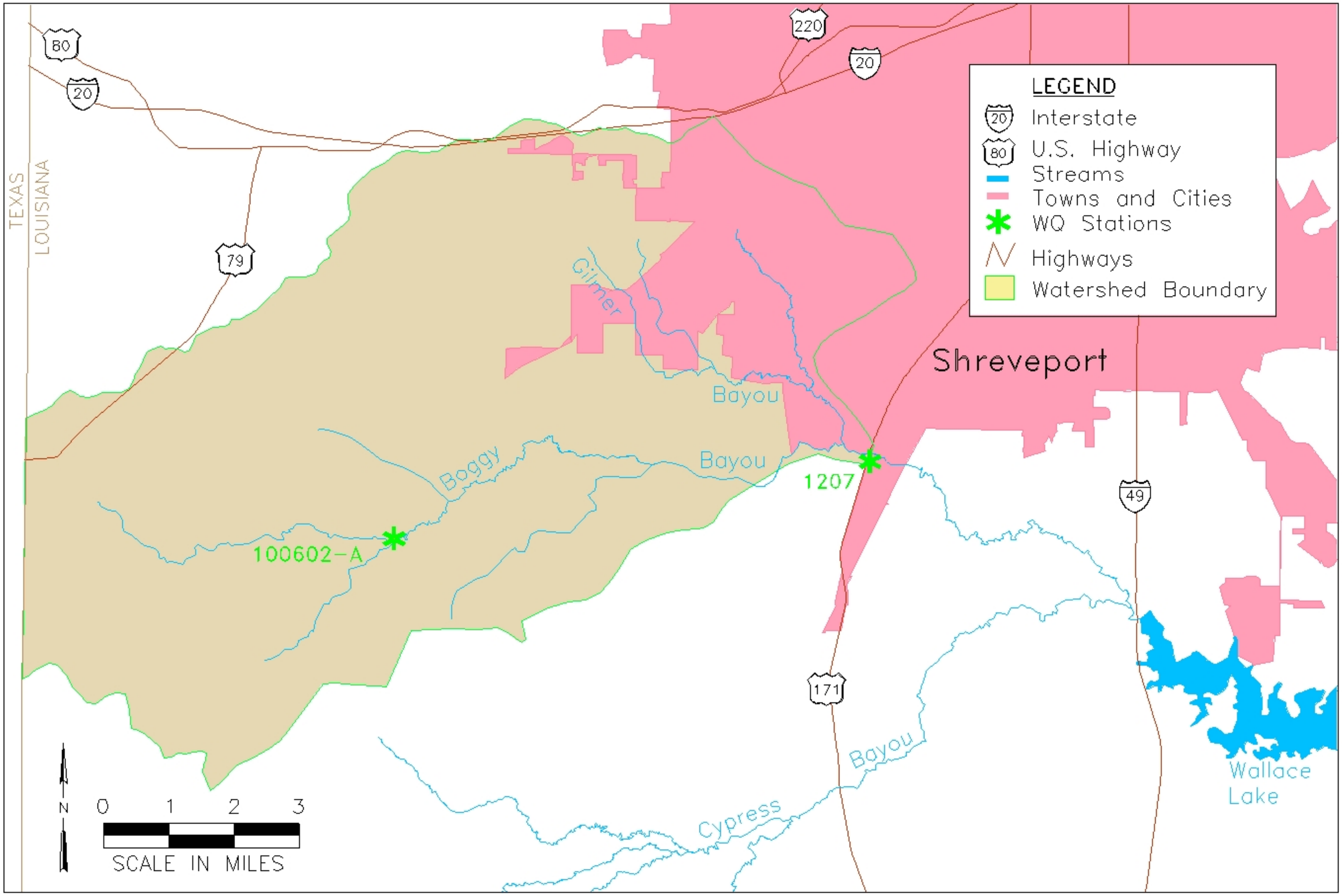

Figure A.1. Watershed map for subsegment 100602.

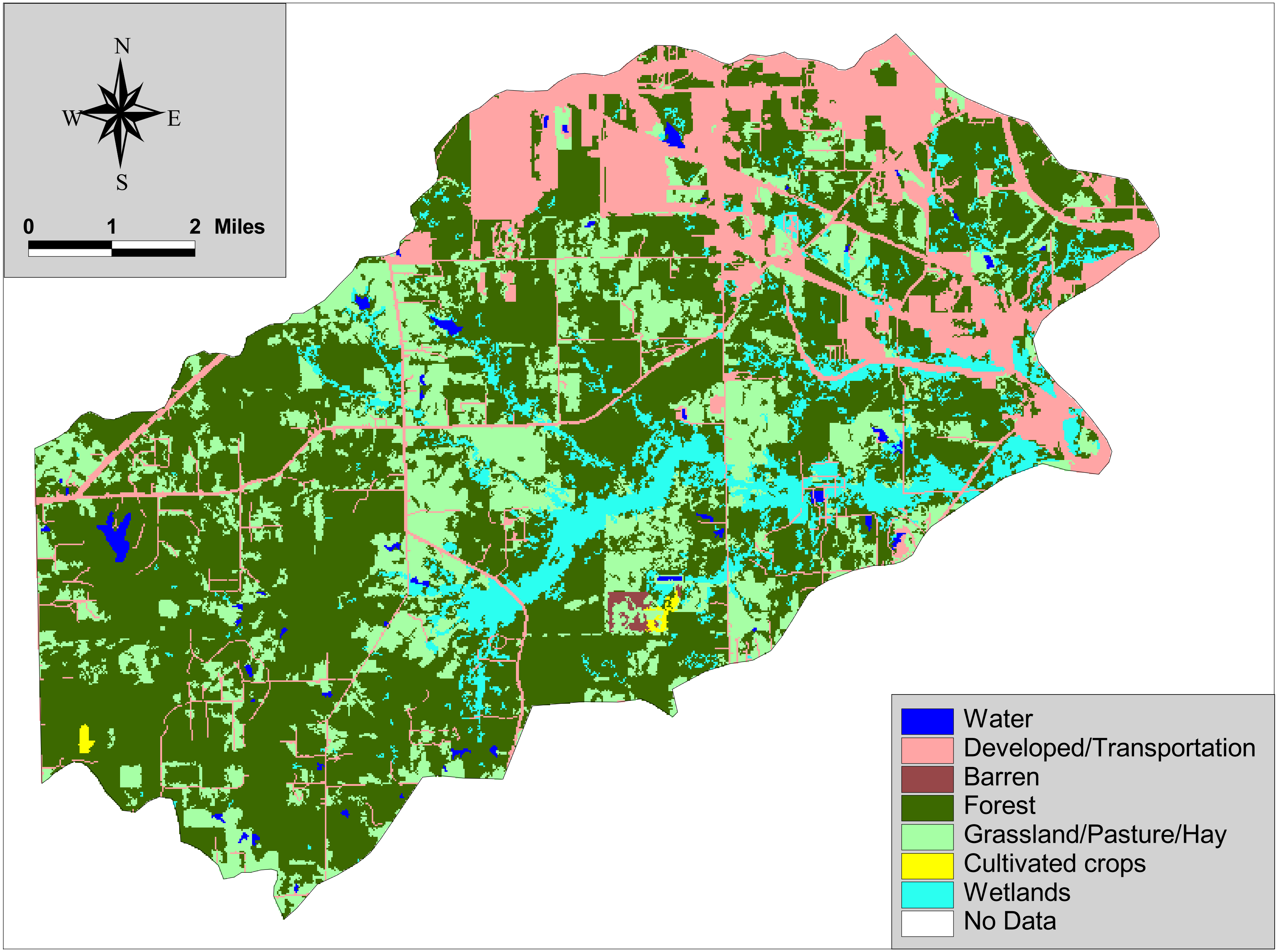

Figure A.2. Land use/land cover for subsegment 100602.

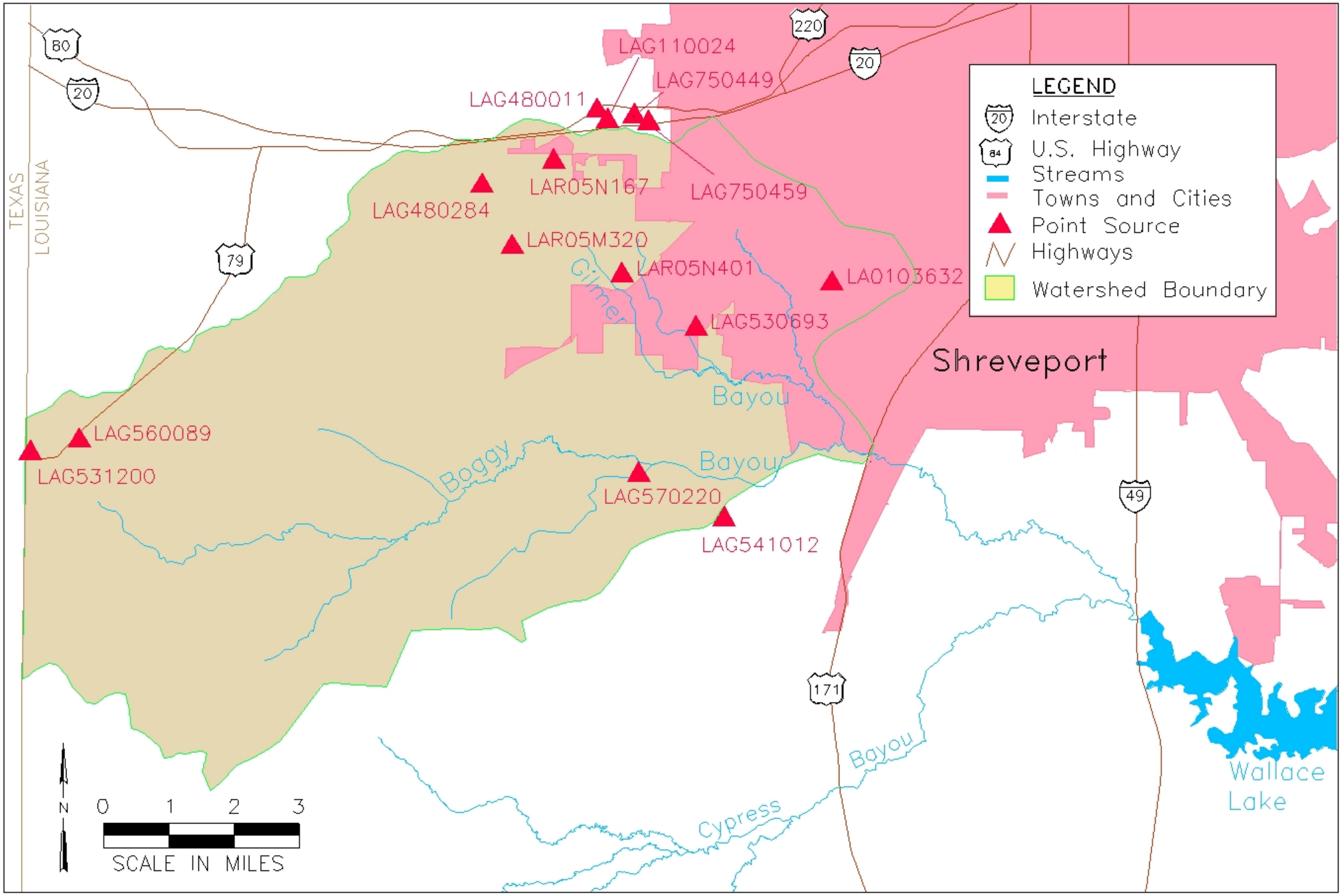

Figure A.3. Locations of point source discharges.

APPENDIX B

LDEQ Water Quality Data

Table B.1. LDEQ historical water quality data for Boggy Bayou southwest ot Shreveport, LA (1207)

Collection Date	Collection Time	Sample Depth (meters)	DO (mg/L)	$NO_2 + NO_3$ (mg/L)[A]	NH_3 (mg/L)[A]	TKN (mg/L)	Total P (mg/L)[A]	Calculated Total N (mg/L)
01/07/02	2:15:00 PM	1.02	8.99	0.17	< 0.10	0.93	0.20	1.10
02/05/02	1:00:00 PM	1	10.80	0.09	< 0.10	0.70	0.10	0.79
03/05/02	11:40:00 AM	1	12.56	0.37	0.12	0.62	0.11	0.99
04/02/02	12:35:00 PM	1	7.02	< 0.05	< 0.10	0.91	0.10	0.94
05/07/02	12:10:00 PM	1	5.90	0.11	< 0.10	0.54	0.13	0.65
06/04/02	12:20:00 PM	1	5.43	< 0.05	< 0.10	0.68	0.07	0.71
07/09/02	9:30:00 AM	1	4.51	< 0.05	< 0.10	0.51	0.09	0.54
08/06/02	1:10:00 PM	1	4.26	< 0.05	< 0.10	0.63	0.10	0.66
09/10/02	12:15 PM	1	4.41	< 0.05	< 0.10	0.48	0.07	0.51
10/08/02	12:40 PM			0.07	< 0.10	0.73	0.06	0.80
11/06/02	12:20 PM	1	8.43	0.13	< 0.10	1.09	0.18	1.22
12/03/02	12:20 PM	1	9.10	0.22	0.13	0.88	0.24	1.10
01/13/04	11:20 AM	1	10.36	0.29	0.56	0.76	0.20	1.05
02/03/04	12:40 PM	0.25	10.02	0.15	< 0.10	0.94	0.22	1.09
03/09/04	2:10 PM	1	7.60	0.06	< 0.10	0.92	0.12	0.98
04/07/04	12:50 PM	1	6.10	< 0.05	< 0.10	1.58	0.10	1.61
05/05/04	10:30 AM	1	6.96	0.06	0.14	1.35	< 0.05	< 0.05
06/29/04	9:50 AM	1	4.98	< 0.05	< 0.10	1.51	0.10	1.54
07/27/04	10:20 AM	1	5.20	< 0.05	< 0.10	0.37	0.12	0.40
08/24/04	12:55 PM	1	5.63	0.07	0.10	0.68	0.12	0.75
09/14/04	1:25 PM	1	5.95	< 0.05	0.24	0.47	0.10	0.50
10/13/04	11:05 AM			0.11	< 0.10	0.92	0.09	1.03
10/20/04	12:30 PM			0.11	< 0.10	0.87	0.15	0.98
11/16/04	10:15 AM	1	8.11	0.27	< 0.10	0.19	0.17	0.46
03/22/05	10:05 AM	1	8.01	0.12	< 0.10	0.53	0.09	0.65
04/12/05	11:10 AM		5.92	0.11	< 0.10	1.35	0.13	1.46
04/26/05	11:28 AM	1	7.52	0.23	< 0.10	0.92	0.16	1.15
05/10/05	9:34 AM	1	5.42	0.07	< 0.10	0.62	0.10	0.69
05/24/05	11:35 AM	1	4.86	< 0.05	< 0.10	0.55	0.08	0.58
06/07/05	9:35 AM	1	3.89	< 0.05	< 0.10	0.72	0.08	0.75
06/21/05	9:56 AM	1	3.52	< 0.05	< 0.10	0.70	0.13	0.73
07/05/05	10:25 AM	1	2.00	0.29	0.22	1.39	0.21	1.68
07/19/05	9:25 AM	1	3.99	0.42	0.11	0.81	0.14	1.23
08/09/05	10:44 AM	1	1.84	0.05	< 0.10	0.55	0.08	0.60
08/23/05	9:40 AM	1	1.95	< 0.05	0.13	0.68	0.10	0.71
09/27/05	10:38 AM	1	2.14	0.05	< 0.10	5.89	0.91	5.94
Number of Values =			33	36	36	36	36	36
Minimum =			1.84	< 0.05	< 0.10	0.19	< 0.05	0.40
Median =			5.90	0.07	0.05	0.73	0.11	0.87
Average =			6.16	0.11	0.09	0.94	0.14	1.05
Maximum =			12.56	0.42	0.56	5.89	0.91	5.94
Number of Values Below Criterion =			12	NA	NA	NA	NA	NA
Percent of Values Below Criterion =			36%	NA	NA	NA	NA	NA

Note: A. Values below the detection limit were estimated as half the detection limit to calculate statistics.

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Table B.2. LDEQ Intensive Survey Data for Subsegments in the Ouachita and Calcasieu Basins With At Least 70% Forest.

Subseg #	Sample No.	CBOD decay rate	UCBOD (mg/l)	Initial TOC (mg/l)	NBOD decay rate	UNBOD (mg/l)	Ratio CBODu / TOC
030401	Mill Creek @ Highway 112	0.07	6.49	6.10	0.06	1.20	1.06
	Mill Creek @ iron bridge	0.04	13.22	15.30	0.08	1.84	0.86
	Mill Creek @ Oakdale Road	0.06	5.49	7.80	0.06	0.80	0.70
	Mill Creek @ Tower Road	0.04	16.42	18.00	0.09	2.18	0.91
	Mill Creek Just above the confluence with Calcasieu	0.04	10.37	12.10	0.05	0.64	0.86
030807	BCH1 / Bear Head Creek @ Hwy. 110 SE of Merryville	0.05	15.60	10.80	0.18	1.42	1.44
	BCH2 / Bear Head Creek @ Hwy. 109 SW of Singer	0.04	21.35	15.90	0.06	1.05	1.34
	BCH3 / Bear Head Creek @ Hwy. 389 E of Fields	0.06	18.37	17.90	0.17	1.71	1.03
	BCH4 / Bear Head Creek @ Green Island Rd. N of Starks	0.04	20.43	20.10	0.06	1.61	1.02
	BCH5 / Bear Head Creek @ Hwy. 12 NE of Starks	0.05	21.49	16.40	0.13	1.53	1.31
	BCH6 / Bear Head Creek @ Creek Rd.	0.04	14.90	2.00	0.09	1.29	7.45
081501	CC1 / Castor Creek @ Hwy. 124 above spillway	0.03	9.58	12.10	0.09	0.62	0.79
	CC2 / Castor Creek @ Hwy. 127	0.03	10.13	11.80	0.03	1.17	0.86
	CC3 / Castor Creek @ Hwy. 506	0.03	9.19	14.00	0.15	0.84	0.66
	CC4 / Castor Creek @ Hwy. 126	0.04	14.15	15.30	0.09	1.76	0.92
	CC5 / Castor Creek @ Hwy. 846	0.03	16.37	16.10	0.11	0.92	1.02
	CC6 / Castor Creek @ Hwy. 4	0.07	11.74	14.40	0.17	2.04	0.82
	CC7 / Castor Creek @ Hwy. 34	0.03	14.85	14.70	0.18	0.67	1.01
	CC8 / Castor Creek @ Chatham Cemetery Road	0.04	14.74	14.50	0.04	0.58	1.02
081401	DR10 / Dugdemona River Smurfit-Stone outfall canal sampling sit	0.05	37.90	29.00	0.10	5.87	1.31
	DR12 / Dugdemona River @ LA 4 located W. of Jonesboro	0.03	20.91	26.90	0.06	1.39	0.78
	DR13 / Dugdemona River @ Parish Rd. W of Evergreen Rd. S. of LA	0.03	13.83	22.60	0.05	0.91	0.61
	DR14 / Dugdemona River @ LA 126 located just E of Brewtons Mill	0.03	11.15	21.70	0.09	0.78	0.51
	DR15 / Dugdemona River @ Carter Crossing Rd. located off Hwy. 5	0.03	7.21	15.40	0.03	0.67	0.47
	DR16 / Dugdemona River just past Restriction below Big Creek do	0.03	7.39	14.40	0.04	0.65	0.51
	DR19 / Dugdemona River Cypress Creek in Jackson-Bienville Wildl	0.05	6.59	6.60	0.04	0.89	1.00
	DR32 / Dugdemona River Little Dugdemona River @ Hwy. 167 betwee	0.05	9.07	2.00	0.07	1.33	4.53
	DR41 / Dugdemona River Big Creek @ LA 505 SW of Dodson	0.05	11.13	12.00	0.05	0.96	0.93
	DR5 / Dugdemona River @ Union Church Rd. (Parish Rd. 122)	0.03	6.72	2.00	0.04	0.52	3.36
	DR6 / Dugdemona River located just W. of Quitman	0.04	7.12	8.00	0.04	0.69	0.89
	DR7 / Dugdemona River located just W. of Hodge	0.05	9.32	8.00	0.03	0.87	1.16
	DR9 / Dugdemona River "In canal, upstream of Smurfit-Stone outf"	0.04	135.26	51.30	0.13	29.26	2.64
	DR25 / Dugdemona River Madden Creek/Redwine Creek @ Turner Rd.	0.03	6.72	7.50	0.03	0.85	0.90
081504	FLCR1 / Flat Creek @ Hwy. 147	0.04	15.66	20.30	0.04	3.79	0.77
	FLCR2 / Flat Creek @ Hwy. 127	0.03	14.71	15.70	0.05	1.18	0.94
	FLCR3 / Flat Creek @ confluence with Castor Creek-~ 3 miles	0.05	8.75	12.80	0.09	1.30	0.68
	Count	36	36	36	36	36	36
	Min	0.03	5.49	2.00	0.03	0.52	0.47
	Average	0.04	16.51	14.76	0.08	2.11	1.31
	Median	0.04	12.48	14.45	0.06	1.11	0.93
	Max	0.07	135.26	51.30	0.18	29.26	7.45

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Figure B.1. Observed DO for Boggy Bayou southwest of Shreveport, LA (1207)

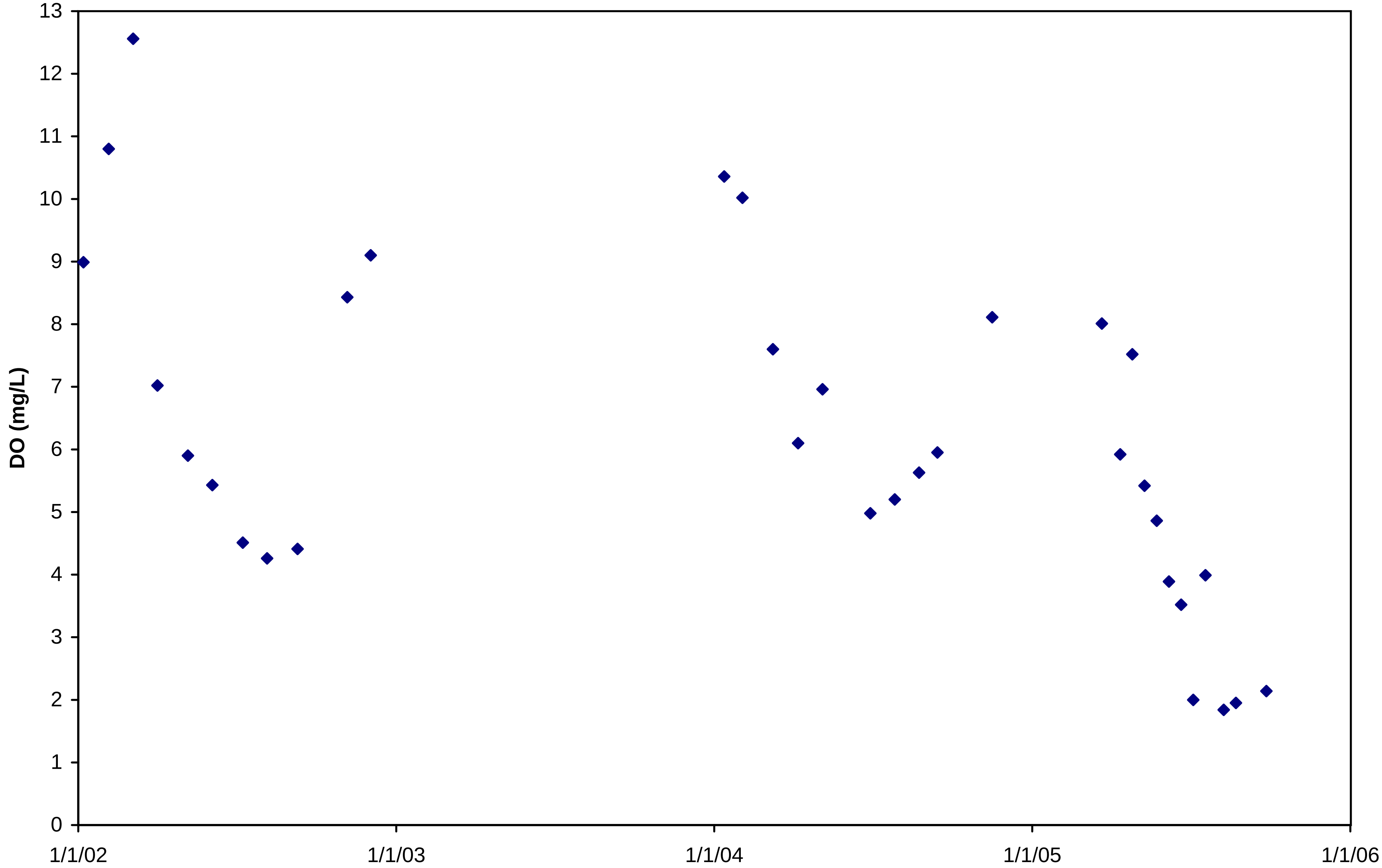


Figure B.2. Observed NO2+NO3 for Boggy Bayou southwest of Shreveport, LA (1207)

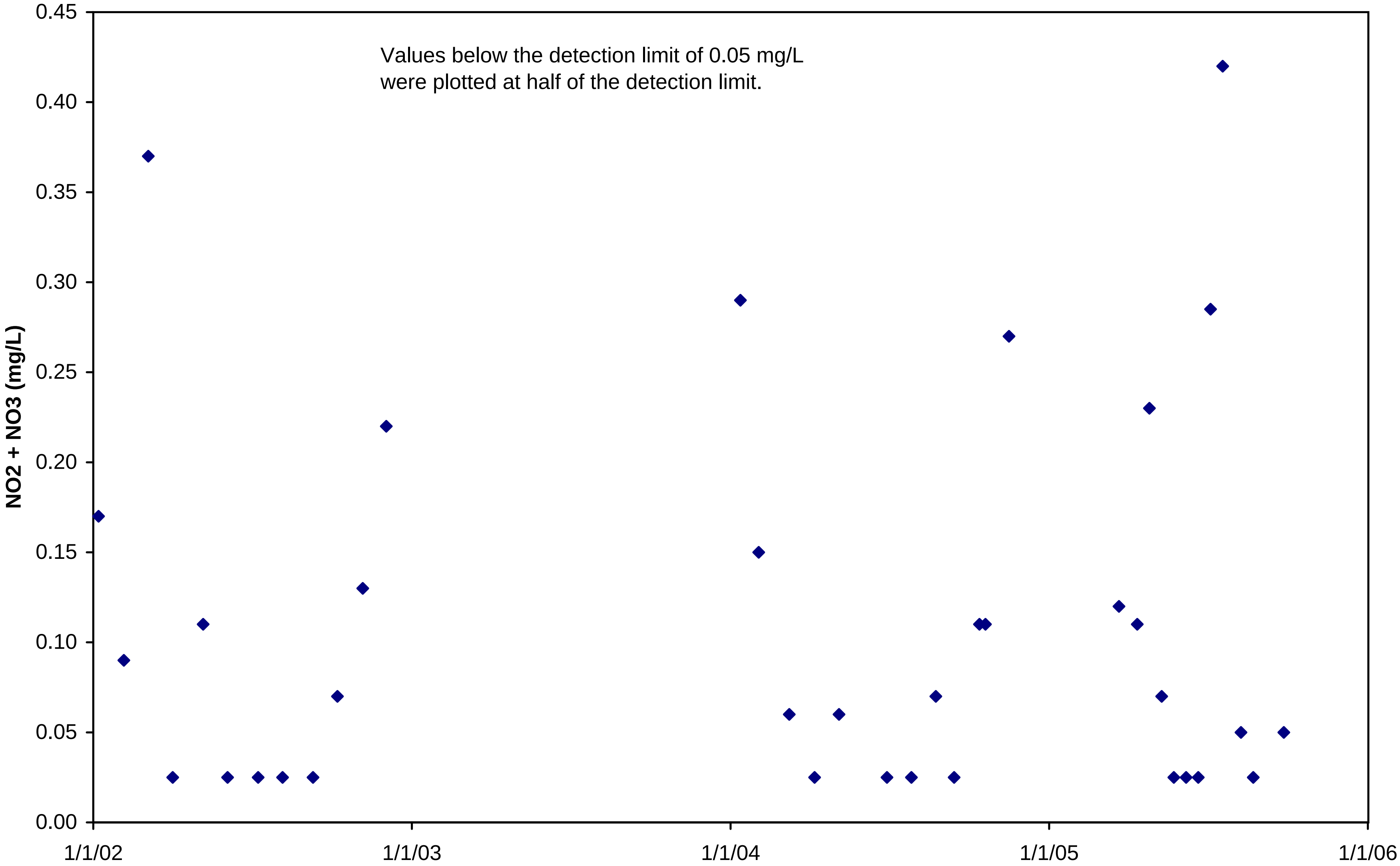


Figure B.3. Observed Ammonia Nitrogen for Boggy Bayou southwest of Shreveport (1207)

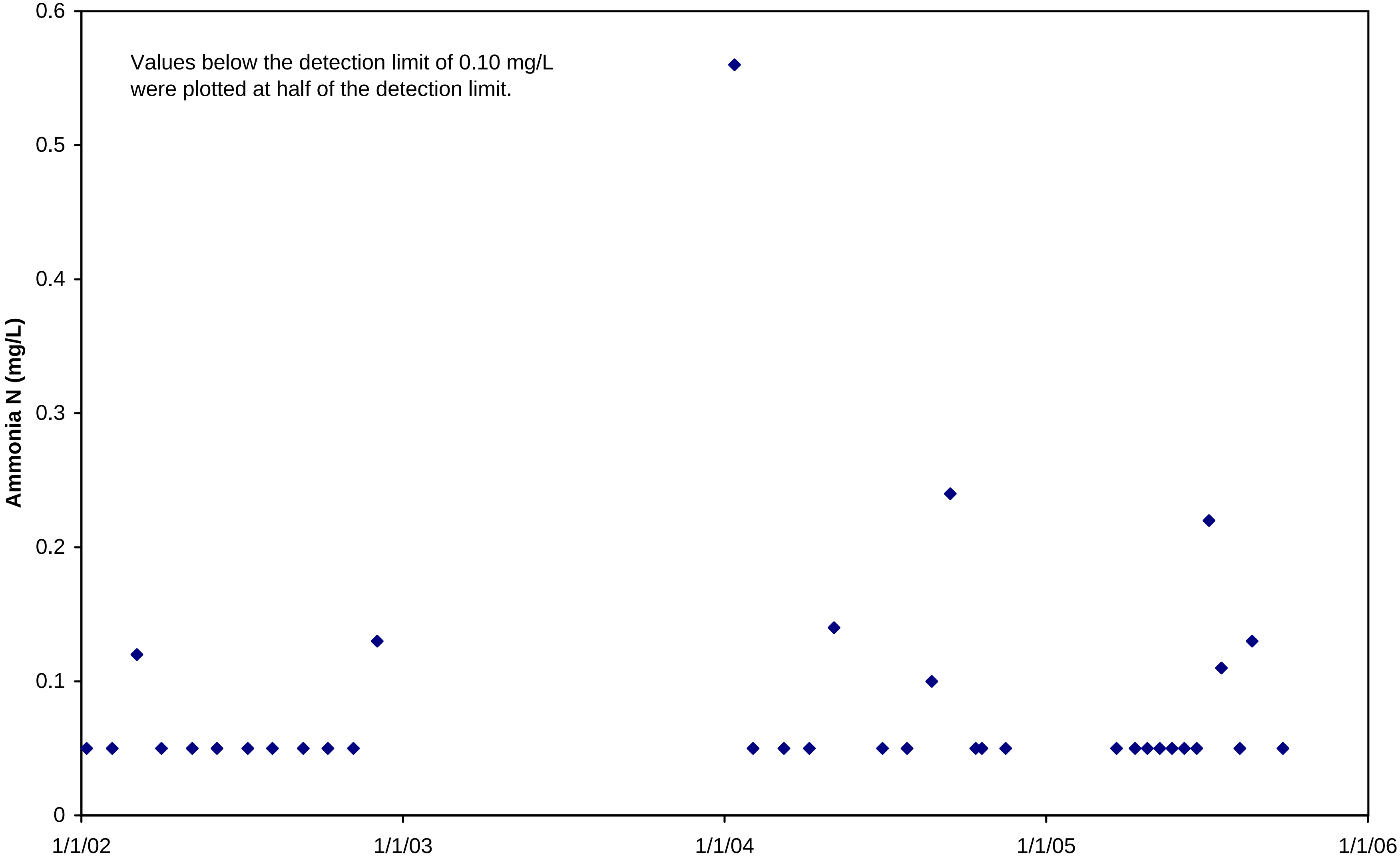


Figure B.4. Observed TKN for Boggy Bayou southwest Shreveport, LA (1207)

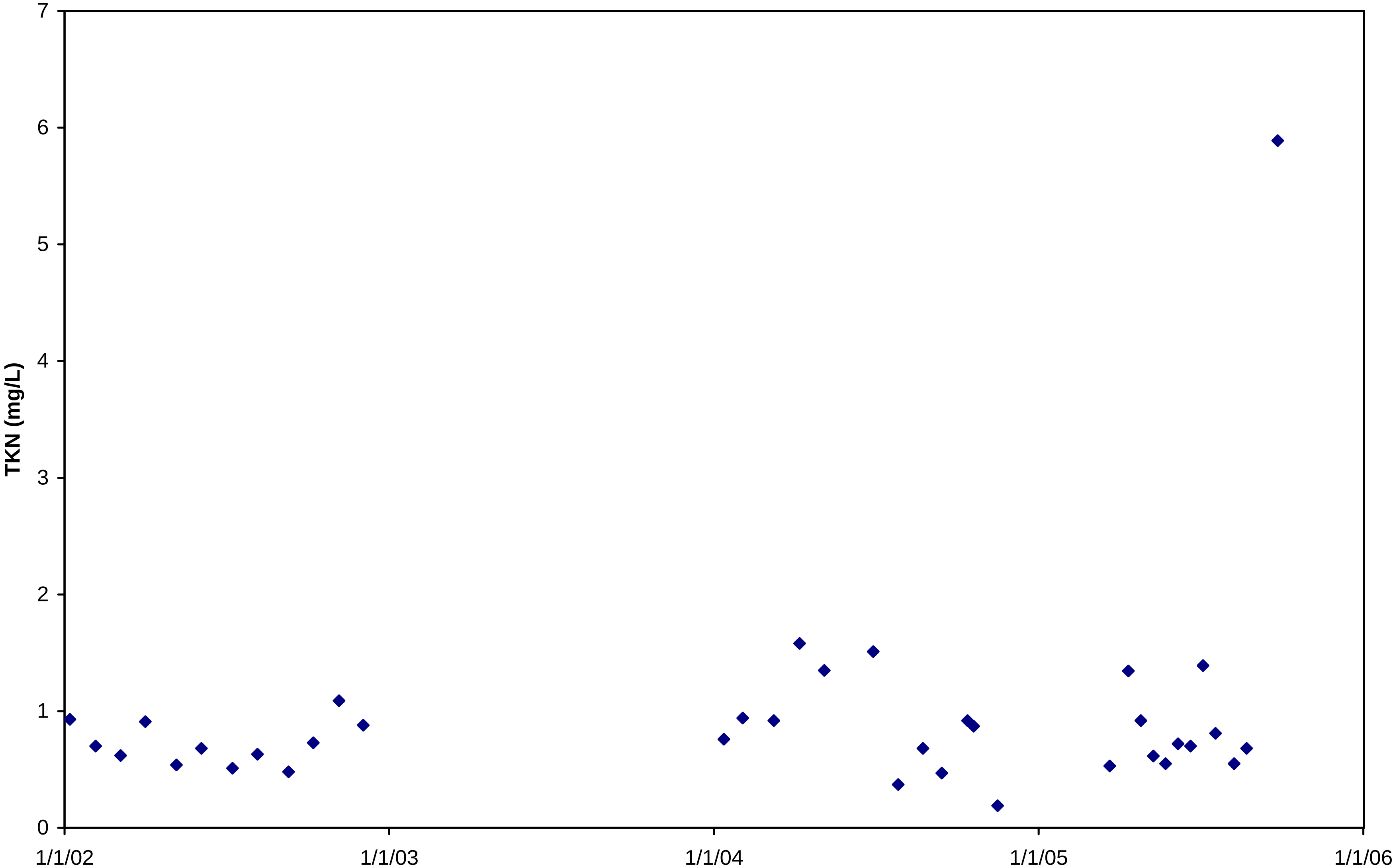
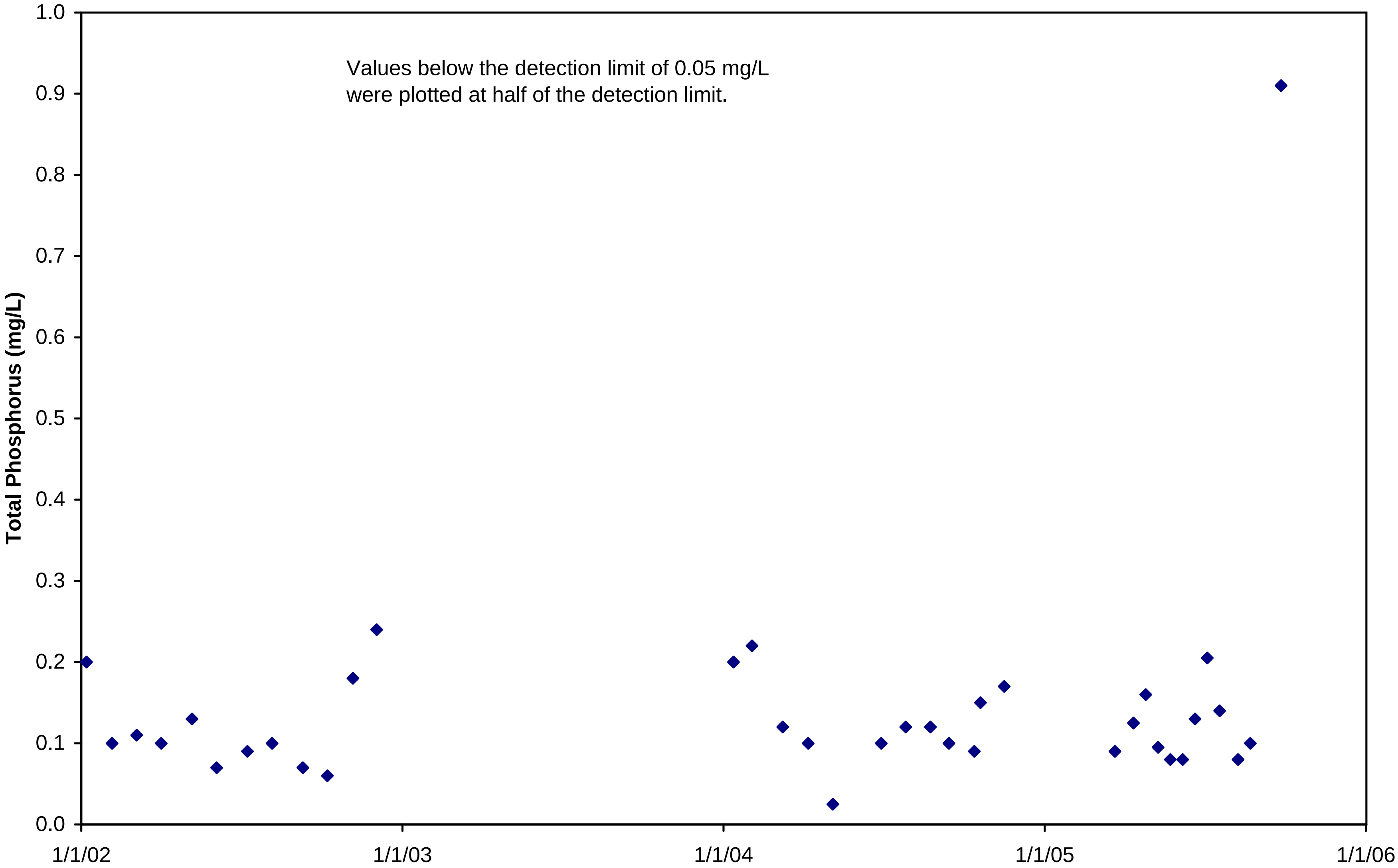


Figure B.5. Observed Total Phosphorus for Boggy Bayou southwest of Shreveport, LA (1207)



APPENDIX C

FTN Field Survey Data

Table C.1. Field data collection sites for FTN Field survey for Red and Sabine basins.

SUBSEG. NUMBER	SITE NO.	SITE NAME	DIRECTIONS	TYPE OF DATA COLLECTED
Red River basin				
100404	100404-A	Cypress Bayou Reservoir at upper end	At LA Hwy 162 bridge east of Benton	In situ
100404	1181	Cypress Bayou Reservoir southeast of Benton, LA	At spillway on Parks Road, 3.1 miles southeast of Benton, 3.5 miles southwest of Bellevue, 9.1 miles north of Bossier	In situ, sample
100405	100405-A	Black Bayou near Benton, LA	At LA Hwy 162 on east edge of Benton	In situ, sample
100405	1182	Black Bayou Reservoir at Linton Road, southeast of Benton, LA	4.4 miles southeast of Benton, 3.2 miles northeast of Dukedale, 4.3 miles southwest of Linton	In situ, sample
100406	363	Flat River Drainage Canal north of Bossier City, LA	At Airline Drive bridge, 4.0 miles south-southeast of Benton, LA	In situ, sample, flow, width
100406	389	Flat River Drainage Canal northeast of Bossier City, LA	At Swan Lake Road bridge 7.5 miles north-northeast of City Hall in Bossier City, LA	In situ, width, flow
100406	390	Flat River Drainage Canal NE of Shreveport	At Deer Point Road bridge 5.75 miles southeast of Benton, LA	In situ, width
100406	272	Flat River east of Taylortown, LA	At State Highway 527 bridge, 13 miles southeast of Shreveport, LA	In situ, flow, width, contin.
100406	100406-A	Flat River east of Poole, LA	At Poole Rd, 3 miles southeast of intersection of Poole Rd and US Hwy 71	In situ, flow, width
100501	100501-A	Bayou Dorcheat south of AR state line	At LA Hwy 157 several miles south of AR state line, east of Springhill, LA	In situ, sample, flow, width
100501	100501-B	Bayou Dorcheat NE of Cotton Valley	At LA Hwy 160 about 4-5 miles northeast of Cotton Valley, LA	In situ, sample, flow, width
100501	61	Bayou Dorcheat west of Minden, LA	At bridge on US Hwy 80, 3.0 miles west of Minden	In situ, flow, width
100501	274	Bayou Dorcheat west of Sibley, LA	At State Highway 164 bridge, 2.0 miles west of Sibley, LA, 6.0 miles southwest of Minden, LA	In situ, flow, width,
100601	100601-A	Wallace Bayou upstream of Bayou Pierre	At White Springs Rd, about 4 miles southwest of Gayles, LA, about 2 miles downstream of Wallace Lake	In situ, sample, flow, width
100601	278	Bayou Pierre near Shreveport, LA	At State Highway 526 bridge, 0.75 mile northeast of Forbing, LA, 8.0 miles south of Shreveport, LA	In situ, sample, flow, width
100601	1183	Bayou Pierre at Ellerbee Road, S of Gayles	3.2 miles south of Gayles, 2.4 miles southwest of Cecile, 5 miles northeast of Frierson	In situ, sample, flow, width
100601	100601-B	Bayou Pierre southwest of Williams, LA	At highway 509, about 4 miles southwest of Williams, LA, about 9 miles south of Caddo/Red River Parish line	In situ, flow, width
100602	100602-A	Boggy Bayou SE of Hicks Crossing, LA	At LA Hwy 169, about 2-3 miles southeast of Hicks Crossing	In situ, sample, flow, width
100602	1207	Boggy Bayou southwest of Shreveport, LA	6.4 miles southwest of Shreveport, 3.1 miles north of Keithville, 2.9 miles southeast of Reservoir	In situ, sample, flow, width
100702	100702-A	Black Lake Bayou west of Mt. Lebanon	At LA Hwy 793 about 5-6 miles west of Mt. Lebanon (in 100701)	In situ, flow, width
100702	100702-B	Leatherman Creek west of Mt. Lebanon	At LA Hwy 793 about 4 miles west of Mt. Lebanon	In situ, sample, flow, width

SUBSEG. NUMBER	SITE NO.	SITE NAME	DIRECTIONS	TYPE OF DATA COLLECTED
100702	282	Black Lake Bayou west of Castor, LA	At LA Highway 4, 2.5 miles west of Castor, LA, 18.5 miles northeast of Coushatta, LA	In situ, sample, flow, width
100702	1187	Black Lake Bayou at Hwy 155, E of Martin	At bridge on State Hwy 155, 3.5 miles east of Martin, 6.2 miles west of Skidder, 5 miles SW of Ashland	In situ, sample, flow, width
100703	100703-A	Black Lake northeast of Campti, LA	On LA Hwy 9 bridge about 6 miles northeast of Campti, LA	In situ, sample
100703	100703-B	Clear Lake outlet northeast of Clarence, LA	At LA Hwy 1226, just downstream of Chivery Dam at outlet of Clear Lake, about 5 miles northeast of Clarence	In situ, sample, flow, width
100803	100803-A	Saline Bayou northeast of Clarence, LA	Access point at end of LA Hwy 1227 at Allen Dam, about 5.5 miles NE of Clarence	In situ, sample, flow, width
100803	1214	Saline Bayou southeast of Clarence, LA	At US Hwy 71, 7 miles east of Natchitoches, 5.1 miles southeast of Clarence, 3.4 miles south of Trichell	In situ, sample, flow, width, contin.
101301	556	Cress Creek west of Oak Grove, LA	At bridge on LA Hwy 8, 2.8 miles W of Oak Grove, 4 miles S of Fairfield, 3.7 miles N of Bagdad	In situ, sample
101301	101301-A	Rigolette Bayou WNW of Bagdad, LA	At LA Hwy 492, about 1 mile WNW of Bagdad, about 7 miles southeast of Colfax	In situ, sample, flow, width
101301	1220	Rigolette Bayou northwest of Pineville, LA	Bridge on Rigolette Rd., 4.8 miles NW of Pineville, 1.6 miles NE of Barrett, 3.9 miles SW of Tio	In situ, sample, flow, width, contin.
101302	101302-A	Iatt Creek near upstream end of Iatt Lake	At LA Hwy 122 about 10 miles east of Montgomery, LA	In situ, sample
101302	570	Beaver Creek south of Faircloth, LA	0.35 miles west of Faircloth, 2 miles northwest of Fairfield, 4.5 miles southwest of Wilhana	In situ, sample
101302	1221	Iatt Lake southwest of Fairfield, LA	Public boat launch near spillway, 4.4 miles southwest Fairfield, 7.1 miles northwest of Oak Grove, 3.7 miles northeast	In situ, sample
101503	371	Saline Bayou east of Alexandria, LA	9.0 miles east of Buckeye, LA, 1.5 mile northeast of Saline Lake, 0.5 mile south of entrance to Bushyhead Bayou	In situ
101503	101503-A	Saline Bayou southeast of Saline Lake	At local road about 1-2 miles southeast of east end of Saline Lake	In situ, sample
101604	1231	Lake Concordia at Ferriday, LA	Sportsman's Marina, 1.7 miles NW of Ridgecrest, 6.8 miles S of Clayton, 16 miles E of Jonesville	In situ, sample
101604	101604-A	Bayou Cocodrie at Ferriday, LA	At US Hwy 65 bridge, about 0.5 miles SW of Lake Concordia	In situ, width, xcs
Sabine River basin				
110401	110401-A	Toro Creek southeast of Florien, LA	At Plainview Road, about 3-4 miles southeast of Florien, LA	In situ, sample, flow, width
110401	1160	Bayou Toro northeast of Toro, LA	At LA Hwy 473, about 2 miles northeast of Toro, LA	In situ, sample, flow, width

Note: “contin.” = continuous in situ monitoring

R:\projects\2110-616\tech\Field_QAPP\Table 3p1 Red and Sabine Sites_actual.doc

Table C.2. In situ data for FTN field survey in Red River and Sabine River basins.

Subsegment Number	Site No.	Site Name	Date	Time	Water Temp. (C)	DO (mg/L)	Conductivity (umhos/cm)	pH (su)
100404	1181	Cypress Bayou Reservoir southeast of Benton	09/01/05	10:44	30.8	7.3	54	7.3
	100404-A	Cypress Bayou Reservoir @ Hwy 162	09/01/05	11:20	30.4	6.1	51	7.0
100405	1182	Black Bayou Reservoir @ Linton Rd	09/01/05	10:20	29.8	5.5	75	7.2
	100405-A	Black Bayou @ Hwy 162	09/01/05	11:45	24.9	1.0	440	6.9
100406	272	Flat River @ Hwy 527	09/02/05	08:15	25.5	2.9	811	7.1
	363	Flat River Airline Dr. bridge	09/01/05	09:30	29.3	5.2	90	7.1
	389	Flat River Dr. Canal Swan L. Rd.	09/01/05	07:54	26.9	1.4	336	7.6
	390	Flat River @ Deer Pt. Road	09/01/05	08:40	27.1	0.4	179	7.2
	100406-A	Flat River @ Swan Lake Bridge	08/31/05	19:00	30.6	5.3	888	7.3
100501	61	Bayou Dorcheat @ Hwy 80	09/01/05	18:45	32.6	7.1	127	6.7
	274	Bayou Dorcheat @ Hwy 164	09/02/05	09:40	29.1	6.2	193	7.6
	100501-A	Bayou Dorcheat	09/01/05	14:35	27.1	3.2	418	7.1
	100501-B	Bayou Dorcheat @ Hwy 160	09/01/05	15:55	31.8	5.9	76	7.2
100601	278	Bayou Pierre nr Shreveport	08/31/05	12:20	31.0	6.8	498	7.0
	1183	Bayou Pierre @ Ellerbee Rd	08/31/05	10:10	25.0	3.7	476	7.2
	100601-A	Wallace Bayou	08/31/05	11:10	29.5	5.9	214	7.6
	100601-B	Bayou Pierre	08/31/05	08:45	26.6	4.9	338	7.4
100602	1207	Boggy Bayou Hwy 171	08/31/05	14:40	31.5	5.2	156	7.1
	100602-A	Boggy Bayou @ Hwy 169	08/31/05	13:45	27.2	4.4	208	7.1
100702	282	Black Lake Bayou Hwy 4	09/07/05	09:20	24.7	5.3	35	6.1
	1187	Black Lake Bayou Hwy 155	09/07/05	10:25	24.9	5.3	40	6.3
	100702-A	Black Lake Bayou Hwy 793	09/07/05	07:20	23.4	2.9	167	6.3
	100702-B	Leatherman Creek	09/07/05	08:05	23.3	3.4	54	6.3
100703	100703-A	Black Lake @ Hwy 9	09/07/05	11:20	27.6	5.3	71	6.4
	100703-B	Clear Lake outlet	09/07/05	12:40	29.8	6.9	96	6.9
100803	1214	Saline Bayou @ Hwy 71	09/07/05	14:40	30.2	5.4	105	6.8
	100803-A	Saline Bayou @ Allen Dam	09/07/05	13:40	30.6	8.3	82	7.8
101301	556	Cress Creek @ Hwy 8	09/08/05	11:30	21.7	7.5	22	6.5
	1220	Rigolette Bayou @ Rig. Road	09/08/05	09:35	27.4	4.3	108	6.8
	101301-A	Rigolette Bayou @ hwy 492	09/08/05	10:20	24.2	5.0	54	6.6
101302	570	Beaver Creek	09/08/05	12:30	20.3	8.3	29	6.5
	1221	Iatt Lake	09/08/05	11:05	26.5	3.2	6	6.3
	101302-A	Iatt Creek @ Hwy 122	09/08/05	12:05	24.2	1.2	129	6.4
101503	101503-A	Saline Bayou on Farm Rd.	09/09/05	07:05	24.0	3.3	179	6.9
101504	371	Saline Bayou @ WMA boatramp	09/08/05	15:30	30.6	8.3	47	8.0
101604	1231	Lake Concordia @ Sportmans Lodge	09/09/05	08:45	28.9	7.5	251	8.3
	101604-A	Bayou Cocodrie @ Hwy 65	09/09/05	08:30	27.2	2.2	282	6.9
110401	1160	Bayou Toro @ Hwy 473	09/08/05	07:30	24.4	4.8	99	6.4
	110401-A	Toro Creek @ Plainview Rd.	09/08/05	06:40	21.8	1.3	81	6.3

FILE: R:\PROJECTS\2110-616\TECH\FIELD_STUDIES\IN-SITU DATA RED-SABINE.XLS

Table C.3 Analytical laboratory results from samples collected in FTN field survey for Red River and Sabine River basins.

Subsegment Number	Site Number	Site Name	Sampling Date	TSS (mg/L	TKN (mg/L)	Total Phos. (mg/L)	TOC (mg/L)	Chlorophyll a (mg/L)	Ammonia as N (mg/L)	NO3 + NO2 N (mg/L)
100404	1181	Cypress Bayou Reservoir nr Benton	09/01/05	7.7	1.8	0.045	9.1	0.035	0.24	<0.05
100405	1182	Black Bayou Reservoir nr Linden Rd	09/01/05	8	1.9	0.061	10	0.051	0.14	<0.05
	100405-A	Black Bayou nr Benton	09/01/05	8.4	2.4	0.082	12	<0.02	0.56	<0.05
100406	363-1	Flat River Dr. Canal nr Bossier City	09/01/05	26	2.5	0.093	10	0.027	0.39	<0.05
	363-2	Flat River Dr. Canal nr Bossier City	09/01/05	26	2.2	0.074	11	0.03	0.36	<0.05
100501	100501-A	Bayou Dorcheat nr AR line	09/01/05	11	1.6	0.15	5.7	<0.02	0.2	0.26
	100501-B	Bayou Dorcheat NE Cotton Valley	09/01/05	4.4	1.7	0.048	8.3	0.021	0.18	<0.05
100601	278	Bayou Pierre nr Shreveport	08/31/05	9.8	1.4	0.25	7.6	<0.02	0.13	<0.05
	1183	Bayou Pierre at Ellerbee Rd.	08/31/05	16	2.3	0.22	2.6	<0.02	0.22	0.39
	100601-A-1	Wallace Bayou u/s B. Pierre	08/31/05	19	1.6	0.085	6.8	<0.02	<0.1	<0.05
	100601-A-2	Wallace Bayou u/s B. Pierre	08/31/05	18	1.8	0.085	6.7	<0.02	<0.1	0.06
100602	1207	Boggy Bayou SW of Shreveport	08/31/05	19	1.5	0.14	6.1	<0.02	<0.1	<0.05
	100602-A	Boggy Bayou SE of Hicks Crossing	08/31/05	78	1.8	0.15	8.1	<0.02	<0.1	<0.05
100702	100702-B	Leatherman Creek	09/07/05	18	2.4	0.11	7.5	0.076	0.32	<0.05
	282	Black Lake Bayou w of Castor	09/07/05	4.8	1.6	0.048	5.9	<0.02	0.22	0.064
	1187	Black Lake Bayou @ Hwy 155	09/07/05	5.2	1.7	0.064	6	<0.02	0.17	0.096
100703	100703-A-1	Black Lake NE Campti	09/07/05	73	1.7	0.048	7.7	<0.02	0.17	<0.05
	100703-A-2	Black Lake NE Campti	09/07/05	4.4	1.9	0.05	7.8	<0.02	0.17	<0.05
	100703-B	Clear Lake outlet	09/07/05	16	1.9	0.12	9.2	0.1	0.25	<0.05
100803	1214	Saline Bayou SE of Clarence	09/07/05	22	1.9	0.08	8.6	0.034	0.23	<0.05
	100803-A	Saline Bayou NE of Clarence	09/07/05	16	3	0.098	8.7	0.05	0.21	<0.05
101301	556	Cress Creek	09/08/05	<4	<1	<0.02	3.1	<0.02	0.16	<0.05
	1220	Rigolette Bayou NE of Pineville	09/08/05	13	1.1	0.082	4.9	<0.02	0.12	<0.05
	570	Beaver Creek	09/08/05	6.2	<1	<0.02	1.5	<0.02	<0.1	0.1
	101301-A	Rigolette Bayou WNW of Bagdad	09/08/05	41	1.3	0.08	3.2	<0.02	0.19	<0.05
101302	1221	Iatt Lake	09/08/05	<4	<1	<0.02	9	<0.02	0.19	<0.05
	101302-A-1	Iatt Creek	09/08/05	5.4	1.4	0.048	11	<0.02	0.22	0.059
	101302-A-2	Iatt Creek	09/08/05	5.2	<1	0.048	11	<0.02	0.14	<0.05
101503	101503-A	Saline Bayou SE of Saline L.	09/09/05	280	2.2	0.15	6.8	0.026	0.58	0.068
101604	1231	Lake Concordia	09/09/05	12	1.9	0.15	7.9	0.049	0.23	<0.05
110401	1160	Bayou Toro NE of Toro	09/08/05	16	1.7	0.1	6.4	<0.02	0.14	<0.05
	110401-A	Toro Creek	09/08/05	6.8	1.4	0.11	7.3	<0.02	0.16	<0.05

FILE: R:\PROJECTS\2110-616\TECH\FIELD_STUDIES\LAB DATA SUMMARY RED-SABINE.XLS

Table C.4. Summary of CBOD time series data from FTN field survey of Red River and Sabine River basins..

Subsegment Number	Sample No.	CBOD 1, 2-day	CBOD 2, 5-day	CBOD 3, 9-day	CBOD 4, 14-Day	CBOD 5, 20-day	k rate (1/day)	CBODu (mg/l)
100404	1181	<2	3.3	5	5.3	5.2	0.22	5.49
100405	1182	2.9	4.8	6.7	8.1	12	0.06	15.61
	100405-A	<2	<2	3.3	5.1	6.9	0.05	12.47
100406	363-1	<2	<2	4.3	5.7	6.6	0.12	7.50
	363-2	<2	<2	4.2	5.8	6.8	0.12	7.69
100501	100501-A	2.4	3.2	3.9	4.2	4.8	0.30	4.43
	100501-B	5.2	6.5	7.6	7.9	12	0.21	10.13
100601	278	<2	<2	2.3	4.6	6.8	0.04	13.85
	1183	<2	<2	<2	5.1	3.9	0.60	4.50
	100601-A-1	<2	<2	<2	2.8	4.4	0.16	5.38
	100601-A-2	<2	2.1	2.3	4.1	5.4	0.04	9.83
100602	1207	<2	<2	2.1	3.4	6	0.04	13.05
	100602-A	2.7	3.9	5	7.8	9.4	0.07	11.99
100702	282	<2	<2	<2	<2	2.2	--	--
	1187	<2	<2	<2	<2	<2	--	--
	100702-B	<2	2.1	3.7	4.6	6.2	0.05	9.62
100703	100703-A-1	<2	<2	<2	2.5	4	0.05	8.69
	100703-A-2	<2	<2	<2	2.3	3.1	0.05	5.60
	100703-B	2.4	5.9	8.9	9.6	14	0.08	16.99
100803	1214	<2	2.7	7.1	7.3	8.9	0.31	8.42
	100803-A	<2	<2	3.9	4.8	6.6	0.05	10.75
101301	556	<2	<2	<2	<2	<2	--	--
	1220	<2	<2	<2	3.1	3.9	0.15	4.43
	101301-A	<2	<2	<2	<2	<2	--	--
101302	570	<2	<2	<2	<2	<2	--	--
	1221	<2	<2	<2	<2	2.2	--	--
	101302-A-1	<2	<2	2.7	3.6	4.3	0.10	5.04
	101302-A-2	<2	<2	<2	2.5	3.4	0.05	5.75
101503	101503-A	<2	<2	3.6	6.2	6.9	0.22	7.29
101604	1231	<2	3.6	7.3	9.9	12	0.06	18.50
110401	1160	<2	<2	<2	<2	2	--	--
	110401-A	<2	<2	<2	<2	2.3	--	--

FILE: R:\PROJECTS\2110-616\TECH\FIELD_STUDIES\RED AND SABINE SUMMARY GSBOD TABLE.XLS

APPENDIX D

LA-QUAL Vector Diagram

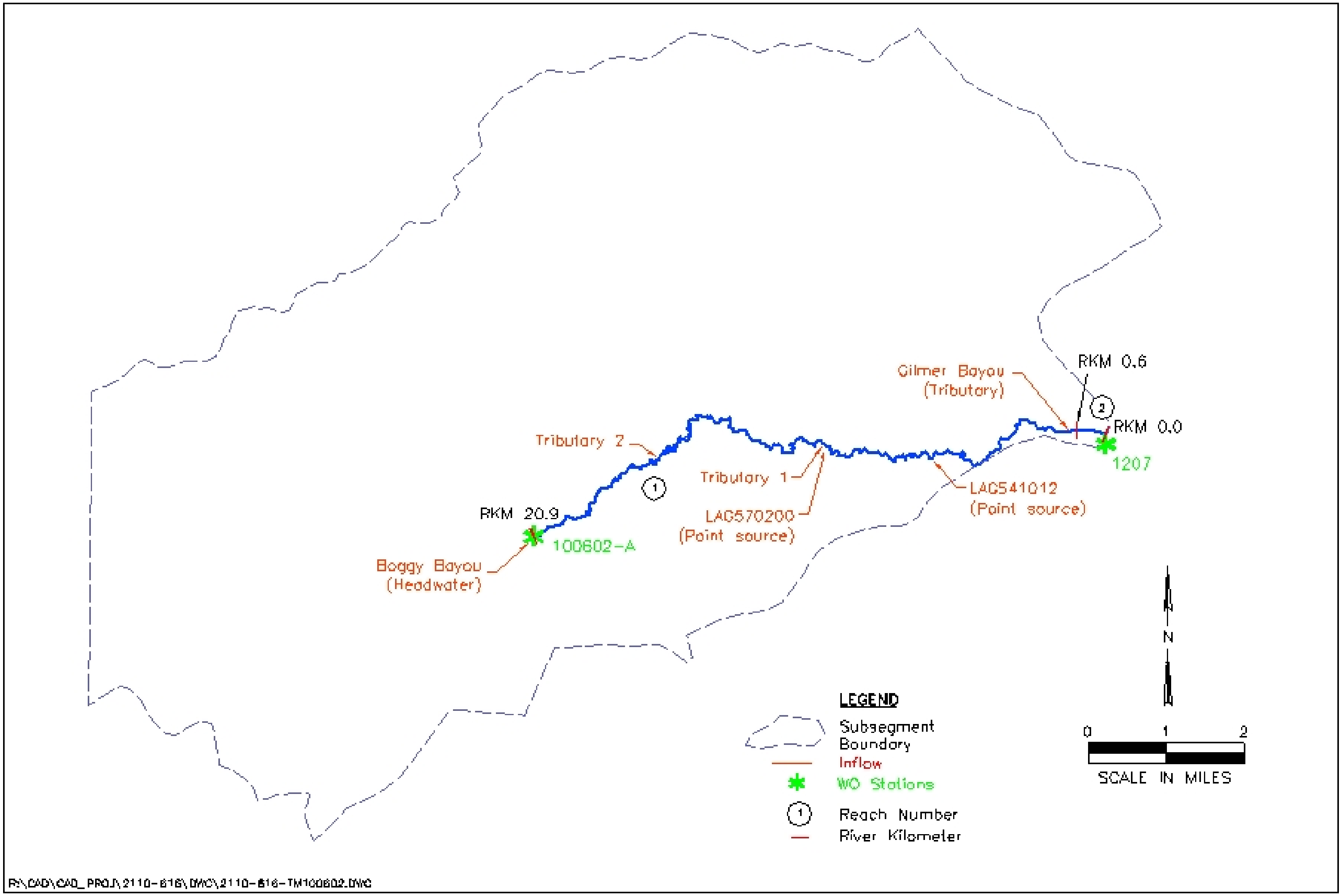
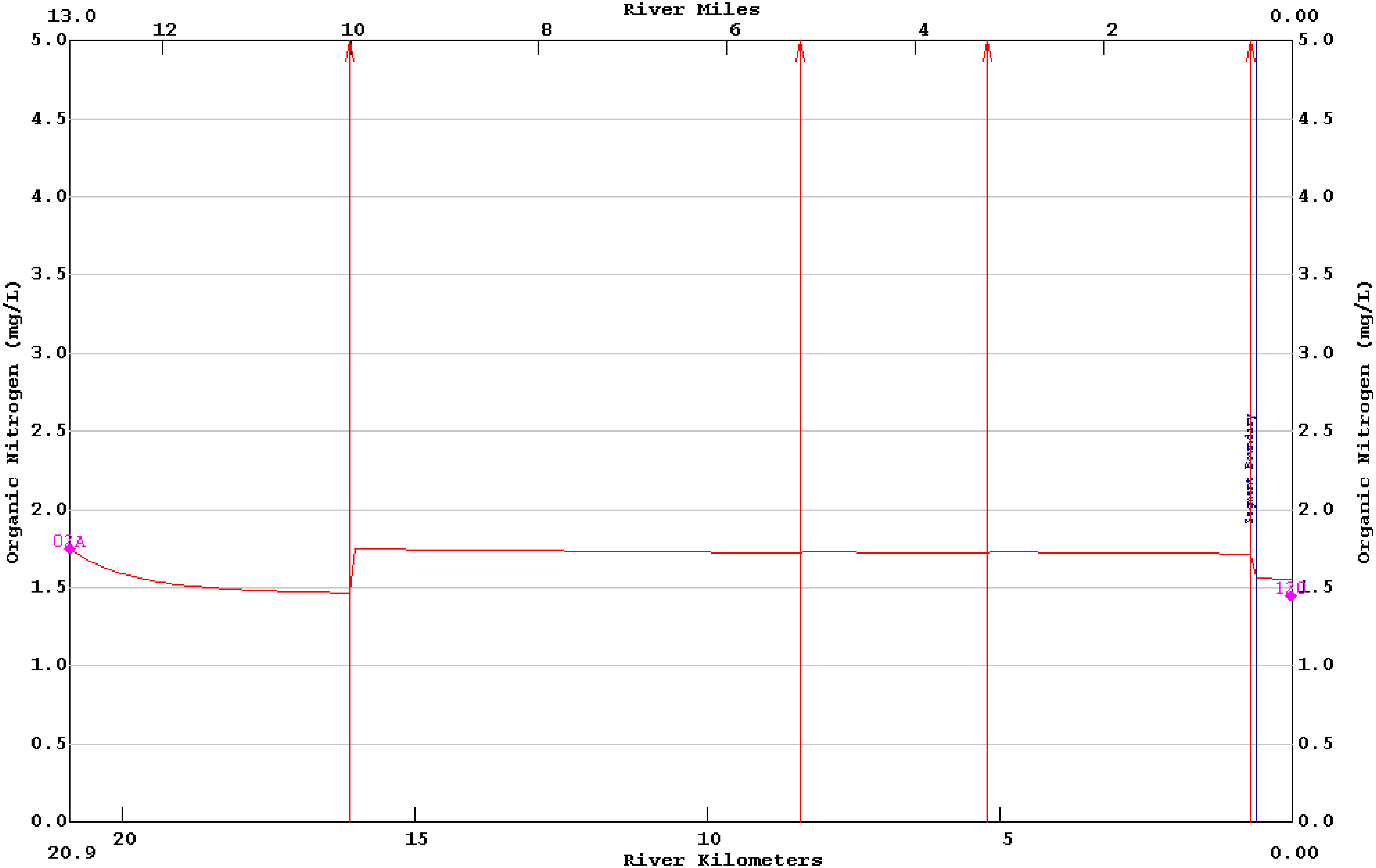


Figure D.1. LA-QUAL vector diagram for Boggy Bayou.

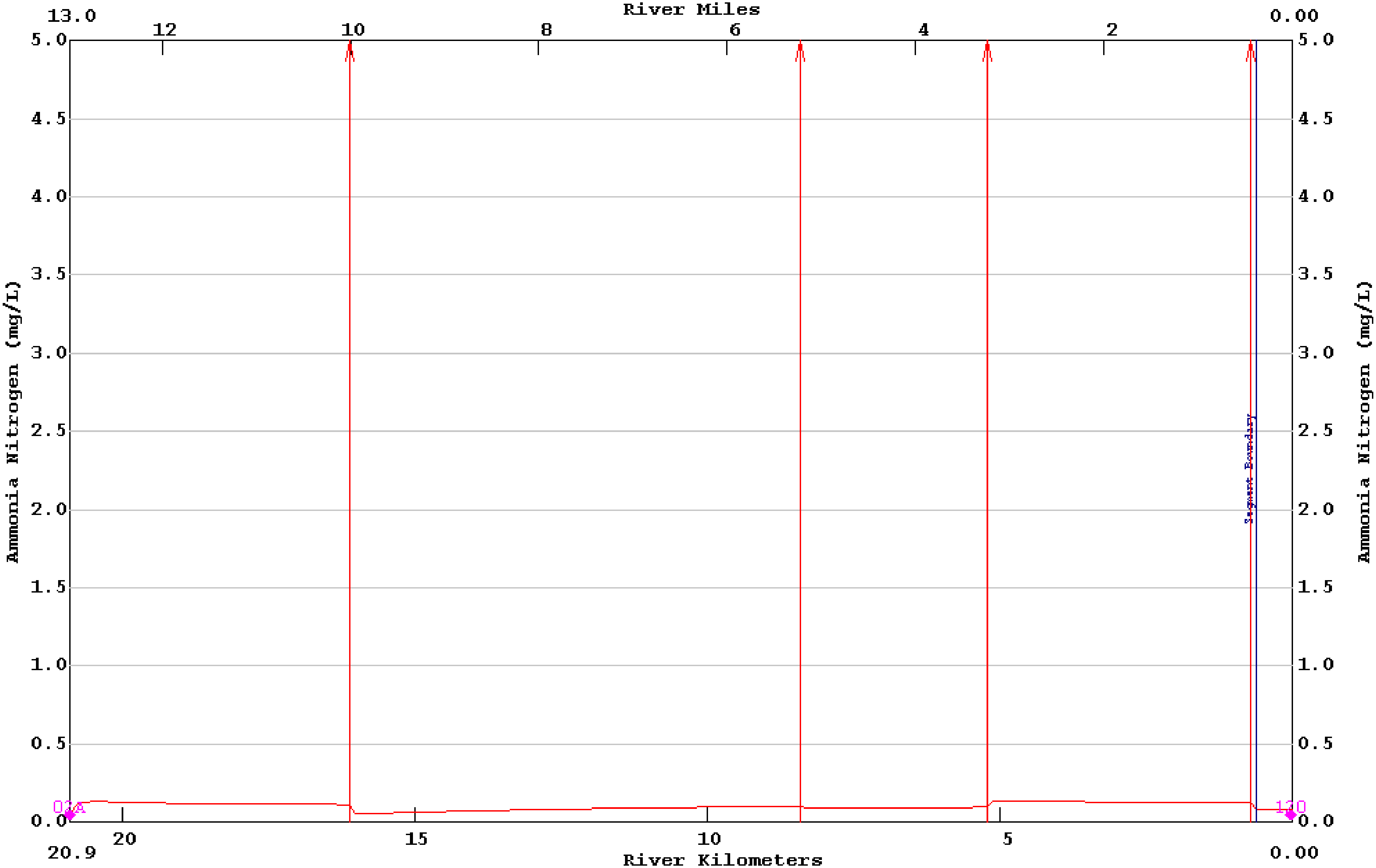
APPENDIX E

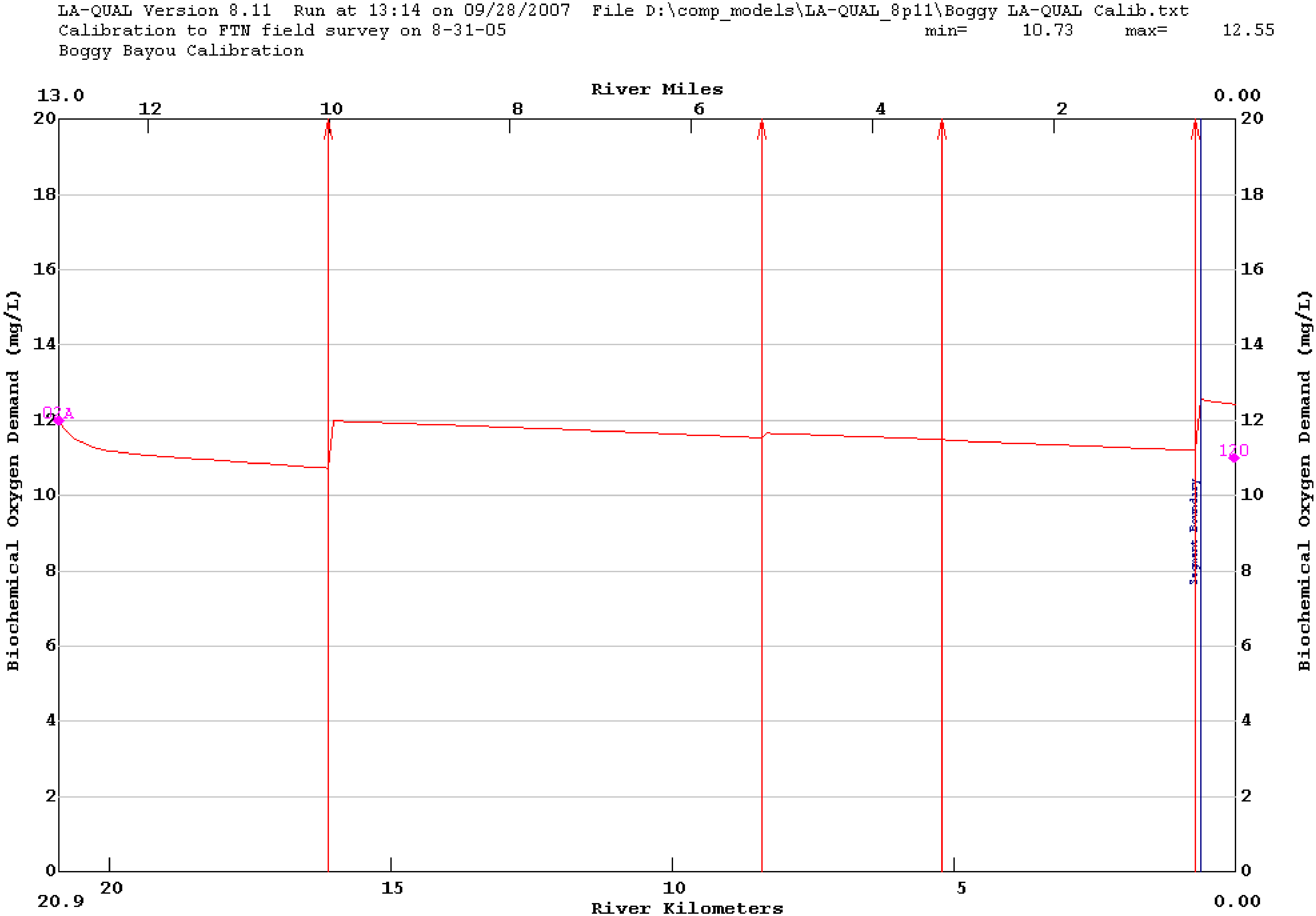
Plots of Predicted and Observed Water Quality

LA-QUAL Version 8.11 Run at 13:14 on 09/28/2007 File D:\comp_models\LA-QUAL_8p11\Boggy LA-QUAL Calib.txt
Calibration to FTN field survey on 8-31-05 min= 1.47 max= 1.75
Boggy Bayou Calibration

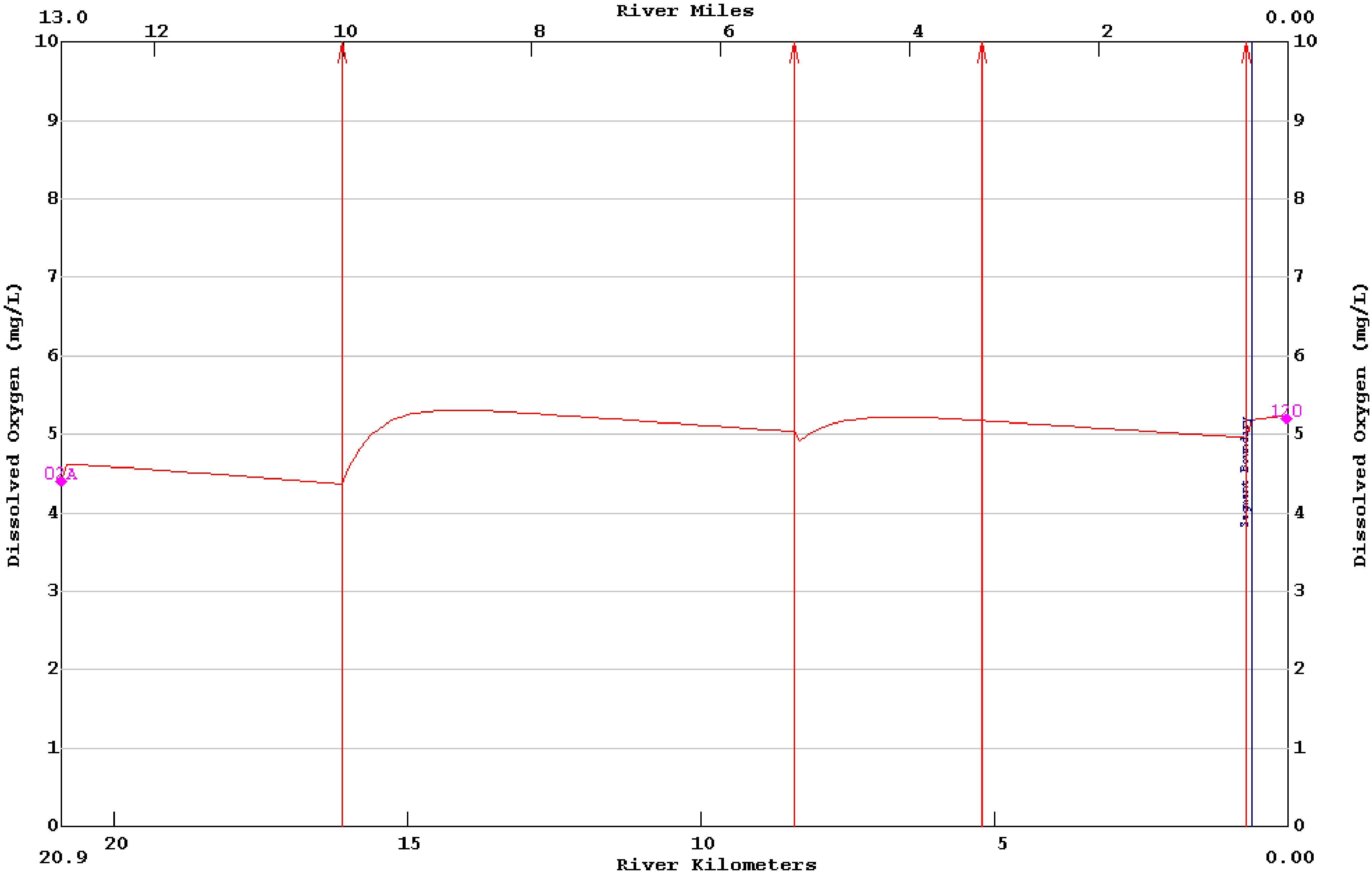


LA-QUAL Version 8.11 Run at 13:14 on 09/28/2007 File D:\comp_models\LA-QUAL_8p11\Boggy LA-QUAL Calib.txt
Calibration to FTN field survey on 8-31-05 min= 0.05 max= 0.13
Boggy Bayou Calibration




LA-QUAL Version 8.11 Run at 13:14 on 09/28/2007 File D:\comp_models\LA-QUAL_8p11\Boggy LA-QUAL Calib.txt
Calibration to FTN field survey on 8-31-05
min= 10.73 max= 12.55
Boggy Bayou Calibration
River Miles
13.0
12
10
8
6
4
2
0.00
20
18
16
14
12
10
8
6
4
2
0
Biochemical Oxygen Demand (mg/L)
02A
120
20.9
20
15
10
5
0.00
River Kilometers

LA-QUAL Version 8.11 Run at 13:14 on 09/28/2007 File D:\comp_models\LA-QUAL_8p11\Boggy LA-QUAL Calib.txt
Calibration to FTN field survey on 8-31-05 min= 4.37 max= 5.31
Boggy Bayou Calibration



APPENDIX F

Printout of Model Output for Calibration

```
LA-QUAL Version 8.11
Louisiana Department of Environmental Quality

Input file is D:\comp_models\LA-QUAL_8p11\Boggy LA-QUAL Calib.txt
Output produced at 10:52 on 09/25/2007

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

CARD TYPE       CONTROL TITLES

TITLE01         LA-QUAL Model for Boggy Bayou (100602)
TITLE02         Calibration to FTN field survey on 8-31-05
CNTROL03  YES   METR
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)
PROGRAM         MAXIMUM ITERATION LIMIT            =       200.00000
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 km		END REACH km	ELEM LENGTH km	REACH LENGTH km	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Boggy Bayou u/s of Gilmer	20.90	TO	0.60	0.1000	20.30	203	1	203
REACH ID	2	B2	Boggy Bayou d/s of Gilmer	0.60	TO	0.00	0.1000	0.60	6	204	209

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	4.100	0.000	0.000	0.280	0.000	0.000	0.00000	0.000
HYDR-1	2	B2	9.100	0.000	0.000	0.160	0.000	0.000	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	27.20	0.00	4.39	0.05	0.03	0.00	0.00	0.00
INITIAL	2	B2	31.50	0.00	5.17	0.05	0.03	0.00	0.00	0.00

ENDATA11

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

CARD	RCH	RCH	K2	K2	K2	K2	BKGRND	BOD	BOD	BOD CONV	ANAER BOD2	BOD2	BOD2	BOD2 CONV	ANAER BOD2

TYPE	NUM	ID	OPT	"A"	"B"	"C"	SOD g/m²/d	DECAY per day	SETT m/d	TO SOD	DECAY per day	DECAY per day	SETT m/d	TO SOD	DECAY per day
COEFF-1	1	B1	15 LOUISIANA	0.000	0.000	0.000	1.500	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	15 LOUISIANA	0.000	0.000	0.000	1.900	0.055	0.000	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	0.020	0.000	1.000	0.180	0.000	0.000	0.000
COEFF-2	2	B2	0.020	0.000	1.000	0.080	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	SHADING

ENDATA14

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

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECAY	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	20.00	0.80	0.00	0.00	0.00	0.00
NONPOINT	2	B2	0.00	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	Boggy Bayou	0	0.00028	0.010	0.00	0.00	0.000	0.000	0.00

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	Boggy Bayou	4.40	12.00	1.75	0.05	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	49	16.10	NPS Unnamed Trib 1	0.02750	0.97105	0.628	0.00	0.00	0.000	0.000
WSTLD-1	126	8.40	NPS Unnamed Trib 2	0.01060	0.37429	0.242	0.00	0.00	0.000	0.000
WSTLD-1	126	8.40	LaLaurie Ln Ox Pond	0.00000	0.00000	0.000	0.00	0.00	0.000	0.000
WSTLD-1	158	5.20	Grawood Church	0.00026	0.00918	0.006	0.00	0.00	0.000	0.000
WSTLD-1	203	0.70	NPS Gilmer Bayou	0.05500	1.94209	1.255	0.00	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	49	NPS Unnamed Trib 1	4.40	12.00	0.00	1.75	0.05	0.00	0.00	0.00
WSTLD-2	126	NPS Unnamed Trib 2	4.40	12.00	0.00	1.75	0.05	0.00	0.00	0.00
WSTLD-2	126	LaLaurie Ln Ox Pond	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WSTLD-2	158	Grawood Church	5.00	8.56	0.00	3.00	6.00	0.00	0.00	0.00
WSTLD-2	203	NPS Gilmer Bayou	5.20	13.50	0.00	1.45	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

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 =   2
PLOT RCH 1 2
ENDATA30

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

OVERLAY 1 Boggy.OVL   :Boggy Bayou Calibration
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 Boggy Bayou LA-QUAL Model for Boggy Bayou (100602)
REACH NO. 1 Boggy Bayou u/s of Gilmer Calibration to FTN field survey on 8-31-05

** 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	0.00028	0.00	0.00	0.00	0.00	4.40	12.00	0.00	12.00	0.00	1.75	0.05	0.00	0.00	0.00	0.00	0.00
49	WSTLD	0.02750	0.00	0.00	0.00	0.00	4.40	12.00	0.00	12.00	0.00	1.75	0.05	0.00	0.00	0.00	0.00	0.00
126	WSTLD	0.01060	0.00	0.00	0.00	0.00	4.40	12.00	0.00	12.00	0.00	1.75	0.05	0.00	0.00	0.00	0.00	0.00
158	WSTLD	0.00026	0.00	0.00	0.00	0.00	5.00	8.56	0.00	8.56	0.00	3.00	6.00	0.00	0.00	0.00	0.00	0.00
203	WSTLD	0.05500	0.00	0.00	0.00	0.00	5.20	13.50	0.00	13.50	0.00	1.45	0.05	0.00	0.00	0.00	0.00	0.00

*** HYDRAULIC PARAMETER VALUES ***

ELEM NO.	BEGIN DIST km	ENDING DIST km	FLOW m³/s	PCT EFF	ADVCTV VELO m/s	TRAVEL TIME days	DEPTH m	WIDTH m	VOLUME m³	SURFACE AREA m²	X-SECT AREA m²	TIDAL PRISM m³	TIDAL VELO m/s	DISPRSN m²/s	MEAN VELO m/s
1	20.90	20.80	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
2	20.80	20.70	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
3	20.70	20.60	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
4	20.60	20.50	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
5	20.50	20.40	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
6	20.40	20.30	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
7	20.30	20.20	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
8	20.20	20.10	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
9	20.10	20.00	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
10	20.00	19.90	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
11	19.90	19.80	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
12	19.80	19.70	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
13	19.70	19.60	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
14	19.60	19.50	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
15	19.50	19.40	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
16	19.40	19.30	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
17	19.30	19.20	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
18	19.20	19.10	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
19	19.10	19.00	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
20	19.00	18.90	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
21	18.90	18.80	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
22	18.80	18.70	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
23	18.70	18.60	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000

24	18.60	18.50	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
25	18.50	18.40	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
26	18.40	18.30	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
27	18.30	18.20	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
28	18.20	18.10	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
29	18.10	18.00	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
30	18.00	17.90	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
31	17.90	17.80	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
32	17.80	17.70	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
33	17.70	17.60	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
34	17.60	17.50	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
35	17.50	17.40	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
36	17.40	17.30	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
37	17.30	17.20	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
38	17.20	17.10	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
39	17.10	17.00	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
40	17.00	16.90	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
41	16.90	16.80	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
42	16.80	16.70	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
43	16.70	16.60	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
44	16.60	16.50	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
45	16.50	16.40	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
46	16.40	16.30	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
47	16.30	16.20	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
48	16.20	16.10	0.00028	0.0	0.00024	4.75	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.000
49	16.10	16.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
50	16.00	15.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
51	15.90	15.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
52	15.80	15.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
53	15.70	15.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
54	15.60	15.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
55	15.50	15.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
56	15.40	15.30	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
57	15.30	15.20	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
58	15.20	15.10	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
59	15.10	15.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
60	15.00	14.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
61	14.90	14.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
62	14.80	14.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
63	14.70	14.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
64	14.60	14.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
65	14.50	14.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
66	14.40	14.30	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
67	14.30	14.20	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
68	14.20	14.10	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
69	14.10	14.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
70	14.00	13.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
71	13.90	13.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
72	13.80	13.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
73	13.70	13.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
74	13.60	13.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024

75	13.50	13.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
76	13.40	13.30	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
77	13.30	13.20	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
78	13.20	13.10	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
79	13.10	13.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
80	13.00	12.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
81	12.90	12.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
82	12.80	12.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
83	12.70	12.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
84	12.60	12.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
85	12.50	12.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
86	12.40	12.30	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
87	12.30	12.20	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
88	12.20	12.10	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
89	12.10	12.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
90	12.00	11.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
91	11.90	11.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
92	11.80	11.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
93	11.70	11.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
94	11.60	11.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
95	11.50	11.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
96	11.40	11.30	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
97	11.30	11.20	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
98	11.20	11.10	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
99	11.10	11.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
100	11.00	10.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
101	10.90	10.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
102	10.80	10.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
103	10.70	10.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
104	10.60	10.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
105	10.50	10.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
106	10.40	10.30	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
107	10.30	10.20	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
108	10.20	10.10	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
109	10.10	10.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
110	10.00	9.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
111	9.90	9.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
112	9.80	9.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
113	9.70	9.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
114	9.60	9.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
115	9.50	9.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
116	9.40	9.30	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
117	9.30	9.20	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
118	9.20	9.10	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
119	9.10	9.00	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
120	9.00	8.90	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
121	8.90	8.80	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
122	8.80	8.70	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
123	8.70	8.60	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
124	8.60	8.50	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024
125	8.50	8.40	0.02778	99.0	0.02420	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.024

126	8.40	8.30	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
127	8.30	8.20	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
128	8.20	8.10	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
129	8.10	8.00	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
130	8.00	7.90	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
131	7.90	7.80	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
132	7.80	7.70	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
133	7.70	7.60	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
134	7.60	7.50	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
135	7.50	7.40	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
136	7.40	7.30	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
137	7.30	7.20	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
138	7.20	7.10	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
139	7.10	7.00	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
140	7.00	6.90	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
141	6.90	6.80	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
142	6.80	6.70	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
143	6.70	6.60	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
144	6.60	6.50	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
145	6.50	6.40	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
146	6.40	6.30	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
147	6.30	6.20	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
148	6.20	6.10	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
149	6.10	6.00	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
150	6.00	5.90	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
151	5.90	5.80	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
152	5.80	5.70	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
153	5.70	5.60	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
154	5.60	5.50	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
155	5.50	5.40	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
156	5.40	5.30	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
157	5.30	5.20	0.03838	99.3	0.03343	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.033
158	5.20	5.10	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
159	5.10	5.00	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
160	5.00	4.90	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
161	4.90	4.80	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
162	4.80	4.70	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
163	4.70	4.60	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
164	4.60	4.50	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
165	4.50	4.40	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
166	4.40	4.30	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
167	4.30	4.20	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
168	4.20	4.10	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
169	4.10	4.00	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
170	4.00	3.90	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
171	3.90	3.80	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
172	3.80	3.70	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
173	3.70	3.60	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
174	3.60	3.50	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
175	3.50	3.40	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
176	3.40	3.30	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034

177	3.30	3.20	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
178	3.20	3.10	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
179	3.10	3.00	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
180	3.00	2.90	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
181	2.90	2.80	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
182	2.80	2.70	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
183	2.70	2.60	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
184	2.60	2.50	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
185	2.50	2.40	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
186	2.40	2.30	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
187	2.30	2.20	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
188	2.20	2.10	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
189	2.10	2.00	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
190	2.00	1.90	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
191	1.90	1.80	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
192	1.80	1.70	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
193	1.70	1.60	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
194	1.60	1.50	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
195	1.50	1.40	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
196	1.40	1.30	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
197	1.30	1.20	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
198	1.20	1.10	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
199	1.10	1.00	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
200	1.00	0.90	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
201	0.90	0.80	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
202	0.80	0.70	0.03864	99.3	0.03366	0.03	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.034
203	0.70	0.60	0.09364	99.7	0.08157	0.01	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.082
TOT						234.13			23304.43	83230.00					
AVG					0.0010		0.28	4.10			1.15				
CUM						234.13									

** 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	20.800	7.94	2.86	0.08	0.00	0.00	0.00	0.00	0.00	2.36	2.36	2.36	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	20.700	7.93	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.37	2.37	2.37	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	20.600	7.93	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.37	2.37	2.37	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	20.500	7.93	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.37	2.37	2.37	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	20.400	7.92	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.38	2.38	2.38	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	20.300	7.92	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.38	2.38	2.38	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	20.200	7.92	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.38	2.38	2.38	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	20.100	7.92	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.39	2.39	2.39	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	20.000	7.91	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.39	2.39	2.39	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	19.900	7.91	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.39	2.39	2.39	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	19.800	7.91	2.87	0.08	0.00	0.00	0.00	0.00	0.00	2.40	2.40	2.40	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	19.700	7.90	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.40	2.40	2.40	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

13	19.600	7.90	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.40	2.40	2.40	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	19.500	7.90	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.41	2.41	2.41	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	19.400	7.89	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.41	2.41	2.41	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	19.300	7.89	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.41	2.41	2.41	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	19.200	7.89	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.41	2.41	2.41	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	19.100	7.89	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.42	2.42	2.42	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	19.000	7.88	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.42	2.42	2.42	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	18.900	7.88	2.88	0.08	0.00	0.00	0.00	0.00	0.00	2.42	2.42	2.42	0.02	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	18.800	7.88	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.43	2.43	2.43	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	18.700	7.87	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.43	2.43	2.43	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	18.600	7.87	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.43	2.43	2.43	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	18.500	7.87	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.44	2.44	2.44	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	18.400	7.87	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.44	2.44	2.44	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	18.300	7.86	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.44	2.44	2.44	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	18.200	7.86	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.45	2.45	2.45	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	18.100	7.86	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.45	2.45	2.45	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	18.000	7.85	2.89	0.08	0.00	0.00	0.00	0.00	0.00	2.45	2.45	2.45	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	17.900	7.85	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.46	2.46	2.46	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	17.800	7.85	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.46	2.46	2.46	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	17.700	7.84	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.46	2.46	2.46	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	17.600	7.84	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.47	2.47	2.47	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	17.500	7.84	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.47	2.47	2.47	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	17.400	7.84	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.47	2.47	2.47	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	17.300	7.83	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.48	2.48	2.48	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	17.200	7.83	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.48	2.48	2.48	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	17.100	7.83	2.90	0.08	0.00	0.00	0.00	0.00	0.00	2.48	2.48	2.48	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	17.000	7.82	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.49	2.49	2.49	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	16.900	7.82	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.49	2.49	2.49	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	16.800	7.82	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.49	2.49	2.49	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	16.700	7.82	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.50	2.50	2.50	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	16.600	7.81	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.50	2.50	2.50	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	16.500	7.81	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.50	2.50	2.50	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	16.400	7.81	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.51	2.51	2.51	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	16.300	7.80	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.51	2.51	2.51	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47	16.200	7.80	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.51	2.51	2.51	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	16.100	7.80	2.91	0.08	0.00	0.00	0.00	0.00	0.00	2.52	2.52	2.52	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	16.000	7.79	4.21	0.08	0.00	0.00	0.00	0.00	0.00	2.52	2.52	2.52	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	15.900	7.79	4.21	0.08	0.00	0.00	0.00	0.00	0.00	2.52	2.52	2.52	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	15.800	7.79	4.21	0.08	0.00	0.00	0.00	0.00	0.00	2.53	2.53	2.53	0.02	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15.700	7.79	4.21	0.08	0.00	0.00	0.00	0.00	0.00	2.53	2.53	2.53	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	15.600	7.78	4.21	0.08	0.00	0.00	0.00	0.00	0.00	2.53	2.53	2.53	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	15.500	7.78	4.21	0.08	0.00	0.00	0.00	0.00	0.00	2.54	2.54	2.54	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	15.400	7.78	4.22	0.08	0.00	0.00	0.00	0.00	0.00	2.54	2.54	2.54	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	15.300	7.77	4.22	0.08	0.00	0.00	0.00	0.00	0.00	2.54	2.54	2.54	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	15.200	7.77	4.22	0.08	0.00	0.00	0.00	0.00	0.00	2.55	2.55	2.55	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	15.100	7.77	4.22	0.08	0.00	0.00	0.00	0.00	0.00	2.55	2.55	2.55	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	15.000	7.77	4.22	0.08	0.00	0.00	0.00	0.00	0.00	2.55	2.55	2.55	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14.900	7.76	4.22	0.08	0.00	0.00	0.00	0.00	0.00	2.56	2.56	2.56	0.02	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	14.800	7.76	4.23	0.08	0.00	0.00	0.00	0.00	0.00	2.56	2.56	2.56	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	14.700	7.76	4.23	0.08	0.00	0.00	0.00	0.00	0.00	2.56	2.56	2.56	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	14.600	7.75	4.23	0.08	0.00	0.00	0.00	0.00	0.00	2.57	2.57	2.57	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

64	14.500	7.75	4.23	0.08	0.00	0.00	0.00	0.00	0.00	2.57	2.57	2.57	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	14.400	7.75	4.23	0.08	0.00	0.00	0.00	0.00	0.00	2.57	2.57	2.57	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	14.300	7.75	4.23	0.08	0.00	0.00	0.00	0.00	0.00	2.58	2.58	2.58	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	14.200	7.74	4.23	0.08	0.00	0.00	0.00	0.00	0.00	2.58	2.58	2.58	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14.100	7.74	4.24	0.08	0.00	0.00	0.00	0.00	0.00	2.58	2.58	2.58	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	14.000	7.74	4.24	0.08	0.00	0.00	0.00	0.00	0.00	2.59	2.59	2.59	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	13.900	7.73	4.24	0.08	0.00	0.00	0.00	0.00	0.00	2.59	2.59	2.59	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	13.800	7.73	4.24	0.08	0.00	0.00	0.00	0.00	0.00	2.60	2.60	2.60	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	13.700	7.73	4.24	0.08	0.00	0.00	0.00	0.00	0.00	2.60	2.60	2.60	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	13.600	7.73	4.24	0.08	0.00	0.00	0.00	0.00	0.00	2.60	2.60	2.60	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	13.500	7.72	4.25	0.08	0.00	0.00	0.00	0.00	0.00	2.61	2.61	2.61	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	13.400	7.72	4.25	0.08	0.00	0.00	0.00	0.00	0.00	2.61	2.61	2.61	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	13.300	7.72	4.25	0.08	0.00	0.00	0.00	0.00	0.00	2.61	2.61	2.61	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	13.200	7.71	4.25	0.08	0.00	0.00	0.00	0.00	0.00	2.62	2.62	2.62	0.02	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	13.100	7.71	4.25	0.08	0.00	0.00	0.00	0.00	0.00	2.62	2.62	2.62	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	13.000	7.71	4.25	0.08	0.00	0.00	0.00	0.00	0.00	2.62	2.62	2.62	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	12.900	7.71	4.26	0.08	0.00	0.00	0.00	0.00	0.00	2.63	2.63	2.63	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	12.800	7.70	4.26	0.08	0.00	0.00	0.00	0.00	0.00	2.63	2.63	2.63	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	12.700	7.70	4.26	0.08	0.00	0.00	0.00	0.00	0.00	2.63	2.63	2.63	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	12.600	7.70	4.26	0.08	0.00	0.00	0.00	0.00	0.00	2.64	2.64	2.64	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	12.500	7.69	4.26	0.08	0.00	0.00	0.00	0.00	0.00	2.64	2.64	2.64	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	12.400	7.69	4.26	0.08	0.00	0.00	0.00	0.00	0.00	2.64	2.64	2.64	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	12.300	7.69	4.26	0.08	0.00	0.00	0.00	0.00	0.00	2.65	2.65	2.65	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	12.200	7.69	4.27	0.08	0.00	0.00	0.00	0.00	0.00	2.65	2.65	2.65	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	12.100	7.68	4.27	0.08	0.00	0.00	0.00	0.00	0.00	2.65	2.65	2.65	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	12.000	7.68	4.27	0.08	0.00	0.00	0.00	0.00	0.00	2.66	2.66	2.66	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	11.900	7.68	4.27	0.08	0.00	0.00	0.00	0.00	0.00	2.66	2.66	2.66	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	11.800	7.67	4.27	0.08	0.00	0.00	0.00	0.00	0.00	2.67	2.67	2.67	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	11.700	7.67	4.27	0.08	0.00	0.00	0.00	0.00	0.00	2.67	2.67	2.67	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93	11.600	7.67	4.28	0.08	0.00	0.00	0.00	0.00	0.00	2.67	2.67	2.67	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94	11.500	7.67	4.28	0.08	0.00	0.00	0.00	0.00	0.00	2.68	2.68	2.68	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	11.400	7.66	4.28	0.08	0.00	0.00	0.00	0.00	0.00	2.68	2.68	2.68	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96	11.300	7.66	4.28	0.08	0.00	0.00	0.00	0.00	0.00	2.68	2.68	2.68	0.02	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97	11.200	7.66	4.28	0.08	0.00	0.00	0.00	0.00	0.00	2.69	2.69	2.69	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	11.100	7.65	4.28	0.08	0.00	0.00	0.00	0.00	0.00	2.69	2.69	2.69	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	11.000	7.65	4.29	0.08	0.00	0.00	0.00	0.00	0.00	2.69	2.69	2.69	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	10.900	7.65	4.29	0.08	0.00	0.00	0.00	0.00	0.00	2.70	2.70	2.70	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
101	10.800	7.65	4.29	0.08	0.00	0.00	0.00	0.00	0.00	2.70	2.70	2.70	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102	10.700	7.64	4.29	0.08	0.00	0.00	0.00	0.00	0.00	2.70	2.70	2.70	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103	10.600	7.64	4.29	0.08	0.00	0.00	0.00	0.00	0.00	2.71	2.71	2.71	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104	10.500	7.64	4.29	0.08	0.00	0.00	0.00	0.00	0.00	2.71	2.71	2.71	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10.400	7.63	4.29	0.08	0.00	0.00	0.00	0.00	0.00	2.72	2.72	2.72	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106	10.300	7.63	4.30	0.08	0.00	0.00	0.00	0.00	0.00	2.72	2.72	2.72	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
107	10.200	7.63	4.30	0.08	0.00	0.00	0.00	0.00	0.00	2.72	2.72	2.72	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108	10.100	7.63	4.30	0.09	0.00	0.00	0.00	0.00	0.00	2.73	2.73	2.73	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
109	10.000	7.62	4.30	0.09	0.00	0.00	0.00	0.00	0.00	2.73	2.73	2.73	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	9.900	7.62	4.30	0.09	0.00	0.00	0.00	0.00	0.00	2.73	2.73	2.73	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
111	9.800	7.62	4.30	0.09	0.00	0.00	0.00	0.00	0.00	2.74	2.74	2.74	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112	9.700	7.61	4.31	0.09	0.00	0.00	0.00	0.00	0.00	2.74	2.74	2.74	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	9.600	7.61	4.31	0.09	0.00	0.00	0.00	0.00	0.00	2.74	2.74	2.74	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
114	9.500	7.61	4.31	0.09	0.00	0.00	0.00	0.00	0.00	2.75	2.75	2.75	0.02	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

115	9.400	7.61	4.31	0.09	0.00	0.00	0.00	0.00	0.00	2.75	2.75	2.75	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
116	9.300	7.60	4.31	0.09	0.00	0.00	0.00	0.00	0.00	2.76	2.76	2.76	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
117	9.200	7.60	4.31	0.09	0.00	0.00	0.00	0.00	0.00	2.76	2.76	2.76	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
118	9.100	7.60	4.32	0.09	0.00	0.00	0.00	0.00	0.00	2.76	2.76	2.76	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
119	9.000	7.60	4.32	0.09	0.00	0.00	0.00	0.00	0.00	2.77	2.77	2.77	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	8.900	7.59	4.32	0.09	0.00	0.00	0.00	0.00	0.00	2.77	2.77	2.77	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
121	8.800	7.59	4.32	0.09	0.00	0.00	0.00	0.00	0.00	2.77	2.77	2.77	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
122	8.700	7.59	4.32	0.09	0.00	0.00	0.00	0.00	0.00	2.78	2.78	2.78	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
123	8.600	7.58	4.32	0.09	0.00	0.00	0.00	0.00	0.00	2.78	2.78	2.78	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
124	8.500	7.58	4.32	0.09	0.00	0.00	0.00	0.00	0.00	2.79	2.79	2.79	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	8.400	7.58	4.33	0.09	0.00	0.00	0.00	0.00	0.00	2.79	2.79	2.79	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	8.300	7.58	4.89	0.09	0.00	0.00	0.00	0.00	0.00	2.79	2.79	2.79	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
127	8.200	7.57	4.90	0.09	0.00	0.00	0.00	0.00	0.00	2.80	2.80	2.80	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
128	8.100	7.57	4.90	0.09	0.00	0.00	0.00	0.00	0.00	2.80	2.80	2.80	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
129	8.000	7.57	4.90	0.09	0.00	0.00	0.00	0.00	0.00	2.80	2.80	2.80	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	7.900	7.56	4.90	0.09	0.00	0.00	0.00	0.00	0.00	2.81	2.81	2.81	0.02	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
131	7.800	7.56	4.90	0.09	0.00	0.00	0.00	0.00	0.00	2.81	2.81	2.81	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
132	7.700	7.56	4.90	0.09	0.00	0.00	0.00	0.00	0.00	2.82	2.82	2.82	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
133	7.600	7.56	4.91	0.09	0.00	0.00	0.00	0.00	0.00	2.82	2.82	2.82	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
134	7.500	7.55	4.91	0.09	0.00	0.00	0.00	0.00	0.00	2.82	2.82	2.82	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	7.400	7.55	4.91	0.09	0.00	0.00	0.00	0.00	0.00	2.83	2.83	2.83	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
136	7.300	7.55	4.91	0.09	0.00	0.00	0.00	0.00	0.00	2.83	2.83	2.83	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
137	7.200	7.55	4.91	0.09	0.00	0.00	0.00	0.00	0.00	2.83	2.83	2.83	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
138	7.100	7.54	4.92	0.09	0.00	0.00	0.00	0.00	0.00	2.84	2.84	2.84	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
139	7.000	7.54	4.92	0.09	0.00	0.00	0.00	0.00	0.00	2.84	2.84	2.84	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	6.900	7.54	4.92	0.09	0.00	0.00	0.00	0.00	0.00	2.85	2.85	2.85	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
141	6.800	7.53	4.92	0.09	0.00	0.00	0.00	0.00	0.00	2.85	2.85	2.85	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
142	6.700	7.53	4.92	0.09	0.00	0.00	0.00	0.00	0.00	2.85	2.85	2.85	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
143	6.600	7.53	4.92	0.09	0.00	0.00	0.00	0.00	0.00	2.86	2.86	2.86	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
144	6.500	7.53	4.93	0.09	0.00	0.00	0.00	0.00	0.00	2.86	2.86	2.86	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	6.400	7.52	4.93	0.09	0.00	0.00	0.00	0.00	0.00	2.86	2.86	2.86	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
146	6.300	7.52	4.93	0.09	0.00	0.00	0.00	0.00	0.00	2.87	2.87	2.87	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
147	6.200	7.52	4.93	0.09	0.00	0.00	0.00	0.00	0.00	2.87	2.87	2.87	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
148	6.100	7.52	4.93	0.09	0.00	0.00	0.00	0.00	0.00	2.88	2.88	2.88	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
149	6.000	7.51	4.94	0.09	0.00	0.00	0.00	0.00	0.00	2.88	2.88	2.88	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	5.900	7.51	4.94	0.09	0.00	0.00	0.00	0.00	0.00	2.88	2.88	2.88	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
151	5.800	7.51	4.94	0.09	0.00	0.00	0.00	0.00	0.00	2.89	2.89	2.89	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
152	5.700	7.50	4.94	0.09	0.00	0.00	0.00	0.00	0.00	2.89	2.89	2.89	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	5.600	7.50	4.94	0.09	0.00	0.00	0.00	0.00	0.00	2.89	2.89	2.89	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
154	5.500	7.50	4.94	0.09	0.00	0.00	0.00	0.00	0.00	2.90	2.90	2.90	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	5.400	7.50	4.95	0.09	0.00	0.00	0.00	0.00	0.00	2.90	2.90	2.90	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
156	5.300	7.49	4.95	0.09	0.00	0.00	0.00	0.00	0.00	2.91	2.91	2.91	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157	5.200	7.49	4.95	0.09	0.00	0.00	0.00	0.00	0.00	2.91	2.91	2.91	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
158	5.100	7.49	4.97	0.09	0.00	0.00	0.00	0.00	0.00	2.91	2.91	2.91	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
159	5.000	7.49	4.97	0.09	0.00	0.00	0.00	0.00	0.00	2.92	2.92	2.92	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	4.900	7.48	4.97	0.09	0.00	0.00	0.00	0.00	0.00	2.92	2.92	2.92	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
161	4.800	7.48	4.97	0.09	0.00	0.00	0.00	0.00	0.00	2.93	2.93	2.93	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
162	4.700	7.48	4.97	0.09	0.00	0.00	0.00	0.00	0.00	2.93	2.93	2.93	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
163	4.600	7.47	4.97	0.09	0.00	0.00	0.00	0.00	0.00	2.93	2.93	2.93	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
164	4.500	7.47	4.98	0.09	0.00	0.00	0.00	0.00	0.00	2.94	2.94	2.94	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	4.400	7.47	4.98	0.09	0.00	0.00	0.00	0.00	0.00	2.94	2.94	2.94	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

166	4.300	7.47	4.98	0.09	0.00	0.00	0.00	0.00	0.00	2.95	2.95	2.95	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
167	4.200	7.46	4.98	0.09	0.00	0.00	0.00	0.00	0.00	2.95	2.95	2.95	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
168	4.100	7.46	4.98	0.09	0.00	0.00	0.00	0.00	0.00	2.95	2.95	2.95	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
169	4.000	7.46	4.99	0.09	0.00	0.00	0.00	0.00	0.00	2.96	2.96	2.96	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	3.900	7.46	4.99	0.09	0.00	0.00	0.00	0.00	0.00	2.96	2.96	2.96	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
171	3.800	7.45	4.99	0.09	0.00	0.00	0.00	0.00	0.00	2.97	2.97	2.97	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
172	3.700	7.45	4.99	0.09	0.00	0.00	0.00	0.00	0.00	2.97	2.97	2.97	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
173	3.600	7.45	4.99	0.09	0.00	0.00	0.00	0.00	0.00	2.97	2.97	2.97	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
174	3.500	7.44	4.99	0.09	0.00	0.00	0.00	0.00	0.00	2.98	2.98	2.98	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	3.400	7.44	5.00	0.09	0.00	0.00	0.00	0.00	0.00	2.98	2.98	2.98	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
176	3.300	7.44	5.00	0.09	0.00	0.00	0.00	0.00	0.00	2.99	2.99	2.99	0.02	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
177	3.200	7.44	5.00	0.09	0.00	0.00	0.00	0.00	0.00	2.99	2.99	2.99	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
178	3.100	7.43	5.00	0.09	0.00	0.00	0.00	0.00	0.00	2.99	2.99	2.99	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
179	3.000	7.43	5.00	0.09	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	2.900	7.43	5.01	0.09	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
181	2.800	7.43	5.01	0.09	0.00	0.00	0.00	0.00	0.00	3.01	3.01	3.01	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
182	2.700	7.42	5.01	0.09	0.00	0.00	0.00	0.00	0.00	3.01	3.01	3.01	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
183	2.600	7.42	5.01	0.09	0.00	0.00	0.00	0.00	0.00	3.01	3.01	3.01	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
184	2.500	7.42	5.01	0.09	0.00	0.00	0.00	0.00	0.00	3.02	3.02	3.02	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	2.400	7.41	5.01	0.09	0.00	0.00	0.00	0.00	0.00	3.02	3.02	3.02	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
186	2.300	7.41	5.02	0.09	0.00	0.00	0.00	0.00	0.00	3.03	3.03	3.03	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
187	2.200	7.41	5.02	0.09	0.00	0.00	0.00	0.00	0.00	3.03	3.03	3.03	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
188	2.100	7.41	5.02	0.09	0.00	0.00	0.00	0.00	0.00	3.03	3.03	3.03	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
189	2.000	7.40	5.02	0.09	0.00	0.00	0.00	0.00	0.00	3.04	3.04	3.04	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
190	1.900	7.40	5.02	0.09	0.00	0.00	0.00	0.00	0.00	3.04	3.04	3.04	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
191	1.800	7.40	5.03	0.09	0.00	0.00	0.00	0.00	0.00	3.05	3.05	3.05	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
192	1.700	7.40	5.03	0.09	0.00	0.00	0.00	0.00	0.00	3.05	3.05	3.05	0.02	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
193	1.600	7.39	5.03	0.09	0.00	0.00	0.00	0.00	0.00	3.05	3.05	3.05	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
194	1.500	7.39	5.03	0.09	0.00	0.00	0.00	0.00	0.00	3.06	3.06	3.06	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
195	1.400	7.39	5.03	0.09	0.00	0.00	0.00	0.00	0.00	3.06	3.06	3.06	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
196	1.300	7.39	5.03	0.09	0.00	0.00	0.00	0.00	0.00	3.07	3.07	3.07	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
197	1.200	7.38	5.04	0.09	0.00	0.00	0.00	0.00	0.00	3.07	3.07	3.07	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
198	1.100	7.38	5.04	0.09	0.00	0.00	0.00	0.00	0.00	3.07	3.07	3.07	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
199	1.000	7.38	5.04	0.09	0.00	0.00	0.00	0.00	0.00	3.08	3.08	3.08	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.900	7.37	5.04	0.09	0.00	0.00	0.00	0.00	0.00	3.08	3.08	3.08	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
201	0.800	7.37	5.04	0.09	0.00	0.00	0.00	0.00	0.00	3.09	3.09	3.09	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202	0.700	7.37	5.04	0.09	0.00	0.00	0.00	0.00	0.00	3.09	3.09	3.09	0.03	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
203	0.600	7.37	8.06	0.09	0.00	0.00	0.00	0.00	0.00	3.09	3.09	3.09	0.03	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			3.54	0.05	0.00	0.00	0.00	0.00	0.00	1.50			0.02	0.00	0.18	0.00	0.00	0.00			0.00	0.00	0.00

* g/m²/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 g/m³	COLI #/100mL	NCM
1	20.800	27.22	0.00	0.00	0.00	4.61	11.79	0.00	11.79	0.00	1.72	0.10	0.14	1.96	0.00	0.00	0.00	0.	0.00
2	20.700	27.24	0.00	0.00	0.00	4.62	11.63	0.00	11.63	0.00	1.70	0.12	0.30	2.13	0.00	0.00	0.00	0.	0.00

3	20.600	27.26	0.00	0.00	0.00	4.61	11.51	0.00	11.51	0.00	1.68	0.13	0.48	2.29	0.00	0.00	0.00	0.	0.00
4	20.500	27.28	0.00	0.00	0.00	4.61	11.42	0.00	11.42	0.00	1.66	0.13	0.66	2.45	0.00	0.00	0.00	0.	0.00
5	20.400	27.31	0.00	0.00	0.00	4.60	11.35	0.00	11.35	0.00	1.64	0.13	0.84	2.61	0.00	0.00	0.00	0.	0.00
6	20.300	27.33	0.00	0.00	0.00	4.60	11.29	0.00	11.29	0.00	1.63	0.13	1.02	2.78	0.00	0.00	0.00	0.	0.00
7	20.200	27.35	0.00	0.00	0.00	4.60	11.25	0.00	11.25	0.00	1.61	0.13	1.20	2.94	0.00	0.00	0.00	0.	0.00
8	20.100	27.37	0.00	0.00	0.00	4.59	11.22	0.00	11.22	0.00	1.60	0.13	1.37	3.10	0.00	0.00	0.00	0.	0.00
9	20.000	27.39	0.00	0.00	0.00	4.59	11.19	0.00	11.19	0.00	1.59	0.13	1.55	3.27	0.00	0.00	0.00	0.	0.00
10	19.900	27.41	0.00	0.00	0.00	4.58	11.17	0.00	11.17	0.00	1.58	0.13	1.72	3.43	0.00	0.00	0.00	0.	0.00
11	19.800	27.43	0.00	0.00	0.00	4.58	11.15	0.00	11.15	0.00	1.57	0.13	1.90	3.59	0.00	0.00	0.00	0.	0.00
12	19.700	27.45	0.00	0.00	0.00	4.57	11.13	0.00	11.13	0.00	1.56	0.12	2.07	3.75	0.00	0.00	0.00	0.	0.00
13	19.600	27.48	0.00	0.00	0.00	4.57	11.11	0.00	11.11	0.00	1.55	0.12	2.24	3.92	0.00	0.00	0.00	0.	0.00
14	19.500	27.50	0.00	0.00	0.00	4.56	11.10	0.00	11.10	0.00	1.54	0.12	2.41	4.08	0.00	0.00	0.00	0.	0.00
15	19.400	27.52	0.00	0.00	0.00	4.55	11.08	0.00	11.08	0.00	1.54	0.12	2.58	4.24	0.00	0.00	0.00	0.	0.00
16	19.300	27.54	0.00	0.00	0.00	4.55	11.07	0.00	11.07	0.00	1.53	0.12	2.75	4.41	0.00	0.00	0.00	0.	0.00
17	19.200	27.56	0.00	0.00	0.00	4.54	11.06	0.00	11.06	0.00	1.53	0.12	2.92	4.57	0.00	0.00	0.00	0.	0.00
18	19.100	27.58	0.00	0.00	0.00	4.54	11.05	0.00	11.05	0.00	1.52	0.12	3.09	4.73	0.00	0.00	0.00	0.	0.00
19	19.000	27.60	0.00	0.00	0.00	4.53	11.04	0.00	11.04	0.00	1.52	0.12	3.26	4.90	0.00	0.00	0.00	0.	0.00
20	18.900	27.62	0.00	0.00	0.00	4.53	11.02	0.00	11.02	0.00	1.51	0.12	3.42	5.06	0.00	0.00	0.00	0.	0.00
21	18.800	27.64	0.00	0.00	0.00	4.52	11.01	0.00	11.01	0.00	1.51	0.12	3.59	5.22	0.00	0.00	0.00	0.	0.00
22	18.700	27.67	0.00	0.00	0.00	4.52	11.00	0.00	11.00	0.00	1.51	0.12	3.76	5.38	0.00	0.00	0.00	0.	0.00
23	18.600	27.69	0.00	0.00	0.00	4.51	10.99	0.00	10.99	0.00	1.50	0.12	3.93	5.55	0.00	0.00	0.00	0.	0.00
24	18.500	27.71	0.00	0.00	0.00	4.50	10.98	0.00	10.98	0.00	1.50	0.12	4.09	5.71	0.00	0.00	0.00	0.	0.00
25	18.400	27.73	0.00	0.00	0.00	4.50	10.97	0.00	10.97	0.00	1.50	0.12	4.26	5.87	0.00	0.00	0.00	0.	0.00
26	18.300	27.75	0.00	0.00	0.00	4.49	10.96	0.00	10.96	0.00	1.49	0.12	4.42	6.04	0.00	0.00	0.00	0.	0.00
27	18.200	27.77	0.00	0.00	0.00	4.49	10.95	0.00	10.95	0.00	1.49	0.12	4.59	6.20	0.00	0.00	0.00	0.	0.00
28	18.100	27.79	0.00	0.00	0.00	4.48	10.94	0.00	10.94	0.00	1.49	0.12	4.75	6.36	0.00	0.00	0.00	0.	0.00
29	18.000	27.81	0.00	0.00	0.00	4.48	10.93	0.00	10.93	0.00	1.49	0.12	4.92	6.52	0.00	0.00	0.00	0.	0.00
30	17.900	27.84	0.00	0.00	0.00	4.47	10.92	0.00	10.92	0.00	1.49	0.12	5.08	6.69	0.00	0.00	0.00	0.	0.00
31	17.800	27.86	0.00	0.00	0.00	4.47	10.91	0.00	10.91	0.00	1.48	0.12	5.25	6.85	0.00	0.00	0.00	0.	0.00
32	17.700	27.88	0.00	0.00	0.00	4.46	10.89	0.00	10.89	0.00	1.48	0.12	5.41	7.01	0.00	0.00	0.00	0.	0.00
33	17.600	27.90	0.00	0.00	0.00	4.45	10.88	0.00	10.88	0.00	1.48	0.12	5.58	7.18	0.00	0.00	0.00	0.	0.00
34	17.500	27.92	0.00	0.00	0.00	4.45	10.87	0.00	10.87	0.00	1.48	0.12	5.74	7.34	0.00	0.00	0.00	0.	0.00
35	17.400	27.94	0.00	0.00	0.00	4.44	10.86	0.00	10.86	0.00	1.48	0.11	5.91	7.50	0.00	0.00	0.00	0.	0.00
36	17.300	27.96	0.00	0.00	0.00	4.44	10.85	0.00	10.85	0.00	1.48	0.11	6.07	7.66	0.00	0.00	0.00	0.	0.00
37	17.200	27.98	0.00	0.00	0.00	4.43	10.84	0.00	10.84	0.00	1.48	0.11	6.24	7.83	0.00	0.00	0.00	0.	0.00
38	17.100	28.00	0.00	0.00	0.00	4.43	10.83	0.00	10.83	0.00	1.48	0.11	6.40	7.99	0.00	0.00	0.00	0.	0.00
39	17.000	28.03	0.00	0.00	0.00	4.42	10.82	0.00	10.82	0.00	1.47	0.11	6.57	8.15	0.00	0.00	0.00	0.	0.00
40	16.900	28.05	0.00	0.00	0.00	4.41	10.81	0.00	10.81	0.00	1.47	0.11	6.73	8.32	0.00	0.00	0.00	0.	0.00
41	16.800	28.07	0.00	0.00	0.00	4.41	10.80	0.00	10.80	0.00	1.47	0.11	6.89	8.48	0.00	0.00	0.00	0.	0.00
42	16.700	28.09	0.00	0.00	0.00	4.40	10.79	0.00	10.79	0.00	1.47	0.11	7.06	8.64	0.00	0.00	0.00	0.	0.00
43	16.600	28.11	0.00	0.00	0.00	4.40	10.78	0.00	10.78	0.00	1.47	0.11	7.22	8.80	0.00	0.00	0.00	0.	0.00
44	16.500	28.13	0.00	0.00	0.00	4.39	10.77	0.00	10.77	0.00	1.47	0.11	7.39	8.97	0.00	0.00	0.00	0.	0.00
45	16.400	28.15	0.00	0.00	0.00	4.39	10.76	0.00	10.76	0.00	1.47	0.11	7.55	9.13	0.00	0.00	0.00	0.	0.00
46	16.300	28.17	0.00	0.00	0.00	4.38	10.75	0.00	10.75	0.00	1.47	0.11	7.71	9.29	0.00	0.00	0.00	0.	0.00
47	16.200	28.20	0.00	0.00	0.00	4.37	10.74	0.00	10.74	0.00	1.47	0.11	7.88	9.46	0.00	0.00	0.00	0.	0.00
48	16.100	28.22	0.00	0.00	0.00	4.37	10.73	0.00	10.73	0.00	1.47	0.11	8.04	9.62	0.00	0.00	0.00	0.	0.00
49	16.000	28.24	0.00	0.00	0.00	4.57	11.98	0.00	11.98	0.00	1.75	0.05	0.08	1.88	0.00	0.00	0.00	0.	0.00
50	15.900	28.26	0.00	0.00	0.00	4.71	11.98	0.00	11.98	0.00	1.75	0.05	0.08	1.88	0.00	0.00	0.00	0.	0.00
51	15.800	28.28	0.00	0.00	0.00	4.82	11.97	0.00	11.97	0.00	1.75	0.05	0.08	1.88	0.00	0.00	0.00	0.	0.00
52	15.700	28.30	0.00	0.00	0.00	4.92	11.97	0.00	11.97	0.00	1.75	0.06	0.08	1.89	0.00	0.00	0.00	0.	0.00
53	15.600	28.32	0.00	0.00	0.00	5.00	11.96	0.00	11.96	0.00	1.75	0.06	0.09	1.89	0.00	0.00	0.00	0.	0.00

54	15.500	28.34	0.00	0.00	0.00	5.06	11.96	0.00	11.96	0.00	1.75	0.06	0.09	1.89	0.00	0.00	0.00	0.	0.00
55	15.400	28.37	0.00	0.00	0.00	5.12	11.95	0.00	11.95	0.00	1.74	0.06	0.09	1.89	0.00	0.00	0.00	0.	0.00
56	15.300	28.39	0.00	0.00	0.00	5.16	11.95	0.00	11.95	0.00	1.74	0.06	0.09	1.89	0.00	0.00	0.00	0.	0.00
57	15.200	28.41	0.00	0.00	0.00	5.19	11.94	0.00	11.94	0.00	1.74	0.06	0.09	1.89	0.00	0.00	0.00	0.	0.00
58	15.100	28.43	0.00	0.00	0.00	5.22	11.94	0.00	11.94	0.00	1.74	0.06	0.09	1.90	0.00	0.00	0.00	0.	0.00
59	15.000	28.45	0.00	0.00	0.00	5.24	11.93	0.00	11.93	0.00	1.74	0.06	0.09	1.90	0.00	0.00	0.00	0.	0.00
60	14.900	28.47	0.00	0.00	0.00	5.26	11.93	0.00	11.93	0.00	1.74	0.06	0.09	1.90	0.00	0.00	0.00	0.	0.00
61	14.800	28.49	0.00	0.00	0.00	5.28	11.92	0.00	11.92	0.00	1.74	0.06	0.09	1.90	0.00	0.00	0.00	0.	0.00
62	14.700	28.51	0.00	0.00	0.00	5.29	11.92	0.00	11.92	0.00	1.74	0.07	0.09	1.90	0.00	0.00	0.00	0.	0.00
63	14.600	28.53	0.00	0.00	0.00	5.29	11.91	0.00	11.91	0.00	1.74	0.07	0.09	1.90	0.00	0.00	0.00	0.	0.00
64	14.500	28.56	0.00	0.00	0.00	5.30	11.90	0.00	11.90	0.00	1.74	0.07	0.10	1.91	0.00	0.00	0.00	0.	0.00
65	14.400	28.58	0.00	0.00	0.00	5.30	11.90	0.00	11.90	0.00	1.74	0.07	0.10	1.91	0.00	0.00	0.00	0.	0.00
66	14.300	28.60	0.00	0.00	0.00	5.31	11.89	0.00	11.89	0.00	1.74	0.07	0.10	1.91	0.00	0.00	0.00	0.	0.00
67	14.200	28.62	0.00	0.00	0.00	5.31	11.89	0.00	11.89	0.00	1.74	0.07	0.10	1.91	0.00	0.00	0.00	0.	0.00
68	14.100	28.64	0.00	0.00	0.00	5.31	11.88	0.00	11.88	0.00	1.74	0.07	0.10	1.91	0.00	0.00	0.00	0.	0.00
69	14.000	28.66	0.00	0.00	0.00	5.31	11.88	0.00	11.88	0.00	1.74	0.07	0.10	1.91	0.00	0.00	0.00	0.	0.00
70	13.900	28.68	0.00	0.00	0.00	5.30	11.87	0.00	11.87	0.00	1.74	0.07	0.10	1.91	0.00	0.00	0.00	0.	0.00
71	13.800	28.70	0.00	0.00	0.00	5.30	11.87	0.00	11.87	0.00	1.74	0.07	0.10	1.92	0.00	0.00	0.00	0.	0.00
72	13.700	28.73	0.00	0.00	0.00	5.30	11.86	0.00	11.86	0.00	1.74	0.07	0.10	1.92	0.00	0.00	0.00	0.	0.00
73	13.600	28.75	0.00	0.00	0.00	5.30	11.86	0.00	11.86	0.00	1.74	0.08	0.11	1.92	0.00	0.00	0.00	0.	0.00
74	13.500	28.77	0.00	0.00	0.00	5.29	11.85	0.00	11.85	0.00	1.74	0.08	0.11	1.92	0.00	0.00	0.00	0.	0.00
75	13.400	28.79	0.00	0.00	0.00	5.29	11.84	0.00	11.84	0.00	1.74	0.08	0.11	1.92	0.00	0.00	0.00	0.	0.00
76	13.300	28.81	0.00	0.00	0.00	5.29	11.84	0.00	11.84	0.00	1.74	0.08	0.11	1.92	0.00	0.00	0.00	0.	0.00
77	13.200	28.83	0.00	0.00	0.00	5.28	11.83	0.00	11.83	0.00	1.74	0.08	0.11	1.93	0.00	0.00	0.00	0.	0.00
78	13.100	28.85	0.00	0.00	0.00	5.28	11.83	0.00	11.83	0.00	1.74	0.08	0.11	1.93	0.00	0.00	0.00	0.	0.00
79	13.000	28.87	0.00	0.00	0.00	5.27	11.82	0.00	11.82	0.00	1.74	0.08	0.11	1.93	0.00	0.00	0.00	0.	0.00
80	12.900	28.89	0.00	0.00	0.00	5.27	11.82	0.00	11.82	0.00	1.74	0.08	0.11	1.93	0.00	0.00	0.00	0.	0.00
81	12.800	28.92	0.00	0.00	0.00	5.26	11.81	0.00	11.81	0.00	1.74	0.08	0.12	1.93	0.00	0.00	0.00	0.	0.00
82	12.700	28.94	0.00	0.00	0.00	5.26	11.80	0.00	11.80	0.00	1.74	0.08	0.12	1.93	0.00	0.00	0.00	0.	0.00
83	12.600	28.96	0.00	0.00	0.00	5.25	11.80	0.00	11.80	0.00	1.74	0.08	0.12	1.94	0.00	0.00	0.00	0.	0.00
84	12.500	28.98	0.00	0.00	0.00	5.25	11.79	0.00	11.79	0.00	1.74	0.08	0.12	1.94	0.00	0.00	0.00	0.	0.00
85	12.400	29.00	0.00	0.00	0.00	5.24	11.79	0.00	11.79	0.00	1.73	0.08	0.12	1.94	0.00	0.00	0.00	0.	0.00
86	12.300	29.02	0.00	0.00	0.00	5.24	11.78	0.00	11.78	0.00	1.73	0.08	0.12	1.94	0.00	0.00	0.00	0.	0.00
87	12.200	29.04	0.00	0.00	0.00	5.23	11.78	0.00	11.78	0.00	1.73	0.08	0.12	1.94	0.00	0.00	0.00	0.	0.00
88	12.100	29.06	0.00	0.00	0.00	5.23	11.77	0.00	11.77	0.00	1.73	0.09	0.13	1.94	0.00	0.00	0.00	0.	0.00
89	12.000	29.09	0.00	0.00	0.00	5.22	11.76	0.00	11.76	0.00	1.73	0.09	0.13	1.95	0.00	0.00	0.00	0.	0.00
90	11.900	29.11	0.00	0.00	0.00	5.22	11.76	0.00	11.76	0.00	1.73	0.09	0.13	1.95	0.00	0.00	0.00	0.	0.00
91	11.800	29.13	0.00	0.00	0.00	5.21	11.75	0.00	11.75	0.00	1.73	0.09	0.13	1.95	0.00	0.00	0.00	0.	0.00
92	11.700	29.15	0.00	0.00	0.00	5.21	11.75	0.00	11.75	0.00	1.73	0.09	0.13	1.95	0.00	0.00	0.00	0.	0.00
93	11.600	29.17	0.00	0.00	0.00	5.20	11.74	0.00	11.74	0.00	1.73	0.09	0.13	1.95	0.00	0.00	0.00	0.	0.00
94	11.500	29.19	0.00	0.00	0.00	5.20	11.73	0.00	11.73	0.00	1.73	0.09	0.13	1.95	0.00	0.00	0.00	0.	0.00
95	11.400	29.21	0.00	0.00	0.00	5.19	11.73	0.00	11.73	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
96	11.300	29.23	0.00	0.00	0.00	5.19	11.72	0.00	11.72	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
97	11.200	29.25	0.00	0.00	0.00	5.18	11.72	0.00	11.72	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
98	11.100	29.28	0.00	0.00	0.00	5.17	11.71	0.00	11.71	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
99	11.000	29.30	0.00	0.00	0.00	5.17	11.70	0.00	11.70	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
100	10.900	29.32	0.00	0.00	0.00	5.16	11.70	0.00	11.70	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
101	10.800	29.34	0.00	0.00	0.00	5.16	11.69	0.00	11.69	0.00	1.73	0.09	0.14	1.97	0.00	0.00	0.00	0.	0.00
102	10.700	29.36	0.00	0.00	0.00	5.15	11.68	0.00	11.68	0.00	1.73	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
103	10.600	29.38	0.00	0.00	0.00	5.15	11.68	0.00	11.68	0.00	1.73	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
104	10.500	29.40	0.00	0.00	0.00	5.14	11.67	0.00	11.67	0.00	1.73	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00

105	10.400	29.42	0.00	0.00	0.00	5.14	11.67	0.00	11.67	0.00	1.73	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
106	10.300	29.45	0.00	0.00	0.00	5.13	11.66	0.00	11.66	0.00	1.73	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
107	10.200	29.47	0.00	0.00	0.00	5.13	11.65	0.00	11.65	0.00	1.73	0.09	0.15	1.98	0.00	0.00	0.00	0.	0.00
108	10.100	29.49	0.00	0.00	0.00	5.12	11.65	0.00	11.65	0.00	1.73	0.10	0.16	1.98	0.00	0.00	0.00	0.	0.00
109	10.000	29.51	0.00	0.00	0.00	5.12	11.64	0.00	11.64	0.00	1.73	0.10	0.16	1.98	0.00	0.00	0.00	0.	0.00
110	9.900	29.53	0.00	0.00	0.00	5.11	11.63	0.00	11.63	0.00	1.73	0.10	0.16	1.98	0.00	0.00	0.00	0.	0.00
111	9.800	29.55	0.00	0.00	0.00	5.11	11.63	0.00	11.63	0.00	1.73	0.10	0.16	1.98	0.00	0.00	0.00	0.	0.00
112	9.700	29.57	0.00	0.00	0.00	5.10	11.62	0.00	11.62	0.00	1.73	0.10	0.16	1.98	0.00	0.00	0.00	0.	0.00
113	9.600	29.59	0.00	0.00	0.00	5.10	11.61	0.00	11.61	0.00	1.73	0.10	0.16	1.99	0.00	0.00	0.00	0.	0.00
114	9.500	29.61	0.00	0.00	0.00	5.09	11.61	0.00	11.61	0.00	1.72	0.10	0.17	1.99	0.00	0.00	0.00	0.	0.00
115	9.400	29.64	0.00	0.00	0.00	5.09	11.60	0.00	11.60	0.00	1.72	0.10	0.17	1.99	0.00	0.00	0.00	0.	0.00
116	9.300	29.66	0.00	0.00	0.00	5.08	11.60	0.00	11.60	0.00	1.72	0.10	0.17	1.99	0.00	0.00	0.00	0.	0.00
117	9.200	29.68	0.00	0.00	0.00	5.08	11.59	0.00	11.59	0.00	1.72	0.10	0.17	1.99	0.00	0.00	0.00	0.	0.00
118	9.100	29.70	0.00	0.00	0.00	5.07	11.58	0.00	11.58	0.00	1.72	0.10	0.17	1.99	0.00	0.00	0.00	0.	0.00
119	9.000	29.72	0.00	0.00	0.00	5.07	11.58	0.00	11.58	0.00	1.72	0.10	0.17	2.00	0.00	0.00	0.00	0.	0.00
120	8.900	29.74	0.00	0.00	0.00	5.06	11.57	0.00	11.57	0.00	1.72	0.10	0.18	2.00	0.00	0.00	0.00	0.	0.00
121	8.800	29.76	0.00	0.00	0.00	5.06	11.56	0.00	11.56	0.00	1.72	0.10	0.18	2.00	0.00	0.00	0.00	0.	0.00
122	8.700	29.78	0.00	0.00	0.00	5.05	11.56	0.00	11.56	0.00	1.72	0.10	0.18	2.00	0.00	0.00	0.00	0.	0.00
123	8.600	29.81	0.00	0.00	0.00	5.04	11.55	0.00	11.55	0.00	1.72	0.10	0.18	2.00	0.00	0.00	0.00	0.	0.00
124	8.500	29.83	0.00	0.00	0.00	5.04	11.54	0.00	11.54	0.00	1.72	0.10	0.18	2.00	0.00	0.00	0.00	0.	0.00
125	8.400	29.85	0.00	0.00	0.00	5.03	11.54	0.00	11.54	0.00	1.72	0.10	0.18	2.01	0.00	0.00	0.00	0.	0.00
126	8.300	29.87	0.00	0.00	0.00	4.92	11.66	0.00	11.66	0.00	1.73	0.09	0.13	1.95	0.00	0.00	0.00	0.	0.00
127	8.200	29.89	0.00	0.00	0.00	4.98	11.65	0.00	11.65	0.00	1.73	0.09	0.14	1.95	0.00	0.00	0.00	0.	0.00
128	8.100	29.91	0.00	0.00	0.00	5.02	11.65	0.00	11.65	0.00	1.73	0.09	0.14	1.95	0.00	0.00	0.00	0.	0.00
129	8.000	29.93	0.00	0.00	0.00	5.06	11.64	0.00	11.64	0.00	1.73	0.09	0.14	1.95	0.00	0.00	0.00	0.	0.00
130	7.900	29.95	0.00	0.00	0.00	5.09	11.64	0.00	11.64	0.00	1.73	0.09	0.14	1.95	0.00	0.00	0.00	0.	0.00
131	7.800	29.97	0.00	0.00	0.00	5.12	11.63	0.00	11.63	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
132	7.700	30.00	0.00	0.00	0.00	5.14	11.63	0.00	11.63	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
133	7.600	30.02	0.00	0.00	0.00	5.16	11.62	0.00	11.62	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
134	7.500	30.04	0.00	0.00	0.00	5.18	11.62	0.00	11.62	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
135	7.400	30.06	0.00	0.00	0.00	5.19	11.61	0.00	11.61	0.00	1.73	0.09	0.14	1.96	0.00	0.00	0.00	0.	0.00
136	7.300	30.08	0.00	0.00	0.00	5.20	11.61	0.00	11.61	0.00	1.73	0.09	0.15	1.96	0.00	0.00	0.00	0.	0.00
137	7.200	30.10	0.00	0.00	0.00	5.21	11.60	0.00	11.60	0.00	1.73	0.09	0.15	1.96	0.00	0.00	0.00	0.	0.00
138	7.100	30.12	0.00	0.00	0.00	5.21	11.60	0.00	11.60	0.00	1.73	0.09	0.15	1.96	0.00	0.00	0.00	0.	0.00
139	7.000	30.14	0.00	0.00	0.00	5.22	11.59	0.00	11.59	0.00	1.73	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
140	6.900	30.17	0.00	0.00	0.00	5.22	11.58	0.00	11.58	0.00	1.72	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
141	6.800	30.19	0.00	0.00	0.00	5.22	11.58	0.00	11.58	0.00	1.72	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
142	6.700	30.21	0.00	0.00	0.00	5.22	11.57	0.00	11.57	0.00	1.72	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
143	6.600	30.23	0.00	0.00	0.00	5.22	11.57	0.00	11.57	0.00	1.72	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
144	6.500	30.25	0.00	0.00	0.00	5.22	11.56	0.00	11.56	0.00	1.72	0.09	0.15	1.97	0.00	0.00	0.00	0.	0.00
145	6.400	30.27	0.00	0.00	0.00	5.22	11.56	0.00	11.56	0.00	1.72	0.09	0.16	1.97	0.00	0.00	0.00	0.	0.00
146	6.300	30.29	0.00	0.00	0.00	5.22	11.55	0.00	11.55	0.00	1.72	0.09	0.16	1.97	0.00	0.00	0.00	0.	0.00
147	6.200	30.31	0.00	0.00	0.00	5.21	11.55	0.00	11.55	0.00	1.72	0.09	0.16	1.97	0.00	0.00	0.00	0.	0.00
148	6.100	30.33	0.00	0.00	0.00	5.21	11.54	0.00	11.54	0.00	1.72	0.09	0.16	1.98	0.00	0.00	0.00	0.	0.00
149	6.000	30.36	0.00	0.00	0.00	5.21	11.53	0.00	11.53	0.00	1.72	0.09	0.16	1.98	0.00	0.00	0.00	0.	0.00
150	5.900	30.38	0.00	0.00	0.00	5.20	11.53	0.00	11.53	0.00	1.72	0.09	0.16	1.98	0.00	0.00	0.00	0.	0.00
151	5.800	30.40	0.00	0.00	0.00	5.20	11.52	0.00	11.52	0.00	1.72	0.09	0.16	1.98	0.00	0.00	0.00	0.	0.00
152	5.700	30.42	0.00	0.00	0.00	5.20	11.52	0.00	11.52	0.00	1.72	0.09	0.16	1.98	0.00	0.00	0.00	0.	0.00
153	5.600	30.44	0.00	0.00	0.00	5.19	11.51	0.00	11.51	0.00	1.72	0.09	0.17	1.98	0.00	0.00	0.00	0.	0.00
154	5.500	30.46	0.00	0.00	0.00	5.19	11.51	0.00	11.51	0.00	1.72	0.09	0.17	1.98	0.00	0.00	0.00	0.	0.00
155	5.400	30.48	0.00	0.00	0.00	5.19	11.50	0.00	11.50	0.00	1.72	0.10	0.17	1.98	0.00	0.00	0.00	0.	0.00

156	5.300	30.50	0.00	0.00	0.00	5.18	11.49	0.00	11.49	0.00	1.72	0.10	0.17	1.99	0.00	0.00	0.00	0.	0.00
157	5.200	30.53	0.00	0.00	0.00	5.18	11.49	0.00	11.49	0.00	1.72	0.10	0.17	1.99	0.00	0.00	0.00	0.	0.00
158	5.100	30.55	0.00	0.00	0.00	5.17	11.46	0.00	11.46	0.00	1.73	0.13	0.17	2.03	0.00	0.00	0.00	0.	0.00
159	5.000	30.57	0.00	0.00	0.00	5.17	11.46	0.00	11.46	0.00	1.73	0.13	0.17	2.04	0.00	0.00	0.00	0.	0.00
160	4.900	30.59	0.00	0.00	0.00	5.16	11.45	0.00	11.45	0.00	1.73	0.13	0.18	2.04	0.00	0.00	0.00	0.	0.00
161	4.800	30.61	0.00	0.00	0.00	5.16	11.45	0.00	11.45	0.00	1.73	0.13	0.18	2.04	0.00	0.00	0.00	0.	0.00
162	4.700	30.63	0.00	0.00	0.00	5.15	11.44	0.00	11.44	0.00	1.73	0.13	0.18	2.04	0.00	0.00	0.00	0.	0.00
163	4.600	30.65	0.00	0.00	0.00	5.15	11.43	0.00	11.43	0.00	1.73	0.13	0.18	2.04	0.00	0.00	0.00	0.	0.00
164	4.500	30.67	0.00	0.00	0.00	5.14	11.43	0.00	11.43	0.00	1.73	0.13	0.18	2.04	0.00	0.00	0.00	0.	0.00
165	4.400	30.70	0.00	0.00	0.00	5.14	11.42	0.00	11.42	0.00	1.73	0.13	0.18	2.04	0.00	0.00	0.00	0.	0.00
166	4.300	30.72	0.00	0.00	0.00	5.13	11.42	0.00	11.42	0.00	1.73	0.13	0.19	2.04	0.00	0.00	0.00	0.	0.00
167	4.200	30.74	0.00	0.00	0.00	5.13	11.41	0.00	11.41	0.00	1.73	0.13	0.19	2.05	0.00	0.00	0.00	0.	0.00
168	4.100	30.76	0.00	0.00	0.00	5.12	11.41	0.00	11.41	0.00	1.73	0.13	0.19	2.05	0.00	0.00	0.00	0.	0.00
169	4.000	30.78	0.00	0.00	0.00	5.12	11.40	0.00	11.40	0.00	1.73	0.13	0.19	2.05	0.00	0.00	0.00	0.	0.00
170	3.900	30.80	0.00	0.00	0.00	5.11	11.39	0.00	11.39	0.00	1.73	0.13	0.19	2.05	0.00	0.00	0.00	0.	0.00
171	3.800	30.82	0.00	0.00	0.00	5.11	11.39	0.00	11.39	0.00	1.72	0.13	0.19	2.05	0.00	0.00	0.00	0.	0.00
172	3.700	30.84	0.00	0.00	0.00	5.10	11.38	0.00	11.38	0.00	1.72	0.13	0.20	2.05	0.00	0.00	0.00	0.	0.00
173	3.600	30.86	0.00	0.00	0.00	5.10	11.38	0.00	11.38	0.00	1.72	0.13	0.20	2.05	0.00	0.00	0.00	0.	0.00
174	3.500	30.89	0.00	0.00	0.00	5.09	11.37	0.00	11.37	0.00	1.72	0.13	0.20	2.05	0.00	0.00	0.00	0.	0.00
175	3.400	30.91	0.00	0.00	0.00	5.09	11.36	0.00	11.36	0.00	1.72	0.13	0.20	2.06	0.00	0.00	0.00	0.	0.00
176	3.300	30.93	0.00	0.00	0.00	5.08	11.36	0.00	11.36	0.00	1.72	0.13	0.20	2.06	0.00	0.00	0.00	0.	0.00
177	3.200	30.95	0.00	0.00	0.00	5.08	11.35	0.00	11.35	0.00	1.72	0.13	0.21	2.06	0.00	0.00	0.00	0.	0.00
178	3.100	30.97	0.00	0.00	0.00	5.07	11.35	0.00	11.35	0.00	1.72	0.13	0.21	2.06	0.00	0.00	0.00	0.	0.00
179	3.000	30.99	0.00	0.00	0.00	5.07	11.34	0.00	11.34	0.00	1.72	0.13	0.21	2.06	0.00	0.00	0.00	0.	0.00
180	2.900	31.01	0.00	0.00	0.00	5.06	11.33	0.00	11.33	0.00	1.72	0.13	0.21	2.06	0.00	0.00	0.00	0.	0.00
181	2.800	31.03	0.00	0.00	0.00	5.06	11.33	0.00	11.33	0.00	1.72	0.13	0.21	2.06	0.00	0.00	0.00	0.	0.00
182	2.700	31.06	0.00	0.00	0.00	5.05	11.32	0.00	11.32	0.00	1.72	0.13	0.21	2.06	0.00	0.00	0.00	0.	0.00
183	2.600	31.08	0.00	0.00	0.00	5.05	11.32	0.00	11.32	0.00	1.72	0.13	0.22	2.06	0.00	0.00	0.00	0.	0.00
184	2.500	31.10	0.00	0.00	0.00	5.04	11.31	0.00	11.31	0.00	1.72	0.13	0.22	2.07	0.00	0.00	0.00	0.	0.00
185	2.400	31.12	0.00	0.00	0.00	5.04	11.30	0.00	11.30	0.00	1.72	0.13	0.22	2.07	0.00	0.00	0.00	0.	0.00
186	2.300	31.14	0.00	0.00	0.00	5.04	11.30	0.00	11.30	0.00	1.72	0.13	0.22	2.07	0.00	0.00	0.00	0.	0.00
187	2.200	31.16	0.00	0.00	0.00	5.03	11.29	0.00	11.29	0.00	1.72	0.13	0.22	2.07	0.00	0.00	0.00	0.	0.00
188	2.100	31.18	0.00	0.00	0.00	5.03	11.29	0.00	11.29	0.00	1.72	0.13	0.22	2.07	0.00	0.00	0.00	0.	0.00
189	2.000	31.20	0.00	0.00	0.00	5.02	11.28	0.00	11.28	0.00	1.72	0.13	0.23	2.07	0.00	0.00	0.00	0.	0.00
190	1.900	31.22	0.00	0.00	0.00	5.02	11.27	0.00	11.27	0.00	1.72	0.13	0.23	2.07	0.00	0.00	0.00	0.	0.00
191	1.800	31.25	0.00	0.00	0.00	5.01	11.27	0.00	11.27	0.00	1.72	0.13	0.23	2.07	0.00	0.00	0.00	0.	0.00
192	1.700	31.27	0.00	0.00	0.00	5.01	11.26	0.00	11.26	0.00	1.72	0.13	0.23	2.08	0.00	0.00	0.00	0.	0.00
193	1.600	31.29	0.00	0.00	0.00	5.00	11.25	0.00	11.25	0.00	1.72	0.12	0.23	2.08	0.00	0.00	0.00	0.	0.00
194	1.500	31.31	0.00	0.00	0.00	5.00	11.25	0.00	11.25	0.00	1.72	0.12	0.23	2.08	0.00	0.00	0.00	0.	0.00
195	1.400	31.33	0.00	0.00	0.00	4.99	11.24	0.00	11.24	0.00	1.72	0.12	0.24	2.08	0.00	0.00	0.00	0.	0.00
196	1.300	31.35	0.00	0.00	0.00	4.99	11.24	0.00	11.24	0.00	1.72	0.12	0.24	2.08	0.00	0.00	0.00	0.	0.00
197	1.200	31.37	0.00	0.00	0.00	4.98	11.23	0.00	11.23	0.00	1.72	0.12	0.24	2.08	0.00	0.00	0.00	0.	0.00
198	1.100	31.39	0.00	0.00	0.00	4.98	11.22	0.00	11.22	0.00	1.72	0.12	0.24	2.08	0.00	0.00	0.00	0.	0.00
199	1.000	31.42	0.00	0.00	0.00	4.97	11.22	0.00	11.22	0.00	1.72	0.12	0.24	2.08	0.00	0.00	0.00	0.	0.00
200	0.900	31.44	0.00	0.00	0.00	4.97	11.21	0.00	11.21	0.00	1.72	0.12	0.25	2.08	0.00	0.00	0.00	0.	0.00
201	0.800	31.46	0.00	0.00	0.00	4.96	11.20	0.00	11.20	0.00	1.72	0.12	0.25	2.09	0.00	0.00	0.00	0.	0.00
202	0.700	31.48	0.00	0.00	0.00	4.96	11.20	0.00	11.20	0.00	1.72	0.12	0.25	2.09	0.00	0.00	0.00	0.	0.00
203	0.600	31.50	0.00	0.00	0.00	5.18	12.55	0.00	12.55	0.00	1.56	0.08	0.10	1.74	0.00	0.00	0.00	0.	0.00

REACH NO. 2 Boggy Bayou d/s of Gilmer Calibration to FTN field survey on 8-31-05

** 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
204	UPR RCH	0.09364	31.50	0.00	0.00	0.00	5.18	12.55	0.00	12.55	0.00	1.56	0.08	0.10	0.00	0.00	0.00	0.00

*** HYDRAULIC PARAMETER VALUES ***

ELEM NO.	BEGIN DIST km	ENDING DIST km	FLOW m^3/s	PCT EFF	ADVCTV VELO m/s	TRAVEL TIME days	DEPTH m	WIDTH m	VOLUME m^3	SURFACE AREA m^2	X-SECT AREA m^2	TIDAL PRISM m^3	TIDAL VELO m/s	DISPRSN m^2/s	MEAN VELO m/s
204	0.60	0.50	0.09364	99.7	0.06431	0.02	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.064
205	0.50	0.40	0.09364	99.7	0.06431	0.02	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.064
206	0.40	0.30	0.09364	99.7	0.06431	0.02	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.064
207	0.30	0.20	0.09364	99.7	0.06431	0.02	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.064
208	0.20	0.10	0.09364	99.7	0.06431	0.02	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.064
209	0.10	0.00	0.09364	99.7	0.06431	0.02	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.064
TOT						0.11			873.60	5460.00					
AVG					0.0643		0.16	9.10			1.46				
CUM						234.24									

*** 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
204	0.500	7.37	12.21	0.09	0.00	0.00	0.00	0.00	0.00	3.92	3.92	3.92	0.03	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	0.400	7.37	12.21	0.09	0.00	0.00	0.00	0.00	0.00	3.92	3.92	3.92	0.03	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
206	0.300	7.37	12.21	0.09	0.00	0.00	0.00	0.00	0.00	3.92	3.92	3.92	0.03	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
207	0.200	7.37	12.21	0.09	0.00	0.00	0.00	0.00	0.00	3.92	3.92	3.92	0.03	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
208	0.100	7.37	12.21	0.09	0.00	0.00	0.00	0.00	0.00	3.92	3.92	3.92	0.03	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
209	0.000	7.37	12.21	0.09	0.00	0.00	0.00	0.00	0.00	3.92	3.92	3.92	0.03	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			9.89	0.05	0.00	0.00	0.00	0.00	0.00	1.90			0.02	0.00	0.08	0.00	0.00	0.00			0.00	0.00	0.00

* $g/m^2/d$ ** 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 g/m^3	COLI #/100mL	NCM

204	0.500	31.50	0.00	0.00	0.00	5.19	12.52	0.00	12.52	0.00	1.56	0.08	0.10	1.74	0.00	0.00	0.00	0.	0.00
205	0.400	31.50	0.00	0.00	0.00	5.20	12.50	0.00	12.50	0.00	1.56	0.08	0.10	1.74	0.00	0.00	0.00	0.	0.00
206	0.300	31.50	0.00	0.00	0.00	5.21	12.48	0.00	12.48	0.00	1.56	0.08	0.10	1.74	0.00	0.00	0.00	0.	0.00
207	0.200	31.50	0.00	0.00	0.00	5.22	12.46	0.00	12.46	0.00	1.56	0.08	0.10	1.74	0.00	0.00	0.00	0.	0.00
208	0.100	31.50	0.00	0.00	0.00	5.23	12.44	0.00	12.44	0.00	1.56	0.08	0.10	1.74	0.00	0.00	0.00	0.	0.00
209	0.000	31.50	0.00	0.00	0.00	5.23	12.42	0.00	12.42	0.00	1.56	0.08	0.10	1.74	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Boggy Bayou

LA-QUAL Model for Boggy Bayou (100602)
Calibration to FTN field survey on 8-31-05

TRAVEL TIME = 234.24 DAYS

MAXIMUM EFFLUENT = 99.70 PERCENT

FLOW	=	0.00028	TO	0.09364	m^3/s
DISPERSION	=	0.0000	TO	0.0000	m^2/s
VELOCITY	=	0.00024	TO	0.08157	m/s
DEPTH	=	0.16	TO	0.28	m
WIDTH	=	4.10	TO	9.10	m
BOD DECAY	=	0.08	TO	0.09	per day
NH3 DECAY	=	0.18	TO	0.42	per day
SOD	=	2.36	TO	3.92	$g/m^2/d$
NH3 SOURCE	=	0.00	TO	0.00	$g/m^2/d$
REAERATION	=	2.86	TO	12.21	per day
BOD SETTLING	=	0.00	TO	0.00	per day
ORG-N DECAY	=	0.02	TO	0.03	per day
ORG-N SETTLING	=	0.00	TO	0.00	per day
TEMPERATURE	=	27.22	TO	31.50	deg C
DISSOLVED OXYGEN	=	4.37	TO	5.31	mg/L

LA-QUAL Model for Boggy Bayou (100602)
Calibration to FTN field survey on 8-31-05

INPUT/OUTPUT LOADING SUMMARY

	FLOW m³/s	DO kg/d	BOD#1 kg/d	BOD#2 kg/d	ORG-N kg/d	NH3-N kg/d	NO3-N kg/d	PHOS kg/d	CHL A	NCM
HEADWATER FLOW	0.000	0.1	0.3	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	0.093	39.3	103.8	0.0	12.7	0.5	0.0	0.0	0.0	0.0
WITHDRAWLS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-0.094	-42.3	-100.5	0.0	-12.6	-0.7	-0.8	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	20.0	0.0	0.8					0.0
NATURAL REAERATION		277.5								
DAM REAERATION		0.0								
BACKGROUND SOD		-247.2								
BOD#1 DECAY		-23.7	-23.7							
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			-1.0	1.0				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-3.7				-0.8	0.8			
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	0.094	316.9	124.1	0.0	13.6	1.5	0.8	0.0	0.0	0.0
TOTAL OUTPUTS	-0.094	-316.9	-124.1	0.0	-13.6	-1.5	-0.8	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

90th Percentile Temperature Calculations

Table G.1. Calculations for 90th percentile temperatures for Black Bayou near Rodessa (LDEQ 0011)

Summer 90th Percentile Temperature = 30.1 C, interpolated from values highlighted below
Winter 90th Percentile Temperature = 21.0 C, from values highlighted below

Date	Season	Water Temp (C)	Percentile	Date	Season	Water Temp (C)	Percentile
10/13/86	summer	15.9	0.35	12/11/84	winter	0.1	0.35
10/01/75	summer	16.0	1.04	1/11/83	winter	0.7	1.05
5/12/81	summer	16.0	1.74	1/10/77	winter	1.0	1.75
10/10/88	summer	18.1	2.43	4/12/83	winter	1.8	2.45
10/12/87	summer	18.4	3.13	1/01/70	winter	3.0	3.15
10/05/76	summer	19.0	3.82	1/01/73	winter	3.0	3.85
5/15/79	summer	19.0	4.51	3/04/02	winter	3.3	4.55
10/14/80	summer	19.0	5.21	1/15/85	winter	3.6	5.24
6/02/76	summer	20.0	5.90	1/08/02	winter	3.8	5.94
10/13/81	summer	20.0	6.60	1/01/68	winter	4.0	6.64
10/11/82	summer	20.0	7.29	1/08/76	winter	4.0	7.34
10/09/89	summer	20.0	7.99	2/12/80	winter	4.0	8.04
5/09/83	summer	20.4	8.68	2/08/83	winter	4.2	8.74
10/11/83	summer	20.4	9.38	1/12/88	winter	4.2	9.44
5/06/02	summer	20.6	10.07	2/12/85	winter	4.8	10.14
10/09/84	summer	20.8	10.76	12/02/76	winter	5.0	10.84
5/01/67	summer	21.0	11.46	1/09/79	winter	5.0	11.54
5/01/69	summer	21.0	12.15	1/13/81	winter	5.0	12.24
6/03/75	summer	21.0	12.85	1/18/82	winter	5.0	12.94
7/06/76	summer	21.0	13.54	2/10/82	winter	5.0	13.64
5/04/77	summer	21.0	14.24	2/08/88	winter	5.1	14.34
6/12/79	summer	21.0	14.93	1/13/87	winter	5.6	15.03
5/09/78	summer	21.5	15.63	12/13/88	winter	6.6	15.73
5/08/89	summer	21.5	16.32	1/10/84	winter	6.9	16.43
9/01/68	summer	22.0	17.01	1/01/69	winter	7.0	17.13
5/01/73	summer	22.0	17.71	12/12/78	winter	7.0	17.83
5/02/75	summer	22.0	18.40	12/15/81	winter	7.0	18.53
9/02/76	summer	22.0	19.10	12/13/82	winter	7.0	19.23
10/04/77	summer	22.0	19.79	1/14/86	winter	7.0	19.93
10/09/78	summer	22.0	20.49	12/02/02	winter	7.7	20.63
6/10/80	summer	22.0	21.18	2/17/87	winter	7.8	21.33
8/04/76	summer	22.5	21.88	1/09/89	winter	7.8	22.03
10/07/02	summer	22.7	22.57	12/11/89	winter	7.9	22.73
5/14/85	summer	22.8	23.26	2/01/67	winter	8.0	23.43
5/12/87	summer	22.9	23.96	2/04/77	winter	8.0	24.13
5/01/68	summer	23.0	24.65	2/13/79	winter	8.5	24.83
10/01/74	summer	23.0	25.35	11/01/68	winter	9.0	25.52
8/05/75	summer	23.0	26.04	3/01/69	winter	9.0	26.22
9/11/79	summer	23.0	26.74	12/01/74	winter	9.0	26.92
5/11/82	summer	23.0	27.43	11/18/80	winter	9.0	27.62
10/15/85	summer	23.0	28.13	2/04/02	winter	9.2	28.32
5/12/86	summer	23.0	28.82	12/14/87	winter	9.3	29.02
8/05/77	summer	23.5	29.51	12/13/83	winter	9.7	29.72
9/08/86	summer	23.7	30.21	2/01/68	winter	10.0	30.42
6/01/67	summer	24.0	30.90	12/08/75	winter	10.0	31.12
10/01/68	summer	24.0	31.60	2/06/76	winter	10.0	31.82

Date	Season	Water Temp (C)	Percentile	Date	Season	Water Temp (C)	Percentile
6/01/69	summer	24.0	32.29	1/04/78	winter	10.0	32.52
6/01/70	summer	24.0	32.99	12/11/79	winter	10.0	33.22
10/01/72	summer	24.0	33.68	1/15/80	winter	10.0	33.92
9/01/74	summer	24.0	34.38	3/14/88	winter	10.7	34.62
5/13/80	summer	24.0	35.07	12/01/67	winter	11.0	35.31
6/13/88	summer	24.0	35.76	12/01/68	winter	11.0	36.01
9/13/05	summer	24.0	36.46	2/10/81	winter	11.0	36.71
5/15/84	summer	24.3	37.15	3/09/82	winter	11.0	37.41
6/12/89	summer	24.4	37.85	12/08/04	winter	11.1	38.11
5/09/88	summer	24.5	38.54	11/20/02	winter	11.4	38.81
6/03/02	summer	24.5	39.24	1/12/05	winter	11.9	39.51
9/20/05	summer	24.9	39.93	3/13/84	winter	11.9	40.21
7/12/05	summer	25.0	40.63	11/13/84	winter	11.9	40.91
10/01/67	summer	25.0	41.32	3/01/68	winter	12.0	41.61
10/01/69	summer	25.0	42.01	12/01/69	winter	12.0	42.31
9/01/71	summer	25.0	42.71	2/01/70	winter	12.0	43.01
5/01/72	summer	25.0	43.40	1/01/72	winter	12.0	43.71
6/01/73	summer	25.0	44.10	12/01/72	winter	12.0	44.41
10/01/73	summer	25.0	44.79	4/02/76	winter	12.0	45.10
6/02/77	summer	25.0	45.49	12/05/77	winter	12.0	45.80
7/10/79	summer	25.0	46.18	3/06/78	winter	12.0	46.50
6/09/81	summer	25.0	46.88	4/15/80	winter	12.0	47.20
9/15/81	summer	25.0	47.57	11/17/81	winter	12.0	47.90
6/14/05	summer	25.0	48.26	11/06/79	winter	12.5	48.60
7/12/83	summer	25.1	48.96	12/09/80	winter	12.5	49.30
8/14/89	summer	25.1	49.65	2/13/89	winter	12.5	50.00
6/08/87	summer	25.2	50.35	4/11/88	winter	12.6	50.70
8/14/84	summer	25.5	51.04	12/08/86	winter	12.7	51.40
9/12/88	summer	25.6	51.74	12/10/85	winter	12.8	52.10
8/16/05	summer	25.7	52.43	2/01/69	winter	13.0	52.80
6/10/86	summer	25.7	53.13	1/01/74	winter	13.0	53.50
9/14/87	summer	25.8	53.82	3/10/81	winter	13.0	54.20
9/09/02	summer	25.8	54.51	11/15/83	winter	13.3	54.90
7/01/67	summer	26.0	55.21	3/10/87	winter	13.3	55.59
9/01/67	summer	26.0	55.90	3/04/77	winter	13.5	56.29
10/01/70	summer	26.0	56.60	4/10/89	winter	13.5	56.99
7/06/77	summer	26.0	57.29	11/17/87	winter	13.7	57.69
9/12/78	summer	26.0	57.99	2/01/72	winter	14.0	58.39
9/11/84	summer	26.0	58.68	1/03/75	winter	14.0	59.09
7/26/05	summer	26.2	59.38	2/05/75	winter	14.0	59.79
9/13/83	summer	26.2	60.07	3/05/75	winter	14.0	60.49
8/15/78	summer	26.5	60.76	3/11/80	winter	14.0	61.19
9/11/89	summer	26.5	61.46	3/15/05	winter	14.0	61.89
9/10/85	summer	26.7	62.15	2/14/84	winter	14.2	62.59
7/11/89	summer	26.9	62.85	11/17/86	winter	14.6	63.29
5/01/70	summer	27.0	63.54	3/01/67	winter	15.0	63.99
9/01/73	summer	27.0	64.24	11/01/67	winter	15.0	64.69
9/06/77	summer	27.0	64.93	2/01/73	winter	15.0	65.38
8/14/79	summer	27.0	65.63	11/01/74	winter	15.0	66.08
8/11/81	summer	27.0	66.32	11/04/75	winter	15.0	66.78
6/15/82	summer	27.0	67.01	3/14/79	winter	15.0	67.48

Table G.1 90th Percentile Temperature Calculations for Station 0011

Date	Season	Water Temp (C)	Percentile
9/14/82	summer	27.0	67.71
8/13/02	summer	27.1	68.40
7/08/02	summer	27.3	69.10
7/13/87	summer	27.5	69.79
6/11/85	summer	27.7	70.49
7/11/88	summer	27.7	71.18
7/09/85	summer	27.8	71.88
9/01/72	summer	28.0	72.57
5/01/74	summer	28.0	73.26
7/03/75	summer	28.0	73.96
6/13/78	summer	28.0	74.65
7/14/81	summer	28.0	75.35
6/12/84	summer	28.0	76.04
8/12/86	summer	28.0	76.74
8/09/83	summer	28.1	77.43
7/10/84	summer	28.3	78.13
8/12/80	summer	28.5	78.82
8/13/85	summer	28.5	79.51
7/14/86	summer	28.8	80.21
7/01/68	summer	29.0	80.90
5/01/71	summer	29.0	81.60
10/01/71	summer	29.0	82.29
7/01/73	summer	29.0	82.99
6/01/74	summer	29.0	83.68
9/01/75	summer	29.0	84.38
7/11/78	summer	29.0	85.07
7/13/82	summer	29.0	85.76
8/10/82	summer	29.0	86.46
8/08/88	summer	29.6	87.15
8/01/69	summer	30.0	87.85
7/01/70	summer	30.0	88.54
7/01/72	summer	30.0	89.24
8/01/73	summer	30.0	89.93
8/10/87	summer	30.5	90.63
8/01/68	summer	31.0	91.32
9/01/69	summer	31.0	92.01
8/01/67	summer	32.0	92.71
8/01/70	summer	32.0	93.40
8/01/71	summer	32.0	94.10
6/01/72	summer	32.0	94.79
8/01/72	summer	32.0	95.49
6/01/68	summer	33.0	96.18
9/01/70	summer	33.0	96.88
7/01/74	summer	34.0	97.57
8/01/74	summer	34.0	98.26
6/01/71	summer	35.0	98.96
7/01/71	summer	41.0	99.65

Date	Season	Water Temp (C)	Percentile
4/13/82	winter	15.0	68.18
3/15/83	winter	15.1	68.88
2/21/05	winter	15.1	69.58
11/14/88	winter	15.7	70.28
2/17/86	winter	15.8	70.98
4/01/02	winter	15.8	71.68
3/01/73	winter	16.0	72.38
4/06/77	winter	16.0	73.08
4/15/86	winter	16.5	73.78
11/01/72	winter	17.0	74.48
4/01/73	winter	17.0	75.17
2/01/74	winter	17.0	75.87
3/04/76	winter	17.0	76.57
4/10/84	winter	17.1	77.27
11/13/89	winter	17.1	77.97
3/17/86	winter	17.2	78.67
4/08/85	winter	17.7	79.37
3/13/89	winter	17.9	80.07
11/01/73	winter	18.0	80.77
11/03/77	winter	18.0	81.47
3/12/85	winter	18.4	82.17
12/01/73	winter	19.0	82.87
4/03/75	winter	19.0	83.57
4/19/05	winter	19.4	84.27
4/01/68	winter	20.0	84.97
4/01/69	winter	20.0	85.66
11/01/69	winter	20.0	86.36
2/01/71	winter	20.0	87.06
4/11/78	winter	20.0	87.76
11/18/85	winter	20.3	88.46
4/01/70	winter	21.0	89.16
3/01/71	winter	21.0	89.86
3/01/72	winter	21.0	90.56
4/17/79	winter	21.0	91.26
4/13/87	winter	21.5	91.96
12/01/70	winter	22.0	92.66
1/01/71	winter	22.0	93.36
11/14/78	winter	22.0	94.06
4/13/81	winter	22.5	94.76
11/01/70	winter	23.0	95.45
4/01/67	winter	24.0	96.15
11/01/71	winter	24.0	96.85
4/01/72	winter	24.0	97.55
4/01/71	winter	25.0	98.25
4/01/74	winter	25.0	98.95
3/01/74	winter	27.0	99.65

FILE: R:\PROJECTS\2110-616\TECH\90TH PERC TEMPS\STN 1207-90TH PERC TEMP, BOGGY BAYOU.XLS

Table G.2. Calculations for 90th percentile temperatures for Boggy Bayou (LDEQ 1207)

Boggy Bayou (LDEQ 1207)			Black Bayou (Station 0011)		
Date	Water Temp (C)	Season	Date	Water Temp (C)	Season
1/7/02	6.03	winter	1/8/02	3.8	winter
2/5/02	8.78	winter	2/4/02	9.21	winter
3/5/02	7.65	winter	3/4/02	3.31	winter
4/2/02	17.62	winter	4/1/02	15.82	winter
5/7/02	24.83	summer	5/6/02	20.58	summer
6/4/02	28.28	summer	6/3/02	24.5	summer
7/9/02	29.96	summer	7/8/02	27.31	summer
8/6/02	29.45	summer	8/13/02	27.09	summer
9/10/02	27.02	summer	9/9/02	25.81	summer
Oct 2002	no data	--	10/7/02	22.68	summer
11/6/02	12.59	winter	11/20/02	11.41	winter
12/3/02	9.77	winter	12/2/02	7.65	winter
1/13/04	8.39	winter	Jan 2004	no data	--
2/3/04	8.79	winter	Jan 2004	no data	--
3/9/04	16.10	winter	Jan 2004	no data	--
4/7/04	17.41	winter	Jan 2004	no data	--
Dec 2004	no data	--	12/8/04	11.1	winter

SUMMER (May - October)

Averages for summer months in which both stations were sampled (May-Sep 2002):
Boggy = 27.9 C   Black = 25.1 C

Difference between stations = 2.8 C

From Table G.1, 90th percentile summer temperature for Black Bayou = 30.1 C

Adjusted 90th percentile temp for Boggy Bayou for summer = 30.1 + 2.8 = 32.9 C

WINTER (November - April)

Averages for winter months in which both stations were sampled (Jan-Apr 2002, Nov-Dec 2002):
Boggy = 10.4 C   Black = 8.5 C

Difference between stations = 1.9 C

From Table G.1, 90th percentile winter temperature for Black Bayou = 21.0 C

Adjusted 90th percentile temp for Boggy Bayou for winter = 21.0 + 1.9 = 22.9 C

FILE: R:\PROJECTS\2110-616\TECH\90TH PERC TEMPS\STN 1207-90TH PERC TEMP, BOGGY BAYOU.XLS

APPENDIX H

Inflow DO Calculations for Projections

INFLOW DO CALCULATIONS FOR BOGGY BAYOU PROJECTIONS

ASSUMPTIONS: % saturation from calibration represents no reduction of NPS loads
100% saturation represents complete reduction of NPS loads

METHDOLOGY: First determine % saturation for calibration conditions, then calculate % saturation for projection conditions based on the assumptions above and the percent reductions specified for that projection. Then convert each % saturation to mg/L based on the projection temperature.

NPS REDUCTIONS: 46% for summer
0% for winter

Calibration:	Calib. Temp (C)	Calib. DO (mg/L)	DO at 100% sat. (mg/L)	% sat for calib.
Headwater inflow	27.2	4.40	7.94	55.4%
Unnamed tribs	27.2	4.40	7.94	55.4%
Gilmer Bayou	31.5	5.20	7.36	70.6%

Summer projection:	% sat for proj.	Proj. temp (C)	DO at 100% sat. (mg/L)	Proj. input DO (mg/L)
Headwater inflow	75.9%	32.0	7.30	5.54
Unnamed tribs	75.9%	32.0	7.30	5.54
Gilmer Bayou	84.1%	32.0	7.30	6.14

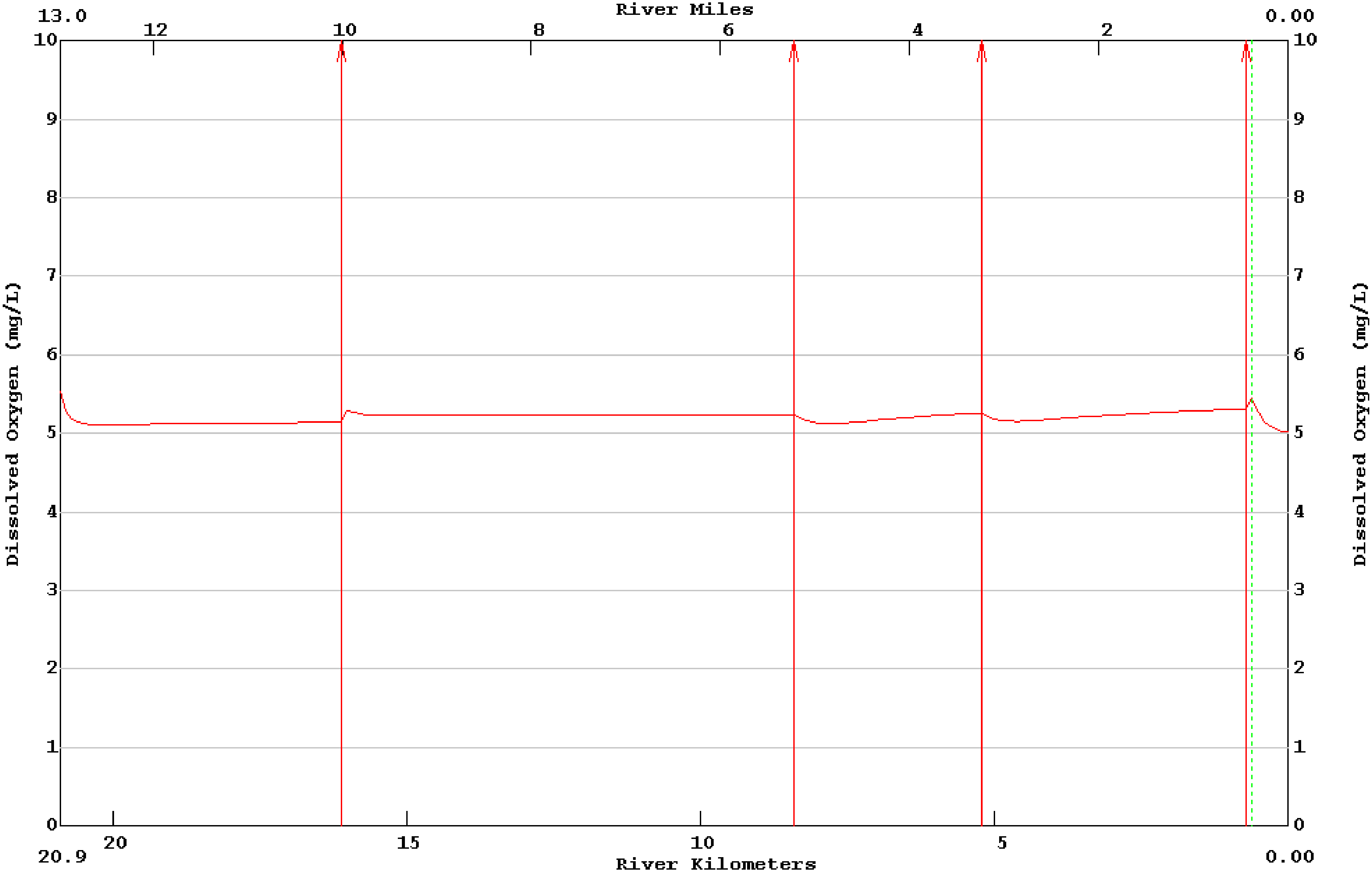
Winter projection:	% sat for proj.	Proj. temp (C)	DO at 100% sat. (mg/L)	Proj. input DO (mg/L)
Headwater inflow	55.4%	22.9	8.60	4.76
Unnamed tribs	55.4%	22.9	8.60	4.76
Gilmer Bayou	70.6%	22.9	8.60	6.07

FILE: R:\PROJECTS\2110-616\TECH\LA-QUAL\BOGGY\PROJECTION_INPUTS.XLS

APPENDIX I

LA-QUAL Output for Summer Projection

LA-QUAL Version 8.11 Run at 12:58 on 09/28/2007 File D:\comp_models\LA-QUAL_8p11\bogsum.txt
Summer Projection with 46% NPS reduction min= 5.02 max= 5.54
LA-QUAL Model for Boggy Bayou (100602)



```
LA-QUAL Version 8.11
Louisiana Department of Environmental Quality

Input file is D:\comp_models\LA-QUAL_8p11\bogsum.txt
Output produced at 12:58 on 09/28/2007

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

CARD TYPE       CONTROL TITLES

TITLE01         LA-QUAL Model for Boggy Bayou (100602)
TITLE02         Summer Projection with 46% NPS reduction
CNTROL03  YES   METR
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)
PROGRAM         MAXIMUM ITERATION LIMIT            =      200.00000
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 km		END REACH km	ELEM LENGTH km	REACH LENGTH km	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Boggy Bayou u/s of Gilmer	20.90	TO	0.60	0.1000	20.30	203	1	203
REACH ID	2	B2	Boggy Bayou d/s of Gilmer	0.60	TO	0.00	0.1000	0.60	6	204	209

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	4.100	0.000	0.000	0.280	0.000	0.000	0.00000	0.000
HYDR-1	2	B2	9.100	0.000	0.000	0.160	0.000	0.000	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	32.00	0.00	5.00	0.05	0.03	0.00	0.00	0.00
INITIAL	2	B2	32.00	0.00	5.00	0.05	0.03	0.00	0.00	0.00

ENDATA11

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

CARD	RCH	RCH	K2	K2	K2	K2	BKGRND	BOD	BOD	BOD CONV	ANAER BOD2	BOD2	BOD2	BOD2 CONV	ANAER BOD2

TYPE	NUM	ID	OPT		"A"	"B"	"C"	SOD g/m²/d	DECAY per day	SETT m/d	TO SOD	DECAY per day	DECAY per day	SETT m/d	TO SOD	DECAY per day
COEFF-1	1	B1	15	LOUISIANA	0.000	0.000	0.000	0.810	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	15	LOUISIANA	0.000	0.000	0.000	1.030	0.055	0.000	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	0.020	0.000	1.000	0.180	0.000	0.000	0.000
COEFF-2	2	B2	0.020	0.000	1.000	0.080	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	SHADING

ENDATA14

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

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECAY	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

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NONPOINT          1   B1       10.80      0.43      0.00      0.00      0.00      0.00
NONPOINT          2   B2        0.00      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     FLOW    TEMP    SALIN      CM-I     CM-II
                                                       m³/s      cfs   deg C      ppt

HDWTR-1           1     Boggy Bayou              0   0.00283    0.100    0.00     0.00     0.000     0.000   0.00
ENDATA20

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

CARD TYPE     ELEMENT   NAME                           DO     BOD#1     ORG-N     NH3-N     NO3-N     BOD#2
                                                     mg/L      mg/L      mg/L      mg/L      mg/L      mg/L

HDWTR-2           1     Boggy Bayou                  5.54      6.48      0.95      0.03      0.00      0.00
ENDATA21

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

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

ENDATA22

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

CARD TYPE   JUNCTION   UPSTRM     RIVER     NAME
             ELEMENT  ELEMENT     KILOM

ENDATA23

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

CARD TYPE  ELEMENT    RKILO  NAME                      FLOW       FLOW     FLOW    TEMP    SALIN      CM-I     CM-II
                                                       m³/s        cfs      MGD   deg C      ppt

WSTLD-1       49      16.10  NPS Unnamed Trib 1     0.00283    0.09993    0.065    0.00     0.00     0.000     0.000
WSTLD-1      126       8.40  NPS Unnamed Trib 2     0.00283    0.09993    0.065    0.00     0.00     0.000     0.000
WSTLD-1      126       8.40  LaLaurie Ln Ox Pond    0.00329    0.11617    0.075    0.00     0.00     0.000     0.000
WSTLD-1      158       5.20  Grawood Church         0.00033    0.01165    0.008    0.00     0.00     0.000     0.000
WSTLD-1      203       0.70  NPS Gilmer Bayou       0.00283    0.09993    0.065    0.00     0.00     0.000     0.000
ENDATA24

$$$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) $$$
                                                                      % BOD                              %
CARD TYPE     ELEMENT   NAME                           DO       BOD      RMVL     ORG-N     NH3-N    NITRIF     NO3-N     BOD#2
                                                     mg/L      mg/L                mg/L      mg/L                mg/L      mg/L
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WSTLD-2	49	NPS Unnamed Trib 1	5.54	6.48	0.00	0.95	0.03	0.00	0.00	0.00
WSTLD-2	126	NPS Unnamed Trib 2	5.54	6.48	0.00	0.95	0.03	0.00	0.00	0.00
WSTLD-2	126	LaLaurie Ln Ox Pond	5.00	23.00	0.00	3.30	1.70	0.00	0.00	0.00
WSTLD-2	158	Grawood Church	5.00	69.00	0.00	5.00	10.00	0.00	0.00	0.00
WSTLD-2	203	NPS Gilmer Bayou	6.14	7.29	0.00	0.78	0.03	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

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 = 2
PLOT RCH 1 2
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 Boggy Bayou LA-QUAL Model for Boggy Bayou (100602)
REACH NO. 1 Boggy Bayou u/s of Gilmer Summer Projection with 46% 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	0.00283	0.00	0.00	0.00	0.00	5.54	6.48	0.00	6.48	0.00	0.95	0.03	0.00	0.00	0.00	0.00	0.00
49	WSTLD	0.00283	0.00	0.00	0.00	0.00	5.54	6.48	0.00	6.48	0.00	0.95	0.03	0.00	0.00	0.00	0.00	0.00
126	WSTLD	0.00283	0.00	0.00	0.00	0.00	5.54	6.48	0.00	6.48	0.00	0.95	0.03	0.00	0.00	0.00	0.00	0.00
126	WSTLD	0.00329	0.00	0.00	0.00	0.00	5.00	23.00	0.00	23.00	0.00	3.30	1.70	0.00	0.00	0.00	0.00	0.00
158	WSTLD	0.00033	0.00	0.00	0.00	0.00	5.00	69.00	0.00	69.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00	0.00
203	WSTLD	0.00283	0.00	0.00	0.00	0.00	6.14	7.29	0.00	7.29	0.00	0.78	0.03	0.00	0.00	0.00	0.00	0.00

** HYDRAULIC PARAMETER VALUES **

ELEM NO.	BEGIN DIST km	ENDING DIST km	FLOW m³/s	PCT EFF	ADVCTV VELO m/s	TRAVEL TIME days	DEPTH m	WIDTH m	VOLUME m³	SURFACE AREA m²	X-SECT AREA m²	TIDAL PRISM m³	TIDAL VELO m/s	DISPRSN m²/s	MEAN VELO m/s
1	20.90	20.80	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
2	20.80	20.70	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
3	20.70	20.60	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
4	20.60	20.50	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
5	20.50	20.40	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
6	20.40	20.30	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
7	20.30	20.20	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
8	20.20	20.10	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
9	20.10	20.00	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
10	20.00	19.90	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
11	19.90	19.80	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
12	19.80	19.70	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
13	19.70	19.60	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
14	19.60	19.50	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
15	19.50	19.40	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
16	19.40	19.30	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
17	19.30	19.20	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
18	19.20	19.10	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
19	19.10	19.00	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
20	19.00	18.90	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
21	18.90	18.80	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
22	18.80	18.70	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
23	18.70	18.60	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002

24	18.60	18.50	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
25	18.50	18.40	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
26	18.40	18.30	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
27	18.30	18.20	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
28	18.20	18.10	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
29	18.10	18.00	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
30	18.00	17.90	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
31	17.90	17.80	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
32	17.80	17.70	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
33	17.70	17.60	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
34	17.60	17.50	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
35	17.50	17.40	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
36	17.40	17.30	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
37	17.30	17.20	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
38	17.20	17.10	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
39	17.10	17.00	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
40	17.00	16.90	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
41	16.90	16.80	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
42	16.80	16.70	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
43	16.70	16.60	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
44	16.60	16.50	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
45	16.50	16.40	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
46	16.40	16.30	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
47	16.30	16.20	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
48	16.20	16.10	0.00283	0.0	0.00247	0.47	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.002
49	16.10	16.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
50	16.00	15.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
51	15.90	15.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
52	15.80	15.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
53	15.70	15.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
54	15.60	15.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
55	15.50	15.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
56	15.40	15.30	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
57	15.30	15.20	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
58	15.20	15.10	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
59	15.10	15.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
60	15.00	14.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
61	14.90	14.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
62	14.80	14.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
63	14.70	14.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
64	14.60	14.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
65	14.50	14.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
66	14.40	14.30	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
67	14.30	14.20	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
68	14.20	14.10	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
69	14.10	14.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
70	14.00	13.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
71	13.90	13.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
72	13.80	13.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
73	13.70	13.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
74	13.60	13.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005

75	13.50	13.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
76	13.40	13.30	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
77	13.30	13.20	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
78	13.20	13.10	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
79	13.10	13.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
80	13.00	12.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
81	12.90	12.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
82	12.80	12.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
83	12.70	12.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
84	12.60	12.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
85	12.50	12.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
86	12.40	12.30	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
87	12.30	12.20	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
88	12.20	12.10	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
89	12.10	12.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
90	12.00	11.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
91	11.90	11.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
92	11.80	11.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
93	11.70	11.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
94	11.60	11.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
95	11.50	11.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
96	11.40	11.30	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
97	11.30	11.20	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
98	11.20	11.10	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
99	11.10	11.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
100	11.00	10.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
101	10.90	10.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
102	10.80	10.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
103	10.70	10.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
104	10.60	10.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
105	10.50	10.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
106	10.40	10.30	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
107	10.30	10.20	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
108	10.20	10.10	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
109	10.10	10.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
110	10.00	9.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
111	9.90	9.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
112	9.80	9.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
113	9.70	9.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
114	9.60	9.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
115	9.50	9.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
116	9.40	9.30	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
117	9.30	9.20	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
118	9.20	9.10	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
119	9.10	9.00	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
120	9.00	8.90	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
121	8.90	8.80	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
122	8.80	8.70	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
123	8.70	8.60	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
124	8.60	8.50	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005
125	8.50	8.40	0.00566	50.0	0.00493	0.23	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.005

126	8.40	8.30	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
127	8.30	8.20	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
128	8.20	8.10	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
129	8.10	8.00	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
130	8.00	7.90	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
131	7.90	7.80	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
132	7.80	7.70	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
133	7.70	7.60	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
134	7.60	7.50	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
135	7.50	7.40	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
136	7.40	7.30	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
137	7.30	7.20	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
138	7.20	7.10	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
139	7.10	7.00	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
140	7.00	6.90	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
141	6.90	6.80	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
142	6.80	6.70	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
143	6.70	6.60	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
144	6.60	6.50	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
145	6.50	6.40	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
146	6.40	6.30	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
147	6.30	6.20	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
148	6.20	6.10	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
149	6.10	6.00	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
150	6.00	5.90	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
151	5.90	5.80	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
152	5.80	5.70	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
153	5.70	5.60	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
154	5.60	5.50	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
155	5.50	5.40	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
156	5.40	5.30	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
157	5.30	5.20	0.01178	76.0	0.01026	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.010
158	5.20	5.10	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
159	5.10	5.00	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
160	5.00	4.90	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
161	4.90	4.80	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
162	4.80	4.70	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
163	4.70	4.60	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
164	4.60	4.50	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
165	4.50	4.40	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
166	4.40	4.30	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
167	4.30	4.20	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
168	4.20	4.10	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
169	4.10	4.00	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
170	4.00	3.90	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
171	3.90	3.80	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
172	3.80	3.70	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
173	3.70	3.60	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
174	3.60	3.50	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
175	3.50	3.40	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
176	3.40	3.30	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011

177	3.30	3.20	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
178	3.20	3.10	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
179	3.10	3.00	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
180	3.00	2.90	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
181	2.90	2.80	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
182	2.80	2.70	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
183	2.70	2.60	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
184	2.60	2.50	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
185	2.50	2.40	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
186	2.40	2.30	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
187	2.30	2.20	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
188	2.20	2.10	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
189	2.10	2.00	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
190	2.00	1.90	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
191	1.90	1.80	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
192	1.80	1.70	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
193	1.70	1.60	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
194	1.60	1.50	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
195	1.50	1.40	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
196	1.40	1.30	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
197	1.30	1.20	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
198	1.20	1.10	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
199	1.10	1.00	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
200	1.00	0.90	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
201	0.90	0.80	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
202	0.80	0.70	0.01211	76.6	0.01055	0.11	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.011
203	0.70	0.60	0.01494	81.1	0.01301	0.09	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.013
TOT						49.25			23304.43	83230.00					
AVG					0.0048		0.28	4.10			1.15				
CUM						49.25									

** 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	20.800	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	20.700	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	20.600	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	20.500	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	20.400	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	20.300	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	20.200	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	20.100	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	20.000	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	19.900	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	19.800	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	19.700	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

13	19.600	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	19.500	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	19.400	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	19.300	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	19.200	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	19.100	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	19.000	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	18.900	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	18.800	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	18.700	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	18.600	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	18.500	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	18.400	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	18.300	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	18.200	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	18.100	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	18.000	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	17.900	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	17.800	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	17.700	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	17.600	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	17.500	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	17.400	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	17.300	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	17.200	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	17.100	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	17.000	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	16.900	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	16.800	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	16.700	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	16.600	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	16.500	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	16.400	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	16.300	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47	16.200	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	16.100	7.30	3.11	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	16.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	15.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	15.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	15.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	15.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	15.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	15.300	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	15.200	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	15.100	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	15.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	14.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	14.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	14.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

64	14.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	14.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	14.300	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	14.200	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14.100	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	14.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	13.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	13.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	13.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	13.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	13.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	13.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	13.300	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	13.200	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	13.100	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	13.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	12.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	12.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	12.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	12.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	12.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	12.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	12.300	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	12.200	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	12.100	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	12.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	11.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	11.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	11.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93	11.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94	11.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	11.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96	11.300	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97	11.200	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	11.100	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	11.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	10.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
101	10.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102	10.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103	10.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104	10.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106	10.300	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
107	10.200	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108	10.100	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
109	10.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	9.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
111	9.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112	9.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	9.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
114	9.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

115	9.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
116	9.300	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
117	9.200	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
118	9.100	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
119	9.000	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	8.900	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
121	8.800	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
122	8.700	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
123	8.600	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
124	8.500	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	8.400	7.30	3.26	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	8.300	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
127	8.200	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
128	8.100	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
129	8.000	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	7.900	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
131	7.800	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
132	7.700	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
133	7.600	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
134	7.500	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	7.400	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
136	7.300	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
137	7.200	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
138	7.100	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
139	7.000	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	6.900	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
141	6.800	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
142	6.700	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
143	6.600	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
144	6.500	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	6.400	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
146	6.300	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
147	6.200	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
148	6.100	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
149	6.000	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	5.900	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
151	5.800	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
152	5.700	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	5.600	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
154	5.500	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	5.400	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
156	5.300	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157	5.200	7.30	3.60	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
158	5.100	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
159	5.000	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	4.900	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
161	4.800	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
162	4.700	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
163	4.600	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
164	4.500	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	4.400	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

166	4.300	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
167	4.200	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
168	4.100	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
169	4.000	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	3.900	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
171	3.800	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
172	3.700	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
173	3.600	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
174	3.500	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	3.400	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
176	3.300	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
177	3.200	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
178	3.100	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
179	3.000	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	2.900	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
181	2.800	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
182	2.700	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
183	2.600	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
184	2.500	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	2.400	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
186	2.300	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
187	2.200	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
188	2.100	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
189	2.000	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
190	1.900	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
191	1.800	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
192	1.700	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
193	1.600	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
194	1.500	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
195	1.400	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
196	1.300	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
197	1.200	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
198	1.100	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
199	1.000	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.900	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
201	0.800	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202	0.700	7.30	3.62	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
203	0.600	7.30	3.78	0.10	0.00	0.00	0.00	0.00	0.00	1.72	1.72	1.72	0.03	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			2.70	0.05	0.00	0.00	0.00	0.00	0.00	0.81			0.02	0.00	0.18	0.00	0.00	0.00			0.00	0.00	0.00

* g/m²/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 g/m³	COLI #/100mL	NCM
1	20.800	32.00	0.00	0.00	0.00	5.28	6.41	0.00	6.41	0.00	0.95	0.03	0.01	0.99	0.00	0.00	0.00	0.	0.00
2	20.700	32.00	0.00	0.00	0.00	5.18	6.34	0.00	6.34	0.00	0.94	0.04	0.01	0.99	0.00	0.00	0.00	0.	0.00

3	20.600	32.00	0.00	0.00	0.00	5.14	6.28	0.00	6.28	0.00	0.94	0.04	0.02	1.00	0.00	0.00	0.00	0.	0.00
4	20.500	32.00	0.00	0.00	0.00	5.12	6.22	0.00	6.22	0.00	0.94	0.04	0.03	1.01	0.00	0.00	0.00	0.	0.00
5	20.400	32.00	0.00	0.00	0.00	5.11	6.16	0.00	6.16	0.00	0.94	0.04	0.04	1.02	0.00	0.00	0.00	0.	0.00
6	20.300	32.00	0.00	0.00	0.00	5.11	6.10	0.00	6.10	0.00	0.93	0.05	0.05	1.03	0.00	0.00	0.00	0.	0.00
7	20.200	32.00	0.00	0.00	0.00	5.11	6.05	0.00	6.05	0.00	0.93	0.05	0.06	1.04	0.00	0.00	0.00	0.	0.00
8	20.100	32.00	0.00	0.00	0.00	5.11	6.00	0.00	6.00	0.00	0.93	0.05	0.07	1.05	0.00	0.00	0.00	0.	0.00
9	20.000	32.00	0.00	0.00	0.00	5.11	5.95	0.00	5.95	0.00	0.93	0.05	0.08	1.05	0.00	0.00	0.00	0.	0.00
10	19.900	32.00	0.00	0.00	0.00	5.11	5.90	0.00	5.90	0.00	0.93	0.05	0.09	1.06	0.00	0.00	0.00	0.	0.00
11	19.800	32.00	0.00	0.00	0.00	5.11	5.86	0.00	5.86	0.00	0.92	0.05	0.10	1.07	0.00	0.00	0.00	0.	0.00
12	19.700	32.00	0.00	0.00	0.00	5.12	5.82	0.00	5.82	0.00	0.92	0.05	0.11	1.08	0.00	0.00	0.00	0.	0.00
13	19.600	32.00	0.00	0.00	0.00	5.12	5.77	0.00	5.77	0.00	0.92	0.05	0.12	1.09	0.00	0.00	0.00	0.	0.00
14	19.500	32.00	0.00	0.00	0.00	5.12	5.74	0.00	5.74	0.00	0.92	0.05	0.13	1.10	0.00	0.00	0.00	0.	0.00
15	19.400	32.00	0.00	0.00	0.00	5.12	5.70	0.00	5.70	0.00	0.91	0.05	0.14	1.11	0.00	0.00	0.00	0.	0.00
16	19.300	32.00	0.00	0.00	0.00	5.12	5.66	0.00	5.66	0.00	0.91	0.05	0.15	1.12	0.00	0.00	0.00	0.	0.00
17	19.200	32.00	0.00	0.00	0.00	5.12	5.63	0.00	5.63	0.00	0.91	0.05	0.16	1.12	0.00	0.00	0.00	0.	0.00
18	19.100	32.00	0.00	0.00	0.00	5.12	5.59	0.00	5.59	0.00	0.91	0.05	0.17	1.13	0.00	0.00	0.00	0.	0.00
19	19.000	32.00	0.00	0.00	0.00	5.12	5.56	0.00	5.56	0.00	0.91	0.05	0.18	1.14	0.00	0.00	0.00	0.	0.00
20	18.900	32.00	0.00	0.00	0.00	5.12	5.53	0.00	5.53	0.00	0.90	0.05	0.19	1.15	0.00	0.00	0.00	0.	0.00
21	18.800	32.00	0.00	0.00	0.00	5.12	5.50	0.00	5.50	0.00	0.90	0.05	0.20	1.16	0.00	0.00	0.00	0.	0.00
22	18.700	32.00	0.00	0.00	0.00	5.12	5.48	0.00	5.48	0.00	0.90	0.05	0.22	1.17	0.00	0.00	0.00	0.	0.00
23	18.600	32.00	0.00	0.00	0.00	5.13	5.45	0.00	5.45	0.00	0.90	0.05	0.23	1.18	0.00	0.00	0.00	0.	0.00
24	18.500	32.00	0.00	0.00	0.00	5.13	5.42	0.00	5.42	0.00	0.89	0.05	0.24	1.18	0.00	0.00	0.00	0.	0.00
25	18.400	32.00	0.00	0.00	0.00	5.13	5.40	0.00	5.40	0.00	0.89	0.05	0.25	1.19	0.00	0.00	0.00	0.	0.00
26	18.300	32.00	0.00	0.00	0.00	5.13	5.38	0.00	5.38	0.00	0.89	0.05	0.26	1.20	0.00	0.00	0.00	0.	0.00
27	18.200	32.00	0.00	0.00	0.00	5.13	5.35	0.00	5.35	0.00	0.89	0.05	0.27	1.21	0.00	0.00	0.00	0.	0.00
28	18.100	32.00	0.00	0.00	0.00	5.13	5.33	0.00	5.33	0.00	0.89	0.05	0.28	1.22	0.00	0.00	0.00	0.	0.00
29	18.000	32.00	0.00	0.00	0.00	5.13	5.31	0.00	5.31	0.00	0.89	0.05	0.29	1.23	0.00	0.00	0.00	0.	0.00
30	17.900	32.00	0.00	0.00	0.00	5.13	5.29	0.00	5.29	0.00	0.88	0.05	0.30	1.24	0.00	0.00	0.00	0.	0.00
31	17.800	32.00	0.00	0.00	0.00	5.13	5.27	0.00	5.27	0.00	0.88	0.05	0.31	1.25	0.00	0.00	0.00	0.	0.00
32	17.700	32.00	0.00	0.00	0.00	5.13	5.26	0.00	5.26	0.00	0.88	0.05	0.32	1.25	0.00	0.00	0.00	0.	0.00
33	17.600	32.00	0.00	0.00	0.00	5.13	5.24	0.00	5.24	0.00	0.88	0.05	0.33	1.26	0.00	0.00	0.00	0.	0.00
34	17.500	32.00	0.00	0.00	0.00	5.13	5.22	0.00	5.22	0.00	0.88	0.05	0.34	1.27	0.00	0.00	0.00	0.	0.00
35	17.400	32.00	0.00	0.00	0.00	5.13	5.21	0.00	5.21	0.00	0.87	0.05	0.35	1.28	0.00	0.00	0.00	0.	0.00
36	17.300	32.00	0.00	0.00	0.00	5.13	5.19	0.00	5.19	0.00	0.87	0.05	0.36	1.29	0.00	0.00	0.00	0.	0.00
37	17.200	32.00	0.00	0.00	0.00	5.14	5.18	0.00	5.18	0.00	0.87	0.05	0.37	1.30	0.00	0.00	0.00	0.	0.00
38	17.100	32.00	0.00	0.00	0.00	5.14	5.16	0.00	5.16	0.00	0.87	0.05	0.39	1.31	0.00	0.00	0.00	0.	0.00
39	17.000	32.00	0.00	0.00	0.00	5.14	5.15	0.00	5.15	0.00	0.87	0.05	0.40	1.31	0.00	0.00	0.00	0.	0.00
40	16.900	32.00	0.00	0.00	0.00	5.14	5.14	0.00	5.14	0.00	0.87	0.05	0.41	1.32	0.00	0.00	0.00	0.	0.00
41	16.800	32.00	0.00	0.00	0.00	5.14	5.13	0.00	5.13	0.00	0.86	0.05	0.42	1.33	0.00	0.00	0.00	0.	0.00
42	16.700	32.00	0.00	0.00	0.00	5.14	5.11	0.00	5.11	0.00	0.86	0.05	0.43	1.34	0.00	0.00	0.00	0.	0.00
43	16.600	32.00	0.00	0.00	0.00	5.14	5.10	0.00	5.10	0.00	0.86	0.05	0.44	1.35	0.00	0.00	0.00	0.	0.00
44	16.500	32.00	0.00	0.00	0.00	5.14	5.09	0.00	5.09	0.00	0.86	0.05	0.45	1.36	0.00	0.00	0.00	0.	0.00
45	16.400	32.00	0.00	0.00	0.00	5.14	5.08	0.00	5.08	0.00	0.86	0.05	0.46	1.37	0.00	0.00	0.00	0.	0.00
46	16.300	32.00	0.00	0.00	0.00	5.14	5.07	0.00	5.07	0.00	0.86	0.05	0.47	1.38	0.00	0.00	0.00	0.	0.00
47	16.200	32.00	0.00	0.00	0.00	5.14	5.06	0.00	5.06	0.00	0.86	0.05	0.48	1.38	0.00	0.00	0.00	0.	0.00
48	16.100	32.00	0.00	0.00	0.00	5.14	5.05	0.00	5.05	0.00	0.85	0.05	0.49	1.39	0.00	0.00	0.00	0.	0.00
49	16.000	32.00	0.00	0.00	0.00	5.29	5.75	0.00	5.75	0.00	0.90	0.04	0.25	1.19	0.00	0.00	0.00	0.	0.00
50	15.900	32.00	0.00	0.00	0.00	5.26	5.73	0.00	5.73	0.00	0.90	0.04	0.25	1.19	0.00	0.00	0.00	0.	0.00
51	15.800	32.00	0.00	0.00	0.00	5.25	5.71	0.00	5.71	0.00	0.90	0.04	0.26	1.20	0.00	0.00	0.00	0.	0.00
52	15.700	32.00	0.00	0.00	0.00	5.24	5.69	0.00	5.69	0.00	0.90	0.04	0.26	1.20	0.00	0.00	0.00	0.	0.00
53	15.600	32.00	0.00	0.00	0.00	5.23	5.67	0.00	5.67	0.00	0.90	0.04	0.27	1.21	0.00	0.00	0.00	0.	0.00

54	15.500	32.00	0.00	0.00	0.00	5.23	5.65	0.00	5.65	0.00	0.90	0.05	0.27	1.21	0.00	0.00	0.00	0.	0.00
55	15.400	32.00	0.00	0.00	0.00	5.23	5.64	0.00	5.64	0.00	0.89	0.05	0.27	1.22	0.00	0.00	0.00	0.	0.00
56	15.300	32.00	0.00	0.00	0.00	5.23	5.62	0.00	5.62	0.00	0.89	0.05	0.28	1.22	0.00	0.00	0.00	0.	0.00
57	15.200	32.00	0.00	0.00	0.00	5.23	5.60	0.00	5.60	0.00	0.89	0.05	0.28	1.22	0.00	0.00	0.00	0.	0.00
58	15.100	32.00	0.00	0.00	0.00	5.23	5.59	0.00	5.59	0.00	0.89	0.05	0.29	1.23	0.00	0.00	0.00	0.	0.00
59	15.000	32.00	0.00	0.00	0.00	5.23	5.57	0.00	5.57	0.00	0.89	0.05	0.29	1.23	0.00	0.00	0.00	0.	0.00
60	14.900	32.00	0.00	0.00	0.00	5.23	5.55	0.00	5.55	0.00	0.89	0.05	0.30	1.24	0.00	0.00	0.00	0.	0.00
61	14.800	32.00	0.00	0.00	0.00	5.23	5.54	0.00	5.54	0.00	0.89	0.05	0.30	1.24	0.00	0.00	0.00	0.	0.00
62	14.700	32.00	0.00	0.00	0.00	5.23	5.52	0.00	5.52	0.00	0.89	0.05	0.31	1.25	0.00	0.00	0.00	0.	0.00
63	14.600	32.00	0.00	0.00	0.00	5.23	5.51	0.00	5.51	0.00	0.89	0.05	0.31	1.25	0.00	0.00	0.00	0.	0.00
64	14.500	32.00	0.00	0.00	0.00	5.23	5.49	0.00	5.49	0.00	0.89	0.05	0.32	1.25	0.00	0.00	0.00	0.	0.00
65	14.400	32.00	0.00	0.00	0.00	5.23	5.48	0.00	5.48	0.00	0.89	0.05	0.32	1.26	0.00	0.00	0.00	0.	0.00
66	14.300	32.00	0.00	0.00	0.00	5.23	5.47	0.00	5.47	0.00	0.88	0.05	0.33	1.26	0.00	0.00	0.00	0.	0.00
67	14.200	32.00	0.00	0.00	0.00	5.23	5.45	0.00	5.45	0.00	0.88	0.05	0.33	1.27	0.00	0.00	0.00	0.	0.00
68	14.100	32.00	0.00	0.00	0.00	5.23	5.44	0.00	5.44	0.00	0.88	0.05	0.34	1.27	0.00	0.00	0.00	0.	0.00
69	14.000	32.00	0.00	0.00	0.00	5.23	5.43	0.00	5.43	0.00	0.88	0.05	0.34	1.28	0.00	0.00	0.00	0.	0.00
70	13.900	32.00	0.00	0.00	0.00	5.23	5.42	0.00	5.42	0.00	0.88	0.05	0.35	1.28	0.00	0.00	0.00	0.	0.00
71	13.800	32.00	0.00	0.00	0.00	5.23	5.40	0.00	5.40	0.00	0.88	0.05	0.35	1.28	0.00	0.00	0.00	0.	0.00
72	13.700	32.00	0.00	0.00	0.00	5.23	5.39	0.00	5.39	0.00	0.88	0.05	0.36	1.29	0.00	0.00	0.00	0.	0.00
73	13.600	32.00	0.00	0.00	0.00	5.23	5.38	0.00	5.38	0.00	0.88	0.05	0.36	1.29	0.00	0.00	0.00	0.	0.00
74	13.500	32.00	0.00	0.00	0.00	5.23	5.37	0.00	5.37	0.00	0.88	0.05	0.37	1.30	0.00	0.00	0.00	0.	0.00
75	13.400	32.00	0.00	0.00	0.00	5.23	5.36	0.00	5.36	0.00	0.88	0.05	0.37	1.30	0.00	0.00	0.00	0.	0.00
76	13.300	32.00	0.00	0.00	0.00	5.23	5.35	0.00	5.35	0.00	0.88	0.05	0.38	1.31	0.00	0.00	0.00	0.	0.00
77	13.200	32.00	0.00	0.00	0.00	5.23	5.34	0.00	5.34	0.00	0.87	0.05	0.39	1.31	0.00	0.00	0.00	0.	0.00
78	13.100	32.00	0.00	0.00	0.00	5.23	5.32	0.00	5.32	0.00	0.87	0.05	0.39	1.31	0.00	0.00	0.00	0.	0.00
79	13.000	32.00	0.00	0.00	0.00	5.23	5.31	0.00	5.31	0.00	0.87	0.05	0.40	1.32	0.00	0.00	0.00	0.	0.00
80	12.900	32.00	0.00	0.00	0.00	5.23	5.30	0.00	5.30	0.00	0.87	0.05	0.40	1.32	0.00	0.00	0.00	0.	0.00
81	12.800	32.00	0.00	0.00	0.00	5.23	5.29	0.00	5.29	0.00	0.87	0.05	0.41	1.33	0.00	0.00	0.00	0.	0.00
82	12.700	32.00	0.00	0.00	0.00	5.23	5.28	0.00	5.28	0.00	0.87	0.05	0.41	1.33	0.00	0.00	0.00	0.	0.00
83	12.600	32.00	0.00	0.00	0.00	5.23	5.28	0.00	5.28	0.00	0.87	0.05	0.42	1.34	0.00	0.00	0.00	0.	0.00
84	12.500	32.00	0.00	0.00	0.00	5.23	5.27	0.00	5.27	0.00	0.87	0.05	0.42	1.34	0.00	0.00	0.00	0.	0.00
85	12.400	32.00	0.00	0.00	0.00	5.23	5.26	0.00	5.26	0.00	0.87	0.05	0.43	1.35	0.00	0.00	0.00	0.	0.00
86	12.300	32.00	0.00	0.00	0.00	5.24	5.25	0.00	5.25	0.00	0.87	0.05	0.43	1.35	0.00	0.00	0.00	0.	0.00
87	12.200	32.00	0.00	0.00	0.00	5.24	5.24	0.00	5.24	0.00	0.87	0.05	0.44	1.35	0.00	0.00	0.00	0.	0.00
88	12.100	32.00	0.00	0.00	0.00	5.24	5.23	0.00	5.23	0.00	0.86	0.05	0.44	1.36	0.00	0.00	0.00	0.	0.00
89	12.000	32.00	0.00	0.00	0.00	5.24	5.22	0.00	5.22	0.00	0.86	0.05	0.45	1.36	0.00	0.00	0.00	0.	0.00
90	11.900	32.00	0.00	0.00	0.00	5.24	5.22	0.00	5.22	0.00	0.86	0.05	0.45	1.37	0.00	0.00	0.00	0.	0.00
91	11.800	32.00	0.00	0.00	0.00	5.24	5.21	0.00	5.21	0.00	0.86	0.05	0.46	1.37	0.00	0.00	0.00	0.	0.00
92	11.700	32.00	0.00	0.00	0.00	5.24	5.20	0.00	5.20	0.00	0.86	0.05	0.46	1.38	0.00	0.00	0.00	0.	0.00
93	11.600	32.00	0.00	0.00	0.00	5.24	5.19	0.00	5.19	0.00	0.86	0.05	0.47	1.38	0.00	0.00	0.00	0.	0.00
94	11.500	32.00	0.00	0.00	0.00	5.24	5.18	0.00	5.18	0.00	0.86	0.05	0.47	1.38	0.00	0.00	0.00	0.	0.00
95	11.400	32.00	0.00	0.00	0.00	5.24	5.18	0.00	5.18	0.00	0.86	0.05	0.48	1.39	0.00	0.00	0.00	0.	0.00
96	11.300	32.00	0.00	0.00	0.00	5.24	5.17	0.00	5.17	0.00	0.86	0.05	0.48	1.39	0.00	0.00	0.00	0.	0.00
97	11.200	32.00	0.00	0.00	0.00	5.24	5.16	0.00	5.16	0.00	0.86	0.05	0.49	1.40	0.00	0.00	0.00	0.	0.00
98	11.100	32.00	0.00	0.00	0.00	5.24	5.16	0.00	5.16	0.00	0.86	0.05	0.49	1.40	0.00	0.00	0.00	0.	0.00
99	11.000	32.00	0.00	0.00	0.00	5.24	5.15	0.00	5.15	0.00	0.86	0.05	0.50	1.41	0.00	0.00	0.00	0.	0.00
100	10.900	32.00	0.00	0.00	0.00	5.24	5.14	0.00	5.14	0.00	0.86	0.05	0.50	1.41	0.00	0.00	0.00	0.	0.00
101	10.800	32.00	0.00	0.00	0.00	5.24	5.14	0.00	5.14	0.00	0.85	0.05	0.51	1.41	0.00	0.00	0.00	0.	0.00
102	10.700	32.00	0.00	0.00	0.00	5.24	5.13	0.00	5.13	0.00	0.85	0.05	0.51	1.42	0.00	0.00	0.00	0.	0.00
103	10.600	32.00	0.00	0.00	0.00	5.24	5.13	0.00	5.13	0.00	0.85	0.05	0.52	1.42	0.00	0.00	0.00	0.	0.00
104	10.500	32.00	0.00	0.00	0.00	5.24	5.12	0.00	5.12	0.00	0.85	0.05	0.52	1.43	0.00	0.00	0.00	0.	0.00

105	10.400	32.00	0.00	0.00	0.00	5.24	5.11	0.00	5.11	0.00	0.85	0.05	0.53	1.43	0.00	0.00	0.00	0.	0.00
106	10.300	32.00	0.00	0.00	0.00	5.24	5.11	0.00	5.11	0.00	0.85	0.05	0.53	1.44	0.00	0.00	0.00	0.	0.00
107	10.200	32.00	0.00	0.00	0.00	5.24	5.10	0.00	5.10	0.00	0.85	0.05	0.54	1.44	0.00	0.00	0.00	0.	0.00
108	10.100	32.00	0.00	0.00	0.00	5.24	5.10	0.00	5.10	0.00	0.85	0.05	0.54	1.44	0.00	0.00	0.00	0.	0.00
109	10.000	32.00	0.00	0.00	0.00	5.24	5.09	0.00	5.09	0.00	0.85	0.05	0.55	1.45	0.00	0.00	0.00	0.	0.00
110	9.900	32.00	0.00	0.00	0.00	5.24	5.09	0.00	5.09	0.00	0.85	0.05	0.56	1.45	0.00	0.00	0.00	0.	0.00
111	9.800	32.00	0.00	0.00	0.00	5.24	5.08	0.00	5.08	0.00	0.85	0.05	0.56	1.46	0.00	0.00	0.00	0.	0.00
112	9.700	32.00	0.00	0.00	0.00	5.24	5.08	0.00	5.08	0.00	0.85	0.05	0.57	1.46	0.00	0.00	0.00	0.	0.00
113	9.600	32.00	0.00	0.00	0.00	5.24	5.07	0.00	5.07	0.00	0.85	0.05	0.57	1.47	0.00	0.00	0.00	0.	0.00
114	9.500	32.00	0.00	0.00	0.00	5.24	5.07	0.00	5.07	0.00	0.85	0.05	0.58	1.47	0.00	0.00	0.00	0.	0.00
115	9.400	32.00	0.00	0.00	0.00	5.24	5.06	0.00	5.06	0.00	0.84	0.05	0.58	1.48	0.00	0.00	0.00	0.	0.00
116	9.300	32.00	0.00	0.00	0.00	5.24	5.06	0.00	5.06	0.00	0.84	0.05	0.59	1.48	0.00	0.00	0.00	0.	0.00
117	9.200	32.00	0.00	0.00	0.00	5.24	5.05	0.00	5.05	0.00	0.84	0.05	0.59	1.48	0.00	0.00	0.00	0.	0.00
118	9.100	32.00	0.00	0.00	0.00	5.24	5.05	0.00	5.05	0.00	0.84	0.05	0.60	1.49	0.00	0.00	0.00	0.	0.00
119	9.000	32.00	0.00	0.00	0.00	5.24	5.04	0.00	5.04	0.00	0.84	0.05	0.60	1.49	0.00	0.00	0.00	0.	0.00
120	8.900	32.00	0.00	0.00	0.00	5.24	5.04	0.00	5.04	0.00	0.84	0.05	0.61	1.50	0.00	0.00	0.00	0.	0.00
121	8.800	32.00	0.00	0.00	0.00	5.24	5.04	0.00	5.04	0.00	0.84	0.05	0.61	1.50	0.00	0.00	0.00	0.	0.00
122	8.700	32.00	0.00	0.00	0.00	5.24	5.03	0.00	5.03	0.00	0.84	0.05	0.62	1.51	0.00	0.00	0.00	0.	0.00
123	8.600	32.00	0.00	0.00	0.00	5.24	5.03	0.00	5.03	0.00	0.84	0.05	0.62	1.51	0.00	0.00	0.00	0.	0.00
124	8.500	32.00	0.00	0.00	0.00	5.24	5.02	0.00	5.02	0.00	0.84	0.05	0.63	1.51	0.00	0.00	0.00	0.	0.00
125	8.400	32.00	0.00	0.00	0.00	5.24	5.02	0.00	5.02	0.00	0.84	0.05	0.63	1.52	0.00	0.00	0.00	0.	0.00
126	8.300	32.00	0.00	0.00	0.00	5.20	10.33	0.00	10.33	0.00	1.55	0.49	0.33	2.36	0.00	0.00	0.00	0.	0.00
127	8.200	32.00	0.00	0.00	0.00	5.16	10.28	0.00	10.28	0.00	1.55	0.47	0.35	2.36	0.00	0.00	0.00	0.	0.00
128	8.100	32.00	0.00	0.00	0.00	5.14	10.22	0.00	10.22	0.00	1.55	0.45	0.37	2.37	0.00	0.00	0.00	0.	0.00
129	8.000	32.00	0.00	0.00	0.00	5.13	10.16	0.00	10.16	0.00	1.54	0.43	0.39	2.37	0.00	0.00	0.00	0.	0.00
130	7.900	32.00	0.00	0.00	0.00	5.13	10.10	0.00	10.10	0.00	1.54	0.42	0.41	2.37	0.00	0.00	0.00	0.	0.00
131	7.800	32.00	0.00	0.00	0.00	5.12	10.05	0.00	10.05	0.00	1.54	0.40	0.43	2.37	0.00	0.00	0.00	0.	0.00
132	7.700	32.00	0.00	0.00	0.00	5.13	9.99	0.00	9.99	0.00	1.54	0.39	0.45	2.38	0.00	0.00	0.00	0.	0.00
133	7.600	32.00	0.00	0.00	0.00	5.13	9.94	0.00	9.94	0.00	1.53	0.37	0.47	2.38	0.00	0.00	0.00	0.	0.00
134	7.500	32.00	0.00	0.00	0.00	5.13	9.88	0.00	9.88	0.00	1.53	0.36	0.49	2.38	0.00	0.00	0.00	0.	0.00
135	7.400	32.00	0.00	0.00	0.00	5.14	9.83	0.00	9.83	0.00	1.53	0.35	0.50	2.38	0.00	0.00	0.00	0.	0.00
136	7.300	32.00	0.00	0.00	0.00	5.15	9.78	0.00	9.78	0.00	1.53	0.34	0.52	2.38	0.00	0.00	0.00	0.	0.00
137	7.200	32.00	0.00	0.00	0.00	5.15	9.73	0.00	9.73	0.00	1.52	0.33	0.54	2.39	0.00	0.00	0.00	0.	0.00
138	7.100	32.00	0.00	0.00	0.00	5.16	9.67	0.00	9.67	0.00	1.52	0.31	0.55	2.39	0.00	0.00	0.00	0.	0.00
139	7.000	32.00	0.00	0.00	0.00	5.17	9.62	0.00	9.62	0.00	1.52	0.30	0.57	2.39	0.00	0.00	0.00	0.	0.00
140	6.900	32.00	0.00	0.00	0.00	5.17	9.57	0.00	9.57	0.00	1.52	0.29	0.58	2.39	0.00	0.00	0.00	0.	0.00
141	6.800	32.00	0.00	0.00	0.00	5.18	9.52	0.00	9.52	0.00	1.52	0.28	0.59	2.39	0.00	0.00	0.00	0.	0.00
142	6.700	32.00	0.00	0.00	0.00	5.19	9.47	0.00	9.47	0.00	1.51	0.28	0.61	2.40	0.00	0.00	0.00	0.	0.00
143	6.600	32.00	0.00	0.00	0.00	5.19	9.42	0.00	9.42	0.00	1.51	0.27	0.62	2.40	0.00	0.00	0.00	0.	0.00
144	6.500	32.00	0.00	0.00	0.00	5.20	9.37	0.00	9.37	0.00	1.51	0.26	0.63	2.40	0.00	0.00	0.00	0.	0.00
145	6.400	32.00	0.00	0.00	0.00	5.20	9.33	0.00	9.33	0.00	1.51	0.25	0.64	2.40	0.00	0.00	0.00	0.	0.00
146	6.300	32.00	0.00	0.00	0.00	5.21	9.28	0.00	9.28	0.00	1.50	0.24	0.66	2.40	0.00	0.00	0.00	0.	0.00
147	6.200	32.00	0.00	0.00	0.00	5.22	9.23	0.00	9.23	0.00	1.50	0.24	0.67	2.41	0.00	0.00	0.00	0.	0.00
148	6.100	32.00	0.00	0.00	0.00	5.22	9.18	0.00	9.18	0.00	1.50	0.23	0.68	2.41	0.00	0.00	0.00	0.	0.00
149	6.000	32.00	0.00	0.00	0.00	5.23	9.14	0.00	9.14	0.00	1.50	0.22	0.69	2.41	0.00	0.00	0.00	0.	0.00
150	5.900	32.00	0.00	0.00	0.00	5.23	9.09	0.00	9.09	0.00	1.50	0.22	0.70	2.41	0.00	0.00	0.00	0.	0.00
151	5.800	32.00	0.00	0.00	0.00	5.24	9.05	0.00	9.05	0.00	1.49	0.21	0.71	2.41	0.00	0.00	0.00	0.	0.00
152	5.700	32.00	0.00	0.00	0.00	5.24	9.00	0.00	9.00	0.00	1.49	0.20	0.72	2.42	0.00	0.00	0.00	0.	0.00
153	5.600	32.00	0.00	0.00	0.00	5.24	8.96	0.00	8.96	0.00	1.49	0.20	0.73	2.42	0.00	0.00	0.00	0.	0.00
154	5.500	32.00	0.00	0.00	0.00	5.25	8.91	0.00	8.91	0.00	1.49	0.19	0.74	2.42	0.00	0.00	0.00	0.	0.00
155	5.400	32.00	0.00	0.00	0.00	5.25	8.87	0.00	8.87	0.00	1.48	0.19	0.75	2.42	0.00	0.00	0.00	0.	0.00

156	5.300	32.00	0.00	0.00	0.00	5.26	8.83	0.00	8.83	0.00	1.48	0.18	0.76	2.43	0.00	0.00	0.00	0.	0.00
157	5.200	32.00	0.00	0.00	0.00	5.26	8.79	0.00	8.79	0.00	1.48	0.18	0.77	2.43	0.00	0.00	0.00	0.	0.00
158	5.100	32.00	0.00	0.00	0.00	5.21	10.37	0.00	10.37	0.00	1.57	0.43	0.77	2.77	0.00	0.00	0.00	0.	0.00
159	5.000	32.00	0.00	0.00	0.00	5.19	10.31	0.00	10.31	0.00	1.57	0.42	0.79	2.77	0.00	0.00	0.00	0.	0.00
160	4.900	32.00	0.00	0.00	0.00	5.17	10.26	0.00	10.26	0.00	1.57	0.40	0.81	2.78	0.00	0.00	0.00	0.	0.00
161	4.800	32.00	0.00	0.00	0.00	5.16	10.20	0.00	10.20	0.00	1.57	0.39	0.82	2.78	0.00	0.00	0.00	0.	0.00
162	4.700	32.00	0.00	0.00	0.00	5.15	10.14	0.00	10.14	0.00	1.56	0.37	0.84	2.78	0.00	0.00	0.00	0.	0.00
163	4.600	32.00	0.00	0.00	0.00	5.15	10.09	0.00	10.09	0.00	1.56	0.36	0.86	2.78	0.00	0.00	0.00	0.	0.00
164	4.500	32.00	0.00	0.00	0.00	5.16	10.04	0.00	10.04	0.00	1.56	0.35	0.87	2.78	0.00	0.00	0.00	0.	0.00
165	4.400	32.00	0.00	0.00	0.00	5.16	9.98	0.00	9.98	0.00	1.56	0.34	0.89	2.79	0.00	0.00	0.00	0.	0.00
166	4.300	32.00	0.00	0.00	0.00	5.16	9.93	0.00	9.93	0.00	1.56	0.33	0.91	2.79	0.00	0.00	0.00	0.	0.00
167	4.200	32.00	0.00	0.00	0.00	5.17	9.88	0.00	9.88	0.00	1.55	0.32	0.92	2.79	0.00	0.00	0.00	0.	0.00
168	4.100	32.00	0.00	0.00	0.00	5.17	9.82	0.00	9.82	0.00	1.55	0.31	0.94	2.79	0.00	0.00	0.00	0.	0.00
169	4.000	32.00	0.00	0.00	0.00	5.18	9.77	0.00	9.77	0.00	1.55	0.30	0.95	2.79	0.00	0.00	0.00	0.	0.00
170	3.900	32.00	0.00	0.00	0.00	5.19	9.72	0.00	9.72	0.00	1.55	0.29	0.96	2.80	0.00	0.00	0.00	0.	0.00
171	3.800	32.00	0.00	0.00	0.00	5.19	9.67	0.00	9.67	0.00	1.54	0.28	0.98	2.80	0.00	0.00	0.00	0.	0.00
172	3.700	32.00	0.00	0.00	0.00	5.20	9.62	0.00	9.62	0.00	1.54	0.27	0.99	2.80	0.00	0.00	0.00	0.	0.00
173	3.600	32.00	0.00	0.00	0.00	5.20	9.57	0.00	9.57	0.00	1.54	0.26	1.00	2.80	0.00	0.00	0.00	0.	0.00
174	3.500	32.00	0.00	0.00	0.00	5.21	9.52	0.00	9.52	0.00	1.54	0.25	1.01	2.80	0.00	0.00	0.00	0.	0.00
175	3.400	32.00	0.00	0.00	0.00	5.21	9.47	0.00	9.47	0.00	1.53	0.25	1.02	2.81	0.00	0.00	0.00	0.	0.00
176	3.300	32.00	0.00	0.00	0.00	5.22	9.43	0.00	9.43	0.00	1.53	0.24	1.04	2.81	0.00	0.00	0.00	0.	0.00
177	3.200	32.00	0.00	0.00	0.00	5.22	9.38	0.00	9.38	0.00	1.53	0.23	1.05	2.81	0.00	0.00	0.00	0.	0.00
178	3.100	32.00	0.00	0.00	0.00	5.23	9.33	0.00	9.33	0.00	1.53	0.23	1.06	2.81	0.00	0.00	0.00	0.	0.00
179	3.000	32.00	0.00	0.00	0.00	5.23	9.29	0.00	9.29	0.00	1.53	0.22	1.07	2.81	0.00	0.00	0.00	0.	0.00
180	2.900	32.00	0.00	0.00	0.00	5.24	9.24	0.00	9.24	0.00	1.52	0.21	1.08	2.82	0.00	0.00	0.00	0.	0.00
181	2.800	32.00	0.00	0.00	0.00	5.24	9.19	0.00	9.19	0.00	1.52	0.21	1.09	2.82	0.00	0.00	0.00	0.	0.00
182	2.700	32.00	0.00	0.00	0.00	5.25	9.15	0.00	9.15	0.00	1.52	0.20	1.10	2.82	0.00	0.00	0.00	0.	0.00
183	2.600	32.00	0.00	0.00	0.00	5.25	9.11	0.00	9.11	0.00	1.52	0.20	1.11	2.82	0.00	0.00	0.00	0.	0.00
184	2.500	32.00	0.00	0.00	0.00	5.26	9.06	0.00	9.06	0.00	1.51	0.19	1.12	2.82	0.00	0.00	0.00	0.	0.00
185	2.400	32.00	0.00	0.00	0.00	5.26	9.02	0.00	9.02	0.00	1.51	0.19	1.13	2.83	0.00	0.00	0.00	0.	0.00
186	2.300	32.00	0.00	0.00	0.00	5.26	8.97	0.00	8.97	0.00	1.51	0.18	1.13	2.83	0.00	0.00	0.00	0.	0.00
187	2.200	32.00	0.00	0.00	0.00	5.27	8.93	0.00	8.93	0.00	1.51	0.18	1.14	2.83	0.00	0.00	0.00	0.	0.00
188	2.100	32.00	0.00	0.00	0.00	5.27	8.89	0.00	8.89	0.00	1.51	0.18	1.15	2.83	0.00	0.00	0.00	0.	0.00
189	2.000	32.00	0.00	0.00	0.00	5.27	8.85	0.00	8.85	0.00	1.50	0.17	1.16	2.83	0.00	0.00	0.00	0.	0.00
190	1.900	32.00	0.00	0.00	0.00	5.28	8.81	0.00	8.81	0.00	1.50	0.17	1.17	2.84	0.00	0.00	0.00	0.	0.00
191	1.800	32.00	0.00	0.00	0.00	5.28	8.77	0.00	8.77	0.00	1.50	0.16	1.17	2.84	0.00	0.00	0.00	0.	0.00
192	1.700	32.00	0.00	0.00	0.00	5.28	8.73	0.00	8.73	0.00	1.50	0.16	1.18	2.84	0.00	0.00	0.00	0.	0.00
193	1.600	32.00	0.00	0.00	0.00	5.29	8.69	0.00	8.69	0.00	1.50	0.16	1.19	2.84	0.00	0.00	0.00	0.	0.00
194	1.500	32.00	0.00	0.00	0.00	5.29	8.65	0.00	8.65	0.00	1.49	0.15	1.20	2.84	0.00	0.00	0.00	0.	0.00
195	1.400	32.00	0.00	0.00	0.00	5.29	8.61	0.00	8.61	0.00	1.49	0.15	1.20	2.85	0.00	0.00	0.00	0.	0.00
196	1.300	32.00	0.00	0.00	0.00	5.29	8.57	0.00	8.57	0.00	1.49	0.15	1.21	2.85	0.00	0.00	0.00	0.	0.00
197	1.200	32.00	0.00	0.00	0.00	5.30	8.53	0.00	8.53	0.00	1.49	0.15	1.22	2.85	0.00	0.00	0.00	0.	0.00
198	1.100	32.00	0.00	0.00	0.00	5.30	8.49	0.00	8.49	0.00	1.48	0.14	1.22	2.85	0.00	0.00	0.00	0.	0.00
199	1.000	32.00	0.00	0.00	0.00	5.30	8.45	0.00	8.45	0.00	1.48	0.14	1.23	2.85	0.00	0.00	0.00	0.	0.00
200	0.900	32.00	0.00	0.00	0.00	5.30	8.42	0.00	8.42	0.00	1.48	0.14	1.24	2.86	0.00	0.00	0.00	0.	0.00
201	0.800	32.00	0.00	0.00	0.00	5.31	8.38	0.00	8.38	0.00	1.48	0.14	1.24	2.86	0.00	0.00	0.00	0.	0.00
202	0.700	32.00	0.00	0.00	0.00	5.31	8.34	0.00	8.34	0.00	1.48	0.13	1.25	2.86	0.00	0.00	0.00	0.	0.00
203	0.600	32.00	0.00	0.00	0.00	5.45	8.12	0.00	8.12	0.00	1.34	0.11	1.02	2.47	0.00	0.00	0.00	0.	0.00

****** 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
204	UPR RCH	0.01494	32.00	0.00	0.00	0.00	5.45	8.12	0.00	8.12	0.00	1.34	0.11	1.02	0.00	0.00	0.00	0.00

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

ELEM NO.	BEGIN DIST km	ENDING DIST km	FLOW m^3/s	PCT EFF	ADVCTV VELO m/s	TRAVEL TIME days	DEPTH m	WIDTH m	VOLUME m^3	SURFACE AREA m^2	X-SECT AREA m^2	TIDAL PRISM m^3	TIDAL VELO m/s	DISPRSN m^2/s	MEAN VELO m/s
204	0.60	0.50	0.01494	81.1	0.01026	0.11	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.010
205	0.50	0.40	0.01494	81.1	0.01026	0.11	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.010
206	0.40	0.30	0.01494	81.1	0.01026	0.11	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.010
207	0.30	0.20	0.01494	81.1	0.01026	0.11	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.010
208	0.20	0.10	0.01494	81.1	0.01026	0.11	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.010
209	0.10	0.00	0.01494	81.1	0.01026	0.11	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.010
TOT						0.68			873.60	5460.00					
AVG					0.0103		0.16	9.10			1.46				
CUM						49.92									

****** 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
204	0.500	7.30	6.31	0.10	0.00	0.00	0.00	0.00	0.00	2.19	2.19	2.19	0.03	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	0.400	7.30	6.31	0.10	0.00	0.00	0.00	0.00	0.00	2.19	2.19	2.19	0.03	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
206	0.300	7.30	6.31	0.10	0.00	0.00	0.00	0.00	0.00	2.19	2.19	2.19	0.03	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
207	0.200	7.30	6.31	0.10	0.00	0.00	0.00	0.00	0.00	2.19	2.19	2.19	0.03	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
208	0.100	7.30	6.31	0.10	0.00	0.00	0.00	0.00	0.00	2.19	2.19	2.19	0.03	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
209	0.000	7.30	6.31	0.10	0.00	0.00	0.00	0.00	0.00	2.19	2.19	2.19	0.03	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			5.07	0.05	0.00	0.00	0.00	0.00	0.00	1.03			0.02	0.00	0.08	0.00	0.00	0.00			0.00	0.00	0.00

* $g/m^2/d$ ** 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 g/m^3	COLI #/100mL	NCM

204	0.500	32.00	0.00	0.00	0.00	5.26	8.03	0.00	8.03	0.00	1.34	0.11	1.02	2.47	0.00	0.00	0.00	0.	0.00
205	0.400	32.00	0.00	0.00	0.00	5.15	7.94	0.00	7.94	0.00	1.34	0.11	1.02	2.47	0.00	0.00	0.00	0.	0.00
206	0.300	32.00	0.00	0.00	0.00	5.09	7.86	0.00	7.86	0.00	1.33	0.12	1.03	2.47	0.00	0.00	0.00	0.	0.00
207	0.200	32.00	0.00	0.00	0.00	5.05	7.78	0.00	7.78	0.00	1.33	0.12	1.03	2.47	0.00	0.00	0.00	0.	0.00
208	0.100	32.00	0.00	0.00	0.00	5.03	7.69	0.00	7.69	0.00	1.32	0.12	1.03	2.47	0.00	0.00	0.00	0.	0.00
209	0.000	32.00	0.00	0.00	0.00	5.02	7.61	0.00	7.61	0.00	1.32	0.12	1.03	2.47	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Boggy Bayou

LA-QUAL Model for Boggy Bayou (100602)
Summer Projection with 46% NPS reduction

TRAVEL TIME = 49.92 DAYS

MAXIMUM EFFLUENT = 81.06 PERCENT

FLOW	=	0.00283	TO	0.01494	m³/s
DISPERSION	=	0.0000	TO	0.0000	m²/s
VELOCITY	=	0.00247	TO	0.01301	m/s
DEPTH	=	0.16	TO	0.28	m
WIDTH	=	4.10	TO	9.10	m
BOD DECAY	=	0.10	TO	0.10	per day
NH3 DECAY	=	0.19	TO	0.43	per day
SOD	=	1.72	TO	2.19	g/m²/d
NH3 SOURCE	=	0.00	TO	0.00	g/m²/d
REAERATION	=	3.11	TO	6.31	per day
BOD SETTLING	=	0.00	TO	0.00	per day
ORG-N DECAY	=	0.03	TO	0.03	per day
ORG-N SETTLING	=	0.00	TO	0.00	per day
TEMPERATURE	=	32.00	TO	32.00	deg C
DISSOLVED OXYGEN	=	5.02	TO	5.45	mg/L

LA-QUAL Model for Boggy Bayou (100602)
Summer Projection with 46% NPS reduction

INPUT/OUTPUT LOADING SUMMARY

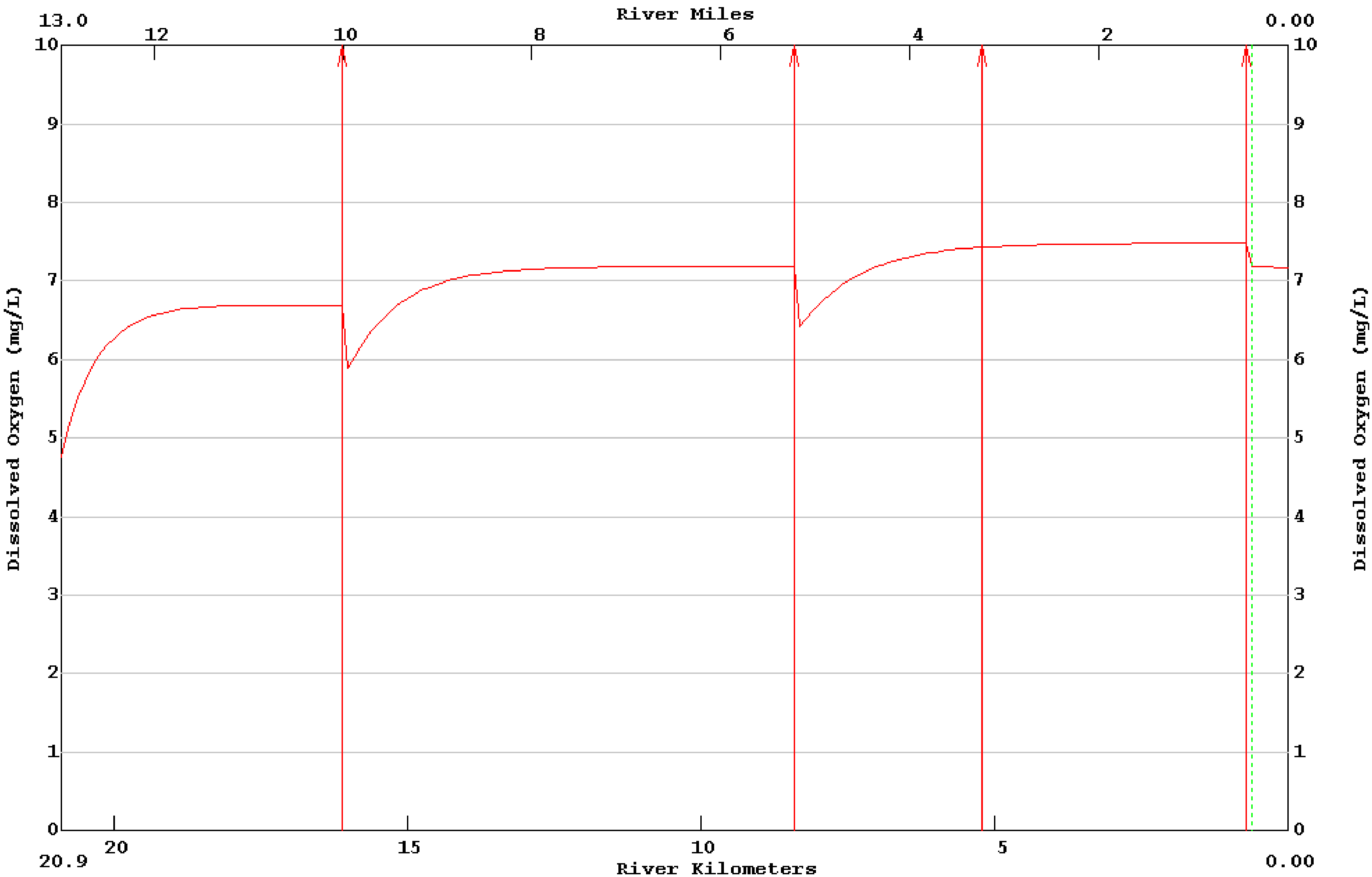
	FLOW m³/s	DO kg/d	BOD#1 kg/d	BOD#2 kg/d	ORG-N kg/d	NH3-N kg/d	NO3-N kg/d	PHOS kg/d	CHL A	NCM
HEADWATER FLOW	0.003	1.4	1.6	0.0	0.2	0.0	0.0	0.0	0.0	0.0
INCREMENTAL INFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INCREMENTAL OUTFLOW	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASTELOADS	0.012	5.8	13.5	0.0	1.7	0.8	0.0	0.0	0.0	0.0
WITHDRAWLS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-0.015	-6.5	-9.8	0.0	-1.7	-0.2	-1.3	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	10.8	0.0	0.4					0.0
NATURAL REAERATION		176.7								
DAM REAERATION		0.0								
BACKGROUND SOD		-155.5								
BOD#1 DECAY		-16.0	-16.0							
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			-0.7	0.7				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-5.8				-1.3	1.3			
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	0.015	183.8	25.8	0.0	2.4	1.5	1.3	0.0	0.0	0.0
TOTAL OUTPUTS	-0.015	-183.8	-25.8	0.0	-2.4	-1.5	-1.3	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 J

LA-QUAL Output for Winter Projection

LA-QUAL Version 8.11 Run at 13:02 on 09/28/2007 File D:\comp_models\LA-QUAL_8p11\bogwin.txt
Winter Projection with 0% NPS reduction min= 4.76 max= 7.48
LA-QUAL Model for Boggy Bayou (100602)



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LA-QUAL Version 8.11
Louisiana Department of Environmental Quality

Input file is D:\comp_models\LA-QUAL_8p11\bogwin.txt
Output produced at 13:02 on 09/28/2007

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

CARD TYPE       CONTROL TITLES

TITLE01         LA-QUAL Model for Boggy Bayou (100602)
TITLE02         Winter Projection with 0% NPS reduction
CNTROL03  YES   METR
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)
PROGRAM         MAXIMUM ITERATION LIMIT            =       200.00000
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
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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 km		END REACH km	ELEM LENGTH km	REACH LENGTH km	ELEMS PER RCH	BEGIN ELEM NUM	END ELEM NUM
REACH ID	1	B1	Boggy Bayou u/s of Gilmer	20.90	TO	0.60	0.1000	20.30	203	1	203
REACH ID	2	B2	Boggy Bayou d/s of Gilmer	0.60	TO	0.00	0.1000	0.60	6	204	209

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	4.100	0.000	0.000	0.280	0.000	0.000	0.00000	0.000
HYDR-1	2	B2	9.100	0.000	0.000	0.160	0.000	0.000	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	22.90	0.00	5.00	0.05	0.03	0.00	0.00	0.00
INITIAL	2	B2	22.90	0.00	5.00	0.05	0.03	0.00	0.00	0.00

ENDATA11

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

CARD	RCH	RCH	K2	K2	K2	K2	BKGRND	BOD	BOD	BOD CONV	ANAER BOD2	BOD2	BOD2	BOD2 CONV	ANAER BOD2

TYPE	NUM	ID	OPT	"A"	"B"	"C"	SOD g/m²/d	DECAY per day	SETT m/d	TO SOD	DECAY per day	DECAY per day	SETT m/d	TO SOD	DECAY per day
COEFF-1	1	B1	15 LOUISIANA	0.000	0.000	0.000	1.500	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000
COEFF-1	2	B2	15 LOUISIANA	0.000	0.000	0.000	1.900	0.055	0.000	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	0.020	0.000	1.000	0.180	0.000	0.000	0.000
COEFF-2	2	B2	0.020	0.000	1.000	0.080	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	SHADING

ENDATA14

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

CARD TYPE	REACH	ID	COLIFORM DIE-OFF	NCM DECAY	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	20.00	0.80	0.00	0.00	0.00	0.00
NONPOINT	2	B2	0.00	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 m³/s	FLOW cfs	TEMP deg C	SALIN ppt	CM-I	CM-II	
HDWTR-1	1	Boggy Bayou	0	0.02830	0.999	0.00	0.00	0.000	0.000	0.00

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	Boggy Bayou	4.76	12.00	1.75	0.05	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 m³/s	FLOW cfs	FLOW MGD	TEMP deg C	SALIN ppt	CM-I	CM-II
WSTLD-1	49	16.10	NPS Unnamed Trib 1	0.02830	0.99929	0.646	0.00	0.00	0.000	0.000
WSTLD-1	126	8.40	NPS Unnamed Trib 2	0.02830	0.99929	0.646	0.00	0.00	0.000	0.000
WSTLD-1	126	8.40	LaLaurie Ln Ox Pond	0.00329	0.11617	0.075	0.00	0.00	0.000	0.000
WSTLD-1	158	5.20	Grawood Church	0.00033	0.01165	0.008	0.00	0.00	0.000	0.000
WSTLD-1	203	0.70	NPS Gilmer Bayou	0.02830	0.99929	0.646	0.00	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	49	NPS Unnamed Trib 1	4.76	12.00	0.00	1.75	0.05	0.00	0.00	0.00
WSTLD-2	126	NPS Unnamed Trib 2	4.76	12.00	0.00	1.75	0.05	0.00	0.00	0.00
WSTLD-2	126	LaLaurie Ln Ox Pond	5.00	23.00	0.00	3.30	1.70	0.00	0.00	0.00
WSTLD-2	158	Grawood Church	5.00	69.00	0.00	5.00	10.00	0.00	0.00	0.00
WSTLD-2	203	NPS Gilmer Bayou	6.07	13.50	0.00	1.45	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

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 = 2
PLOT RCH 1 2
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 4 ITERATIONS
.....CONSTITUENT CALCULATIONS COMPLETED
.....GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

FINAL REPORT Boggy Bayou LA-QUAL Model for Boggy Bayou (100602)
REACH NO. 1 Boggy Bayou u/s of Gilmer Winter Projection with 0% 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	0.02830	0.00	0.00	0.00	0.00	4.76	12.00	0.00	12.00	0.00	1.75	0.05	0.00	0.00	0.00	0.00	0.00
49	WSTLD	0.02830	0.00	0.00	0.00	0.00	4.76	12.00	0.00	12.00	0.00	1.75	0.05	0.00	0.00	0.00	0.00	0.00
126	WSTLD	0.02830	0.00	0.00	0.00	0.00	4.76	12.00	0.00	12.00	0.00	1.75	0.05	0.00	0.00	0.00	0.00	0.00
126	WSTLD	0.00329	0.00	0.00	0.00	0.00	5.00	23.00	0.00	23.00	0.00	3.30	1.70	0.00	0.00	0.00	0.00	0.00
158	WSTLD	0.00033	0.00	0.00	0.00	0.00	5.00	69.00	0.00	69.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00	0.00
203	WSTLD	0.02830	0.00	0.00	0.00	0.00	6.07	13.50	0.00	13.50	0.00	1.45	0.05	0.00	0.00	0.00	0.00	0.00

** HYDRAULIC PARAMETER VALUES **

ELEM NO.	BEGIN DIST km	ENDING DIST km	FLOW m^3/s	PCT EFF	ADVCTV VELO m/s	TRAVEL TIME days	DEPTH m	WIDTH m	VOLUME m^3	SURFACE AREA m^2	X-SECT AREA m^2	TIDAL PRISM m^3	TIDAL VELO m/s	DISPRSN m^2/s	MEAN VELO m/s
1	20.90	20.80	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
2	20.80	20.70	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
3	20.70	20.60	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
4	20.60	20.50	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
5	20.50	20.40	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
6	20.40	20.30	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
7	20.30	20.20	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
8	20.20	20.10	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
9	20.10	20.00	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
10	20.00	19.90	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
11	19.90	19.80	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
12	19.80	19.70	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
13	19.70	19.60	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
14	19.60	19.50	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
15	19.50	19.40	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
16	19.40	19.30	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
17	19.30	19.20	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
18	19.20	19.10	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
19	19.10	19.00	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
20	19.00	18.90	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
21	18.90	18.80	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
22	18.80	18.70	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
23	18.70	18.60	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025

24	18.60	18.50	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
25	18.50	18.40	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
26	18.40	18.30	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
27	18.30	18.20	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
28	18.20	18.10	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
29	18.10	18.00	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
30	18.00	17.90	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
31	17.90	17.80	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
32	17.80	17.70	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
33	17.70	17.60	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
34	17.60	17.50	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
35	17.50	17.40	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
36	17.40	17.30	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
37	17.30	17.20	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
38	17.20	17.10	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
39	17.10	17.00	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
40	17.00	16.90	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
41	16.90	16.80	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
42	16.80	16.70	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
43	16.70	16.60	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
44	16.60	16.50	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
45	16.50	16.40	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
46	16.40	16.30	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
47	16.30	16.20	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
48	16.20	16.10	0.02830	0.0	0.02465	0.05	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.025
49	16.10	16.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
50	16.00	15.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
51	15.90	15.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
52	15.80	15.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
53	15.70	15.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
54	15.60	15.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
55	15.50	15.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
56	15.40	15.30	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
57	15.30	15.20	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
58	15.20	15.10	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
59	15.10	15.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
60	15.00	14.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
61	14.90	14.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
62	14.80	14.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
63	14.70	14.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
64	14.60	14.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
65	14.50	14.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
66	14.40	14.30	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
67	14.30	14.20	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
68	14.20	14.10	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
69	14.10	14.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
70	14.00	13.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
71	13.90	13.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
72	13.80	13.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
73	13.70	13.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
74	13.60	13.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049

75	13.50	13.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
76	13.40	13.30	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
77	13.30	13.20	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
78	13.20	13.10	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
79	13.10	13.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
80	13.00	12.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
81	12.90	12.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
82	12.80	12.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
83	12.70	12.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
84	12.60	12.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
85	12.50	12.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
86	12.40	12.30	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
87	12.30	12.20	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
88	12.20	12.10	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
89	12.10	12.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
90	12.00	11.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
91	11.90	11.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
92	11.80	11.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
93	11.70	11.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
94	11.60	11.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
95	11.50	11.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
96	11.40	11.30	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
97	11.30	11.20	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
98	11.20	11.10	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
99	11.10	11.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
100	11.00	10.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
101	10.90	10.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
102	10.80	10.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
103	10.70	10.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
104	10.60	10.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
105	10.50	10.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
106	10.40	10.30	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
107	10.30	10.20	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
108	10.20	10.10	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
109	10.10	10.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
110	10.00	9.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
111	9.90	9.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
112	9.80	9.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
113	9.70	9.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
114	9.60	9.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
115	9.50	9.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
116	9.40	9.30	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
117	9.30	9.20	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
118	9.20	9.10	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
119	9.10	9.00	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
120	9.00	8.90	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
121	8.90	8.80	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
122	8.80	8.70	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
123	8.70	8.60	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
124	8.60	8.50	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049
125	8.50	8.40	0.05660	50.0	0.04930	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.049

126	8.40	8.30	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
127	8.30	8.20	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
128	8.20	8.10	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
129	8.10	8.00	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
130	8.00	7.90	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
131	7.90	7.80	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
132	7.80	7.70	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
133	7.70	7.60	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
134	7.60	7.50	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
135	7.50	7.40	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
136	7.40	7.30	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
137	7.30	7.20	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
138	7.20	7.10	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
139	7.10	7.00	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
140	7.00	6.90	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
141	6.90	6.80	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
142	6.80	6.70	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
143	6.70	6.60	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
144	6.60	6.50	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
145	6.50	6.40	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
146	6.40	6.30	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
147	6.30	6.20	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
148	6.20	6.10	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
149	6.10	6.00	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
150	6.00	5.90	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
151	5.90	5.80	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
152	5.80	5.70	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
153	5.70	5.60	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
154	5.60	5.50	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
155	5.50	5.40	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
156	5.40	5.30	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
157	5.30	5.20	0.08819	67.9	0.07682	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
158	5.20	5.10	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
159	5.10	5.00	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
160	5.00	4.90	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
161	4.90	4.80	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
162	4.80	4.70	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
163	4.70	4.60	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
164	4.60	4.50	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
165	4.50	4.40	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
166	4.40	4.30	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
167	4.30	4.20	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
168	4.20	4.10	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
169	4.10	4.00	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
170	4.00	3.90	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
171	3.90	3.80	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
172	3.80	3.70	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
173	3.70	3.60	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
174	3.60	3.50	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
175	3.50	3.40	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
176	3.40	3.30	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077

177	3.30	3.20	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
178	3.20	3.10	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
179	3.10	3.00	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
180	3.00	2.90	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
181	2.90	2.80	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
182	2.80	2.70	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
183	2.70	2.60	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
184	2.60	2.50	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
185	2.50	2.40	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
186	2.40	2.30	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
187	2.30	2.20	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
188	2.20	2.10	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
189	2.10	2.00	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
190	2.00	1.90	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
191	1.90	1.80	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
192	1.80	1.70	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
193	1.70	1.60	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
194	1.60	1.50	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
195	1.50	1.40	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
196	1.40	1.30	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
197	1.30	1.20	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
198	1.20	1.10	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
199	1.10	1.00	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
200	1.00	0.90	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
201	0.90	0.80	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
202	0.80	0.70	0.08852	68.0	0.07711	0.02	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.077
203	0.70	0.60	0.11682	75.8	0.10176	0.01	0.28	4.10	114.80	410.00	1.15	0.00	0.000	0.000	0.102
TOT						5.23			23304.43	83230.00					
AVG					0.0449		0.28	4.10			1.15				
CUM						5.23									

** BIOLOGICAL AND PHYSICAL COEFFICIENTS **

ELEM	ENDING	SAT	REAER	BOD#1	BOD#1	ABOD#1	BOD#2	BOD#2	ABOD#2	BKGD	FULL	CORR	ORGN	ORGN	NH3	NH3	DENIT	PO4	ALG	MAC	COLI	NCM	NCM
NO.	DIST	D.O.	RATE	DECAY	SETT	DECAY	DECAY	SETT	DECAY	SOD	SOD	SOD	DECAY	SETT	DECAY	SRCE	RATE	SRCE	PROD	PROD	DECAY	DECAY	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
1	20.800	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	20.700	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	20.600	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	20.500	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	20.400	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	20.300	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	20.200	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	20.100	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	20.000	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	19.900	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	19.800	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	19.700	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

13	19.600	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	19.500	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	19.400	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	19.300	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	19.200	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	19.100	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	19.000	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	18.900	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	18.800	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	18.700	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	18.600	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	18.500	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	18.400	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	18.300	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	18.200	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	18.100	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	18.000	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	17.900	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	17.800	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	17.700	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	17.600	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	17.500	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	17.400	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	17.300	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	17.200	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	17.100	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	17.000	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	16.900	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	16.800	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	16.700	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	16.600	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	16.500	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	16.400	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	16.300	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47	16.200	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	16.100	8.59	3.84	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	16.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	15.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	15.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	15.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	15.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	15.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	15.300	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	15.200	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	15.100	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	15.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	14.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	14.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	14.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

64	14.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	14.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	14.300	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	14.200	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14.100	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	14.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	13.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	13.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	13.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	13.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	13.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	13.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	13.300	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	13.200	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	13.100	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	13.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	12.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	12.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	12.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	12.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	12.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	12.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	12.300	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	12.200	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	12.100	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	12.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	11.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	11.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	11.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93	11.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94	11.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	11.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96	11.300	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97	11.200	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	11.100	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	11.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	10.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
101	10.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102	10.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103	10.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104	10.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106	10.300	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
107	10.200	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108	10.100	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
109	10.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	9.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
111	9.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112	9.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	9.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
114	9.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

115	9.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
116	9.300	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
117	9.200	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
118	9.100	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
119	9.000	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	8.900	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
121	8.800	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
122	8.700	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
123	8.600	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
124	8.500	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	8.400	8.59	5.17	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	8.300	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
127	8.200	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
128	8.100	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
129	8.000	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	7.900	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
131	7.800	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
132	7.700	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
133	7.600	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
134	7.500	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	7.400	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
136	7.300	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
137	7.200	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
138	7.100	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
139	7.000	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	6.900	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
141	6.800	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
142	6.700	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
143	6.600	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
144	6.500	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	6.400	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
146	6.300	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
147	6.200	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
148	6.100	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
149	6.000	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	5.900	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
151	5.800	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
152	5.700	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	5.600	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
154	5.500	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	5.400	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
156	5.300	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157	5.200	8.59	6.66	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
158	5.100	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
159	5.000	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	4.900	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
161	4.800	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
162	4.700	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
163	4.600	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
164	4.500	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	4.400	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

166	4.300	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
167	4.200	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
168	4.100	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
169	4.000	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	3.900	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
171	3.800	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
172	3.700	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
173	3.600	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
174	3.500	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	3.400	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
176	3.300	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
177	3.200	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
178	3.100	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
179	3.000	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	2.900	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
181	2.800	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
182	2.700	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
183	2.600	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
184	2.500	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	2.400	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
186	2.300	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
187	2.200	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
188	2.100	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
189	2.000	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
190	1.900	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
191	1.800	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
192	1.700	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
193	1.600	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
194	1.500	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
195	1.400	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
196	1.300	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
197	1.200	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
198	1.100	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
199	1.000	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.900	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
201	0.800	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202	0.700	8.59	6.67	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
203	0.600	8.59	8.00	0.06	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			5.14	0.05	0.00	0.00	0.00	0.00	0.00	1.50			0.02	0.00	0.18	0.00	0.00	0.00			0.00	0.00	0.00

* g/m²/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 g/m³	COLI #/100mL	NCM
1	20.800	22.90	0.00	0.00	0.00	5.06	12.00	0.00	12.00	0.00	1.75	0.05	0.00	1.80	0.00	0.00	0.00	0.	0.00
2	20.700	22.90	0.00	0.00	0.00	5.31	12.01	0.00	12.01	0.00	1.75	0.05	0.00	1.80	0.00	0.00	0.00	0.	0.00

3	20.600	22.90	0.00	0.00	0.00	5.52	12.01	0.00	12.01	0.00	1.75	0.05	0.00	1.80	0.00	0.00	0.00	0.	0.00
4	20.500	22.90	0.00	0.00	0.00	5.71	12.02	0.00	12.02	0.00	1.75	0.05	0.00	1.81	0.00	0.00	0.00	0.	0.00
5	20.400	22.90	0.00	0.00	0.00	5.86	12.02	0.00	12.02	0.00	1.75	0.06	0.00	1.81	0.00	0.00	0.00	0.	0.00
6	20.300	22.90	0.00	0.00	0.00	5.99	12.03	0.00	12.03	0.00	1.75	0.06	0.00	1.81	0.00	0.00	0.00	0.	0.00
7	20.200	22.90	0.00	0.00	0.00	6.10	12.03	0.00	12.03	0.00	1.75	0.06	0.00	1.81	0.00	0.00	0.00	0.	0.00
8	20.100	22.90	0.00	0.00	0.00	6.19	12.04	0.00	12.04	0.00	1.75	0.06	0.00	1.81	0.00	0.00	0.00	0.	0.00
9	20.000	22.90	0.00	0.00	0.00	6.27	12.04	0.00	12.04	0.00	1.75	0.06	0.01	1.81	0.00	0.00	0.00	0.	0.00
10	19.900	22.90	0.00	0.00	0.00	6.34	12.05	0.00	12.05	0.00	1.75	0.06	0.01	1.82	0.00	0.00	0.00	0.	0.00
11	19.800	22.90	0.00	0.00	0.00	6.39	12.05	0.00	12.05	0.00	1.75	0.06	0.01	1.82	0.00	0.00	0.00	0.	0.00
12	19.700	22.90	0.00	0.00	0.00	6.44	12.06	0.00	12.06	0.00	1.75	0.06	0.01	1.82	0.00	0.00	0.00	0.	0.00
13	19.600	22.90	0.00	0.00	0.00	6.48	12.06	0.00	12.06	0.00	1.75	0.07	0.01	1.82	0.00	0.00	0.00	0.	0.00
14	19.500	22.90	0.00	0.00	0.00	6.52	12.07	0.00	12.07	0.00	1.75	0.07	0.01	1.82	0.00	0.00	0.00	0.	0.00
15	19.400	22.90	0.00	0.00	0.00	6.54	12.07	0.00	12.07	0.00	1.75	0.07	0.01	1.82	0.00	0.00	0.00	0.	0.00
16	19.300	22.90	0.00	0.00	0.00	6.57	12.08	0.00	12.08	0.00	1.75	0.07	0.01	1.83	0.00	0.00	0.00	0.	0.00
17	19.200	22.90	0.00	0.00	0.00	6.59	12.08	0.00	12.08	0.00	1.75	0.07	0.01	1.83	0.00	0.00	0.00	0.	0.00
18	19.100	22.90	0.00	0.00	0.00	6.61	12.09	0.00	12.09	0.00	1.75	0.07	0.01	1.83	0.00	0.00	0.00	0.	0.00
19	19.000	22.90	0.00	0.00	0.00	6.62	12.09	0.00	12.09	0.00	1.75	0.07	0.01	1.83	0.00	0.00	0.00	0.	0.00
20	18.900	22.90	0.00	0.00	0.00	6.63	12.09	0.00	12.09	0.00	1.75	0.07	0.01	1.83	0.00	0.00	0.00	0.	0.00
21	18.800	22.90	0.00	0.00	0.00	6.65	12.10	0.00	12.10	0.00	1.75	0.07	0.01	1.83	0.00	0.00	0.00	0.	0.00
22	18.700	22.90	0.00	0.00	0.00	6.65	12.10	0.00	12.10	0.00	1.75	0.07	0.01	1.84	0.00	0.00	0.00	0.	0.00
23	18.600	22.90	0.00	0.00	0.00	6.66	12.11	0.00	12.11	0.00	1.75	0.08	0.01	1.84	0.00	0.00	0.00	0.	0.00
24	18.500	22.90	0.00	0.00	0.00	6.67	12.11	0.00	12.11	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00
25	18.400	22.90	0.00	0.00	0.00	6.67	12.12	0.00	12.12	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00
26	18.300	22.90	0.00	0.00	0.00	6.68	12.12	0.00	12.12	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00
27	18.200	22.90	0.00	0.00	0.00	6.68	12.13	0.00	12.13	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00
28	18.100	22.90	0.00	0.00	0.00	6.68	12.13	0.00	12.13	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
29	18.000	22.90	0.00	0.00	0.00	6.69	12.14	0.00	12.14	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
30	17.900	22.90	0.00	0.00	0.00	6.69	12.14	0.00	12.14	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
31	17.800	22.90	0.00	0.00	0.00	6.69	12.14	0.00	12.14	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
32	17.700	22.90	0.00	0.00	0.00	6.69	12.15	0.00	12.15	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
33	17.600	22.90	0.00	0.00	0.00	6.69	12.15	0.00	12.15	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
34	17.500	22.90	0.00	0.00	0.00	6.69	12.16	0.00	12.16	0.00	1.75	0.09	0.02	1.85	0.00	0.00	0.00	0.	0.00
35	17.400	22.90	0.00	0.00	0.00	6.69	12.16	0.00	12.16	0.00	1.75	0.09	0.02	1.86	0.00	0.00	0.00	0.	0.00
36	17.300	22.90	0.00	0.00	0.00	6.70	12.17	0.00	12.17	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
37	17.200	22.90	0.00	0.00	0.00	6.70	12.17	0.00	12.17	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
38	17.100	22.90	0.00	0.00	0.00	6.70	12.18	0.00	12.18	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
39	17.000	22.90	0.00	0.00	0.00	6.70	12.18	0.00	12.18	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
40	16.900	22.90	0.00	0.00	0.00	6.70	12.18	0.00	12.18	0.00	1.74	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
41	16.800	22.90	0.00	0.00	0.00	6.70	12.19	0.00	12.19	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
42	16.700	22.90	0.00	0.00	0.00	6.70	12.19	0.00	12.19	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
43	16.600	22.90	0.00	0.00	0.00	6.70	12.20	0.00	12.20	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
44	16.500	22.90	0.00	0.00	0.00	6.70	12.20	0.00	12.20	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
45	16.400	22.90	0.00	0.00	0.00	6.70	12.21	0.00	12.21	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
46	16.300	22.90	0.00	0.00	0.00	6.70	12.21	0.00	12.21	0.00	1.74	0.10	0.03	1.87	0.00	0.00	0.00	0.	0.00
47	16.200	22.90	0.00	0.00	0.00	6.70	12.21	0.00	12.21	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
48	16.100	22.90	0.00	0.00	0.00	6.70	12.22	0.00	12.22	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
49	16.000	22.90	0.00	0.00	0.00	5.89	12.11	0.00	12.11	0.00	1.75	0.07	0.02	1.84	0.00	0.00	0.00	0.	0.00
50	15.900	22.90	0.00	0.00	0.00	6.03	12.11	0.00	12.11	0.00	1.75	0.07	0.02	1.84	0.00	0.00	0.00	0.	0.00
51	15.800	22.90	0.00	0.00	0.00	6.15	12.12	0.00	12.12	0.00	1.75	0.07	0.02	1.84	0.00	0.00	0.00	0.	0.00
52	15.700	22.90	0.00	0.00	0.00	6.27	12.12	0.00	12.12	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00
53	15.600	22.90	0.00	0.00	0.00	6.37	12.12	0.00	12.12	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00

54	15.500	22.90	0.00	0.00	0.00	6.45	12.12	0.00	12.12	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00
55	15.400	22.90	0.00	0.00	0.00	6.53	12.13	0.00	12.13	0.00	1.75	0.08	0.02	1.84	0.00	0.00	0.00	0.	0.00
56	15.300	22.90	0.00	0.00	0.00	6.61	12.13	0.00	12.13	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
57	15.200	22.90	0.00	0.00	0.00	6.67	12.13	0.00	12.13	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
58	15.100	22.90	0.00	0.00	0.00	6.72	12.13	0.00	12.13	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
59	15.000	22.90	0.00	0.00	0.00	6.77	12.13	0.00	12.13	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
60	14.900	22.90	0.00	0.00	0.00	6.82	12.14	0.00	12.14	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
61	14.800	22.90	0.00	0.00	0.00	6.86	12.14	0.00	12.14	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
62	14.700	22.90	0.00	0.00	0.00	6.90	12.14	0.00	12.14	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
63	14.600	22.90	0.00	0.00	0.00	6.93	12.14	0.00	12.14	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
64	14.500	22.90	0.00	0.00	0.00	6.96	12.15	0.00	12.15	0.00	1.75	0.08	0.02	1.85	0.00	0.00	0.00	0.	0.00
65	14.400	22.90	0.00	0.00	0.00	6.98	12.15	0.00	12.15	0.00	1.75	0.08	0.03	1.85	0.00	0.00	0.00	0.	0.00
66	14.300	22.90	0.00	0.00	0.00	7.00	12.15	0.00	12.15	0.00	1.75	0.08	0.03	1.85	0.00	0.00	0.00	0.	0.00
67	14.200	22.90	0.00	0.00	0.00	7.02	12.15	0.00	12.15	0.00	1.75	0.08	0.03	1.85	0.00	0.00	0.00	0.	0.00
68	14.100	22.90	0.00	0.00	0.00	7.04	12.15	0.00	12.15	0.00	1.75	0.08	0.03	1.85	0.00	0.00	0.00	0.	0.00
69	14.000	22.90	0.00	0.00	0.00	7.06	12.16	0.00	12.16	0.00	1.75	0.08	0.03	1.86	0.00	0.00	0.00	0.	0.00
70	13.900	22.90	0.00	0.00	0.00	7.07	12.16	0.00	12.16	0.00	1.75	0.08	0.03	1.86	0.00	0.00	0.00	0.	0.00
71	13.800	22.90	0.00	0.00	0.00	7.08	12.16	0.00	12.16	0.00	1.75	0.08	0.03	1.86	0.00	0.00	0.00	0.	0.00
72	13.700	22.90	0.00	0.00	0.00	7.09	12.16	0.00	12.16	0.00	1.75	0.08	0.03	1.86	0.00	0.00	0.00	0.	0.00
73	13.600	22.90	0.00	0.00	0.00	7.10	12.17	0.00	12.17	0.00	1.75	0.08	0.03	1.86	0.00	0.00	0.00	0.	0.00
74	13.500	22.90	0.00	0.00	0.00	7.11	12.17	0.00	12.17	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
75	13.400	22.90	0.00	0.00	0.00	7.12	12.17	0.00	12.17	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
76	13.300	22.90	0.00	0.00	0.00	7.13	12.17	0.00	12.17	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
77	13.200	22.90	0.00	0.00	0.00	7.13	12.17	0.00	12.17	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
78	13.100	22.90	0.00	0.00	0.00	7.14	12.18	0.00	12.18	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
79	13.000	22.90	0.00	0.00	0.00	7.15	12.18	0.00	12.18	0.00	1.75	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
80	12.900	22.90	0.00	0.00	0.00	7.15	12.18	0.00	12.18	0.00	1.74	0.09	0.03	1.86	0.00	0.00	0.00	0.	0.00
81	12.800	22.90	0.00	0.00	0.00	7.15	12.18	0.00	12.18	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
82	12.700	22.90	0.00	0.00	0.00	7.16	12.18	0.00	12.18	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
83	12.600	22.90	0.00	0.00	0.00	7.16	12.19	0.00	12.19	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
84	12.500	22.90	0.00	0.00	0.00	7.16	12.19	0.00	12.19	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
85	12.400	22.90	0.00	0.00	0.00	7.17	12.19	0.00	12.19	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
86	12.300	22.90	0.00	0.00	0.00	7.17	12.19	0.00	12.19	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
87	12.200	22.90	0.00	0.00	0.00	7.17	12.20	0.00	12.20	0.00	1.74	0.09	0.03	1.87	0.00	0.00	0.00	0.	0.00
88	12.100	22.90	0.00	0.00	0.00	7.17	12.20	0.00	12.20	0.00	1.74	0.09	0.04	1.87	0.00	0.00	0.00	0.	0.00
89	12.000	22.90	0.00	0.00	0.00	7.17	12.20	0.00	12.20	0.00	1.74	0.09	0.04	1.87	0.00	0.00	0.00	0.	0.00
90	11.900	22.90	0.00	0.00	0.00	7.17	12.20	0.00	12.20	0.00	1.74	0.09	0.04	1.87	0.00	0.00	0.00	0.	0.00
91	11.800	22.90	0.00	0.00	0.00	7.18	12.20	0.00	12.20	0.00	1.74	0.09	0.04	1.87	0.00	0.00	0.00	0.	0.00
92	11.700	22.90	0.00	0.00	0.00	7.18	12.21	0.00	12.21	0.00	1.74	0.09	0.04	1.87	0.00	0.00	0.00	0.	0.00
93	11.600	22.90	0.00	0.00	0.00	7.18	12.21	0.00	12.21	0.00	1.74	0.09	0.04	1.87	0.00	0.00	0.00	0.	0.00
94	11.500	22.90	0.00	0.00	0.00	7.18	12.21	0.00	12.21	0.00	1.74	0.09	0.04	1.88	0.00	0.00	0.00	0.	0.00
95	11.400	22.90	0.00	0.00	0.00	7.18	12.21	0.00	12.21	0.00	1.74	0.09	0.04	1.88	0.00	0.00	0.00	0.	0.00
96	11.300	22.90	0.00	0.00	0.00	7.18	12.22	0.00	12.22	0.00	1.74	0.09	0.04	1.88	0.00	0.00	0.00	0.	0.00
97	11.200	22.90	0.00	0.00	0.00	7.18	12.22	0.00	12.22	0.00	1.74	0.09	0.04	1.88	0.00	0.00	0.00	0.	0.00
98	11.100	22.90	0.00	0.00	0.00	7.18	12.22	0.00	12.22	0.00	1.74	0.09	0.04	1.88	0.00	0.00	0.00	0.	0.00
99	11.000	22.90	0.00	0.00	0.00	7.18	12.22	0.00	12.22	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
100	10.900	22.90	0.00	0.00	0.00	7.18	12.22	0.00	12.22	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
101	10.800	22.90	0.00	0.00	0.00	7.18	12.23	0.00	12.23	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
102	10.700	22.90	0.00	0.00	0.00	7.18	12.23	0.00	12.23	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
103	10.600	22.90	0.00	0.00	0.00	7.18	12.23	0.00	12.23	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
104	10.500	22.90	0.00	0.00	0.00	7.18	12.23	0.00	12.23	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00

105	10.400	22.90	0.00	0.00	0.00	7.18	12.23	0.00	12.23	0.00	1.74	0.10	0.04	1.88	0.00	0.00	0.00	0.	0.00
106	10.300	22.90	0.00	0.00	0.00	7.18	12.24	0.00	12.24	0.00	1.74	0.10	0.04	1.89	0.00	0.00	0.00	0.	0.00
107	10.200	22.90	0.00	0.00	0.00	7.18	12.24	0.00	12.24	0.00	1.74	0.10	0.04	1.89	0.00	0.00	0.00	0.	0.00
108	10.100	22.90	0.00	0.00	0.00	7.18	12.24	0.00	12.24	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
109	10.000	22.90	0.00	0.00	0.00	7.18	12.24	0.00	12.24	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
110	9.900	22.90	0.00	0.00	0.00	7.18	12.24	0.00	12.24	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
111	9.800	22.90	0.00	0.00	0.00	7.18	12.25	0.00	12.25	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
112	9.700	22.90	0.00	0.00	0.00	7.18	12.25	0.00	12.25	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
113	9.600	22.90	0.00	0.00	0.00	7.18	12.25	0.00	12.25	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
114	9.500	22.90	0.00	0.00	0.00	7.18	12.25	0.00	12.25	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
115	9.400	22.90	0.00	0.00	0.00	7.18	12.25	0.00	12.25	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
116	9.300	22.90	0.00	0.00	0.00	7.18	12.26	0.00	12.26	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
117	9.200	22.90	0.00	0.00	0.00	7.18	12.26	0.00	12.26	0.00	1.74	0.10	0.05	1.89	0.00	0.00	0.00	0.	0.00
118	9.100	22.90	0.00	0.00	0.00	7.18	12.26	0.00	12.26	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
119	9.000	22.90	0.00	0.00	0.00	7.18	12.26	0.00	12.26	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
120	8.900	22.90	0.00	0.00	0.00	7.18	12.27	0.00	12.27	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
121	8.800	22.90	0.00	0.00	0.00	7.18	12.27	0.00	12.27	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
122	8.700	22.90	0.00	0.00	0.00	7.18	12.27	0.00	12.27	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
123	8.600	22.90	0.00	0.00	0.00	7.18	12.27	0.00	12.27	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
124	8.500	22.90	0.00	0.00	0.00	7.18	12.27	0.00	12.27	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
125	8.400	22.90	0.00	0.00	0.00	7.18	12.28	0.00	12.28	0.00	1.74	0.10	0.05	1.90	0.00	0.00	0.00	0.	0.00
126	8.300	22.90	0.00	0.00	0.00	6.43	12.59	0.00	12.59	0.00	1.80	0.15	0.04	1.98	0.00	0.00	0.00	0.	0.00
127	8.200	22.90	0.00	0.00	0.00	6.53	12.59	0.00	12.59	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
128	8.100	22.90	0.00	0.00	0.00	6.61	12.59	0.00	12.59	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
129	8.000	22.90	0.00	0.00	0.00	6.69	12.59	0.00	12.59	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
130	7.900	22.90	0.00	0.00	0.00	6.77	12.59	0.00	12.59	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
131	7.800	22.90	0.00	0.00	0.00	6.83	12.59	0.00	12.59	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
132	7.700	22.90	0.00	0.00	0.00	6.89	12.59	0.00	12.59	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
133	7.600	22.90	0.00	0.00	0.00	6.95	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
134	7.500	22.90	0.00	0.00	0.00	7.00	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
135	7.400	22.90	0.00	0.00	0.00	7.04	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
136	7.300	22.90	0.00	0.00	0.00	7.08	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
137	7.200	22.90	0.00	0.00	0.00	7.12	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
138	7.100	22.90	0.00	0.00	0.00	7.15	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
139	7.000	22.90	0.00	0.00	0.00	7.18	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
140	6.900	22.90	0.00	0.00	0.00	7.21	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
141	6.800	22.90	0.00	0.00	0.00	7.24	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
142	6.700	22.90	0.00	0.00	0.00	7.26	12.60	0.00	12.60	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
143	6.600	22.90	0.00	0.00	0.00	7.28	12.61	0.00	12.61	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
144	6.500	22.90	0.00	0.00	0.00	7.30	12.61	0.00	12.61	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
145	6.400	22.90	0.00	0.00	0.00	7.32	12.61	0.00	12.61	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
146	6.300	22.90	0.00	0.00	0.00	7.33	12.61	0.00	12.61	0.00	1.80	0.15	0.04	1.99	0.00	0.00	0.00	0.	0.00
147	6.200	22.90	0.00	0.00	0.00	7.35	12.61	0.00	12.61	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
148	6.100	22.90	0.00	0.00	0.00	7.36	12.61	0.00	12.61	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
149	6.000	22.90	0.00	0.00	0.00	7.37	12.61	0.00	12.61	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
150	5.900	22.90	0.00	0.00	0.00	7.38	12.61	0.00	12.61	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
151	5.800	22.90	0.00	0.00	0.00	7.39	12.61	0.00	12.61	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
152	5.700	22.90	0.00	0.00	0.00	7.40	12.61	0.00	12.61	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
153	5.600	22.90	0.00	0.00	0.00	7.41	12.62	0.00	12.62	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
154	5.500	22.90	0.00	0.00	0.00	7.41	12.62	0.00	12.62	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
155	5.400	22.90	0.00	0.00	0.00	7.42	12.62	0.00	12.62	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00

156	5.300	22.90	0.00	0.00	0.00	7.43	12.62	0.00	12.62	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
157	5.200	22.90	0.00	0.00	0.00	7.43	12.62	0.00	12.62	0.00	1.80	0.15	0.05	2.00	0.00	0.00	0.00	0.	0.00
158	5.100	22.90	0.00	0.00	0.00	7.43	12.83	0.00	12.83	0.00	1.81	0.19	0.05	2.05	0.00	0.00	0.00	0.	0.00
159	5.000	22.90	0.00	0.00	0.00	7.43	12.83	0.00	12.83	0.00	1.81	0.19	0.05	2.05	0.00	0.00	0.00	0.	0.00
160	4.900	22.90	0.00	0.00	0.00	7.44	12.83	0.00	12.83	0.00	1.81	0.19	0.05	2.05	0.00	0.00	0.00	0.	0.00
161	4.800	22.90	0.00	0.00	0.00	7.44	12.83	0.00	12.83	0.00	1.81	0.19	0.05	2.05	0.00	0.00	0.00	0.	0.00
162	4.700	22.90	0.00	0.00	0.00	7.45	12.83	0.00	12.83	0.00	1.81	0.19	0.05	2.05	0.00	0.00	0.00	0.	0.00
163	4.600	22.90	0.00	0.00	0.00	7.45	12.83	0.00	12.83	0.00	1.81	0.19	0.05	2.05	0.00	0.00	0.00	0.	0.00
164	4.500	22.90	0.00	0.00	0.00	7.45	12.83	0.00	12.83	0.00	1.81	0.19	0.05	2.05	0.00	0.00	0.00	0.	0.00
165	4.400	22.90	0.00	0.00	0.00	7.46	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.05	0.00	0.00	0.00	0.	0.00
166	4.300	22.90	0.00	0.00	0.00	7.46	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.05	0.00	0.00	0.00	0.	0.00
167	4.200	22.90	0.00	0.00	0.00	7.46	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.05	0.00	0.00	0.00	0.	0.00
168	4.100	22.90	0.00	0.00	0.00	7.46	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.05	0.00	0.00	0.00	0.	0.00
169	4.000	22.90	0.00	0.00	0.00	7.46	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
170	3.900	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
171	3.800	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
172	3.700	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
173	3.600	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
174	3.500	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
175	3.400	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
176	3.300	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
177	3.200	22.90	0.00	0.00	0.00	7.47	12.84	0.00	12.84	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
178	3.100	22.90	0.00	0.00	0.00	7.47	12.85	0.00	12.85	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
179	3.000	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
180	2.900	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
181	2.800	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.19	0.06	2.06	0.00	0.00	0.00	0.	0.00
182	2.700	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.19	0.07	2.06	0.00	0.00	0.00	0.	0.00
183	2.600	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.19	0.07	2.06	0.00	0.00	0.00	0.	0.00
184	2.500	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.19	0.07	2.06	0.00	0.00	0.00	0.	0.00
185	2.400	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.18	0.07	2.06	0.00	0.00	0.00	0.	0.00
186	2.300	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.18	0.07	2.06	0.00	0.00	0.00	0.	0.00
187	2.200	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.18	0.07	2.06	0.00	0.00	0.00	0.	0.00
188	2.100	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
189	2.000	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
190	1.900	22.90	0.00	0.00	0.00	7.48	12.85	0.00	12.85	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
191	1.800	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
192	1.700	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
193	1.600	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
194	1.500	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
195	1.400	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
196	1.300	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
197	1.200	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.07	2.07	0.00	0.00	0.00	0.	0.00
198	1.100	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.08	2.07	0.00	0.00	0.00	0.	0.00
199	1.000	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.08	2.07	0.00	0.00	0.00	0.	0.00
200	0.900	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.08	2.07	0.00	0.00	0.00	0.	0.00
201	0.800	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.08	2.07	0.00	0.00	0.00	0.	0.00
202	0.700	22.90	0.00	0.00	0.00	7.48	12.86	0.00	12.86	0.00	1.81	0.18	0.08	2.07	0.00	0.00	0.00	0.	0.00
203	0.600	22.90	0.00	0.00	0.00	7.18	13.02	0.00	13.02	0.00	1.72	0.15	0.06	1.93	0.00	0.00	0.00	0.	0.00

** 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
204	UPR RCH	0.11682	22.90	0.00	0.00	0.00	7.18	13.02	0.00	13.02	0.00	1.72	0.15	0.06	0.00	0.00	0.00	0.00

** HYDRAULIC PARAMETER VALUES **

ELEM NO.	BEGIN DIST km	ENDING DIST km	FLOW m³/s	PCT EFF	ADVCTV VELO m/s	TRAVEL TIME days	DEPTH m	WIDTH m	VOLUME m³	SURFACE AREA m²	X-SECT AREA m²	TIDAL PRISM m³	TIDAL VELO m/s	DISPRSN m²/s	MEAN VELO m/s
204	0.60	0.50	0.11682	75.8	0.08023	0.01	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.080
205	0.50	0.40	0.11682	75.8	0.08023	0.01	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.080
206	0.40	0.30	0.11682	75.8	0.08023	0.01	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.080
207	0.30	0.20	0.11682	75.8	0.08023	0.01	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.080
208	0.20	0.10	0.11682	75.8	0.08023	0.01	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.080
209	0.10	0.00	0.11682	75.8	0.08023	0.01	0.16	9.10	145.60	910.00	1.46	0.00	0.000	0.000	0.080
TOT						0.09			873.60	5460.00					
AVG					0.0802		0.16	9.10			1.46				
CUM						5.32									

** 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
204	0.500	8.59	10.58	0.06	0.00	0.00	0.00	0.00	0.00	2.28	2.28	2.28	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	0.400	8.59	10.58	0.06	0.00	0.00	0.00	0.00	0.00	2.28	2.28	2.28	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
206	0.300	8.59	10.58	0.06	0.00	0.00	0.00	0.00	0.00	2.28	2.28	2.28	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
207	0.200	8.59	10.58	0.06	0.00	0.00	0.00	0.00	0.00	2.28	2.28	2.28	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
208	0.100	8.59	10.58	0.06	0.00	0.00	0.00	0.00	0.00	2.28	2.28	2.28	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
209	0.000	8.59	10.58	0.06	0.00	0.00	0.00	0.00	0.00	2.28	2.28	2.28	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG 20 DEG C RATE			10.00	0.05	0.00	0.00	0.00	0.00	0.00	1.90			0.02	0.00	0.08	0.00	0.00	0.00			0.00	0.00	0.00

* g/m²/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 g/m³	COLI #/100mL	NCM

204	0.500	22.90	0.00	0.00	0.00	7.18	13.01	0.00	13.01	0.00	1.72	0.15	0.06	1.93	0.00	0.00	0.00	0.	0.00
205	0.400	22.90	0.00	0.00	0.00	7.18	12.99	0.00	12.99	0.00	1.72	0.15	0.06	1.93	0.00	0.00	0.00	0.	0.00
206	0.300	22.90	0.00	0.00	0.00	7.18	12.98	0.00	12.98	0.00	1.72	0.15	0.06	1.93	0.00	0.00	0.00	0.	0.00
207	0.200	22.90	0.00	0.00	0.00	7.18	12.97	0.00	12.97	0.00	1.72	0.15	0.06	1.93	0.00	0.00	0.00	0.	0.00
208	0.100	22.90	0.00	0.00	0.00	7.17	12.96	0.00	12.96	0.00	1.72	0.15	0.06	1.93	0.00	0.00	0.00	0.	0.00
209	0.000	22.90	0.00	0.00	0.00	7.17	12.95	0.00	12.95	0.00	1.72	0.15	0.06	1.93	0.00	0.00	0.00	0.	0.00

STREAM SUMMARY
Boggy Bayou

LA-QUAL Model for Boggy Bayou (100602)
Winter Projection with 0% NPS reduction

TRAVEL TIME = 5.32 DAYS

MAXIMUM EFFLUENT = 75.77 PERCENT

FLOW	=	0.02830	TO	0.11682	m³/s
DISPERSION	=	0.0000	TO	0.0000	m²/s
VELOCITY	=	0.02465	TO	0.10176	m/s
DEPTH	=	0.16	TO	0.28	m
WIDTH	=	4.10	TO	9.10	m
BOD DECAY	=	0.06	TO	0.06	per day
NH3 DECAY	=	0.10	TO	0.22	per day
SOD	=	1.80	TO	2.28	g/m²/d
NH3 SOURCE	=	0.00	TO	0.00	g/m²/d
REAERATION	=	3.84	TO	10.58	per day
BOD SETTLING	=	0.00	TO	0.00	per day
ORG-N DECAY	=	0.02	TO	0.02	per day
ORG-N SETTLING	=	0.00	TO	0.00	per day
TEMPERATURE	=	22.90	TO	22.90	deg C
DISSOLVED OXYGEN	=	5.06	TO	7.48	mg/L

LA-QUAL Model for Boggy Bayou (100602)
Winter Projection with 0% NPS reduction

INPUT/OUTPUT LOADING SUMMARY

	FLOW m^3/s	DO kg/d	BOD#1 kg/d	BOD#2 kg/d	ORG-N kg/d	NH3-N kg/d	NO3-N kg/d	PHOS kg/d	CHL A	NCM
HEADWATER FLOW	0.028	11.6	29.3	0.0	4.3	0.1	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	0.089	39.7	100.2	0.0	13.2	1.1	0.0	0.0	0.0	0.0
WITHDRAWLS	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLOW THRU LOWER BNDRY	-0.117	-72.4	-130.7	0.0	-17.4	-1.6	-0.6	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	20.0	0.0	0.8					0.0
NATURAL REAERATION		204.9								
DAM REAERATION		0.0								
BACKGROUND SOD		-162.3								
BOD#1 DECAY		-18.9	-18.9							
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			-0.9	0.9				
ORG-N SETTLING					0.0	0.0				
NH3 DECAY		-2.7				-0.6	0.6			
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	0.117	256.2	149.5	0.0	18.3	2.2	0.6	0.0	0.0	0.0
TOTAL OUTPUTS	-0.117	-256.2	-149.5	0.0	-18.3	-2.2	-0.6	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 K

Input and Output for TMDL Calculation Program

SUMMARY OF TMDL CALCULATIONS FOR DO TMDLs IN RED AND SABINE BASINS

Total maximum daily load (TMDL) is sum of these six components:

- Wasteload allocations (WLA) for point sources
- Margin of safety (MOS) for point sources
- Future growth (FG) for point sources
- Load allocations (LA) for nonpoint sources
- Margin of safety (MOS) for nonpoint sources
- Future growth (FG) for nonpoint sources

Point sources:

- For this analysis, all effluent flows are set to 125% of design or expected flow (for both simulated point sources and minor point sources)

- Each load calculated as: Load, kg/day = (Flow, m^3/sec) × (Concentration, mg/L) × 86.4

- Oxygen demand from ammonia and organic nitrogen = nitrogen load × 4.33

- Total point source load = sum of point source loads simulated in model + sum of minor point source loads calculated in spreadsheet

- MOS for all point sources = 10% × total point source load
- FG for all point sources = 10% × total point source load

- WLA for each simulated point source = 80% × simulated load for that point source
- WLA for all minor point sources = 80% × total load for minor point sources

Nonpoint sources:

- This includes headwaters, tributaries, incremental inflow, sediment oxygen demand, benthic ammonia loads, mass loads of CBODu, and mass loads of organic nitrogen.

- Each load for headwaters, tributaries, and incremental inflow is calculated as:
  Load, kg/day = (Flow, m^3/sec) × (Concentration, mg/L) × 86.4

- For this analysis, the sediment oxygen demand (SOD) is corrected for temperature by multiplying the model input values times 1.065^(Temperature,°C −20)

- Loads from SOD and benthic ammonia are calculated as:
  Load, kg/day = (rate per unit area, g/m^2/day)× (stream bottom area, m^2) × 0.001

- Oxygen demand from ammonia and organic nitrogen = nitrogen load × 4.33

- MOS for nonpoint sources = 10% × sum of all nonpoint source loads
- FG for nonpoint sources = 10% × sum of all nonpoint source loads

- LA for nonpoint sources = 80% × sum of all nonpoint source loads

```
100602                 Subsegment number for this TMDL
"Boggy Bayou"          Subsegment name (max 50 chars)
"bogsum.out"           Name of LA-QUAL output file
2                      Total number of reaches in the model
100602                 Subsegment that reach 1 is in
100602                 Subsegment that reach 2 is in
10                     point source margin of safety (%)
10                     point source Future Gorwth (%)
10                     NPS margin of safety (%)
10                     NPS Future Growth (%)
4.33                   Ratio of oxygen demand to nitrogen
6                      Number of minor point sources
                       MINOR POINT SOURCE DISCHARGE #1:
"LAG480011"               NPDES permit number (9 chars)
"001"                     Outfall number (3 chars)
0.0018                    Flow (MGD)
"LA Lift & Equip"         Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
0                         COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #2:
"LAG480284"               NPDES permit number (9 chars)
"001"                     Outfall number (3 chars)
0.0026                    Flow (MGD)
"Jack Cooper Trans"       Comment for flow (max 40 chars)
45                         CBOD5 or BOD5 permit limit
0                          COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #3:
"LAG530693"               NPDES permit number (9 chars)
"001"                     Outfall number (3 chars)
0.000675                  Flow (MGD)
"KEH Property"            Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
0                         COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #4:
"LAG560089"               NPDES permit number (9 chars)
"  "                      Outfall number (3 chars)
0.033                     Flow (MGD)
"Wildwood Estates"        Comment for flow (max 40 chars)
20                        CBOD5 or BOD5 permit limit
0                         COD permit limit
6.7                       Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #5:
"LAG750459"               NPDES permit number (9 chars)
"002"                     Outfall number (3 chars)
0.005                     Flow (MGD)
"Norwell Equip"           Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
0                         COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #6:
"LAG750449"               NPDES permit number (9 chars)
"002"                     Outfall number (3 chars)
0.005                     Flow (MGD)
"Deep South Equip"        Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
```

```
0                          COD permit limit
10                         Ammonia N permit limit
""                         Comment for conc. limits (max 40 chars)
No                      Nutrient TMDL needed?
1.0                     Natural ratio of total N to total P
```

TMDL CALCULATIONS FOR SUBSEGMENT: 100602 Boggy Bayou
FTN ASSOCIATES, LTD.
Program:Pr20m6f

INFO FOR INPUT FILE WITH USER SPECIFIED DATA AND OPTIONS:
File name:tmdlbogs.inp

INFO FOR LA-QUAL OUTPUT FILE:
File name:bogsum.out
Date/Time:Output produced at 12:58 on 09/28/2007
LA-QUAL Version 8.11

LIST OF ALL REACHES IN LA-QUAL OUTPUT FILE:
Reach 1 (Elements 1 - 203) is in subsegment 100602 Boggy Bayou u/s
Reach 2 (Elements 204 - 209) is in subsegment 100602 Boggy Bayou d/s

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CALCULATIONS FOR LOADS FROM NPS INFLOWS (HEADWATERS, TRIBUTARIES, AND INCREMENTAL INFLOW):

Equation used: (Load, kg/day) = (Inflow rate, m3/sec) * (Conc., mg/L) * 1.0E-6 kg/mg * 1.0E3 L/m3 * 86400 sec/day

Values from LA-QUAL output:

Reach or Element number	Inflow rate (m3/sec)	CBODu conc. (mg/L)	Organic N conc. (mg/L)	Ammonia N conc. (mg/L)	NO2+NO3 N conc. (mg/L)	Name of inflow
1	0.00283	6.48	0.95	0.03	0.00	Boggy Bayou
49	0.00283	6.48	0.95	0.03	0.00	NPS Unnamed Trib 1
126	0.00283	6.48	0.95	0.03	0.00	NPS Unnamed Trib 2
203	0.00283	7.29	0.78	0.03	0.00	NPS Gilmer Bayou

Calculated values:

Element number	CBODu load (kg/day)	Organic N load (kg/day)	Ammonia N load (kg/day)	NO2+NO3 N load (kg/day)
1	1.58	0.23	0.01	0.00
49	1.58	0.23	0.01	0.00
126	1.58	0.23	0.01	0.00
203	1.78	0.19	0.01	0.00
Subsegment totals:	5.07	0.88	0.04	0.00

CALCULATIONS FOR NONPOINT SOURCE MASS LOADS IN DATA TYPE 19:

Values from LA-QUAL output:

Reach number	CBODu mass load (kg/day)	Organic N mass load (kg/day)
1	10.80	0.43
2	0.00	0.00
Subsegment totals	10.80	0.43

CALCULATIONS FOR LOADS FROM SOD AND BENTHIC AMMONIA:

SOD temperature correction factor used in LA-QUAL model: 1.065 (default)

Equations used: SOD temp. corrected = (SOD at 20 C) * 1.065^(Water temp - 20 C)
SOD load = (SOD temp. corrected, g/m2/day) * (Surface area, m2) * 1.0E-3 kg/g
Benthic NH3-N load = (Benthic ammonia N, g/m2/day) * (Surface area, m2) * 1.0E-3 kg/g

		Values from LA-QUAL output:				Calculated values:		
Reach number	Element number	Water temp. (deg C)	Surface area (m2)	SOD at 20 C (g/m2/day)	Benthic ammonia N (g/m2/day)	SOD temp. corrected (g/m2/day)	SOD load (kg/day)	Benthic NH3-N load (kg/day)
1	1	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	2	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	3	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	4	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	5	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	6	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	7	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	8	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	9	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	10	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	11	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	12	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	13	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	14	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	15	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	16	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	17	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	18	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	19	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	20	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	21	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	22	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	23	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	24	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	25	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	26	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	27	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	28	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	29	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	30	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	31	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	32	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	33	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	34	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	35	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	36	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	37	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	38	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	39	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	40	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	41	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	42	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	43	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	44	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	45	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	46	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	47	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	48	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	49	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	50	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	51	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	52	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	53	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	54	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	55	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	56	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	57	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	58	32.00	410.0	1.720	0.00	1.720	0.71	0.00

1	59	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	60	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	61	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	62	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	63	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	64	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	65	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	66	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	67	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	68	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	69	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	70	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	71	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	72	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	73	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	74	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	75	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	76	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	77	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	78	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	79	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	80	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	81	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	82	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	83	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	84	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	85	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	86	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	87	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	88	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	89	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	90	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	91	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	92	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	93	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	94	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	95	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	96	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	97	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	98	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	99	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	100	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	101	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	102	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	103	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	104	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	105	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	106	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	107	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	108	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	109	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	110	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	111	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	112	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	113	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	114	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	115	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	116	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	117	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	118	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	119	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	120	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	121	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	122	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	123	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	124	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	125	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	126	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	127	32.00	410.0	1.720	0.00	1.720	0.71	0.00

1	128	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	129	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	130	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	131	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	132	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	133	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	134	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	135	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	136	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	137	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	138	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	139	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	140	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	141	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	142	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	143	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	144	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	145	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	146	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	147	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	148	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	149	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	150	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	151	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	152	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	153	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	154	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	155	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	156	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	157	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	158	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	159	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	160	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	161	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	162	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	163	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	164	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	165	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	166	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	167	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	168	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	169	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	170	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	171	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	172	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	173	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	174	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	175	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	176	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	177	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	178	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	179	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	180	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	181	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	182	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	183	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	184	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	185	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	186	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	187	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	188	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	189	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	190	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	191	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	192	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	193	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	194	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	195	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	196	32.00	410.0	1.720	0.00	1.720	0.71	0.00

1	197	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	198	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	199	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	200	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	201	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	202	32.00	410.0	1.720	0.00	1.720	0.71	0.00
1	203	32.00	410.0	1.720	0.00	1.720	0.71	0.00
2	204	32.00	910.0	1.720	0.00	2.190	1.99	0.00
2	205	32.00	910.0	1.720	0.00	2.190	1.99	0.00
2	206	32.00	910.0	1.720	0.00	2.190	1.99	0.00
2	207	32.00	910.0	1.720	0.00	2.190	1.99	0.00
2	208	32.00	910.0	1.720	0.00	2.190	1.99	0.00
2	209	32.00	910.0	1.720	0.00	2.190	1.99	0.00
				Subsegment totals:			155.11	0.00

CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES EXPLICITLY MODELED:

Equation used: (Load, kg/day) = (Inflow rate, m3/sec) * (Conc., mg/L) * 1.0E-6 kg/mg * 1.0E3 L/m3 * 86400 sec/day

Values from LA-QUAL output:

Element number	Inflow rate (m3/sec)	CBODu conc. (mg/L)	Organic N conc. (mg/L)	Ammonia N conc. (mg/L)	NO2+NO3 N conc. (mg/L)	Name of discharge
126	0.00329	23.000	3.300	1.700	0.000	LaLaurie Ln Ox Pon
158	0.00033	69.000	5.000	10.000	0.000	Grawood Church

Calculated values:

Element number	CBODu load (kg/day)	Organic N load (kg/day)	Ammonia N load (kg/day)	NO2+NO3 N load (kg/day)
126	6.54	0.94	0.48	0.00
158	1.97	0.14	0.29	0.00
Subsegment total	8.51	1.08	0.77	0.00

CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES NOT EXPLICITLY MODELED:

Equations used: Flow rate from TMDL calcs = Permit flow rate * 1.250 (to incorporate MOS and FG)
(Load, kg/day) = (Flow rate, MGD) * (Conc., mg/L) * 3.785 L/gal * 1.0E6 gal/MG * 1.0E-6 kg/mg

Assumptions: Ratio of CBODu to CBOD5 for point source dissharges = 2.3 (guidance from LTP).
For permits with BOD or ammonia limits, NO2+NO3 = 10 mg/L (drinking water criteria).
For permits with COD limits, assume that CBODu is about the same magnitude as COD and that discharges of nitrogen (organic, ammonia, and NO2+NO3) are negligible.

NPDES permit number	Outfall number	Permit flow rate (MGD)	Factor to incorporate MOS and FG into flow	Flow rate for TMDL calcs (MGD	Comments
LAG480011	001	0.002	1.250	0.002	LA Lift & Equip
LAG480284	001	0.003	1.250	0.003	Jack Cooper Trans

LAG530693	001	0.001	1.250	0.001	KEH Property
LAG560089		0.033	1.250	0.041	Wildwood Estates
LAG750459	002	0.005	1.250	0.006	Norwell Equip
LAG750449	002	0.005	1.250	0.006	Deep South Equip

User specified permit limits:

NPDES permit number	Outfall number	CBOD5 (mg/L)	COD (mg/L)	Ammonia (mg/L)	Comments
LAG480011	001	45.0	0.0	10.0	
LAG480284	001	45.0	0.0	10.0	
LAG530693	001	45.0	0.0	10.0	
LAG560089		20.0	0.0	6.7	
LAG750459	002	45.0	0.0	10.0	
LAG750449	002	45.0	0.0	10.0	

Values for TMDL calculations:

NPDES permit number	Outfall number	CBODu (mg/L)	Organic N (mg/L)	Ammonia N (mg/L)	NO2+NO3 N (mg/L)	Comments
LAG480011	001	103.50	20.00	10.00	0.00	
LAG480284	001	103.50	20.00	10.00	0.00	
LAG530693	001	103.50	20.00	10.00	0.00	
LAG560089		46.00	13.40	6.70	0.00	
LAG750459	002	103.50	20.00	10.00	0.00	
LAG750449	002	103.50	20.00	10.00	0.00	

Calculated loads:

NPDES permit number	Outfall number	CBODu (kg/day)	Organic N (kg/day)	AmmoniaN (kg.day)	NO2+NO3 N (kg.day)	Comments
LAG480011	001	0.88	0.17	0.09	0.00	
LAG480284	001	1.27	0.25	0.12	0.00	
LAG530693	001	0.33	0.06	0.03	0.00	
LAG560089		7.18	2.09	1.05	0.00	
LAG750459	002	2.45	0.47	0.24	0.00	
LAG750449	002	2.45	0.47	0.24	0.00	
Subsegment total		14.56	3.52	1.76	0.00	

SUMMARY OF NONPOINT SOURCE OXYGEN DEMAND FOR THIS SUBSEGEMENT:

Equations used: Organic N oxygen demand, kg/day = 4.3300 * Organic N load, kg/day of N
Ammonia N oxygen demand, kg/day = 4.3300 * Ammonia N load, kg/day of N
Margin of safety = 10.0% * nonpoint source load
Future Growth = 10.0% * nonpoint source load
Load Allocation = 80.0% * nonpoint source load

Values from calculations above

	SOD (kg/day)	CBODu (kg/day)	Nitrogen loads (kg/day of N): Organic (kg/day)	Ammonia (kg/day)	NO2+NO3 N (kg/day)
NPS inflows	N/A	5.07	0.88	0.04	0.00
Mass LOads (data type 19)	N/A	10.80	0.43	N/A	N/A
SOD and Benthic	155.11	N/A	N/A	0.00	N/A

Calculated loads of oxygen demand:

	SOD (kg/day)	CBODu (kg/day)	Oygen demand loads: Organic (kg/day)	Ammonia (kg/day)	Total Oxygen demand (kg/day)
NPS inflows	N/A	5.07	3.81	0.17	9.06
Mass LOads (data type 19)	N/A	10.80	1.86	N/A	12.66
SOD and Benthic	155.11	N/A	N/A	0.00	155.11
Total for all NPS loads	155.11	15.87	5.67	0.17	176.83
NPS future growth (10.0%)	15.51	1.59	0.57	0.02	17.68
NPS margin of safety (10.0%)	15.51	1.59	0.57	0.02	17.68
NPS load allocation (80.0%)	124.09	12.69	4.53	0.13	141.47

SUMMARY OF POINT SOURCE OXYGEN DEMAND FOR THIS SUBSEGEMENT

Equations used: Organic N oxygen demand, kg/day = 4.3300 * Organic N load, kg/day of N
Ammonia N oxygen demand, kg/day = 4.3300 * Ammonia N load, kg/day of N
Margin of Safety = 10.0% * point source load
Future Growth = 10.0% * nonpoint source load
Wasteload Allocation (WLA) for modeled point source = 80.0% * modeled load
Wasteload Allocation (WLA) for minor point sources = 80.0% * calculated load

Values from calculations above

	CBODu (kg/day)	Nitrogen loads (kg/day of N): Organic N (kg/day)	Ammonia N (kg/day)	NO3+NO2 (kg/day)
Modeled load for: LaLaurie Ln Ox Pon	6.54	0.94	0.48	0.00
Modeled load for: Grawood Church	1.97	0.14	0.29	0.00
Calculated load for minor point source	14.56	3.52	1.76	0.00

Calculated loads of oxygen demand

	CBODu (kg/day)	Oygen demand loads: Organic N (kg/day)	Ammonia N (kg/day)	Total Oxygen demand (kg/day)
Modeled load for: LaLaurie Ln Ox Pon	6.54	4.06	2.09	12.69
Modeled load for: Grawood Church	1.97	0.62	1.23	3.82
Calculated load for minor point source	14.56	15.24	7.62	37.42
Total for all point source loads	23.07	19.91	10.94	53.93
MOS for all point Sources (10.0%)	2.31	1.99	1.09	5.39
FG for all point Sources (10.0%)	2.31	1.99	1.09	5.39
WLA for: LaLaurie Ln Ox Pon (80.0%)	5.23	3.25	1.67	10.15
WLA for: Grawood Church (80.0%)	1.57	0.49	0.99	3.06
WLA for minor point sources (80.0%)	11.65	12.19	6.09	29.93

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100602                 Subsegment number for this TMDL
"Boggy Bayou"          Subsegment name (max 50 chars)
"bogwin.out"           Name of LA-QUAL output file
2                      Total number of reaches in the model
100602                 Subsegment that reach 1 is in
100602                 Subsegment that reach 2 is in
10                     point source margin of safety (%)
10                     point source Future Gorwth (%)
10                     NPS margin of safety (%)
10                     NPS Future Growth (%)
4.33                   Ratio of oxygen demand to nitrogen
6                      Number of minor point sources
                       MINOR POINT SOURCE DISCHARGE #1:
"LAG480011"               NPDES permit number (9 chars)
"001"                     Outfall number (3 chars)
0.0018                    Flow (MGD)
"LA Lift & Equip"         Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
0                         COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #2:
"LAG480284"               NPDES permit number (9 chars)
"001"                     Outfall number (3 chars)
0.0026                    Flow (MGD)
"Jack Cooper Trans"       Comment for flow (max 40 chars)
45                         CBOD5 or BOD5 permit limit
0                          COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #3:
"LAG530693"               NPDES permit number (9 chars)
"001"                     Outfall number (3 chars)
0.000675                  Flow (MGD)
"KEH Property"            Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
0                         COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #4:
"LAG560089"               NPDES permit number (9 chars)
"  "                      Outfall number (3 chars)
0.033                     Flow (MGD)
"Wildwood Estates"        Comment for flow (max 40 chars)
20                        CBOD5 or BOD5 permit limit
0                         COD permit limit
6.7                       Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #5:
"LAG750459"               NPDES permit number (9 chars)
"002"                     Outfall number (3 chars)
0.005                     Flow (MGD)
"Norwell Equip"           Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
0                         COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
                       MINOR POINT SOURCE DISCHARGE #6:
"LAG750449"               NPDES permit number (9 chars)
"002"                     Outfall number (3 chars)
0.005                     Flow (MGD)
"Deep South Equip"        Comment for flow (max 40 chars)
45                        CBOD5 or BOD5 permit limit
0                         COD permit limit
10                        Ammonia N permit limit
""                        Comment for conc. limits (max 40 chars)
No                     Nutrient TMDL needed?
1.0                    Natural ratio of total N to total P
```

TMDL CALCULATIONS FOR SUBSEGMENT: 100602 Boggy Bayou
FTN ASSOCIATES, LTD.
Program:Pr20m6f

INFO FOR INPUT FILE WITH USER SPECIFIED DATA AND OPTIONS:
File name:tmdlbogw.inp

INFO FOR LA-QUAL OUTPUT FILE:
File name:bogwin.out
Date/Time:Output produced at 13:02 on 09/28/2007
LA-QUAL Version 8.11

LIST OF ALL REACHES IN LA-QUAL OUTPUT FILE:
Reach 1 (Elements 1 - 203) is in subsegment 100602 Boggy Bayou u/s
Reach 2 (Elements 204 - 209) is in subsegment 100602 Boggy Bayou d/s

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CALCULATIONS FOR LOADS FROM NPS INFLOWS (HEADWATERS, TRIBUTARIES, AND INCREMENTAL INFLOW):

Equation used: (Load, kg/day) = (Inflow rate, m3/sec) * (Conc., mg/L) * 1.0E-6 kg/mg * 1.0E3 L/m3 * 86400 sec/day

Values from LA-QUAL output:

Reach or Element number	Inflow rate (m3/sec)	CBODu conc. (mg/L)	Organic N conc. (mg/L)	Ammonia N conc. (mg/L)	NO2+NO3 N conc. (mg/L)	Name of inflow
1	0.02830	12.00	1.75	0.05	0.00	Boggy Bayou
49	0.02830	12.00	1.75	0.05	0.00	NPS Unnamed Trib 1
126	0.02830	12.00	1.75	0.05	0.00	NPS Unnamed Trib 2
203	0.02830	13.50	1.45	0.05	0.00	NPS Gilmer Bayou

Calculated values:

Element number	CBODu load (kg/day)	Organic N load (kg/day)	Ammonia N load (kg/day)	NO2+NO3 N load (kg/day)
1	29.34	4.28	0.12	0.00
49	29.34	4.28	0.12	0.00
126	29.34	4.28	0.12	0.00
203	33.01	3.55	0.12	0.00
Subsegment totals:	92.69	16.39	0.48	0.00

CALCULATIONS FOR NONPOINT SOURCE MASS LOADS IN DATA TYPE 19:

Values from LA-QUAL output:

Reach number	CBODu mass load (kg/day)	Organic N mass load (kg/day)
1	20.00	0.80
2	0.00	0.00
Subsegment totals	20.00	0.80

CALCULATIONS FOR LOADS FROM SOD AND BENTHIC AMMONIA:

SOD temperature correction factor used in LA-QUAL model: 1.065 (default)

Equations used: SOD temp. corrected = (SOD at 20 C) * 1.065^(Water temp - 20 C)
SOD load = (SOD temp. corrected, g/m2/day) * (Surface area, m2) * 1.0E-3 kg/g
Benthic NH3-N load = (Benthic ammonia N, g/m2/day) * (Surface area, m2) * 1.0E-3 kg/g

		Values from LA-QUAL output:				Calculated values:		
Reach number	Element number	Water temp. (deg C)	Surface area (m2)	SOD at 20 C (g/m2/day)	Benthic ammonia N (g/m2/day)	SOD temp. corrected (g/m2/day)	SOD load (kg/day)	Benthic NH3-N load (kg/day)
1	1	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	2	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	3	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	4	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	5	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	6	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	7	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	8	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	9	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	10	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	11	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	12	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	13	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	14	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	15	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	16	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	17	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	18	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	19	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	20	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	21	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	22	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	23	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	24	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	25	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	26	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	27	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	28	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	29	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	30	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	31	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	32	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	33	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	34	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	35	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	36	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	37	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	38	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	39	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	40	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	41	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	42	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	43	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	44	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	45	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	46	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	47	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	48	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	49	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	50	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	51	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	52	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	53	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	54	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	55	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	56	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	57	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	58	22.90	410.0	1.800	0.00	1.800	0.74	0.00

1	59	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	60	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	61	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	62	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	63	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	64	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	65	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	66	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	67	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	68	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	69	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	70	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	71	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	72	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	73	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	74	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	75	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	76	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	77	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	78	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	79	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	80	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	81	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	82	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	83	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	84	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	85	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	86	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	87	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	88	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	89	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	90	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	91	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	92	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	93	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	94	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	95	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	96	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	97	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	98	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	99	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	100	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	101	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	102	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	103	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	104	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	105	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	106	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	107	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	108	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	109	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	110	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	111	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	112	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	113	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	114	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	115	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	116	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	117	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	118	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	119	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	120	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	121	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	122	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	123	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	124	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	125	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	126	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	127	22.90	410.0	1.800	0.00	1.800	0.74	0.00

1	128	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	129	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	130	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	131	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	132	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	133	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	134	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	135	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	136	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	137	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	138	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	139	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	140	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	141	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	142	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	143	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	144	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	145	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	146	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	147	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	148	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	149	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	150	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	151	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	152	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	153	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	154	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	155	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	156	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	157	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	158	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	159	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	160	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	161	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	162	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	163	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	164	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	165	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	166	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	167	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	168	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	169	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	170	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	171	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	172	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	173	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	174	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	175	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	176	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	177	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	178	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	179	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	180	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	181	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	182	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	183	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	184	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	185	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	186	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	187	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	188	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	189	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	190	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	191	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	192	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	193	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	194	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	195	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	196	22.90	410.0	1.800	0.00	1.800	0.74	0.00

1	197	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	198	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	199	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	200	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	201	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	202	22.90	410.0	1.800	0.00	1.800	0.74	0.00
1	203	22.90	410.0	1.800	0.00	1.800	0.74	0.00
2	204	22.90	910.0	1.800	0.00	2.280	2.07	0.00
2	205	22.90	910.0	1.800	0.00	2.280	2.07	0.00
2	206	22.90	910.0	1.800	0.00	2.280	2.07	0.00
2	207	22.90	910.0	1.800	0.00	2.280	2.07	0.00
2	208	22.90	910.0	1.800	0.00	2.280	2.07	0.00
2	209	22.90	910.0	1.800	0.00	2.280	2.07	0.00
				Subsegment totals:			162.26	0.00

CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES EXPLICITLY MODELED:

Equation used: (Load, kg/day) = (Inflow rate, m3/sec) * (Conc., mg/L) * 1.0E-6 kg/mg * 1.0E3 L/m3 * 86400 sec/day

Values from LA-QUAL output:

Element number	Inflow rate (m3/sec)	CBODu conc. (mg/L)	Organic N conc. (mg/L)	Ammonia N conc. (mg/L)	NO2+NO3 N conc. (mg/L)	Name of discharge
126	0.00329	23.000	3.300	1.700	0.000	LaLaurie Ln Ox Pon
158	0.00033	69.000	5.000	10.000	0.000	Grawood Church

Calculated values:

Element number	CBODu load (kg/day)	Organic N load (kg/day)	Ammonia N load (kg/day)	NO2+NO3 N load (kg/day)
126	6.54	0.94	0.48	0.00
158	1.97	0.14	0.29	0.00
Subsegment total	8.51	1.08	0.77	0.00

CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES NOT EXPLICITLY MODELED:

Equations used: Flow rate from TMDL calcs = Permit flow rate * 1.250 (to incorporate MOS and FG)
(Load, kg/day) = (Flow rate, MGD) * (Conc., mg/L) * 3.785 L/gal * 1.0E6 gal/MG * 1.0E-6 kg/mg

Assumptions: Ratio of CBODu to CBOD5 for point source dissharges = 2.3 (guidance from LTP).
For permits with BOD or ammonia limits, NO2+NO3 = 10 mg/L (drinking water criteria).
For permits with COD limits, assume that CBODu is about the same magnitude as COD and that discharges of nitrogen (organic, ammonia, and NO2+NO3) are negligible.

NPDES permit number	Outfall number	Permit flow rate (MGD)	Factor to incorporate MOS and FG into flow	Flow rate for TMDL calcs (MGD	Comments
LAG480011	001	0.002	1.250	0.002	LA Lift & Equip
LAG480284	001	0.003	1.250	0.003	Jack Cooper Trans

LAG530693	001	0.001	1.250	0.001	KEH Property
LAG560089		0.033	1.250	0.041	Wildwood Estates
LAG750459	002	0.005	1.250	0.006	Norwell Equip
LAG750449	002	0.005	1.250	0.006	Deep South Equip

User specified permit limits:

NPDES permit number	Outfall number	CBOD5 (mg/L)	COD (mg/L)	Ammonia (mg/L)	Comments
LAG480011	001	45.0	0.0	10.0	
LAG480284	001	45.0	0.0	10.0	
LAG530693	001	45.0	0.0	10.0	
LAG560089		20.0	0.0	6.7	
LAG750459	002	45.0	0.0	10.0	
LAG750449	002	45.0	0.0	10.0	

Values for TMDL calculations:

NPDES permit number	Outfall number	CBODu (mg/L)	Organic N (mg/L)	Ammonia N (mg/L)	NO2+NO3 N (mg/L)	Comments
LAG480011	001	103.50	20.00	10.00	0.00	
LAG480284	001	103.50	20.00	10.00	0.00	
LAG530693	001	103.50	20.00	10.00	0.00	
LAG560089		46.00	13.40	6.70	0.00	
LAG750459	002	103.50	20.00	10.00	0.00	
LAG750449	002	103.50	20.00	10.00	0.00	

Calculated loads:

NPDES permit number	Outfall number	CBODu (kg/day)	Organic N (kg/day)	AmmoniaN (kg.day)	NO2+NO3 N (kg.day)	Comments
LAG480011	001	0.88	0.17	0.09	0.00	
LAG480284	001	1.27	0.25	0.12	0.00	
LAG530693	001	0.33	0.06	0.03	0.00	
LAG560089		7.18	2.09	1.05	0.00	
LAG750459	002	2.45	0.47	0.24	0.00	
LAG750449	002	2.45	0.47	0.24	0.00	
Subsegment total		14.56	3.52	1.76	0.00	

SUMMARY OF NONPOINT SOURCE OXYGEN DEMAND FOR THIS SUBSEGEMENT:

Equations used: Organic N oxygen demand, kg/day = 4.3300 * Organic N load, kg/day of N
Ammonia N oxygen demand, kg/day = 4.3300 * Ammonia N load, kg/day of N
Margin of safety = 10.0% * nonpoint source load
Future Growth = 10.0% * nonpoint source load
Load Allocation = 80.0% * nonpoint source load

Values from calculations above

	SOD (kg/day)	CBODu (kg/day)	Nitrogen loads (kg/day of N): Organic (kg/day)	Ammonia (kg/day)	NO2+NO3 N (kg/day)
NPS inflows	N/A	92.69	16.39	0.48	0.00
Mass LOads (data type 19)	N/A	20.00	0.80	N/A	N/A
SOD and Benthic	162.26	N/A	N/A	0.00	N/A

Calculated loads of oxygen demand:

	SOD (kg/day)	CBODu (kg/day)	Oygen demand loads: Organic (kg/day)	Oygen demand loads: Ammonia (kg/day)	Total Oxygen demand (kg/day)
NPS inflows	N/A	92.69	70.97	2.08	165.74
Mass LOads (data type 19)	N/A	20.00	3.46	N/A	23.46
SOD and Benthic	162.26	N/A	N/A	0.00	162.26
Total for all NPS loads	162.26	112.69	74.43	2.08	351.47
NPS future growth (10.0%)	16.23	11.27	7.44	0.21	35.15
NPS margin of safety (10.0%)	16.23	11.27	7.44	0.21	35.15
NPS load allocation (80.0%)	129.80	90.15	59.55	1.66	281.17

SUMMARY OF POINT SOURCE OXYGEN DEMAND FOR THIS SUBSEGEMENT

Equations used: Organic N oxygen demand, kg/day = 4.3300 * Organic N load, kg/day of N
Ammonia N oxygen demand, kg/day = 4.3300 * Ammonia N load, kg/day of N
Margin of Safety = 10.0% * point source load
Future Growth = 10.0% * nonpoint source load
Wasteload Allocation (WLA) for modeled point source = 80.0% * modeled load
Wasteload Allocation (WLA) for minor point sources = 80.0% * calculated load

Values from calculations above

	CBODu (kg/day)	Nitrogen loads (kg/day of N): Organic N (kg/day)	Nitrogen loads (kg/day of N): Ammonia N (kg/day)	Nitrogen loads (kg/day of N): NO3+NO2 (kg/day)
Modeled load for: LaLaurie Ln Ox Pon	6.54	0.94	0.48	0.00
Modeled load for: Grawood Church	1.97	0.14	0.29	0.00
Calculated load for minor point source	14.56	3.52	1.76	0.00

Calculated loads of oxygen demand

	CBODu (kg/day)	Oygen demand loads: Organic N (kg/day)	Oygen demand loads: Ammonia N (kg/day)	Total Oxygen demand (kg/day)
Modeled load for: LaLaurie Ln Ox Pon	6.54	4.06	2.09	12.69
Modeled load for: Grawood Church	1.97	0.62	1.23	3.82
Calculated load for minor point source	14.56	15.24	7.62	37.42
Total for all point source loads	23.07	19.91	10.94	53.93
MOS for all point Sources (10.0%)	2.31	1.99	1.09	5.39
FG for all point Sources (10.0%)	2.31	1.99	1.09	5.39
WLA for: LaLaurie Ln Ox Pon (80.0%)	5.23	3.25	1.67	10.15
WLA for: Grawood Church (80.0%)	1.57	0.49	0.99	3.06
WLA for minor point sources (80.0%)	11.65	12.19	6.09	29.93

APPENDIX L

Source Code for TMDL Calculation Program

```
        program pr20m6f
C**** For this prograqm to work the echo of the input and final report must be turned on:
C     1) The echo of the input provides MAJORITY of the ionformation for the calcuations,
C     2) The Hydralic, SOD, and NH3Sr data (needed for surface area for the SOD) are found
C        in the final report reach summary.

C     Printing:
C     This is printed in MSWord or VSlick by setting the left and right margins to 0.3 and 0.38
C     and setting the font to Courier New 9 pt normal text.

C     This program is specifcally formated for LA-QUAL 8.11.


C************************************Search program (part 1)****************************************
C This whole program is written by Richard R. Bennett on 9/20/07 for LA-QUAL version 8.0
C Every variable is used in this program except

       INTEGER imp,i,a,c,d,e,f,g,h,j,k,l,m,n,o,q,k1
       Character*132 line,stream_id
       Character*8 target
       character*21 target2
       character*15 target3
       character*16 target3b,target5b,target5c,target6,t
     &arget7,target8,target9,target10
       character*36 target4


C**********All arrays are entered in the order in which they occurr in the program
C**************Input REAL arrays

      integer total_elem
      integer incr_reach(1:999)
       REAL SOD_temp_cor(1:999),C2_NH3SR(1:999),
     &incr2_CBODu_con(1:999),incr2_Org_N_con(1:999), incr2_Amm_N_con(1:
     &999),incr2_Nitrate_con(1:999), NP_BOD(1:999),NP_ORG(1:999),
     & HDWT1_Flow(1:999),incr_flow(1:999)
       INTEGER HDWT1_elem(1:999)
       REAL WSTLD_Flow(1:999),Elem_end(1:999),Elem_begin(1:999)
       character NPS_wstld_name(1:999)*25,PS_Wstld_name(1:999)*20
       REAL WSTLD2_BOD(1:999),WSTLD2_ORG(1:999),WSTLD2
     &_NH3(1:999), WSTLD2_NO3(1:999)
       REAL nps_WSTLD_Flow(1:999),nps_elem_wstld(1:999)
       REAL NPS_WSTLD2_BOD(1:999),NPS_WSTLD2_ORG(1:999),NPS_WSTLD2
     &_NH3(1:999),NPS_WSTLD2_NO3(1:999)
       REAL PS_WSTLD_Flow(1:999),ps_elem_wstld(1:999)
       REAL ps_WSTLD2_BOD(1:999),ps_WSTLD2_ORG(1:999),ps_WSTLD2
     &_NH3(1:999),ps_WSTLD2_NO3(1:999)
       Integer NP_reach(1:999),elem_wstld(1:999),num,num_pt_sour
       real ps_mos,ps_mos_per,nps_mos,nps_mos_per
       real ps_FG,ps_FG_per,nps_FG,nps_FG_per
       Real Temp(1:999),S_area_int(1:1000)
       integer elem_col_int
       character source_type(1:999)*3,reach_name(1:999)*15,wstld_name(1:
     &100)*20, hdwt1_name(1:999)*25,reach_subseg_num(1:999)*20,
     &permit_number(1:999)*20,outfall_num(1:999)*20,comment(1:999)*40,
     &comment_con(1:999)*40,nut_tmdl_need*4
       Real perm_flow(1:999),CBOD5_Perm(1:999), cod_perm(1:999),ammon_pe
     &rm(1:999),nat_rat,ammoxy_rat
       real HDWT2_BOD_con(1:999),HDWT2_ORG_con(1:999), HDWT2_NH3_con(1:1
     &00), HDWT2_NO3_con(1:999)
       real incr_outflow(1:999),incr_inflow(1:999)

C****************Character Search Strings
      target = 'CNTROL04'
      target2= 'THETA        BENTHAL'
      target3= '$$$ DATA TYPE 8'  ! Reach ID data
      target3b='$$$ DATA TYPE 11' ! Reach Initial conditions (need temps)
      target4= 'BIOLOGICAL AND PHYSICAL COEFFICIENTS' ! SOD and NH3Sr rates (Final Report)
      target5b= '$$$ DATA TYPE 16'  ! Incrmental flows
      target5c= '$$$ DATA TYPE 17'  ! Incrmental WQ
      target6= '$$$ DATA TYPE 19'   ! Mass laods
      target7= '$$$ DATA TYPE 20'   ! Headwater flows
      Target8= '$$$ DATA TYPE 21'   ! Headwater WQ
      Target9= '$$$ DATA TYPE 24'   ! Wasteload flows
```

```
      target10= '$$$ DATA TYPE 25'  ! Wastelaod WQ

C****************Array counterrs
      num=0
      num_incr=0
      num_hdwt=0
      num_wstld=0
      nps_num_wstld=0
      ps_num_wstld=0
      a=0
      cir=0
      c=0
      d=0
      e=0
      f=0
      g=0
      h=0
      j=0
      k=0
      k1=0
      l=0
      m=0
      nps=1
      ps=1
      n=0
      o=0
      q=0


      Character*70 userFilename,Laqualfilename,subsegname,subsegnumber,
     &pertime,LAQUAL_version,laqualfileoutput

      print*,'Enter user input filename: ' ! this is the TMDL program input file
      read*,userfilename                   ! it is NOT hte LA-QUAL file!!!!

      imp=1000000


C*Read input file
      OPEN(UNIT=12, FILE=userfilename, STATUS='OLD') ! input file
      Open (unit=11, FILE='tmdl-res.txt', Status='UNKNOWN')  ! output file
c      OPEN (UNIT=13, FILE='inter-res.txt', Status='UNKNOWN') ! debugging file
      REad(12,*)subsegnumber  ! subsegment number
      REad(12,*)subsegname    ! subsegment name
      read(12,*)laqualfileoutput ! LA-QUAL output file
      read(12,*)usernum          ! number of reaches in output file
      do 10 I=1,usernum          ! read subsegment number for each reach loop
10       read(12,*)reach_subseg_num(I)
      read(12,*)ps_mos_per  ! point source MOS in percent
      read(12,*)ps_FG_per   ! point source FG in percent
      read(12,*)nps_mos_per  ! nonpoint source MOS in percent
      read(12,*)nps_FG_per   ! nonpoint source FG in percent
      READ(12,*)ammoxy_rat   ! ammonia oxidation rate
      read(12,*)num_pt_sour  ! number of point sources in input file
      do 20 I=1,num_pt_sour  ! read point source data loop
         read(12,*)
         read(12,*)permit_number(I) ! permit number
         read(12,*)outfall_num(I)   ! outfall number
         read(12,*)perm_flow(I)     ! permit flow (MGD)
         read(12,*)comment(I)       ! comment (usually facility name)
         read(12,*)cbod5_perm(I)    ! CBOD5 or BOD5 permit conc in mg/L
         read(12,*)COD_perm(I)      ! COD permit conc in mg/L
         read(12,*)ammon_perm(I)    ! ammonia permit conc in mg/L
         read(12,*)comment_con(I)   ! comment for concentration
20    continue
      read(12,*)nut_tmdl_need       ! is a nutrietn TMDL needed?
      read(12,*) nat_rat            ! ratio of natural nitrogen to phosphorus

      ps_mos=ps_mos_per/100.000
      ps_FG=ps_FG_per/100.000
      nps_mos=nps_mos_per/100.000
      nps_FG=nps_FG_per/100.000

      laqualfilename=laqualfileoutput
```

```
      OPEN(UNIT=10, FILE=Laqualfilename, STATUS='OLD') ! this is teh LA-QUAL output file

1030  FORMAT(A35,3X,A25)
      DO 100 i=1,imp
      READ(10,'(A132)') line

C**********Are we at the end of the file?
      if(line(11:29).EQ.'EXECUTION COMPLETED')GO TO 900


C************ read LA-QUAL version
      if (i .EQ. 1) then
          read (line(1:32),'(A32)') LAQUAL_version
      end if

C**********when was the LA-QUAL file made and metric units
      if (line (1:6) .EQ. 'Output') then
         read(line(1:38),'(A38)') pertime
      else IF (line(1:8).EQ. target) then
1020     FORMAT (A35,3X,A10,3X,A10)

C**********Look for theta Benthal
         else IF (line(1:21).EQ. target2) then
1040        Format (A36,5X,A40)

C**********Data T8,Count number of reaches
         else IF (line (1:15) .EQ. target3) then
            Read (10,*)
            Read (10,*)
            Read (10,*)
            Read (10,*)
105         Read (10, '(A132)') stream_id
            if (stream_id(1:8).EQ. 'REACH ID')then
              num=num+1
              read(stream_ID(23:48),'(A15)')reach_name(num)
              read(stream_ID(109:111),)elem_begin(num)
              read(stream_ID(116:118),)elem_end(num)
              total_elem=elem_end(num)
              go to 105
            end if

C**********Data T11, read temp
      else IF (line (1:16).EQ. target3b) then
            READ (10,*)
            READ (10,*)
            READ (10,*)
107         READ (10,'(A132)') stream_id
            if (stream_id(1:7) .EQ. 'INITIAL') then
               q=q+1
               READ(stream_id(32:36),'(F5.0)') temp(q)
               go to 107
               end if

C**********FINAL REPORT,(read COEF-1 Bckgrd SOD and NH3SR)
      else IF (line (49:84) .EQ. target4) then
            Read (10,*)
            Read (10,*)
            Read (10,*)
            Read (10,*)
            Read (10,*)
110         Read (10, '(A132)') stream_id
            if (stream_id(1:7).NE. ' ') then
               a=a+1
               READ(Stream_id(1:4),'(I4)')elem
               READ(stream_id(68:73),'(F7.0)') SOD_temp_cor(elem)
               READ(Stream_id(106:111),'(F6.0)') C2_NH3SR(elem)
c               elem is used to put them in numerical order, NOT
c               in the order they are read from the LA_QUAL file!
c               (this only comes into play for branched models)
1060        FORMAT (A35,5X,A10,5X,A10)
            GO TO 110
            end if

C***********Data Type (incremenatal flow data part1)
```

```
      else if (line(1:16) .EQ. target5b) then
           read(10,*)
           read(10,*)
           read(10,*)
117        read(10,'(A132)')stream_id
           if (stream_id(1:6) .EQ. 'INCR-1') then
               num_incr=num_incr+1
               read(stream_id(17:19),'(I3)') incr_reach(num_incr)
               read(stream_id(32:38),'(F7.0)') incr_outflow(num_incr)
               read(stream_id(44:50),'(F7.0)') incr_inflow(num_incr)
               incr_flow(num_incr) = abs(incr_inflow(num_incr))-abs(inc
     &r_outflow(num_incr))
           go to 117
           end if

C**********Data Tyoe (incremental flow part 2)
      else if (line(1:16) .EQ. target5c) then
           num_incr=0
           read(10,*)
           read(10,*)
           read(10,*)
118         read(10,'(A132)')stream_id
           if (stream_id(1:6) .EQ. 'INCR-2') then
           num_incr=num_incr+1
           read(stream_id(37:46),'(F10.0)') incr2_CBODu_con(num_incr)
           read(stream_id(47:56),'(F10.0)') incr2_Org_N_con(num_incr)
           read(stream_id(57:66),'(F10.0)') incr2_Amm_N_con(num_incr)
           read(stream_id(67:76),'(F10.0)') incr2_Nitrate_con(num_incr)
           go to 118
           end if

C***********Data T19(reads BOD and ORG-N)
      else IF (line (1:16) .EQ. target6) then
           Read (10,*)
           Read (10,*)
           READ (10,*)
120        Read (10, '(A132)') stream_id
           if (stream_id(1:8).EQ. 'NONPOINT') then
              c=c+1
              d=d+1
              read(stream_ID(17:19),'(I3)')NP_reach(c)
              READ(stream_id(28:36),'(F9.0)')NP_BOD(c)
              READ(stream_id(38:46),'(F9.0)')NP_ORG(d)
1080       Format (A35,5X,A10,2X,A10,2X,A10)
           GO TO 120
           end if

C**********DATA T20(reads flow for HDWTR-1)
        else IF (line (1:16) .EQ. target7) then
           Read (10,*)
           READ (10,*)
           Read (10,*)
           REad (10,*)
125        Read (10, '(A132)') stream_id
           if (stream_id(1:7).EQ. 'HDWTR-1') then
              num_hdwt=num_HDwt+1
              e=e+1
              Read(stream_id(17:19),'(I3)')HDWT1_elem(e)
              read(stream_id(25:44),'(A20)')hdwt1_name(e)
              READ(stream_id(53:59),'(F7.0)') HDWT1_Flow(e)
              GO TO 125
           end if

C**********DATA T21(read BOD,ORG-N,NH3,NO3+2 for HDWTR-2)
        else IF (line (1:16) .EQ. target8) then
           Read (10,*)
           Read (10,*)
           READ (10,*)
           Read (10,*)
130        Read (10, '(A132)') stream_id
           if (stream_id(1:7).EQ. 'HDWTR-2') then
           f=f+1
           g=g+1
           h=h+1
```

```
            j=j+1
            READ(stream_id(58:66),'(F9.0)') HDWT2_BOD_con(f)
            READ(stream_id(68:76),'(F9.0)') HDWT2_ORG_con(g)
            READ(stream_id(78:86),'(F9.0)') HDWT2_NH3_con(h)
            READ(stream_id(88:96),'(F9.0)') HDWT2_NO3_con(j)
1090        Format (A35,5X,A5,5X,A5,5X,A5,5X,A5)
            GO TO 130
            end if

C**********DATA T24(flow for WSTLD-1)
          ps=1
          nps=1
          else IF (line (1:16) .EQ. target9) then
            Read (10,*)
            Read (10,*)
            Read (10,*)
            READ (10,*)
135         Read (10, '(A132)') stream_id
            if (stream_id(1:7).EQ. 'WSTLD-1') then
               num_wstld=num_wstld+1
               k=k+1
               READ(stream_id(52:59),'(F8.0)')WSTLD_Flow(k)
               read(stream_id(13:16),'(I4)')elem_wstld(k)
               read(stream_id(30:47),'(A18)')wstld_name(k)
               if (stream_id(30:32).EQ.'NPS') then !
                  nps_num_wstld=nps_num_wstld+1
                  NPS_wstld_name(nps) = wstld_name(K)
                  NPS_elem_wstld(nps) = elem_wstld(K)
                  NPS_wstld_flow(nps) = wstld_flow(K)
                  nps=nps+1
               else
                    ps_num_wstld=ps_num_wstld+1
                    PS_wstld_name(ps) = wstld_name(K)
                    PS_elem_wstld(ps) = elem_wstld(K)
                    PS_wstld_flow(ps) = wstld_flow(K)
                    ps=ps+1
c                   this loop and if statement is used to separate
c                   point and nonpoint wastelaods
               end if
            GO TO 135
            end if

C**********DATA T25(BOD,ORG-N,NH3,NO3+2) for WSTLD-2
      ps=1
      nps=1
         else IF (line (1:16) .EQ. target10) then
            Read (10,*)
            Read (10,*)
            READ (10,*)
            READ (10,*)
140         Read (10, '(A132)') stream_id
            if (stream_id(1:7).EQ. 'WSTLD-2') then
            l=l+1
            m=m+1
            n=n+1
            o=o+1
            k1=k1+1
            READ(stream_id(25:27),'(A3)')source_type(k1)
            READ(stream_id(57:66),'(F10.0)')WSTLD2_BOD(l)
            READ(stream_id(77:86),'(F10.0)')WSTLD2_ORG(m)
            READ(stream_id(87:96),'(F10.0)')WSTLD2_NH3(n)
            READ(stream_id(107:116),'(F10.0)')WSTLD2_NO3(o)
            if (source_type(K1).EQ.'NPS') then
                  nps_wstld2_bod(nps) = wstld2_bod(l)
                  nps_wstld2_org(nps) = wstld2_org(m)
                  nps_wstld2_nh3(nps) = WSTLD2_NH3(N)
                  nps_wstld2_no3(nps) = wstld2_no3(o)
                  nps=nps+1
               else
                  ps_wstld2_bod(ps) = wstld2_bod(l)
                  ps_wstld2_org(ps) = wstld2_org(m)
                  ps_wstld2_nh3(ps) = WSTLD2_NH3(N)
                  ps_wstld2_no3(ps) = wstld2_no3(o)
                  ps=ps+1
```

```
                 end if
c must have blank space after else or the else will only apply to the first statement and NOT
c to all of them

1095        Format (A35,6X,A5,2X,A5,2X,A5,2X,A5,2X,A5)
            GO TO 140
            end if

C*************FINAL REPORT, hydrualic parameter
        else IF (line (1:62) .EQ. ' ************************************
     &*************** HYDRAULIC') then
             Read (10,*)
             READ (10,*)
             READ (10,*)
             READ (10,*)
             READ (10,*)
145          Read (10, '(A132)') stream_id
             if (stream_id(3:5).NE. '   ') then
c               p=p+1
C* these numbers are NOT in numerical order, they are in Branch (ie model layout) order
               read(stream_id(3:5),'(I3)')elem_col_int
               READ(stream_id(84:94),'(F11.0)')S_Area_int(elem_col_int)
               GO TO 145
            end if
1200  FORMAT (A35,5X,I4)
      END IF
100   Continue
900   CONTINUE
      Print*,'Program has finished reading the inputs!!!'


C****************************PART 2************************************
C************************Calculations

C*variables mostly in order of use
      real con3,con4,nps_FG_summary_org
      real mldt19_tot_cbodu, mldt19_tot_org
      real incr_CBODu(1:999), incr_Org_N(1:999), incr_Amm_N(1:999),
     &incr_NItrate(1:999)
      real incr_CBODu_tot, incr_Org_N_tot, incr_Amm_N_tot,incr_NItrate_t
     &ot
      real WSTLD2_BOD_con(1:999),WSTLD2_ORG_con(1:999),WSTLD2_NH3_con
     &(1:999),WSTLD2_NO3_con(1:999)
      real WSTLD2_BOD_cal(1:999),WSTLD2_Org_cal(1:999),WSTLD2_NH3_cal
     &(1:999),WSTLD2_NO3_cal(1:999)
      real WSTLD2_BOD_cal_tot,WSTLD2_Org_cal_tot,WSTLD2_NH3_cal_tot,
     &WSTLD2_NO3_cal_tot
      real ps_WSTLD2_BOD_con(1:999),ps_WSTLD2_ORG_con(1:999),ps_WSTLD2_N
     &H3_con(1:999),ps_WSTLD2_NO3_con(1:999)
      real ps_WSTLD2_BOD_cal(1:999),ps_WSTLD2_Org_cal(1:999),ps_WSTLD2_N
     &H3_cal(1:999),ps_WSTLD2_NO3_cal(1:999)
      real ps_WSTLD2_BOD_cal_tot, ps_WSTLD2_Org_cal_tot, ps_WSTLD2_NH3_c
     &al_tot,ps_WSTLD2_NO3_cal_tot
      real nps_WSTLD2_BOD_con(1:999),nps_WSTLD2_ORG_con(1:999),nps_WSTLD
     &2_NH3_con(1:999),nps_WSTLD2_NO3_con(1:999)
      real nps_WSTLD2_BOD_cal(1:999),nps_WSTLD2_Org_cal(1:999),nps_WSTLD
     &2_NH3_cal(1:999),nps_WSTLD2_NO3_cal(1:999)
      real nps_WSTLD2_BOD_cal_tot,nps_WSTLD2_Org_cal_tot, nps_WSTLD2_NH3
     &_cal_tot,nps_WSTLD2_NO3_cal_tot
      real nps_BOD_tot,nps_Org_N_tot,nps_NH3_N_tot,nps_NO3_tot
      real HDWT_BOD_cal(1:999), HDWT_Org_cal(1:999), HDWT_NH3_cal(1:999)
     &, HDWT_NO3_cal(1:999)
      real HDWT_BOD_cal_tot, HDWT_Org_cal_tot, HDWT_NH3_cal_tot,
     &HDWT_NO3_cal_tot
      real elem_benthis(1:1000), elem_sod(1:1000), elem_temp(1:1000)
     &,sod_load(1:1000), benthic(1:1000)
      real nps_sod_load_tot, nps_benthic_tot,fac_mos_FG
      reaL tmdl_cal_flow(1:999)
      real cbodu_tmdl_val(1:999), org_N_tmdl_val(1:999),ammon_tmdl_val(1
     &:100),no3_tmdl_val(1:999)
      real  cbodu_tmdl_cal(1:999),org_N_tmdl_cal(1:999), ammon_tmdl_cal(
     &1:100), no3_tmdl_cal(1:999)
      real  cbodu_tmdl_tot,org_N_tmdl_tot,ammon_tmdl_tot,no3_tmdl_tot
      real nps_summary_cbodu,nps_summary_org,nps_summary_ammon
```

```
      real oxy_dem_nps_org_N_tot, oxy_dem_nps_nh3_tot
      real nps_mos_sod_load_tot,nps_mos_summary_cbodu,nps_mos_summary_or
     &g,nps_mos_summary_ammon,nps_mos_nps_NO3_tot
      real nps_FG_sod_load_tot,nps_FG_summary_cbodu
     &,nps_FG_summary_ammon,nps_FG_nps_NO3_tot
      real nps_LA_sod_load_tot,nps_LA_summary_cbodu,nps_LA_summary_org,n
     &ps_LA_summary_ammon,nps_LA_nps_NO3_tot
      real ps_summary_cbodu,ps_summary_org,ps_summary_nh3_n
      real mos_ps_summary_cbodu,mos_ps_summary_org,mos_ps_summary_nh3_n
      real FG_ps_summary_cbodu,FG_ps_summary_org,FG_ps_summary_nh3_n
      real wla_ps_cbodu_tmdl_tot,wla_ps_org_N_tmdl_tot, wla_ps_ammon_tmd
     &l_tot
      real wla_ps_WSTLD2_BOD_cal(1:999),wla_ps_WSTLD2_ORG_cal(1:999),wla
     &_ps_WSTLD2_NH3_cal(1:999)
      real oxy_dem_mldt19_tot_org,nps_inflows_tot_oxy_demand,
     &mldt19_tot_oxy_dem,tot_oxy_dem_sod_ben
      real oxy_dem_ps_WSTLD2_Bod_cal(1:999),oxy_dem_ps_WSTLD2_ORG_cal(1:
     &100),oxy_dem_ps_WSTLD2_Nh3_cal(1:999),tot_oxy_dem_nps,
     &wla_min_ps_summary_tot
      real oxy_dem_ps_WSTLD2_Org_cal_tot,oxy_dem_ps_WSTLD2_NH3_cal_tot
      real nps_mos_tot_oxy_dem,nps_FG_tot_oxy_dem,nps_LA_tot_oxy_dem
      real oxy_dem_org_N_tmdl,oxy_dem_ammon_tmdl,min_ps_summary_tot,
     &mod_tot_oxy_dem_ps(1:999),mos_tot_oxy_dem_summary,wla_mod_tot_oxy_
     &dem_ps(1:999)
      real nut_tmdl_nps_org_N_tot,nps_tot_nitrogen_load,nps_total_P
      real ps_nut_tmdl_summary_org_N_tot,ps_nut_tmdl_summary_nh3_N_tot,
     &ps_nut_tmdl_summary_no3_N_tot,ps_tot_nitrogen_final_load,ps_tot_P_
     &final,ps_tot_sum_total_nitrogen_load,ps_tot_sum_total_P
      real mos_ps_nut_tmdl_sum_org_N_tot,
     &mos_ps_nut_tmdl_sum_nh3_N_tot,
     &mos_ps_nut_tmdl_sum_no3_N_tot,
     &mos_ps_tot_nitrogen_final_load,
     &mos_ps_tot_P_final
      real FG_ps_nut_tmdl_sum_org_N_tot,
     &FG_ps_nut_tmdl_sum_nh3_N_tot,
     &FG_ps_nut_tmdl_sum_no3_N_tot,
     &FG_ps_tot_nitrogen_final_load,
     &FG_ps_tot_P_final
      real wla_min_ps_nut_tmdl_sum_org,
     &wla_min_ps_nut_tmdl_sum_nh3,
     &wla_min_ps_nut_tmdl_sum_no3,
     &wla_min_ps_nitrogen_final_load,
     &wla_min_ps_P_final
      real wla_ps_WSTLD2_org_cal_sum(1:999),wla_ps_WSTLD2_NH3_cal_sum(1:
     &100),wla_ps_WSTLD2_NO3_cal_sum(1:999)
      real wla_ps_total_nitrogen_load(1:999), wla_ps_total_P(1:999)
      real nps_mos_nut_tmdl_nps_Org_N_tot,nps_mos_nps_nh3_n_tot,
     &nps_mos_tot_nitrogen_load,nps_mos_total_p
      real nps_FG_nut_tmdl_nps_Org_N_tot,nps_FG_nps_nh3_n_tot,
     &nps_FG_tot_nitrogen_load,nps_FG_total_p
      real nps_la_nut_tmdl_nps_Org_N_tot,nps_la_nps_nh3_n_tot,
     &nps_la_tot_nitrogen_load,nps_la_total_p
      real min_ps_total_nitrogen_load,min_ps_total_P
      real ps_total_nitrogen_load(1:999),ps_total_P(1:999)

      if (usernum.NE.num) then
        print*,'Usernum does not equal num, there has been a read failur
     &e!',num,usernum
        Write(11,*)'This output is NOT correct!'
        end if

      mldt19_tot_cbodu=0
      mldt19_tot_org=0

      incr_CBODu_tot=0
      incr_Org_N_tot=0
      incr_Amm_N_tot=0
      incr_Nitrate_tot=0

      ps_WSTLD2_BOD_cal_tot=0
      ps_WSTLD2_Org_cal_tot=0
      ps_WSTLD2_NH3_cal_tot=0

      nps_WSTLD2_BOD_cal_tot=0
```

```
      nps_WSTLD2_Org_cal_tot=0
      nps_WSTLD2_NH3_cal_tot=0

      WSTLD2_BOD_cal_tot=0
      WSTLD2_Org_cal_tot=0
      WSTLD2_NH3_cal_tot=0

      HDWT_BOD_cal_tot=0
      HDWT_Org_cal_tot=0
      HDWT_NH3_cal_tot=0
      HDWT_NO3_cal_tot=0

      nps_sod_load_tot=0
      nps_benthic_tot=0

      cbodu_tmdl_tot=0
      org_N_tmdl_tot=0
      ammon_tmdl_tot=0
      no3_tmdl_tot=0

      fac_mos_FG=1/(1-(ps_mos+ps_FG))
      con3 = 1.00/1000000.00*1000.00*86400.00
      con4 = 3.7850000000 ! MGD * mg/L * con4,
c     con4 = 3.785 L/gal * 1.0E6 gal/MG * 1.0E-6 kg/mg

      do 180 I=1,num
      mldt19_tot_cbodu=mldt19_tot_cbodu+NP_bod(I)
      mldt19_tot_org= mldt19_tot_org+NP_org(I)
180   continue

C* Here I will arrange the elemntal surface areas into the numerical order to match the order the SOD
C* and NH3 data are in.
c          elem_col(1) = elem_col_int(1)
c          S_Area(1) = S_Area_int(1)
c      DO 185 I=2,total_elem   !need to start at 2 for comaprisons
c          elem_col(I)=I
c          if (elem_col_int(I).EQ.I) then
c             S_Area(I) = S_Area_int(I)
c          else
c
c             DO 184 R=1,total_elem  !go through the list until we get a match
c             if (Elem_col_int(R).EQ.Elem_col(I)) then
c                S_Area(I) = S_Area_int(I)
c             end if
c184         continue
c          end if

c185   continue

      cir=num_incr
      DO 190 cirr=1,cir

      incr_CBODu(cirr)=incr_flow(cirr)*incr2_CBODu_con(cirr)*con3
      incr_Org_N(cirr)=incr_flow(cirr)*incr2_Org_N_con(cirr)*con3
      incr_Amm_N(cirr)=incr_flow(cirr)*incr2_Amm_N_con(cirr)*con3
      incr_NItrate(cirr)=incr_flow(cirr)*incr2_Nitrate_con(cirr)*con3

      incr_CBODu_tot=incr_CBODu_tot+incr_CBODu(cirr)
      incr_Org_N_tot=incr_Org_N_tot+incr_Org_N(cirr)
      incr_Amm_N_tot=incr_Amm_N_tot+incr_Amm_N(cirr)
      incr_Nitrate_tot=incr_Nitrate_tot+incr_Nitrate(cirr)
190   continue

C*********** calcualtions for point soucers EXPLICITLY modeled
      cir=ps_num_wstld
      DO 194 cirr=1,cir
      ps_WSTLD2_BOD_con(cirr)=ps_wstld2_bod(cirr)
      ps_WSTLD2_ORG_con(cirr)=ps_wstld2_org(cirr)
      ps_WSTLD2_NH3_con(cirr)=ps_wstld2_nh3(cirr)
      ps_WSTLD2_NO3_con(cirr)=ps_wstld2_no3(cirr)

      ps_WSTLD2_BOD_cal(cirr)=ps_WSTLD_Flow(cirr)*ps_WSTLD2_BOD_con(cirr
     &)*con3
      ps_WSTLD2_Org_cal(cirr)=ps_WSTLD_FLow(cirr)*ps_WSTLD2_Org_con(cirr
```

```
     &)*con3
      ps_WSTLD2_NH3_cal(cirr)=ps_WSTLD_FLow(cirr)*ps_WSTLD2_NH3_con(cirr
     &)*con3
      ps_WSTLD2_NO3_cal(cirr)=ps_WSTLD_Flow(cirr)*ps_WSTLD2_NO3_con(cirr
     &)*con3

      wla_ps_WSTLD2_org_cal_sum(cirr)=ps_WSTLD2_org_cal(cirr)*(1-ps_mos-
     &ps_FG)
      wla_ps_WSTLD2_NH3_cal_sum(cirr)=ps_WSTLD2_NH3_cal(cirr)*(1-ps_mos-
     &ps_FG)
      wla_ps_WSTLD2_NO3_cal_sum(cirr)=ps_WSTLD2_NO3_cal(cirr)*(1-ps_mos-
     &ps_FG)

      ps_WSTLD2_BOD_cal_tot=ps_WSTLD2_BOD_cal_tot+ps_WSTLD2_BOD_cal(cirr
     &)
      ps_WSTLD2_Org_cal_tot=ps_WSTLD2_Org_cal_tot+ps_WSTLD2_Org_cal(cirr
     &)
      ps_WSTLD2_NH3_cal_tot=ps_WSTLD2_NH3_cal_tot+ps_WSTLD2_NH3_cal(cirr
     &)
      ps_WSTLD2_NO3_cal_tot=ps_WSTLD2_NO3_cal_tot+ps_WSTLD2_NO3_cal(cirr
     &)

       oxy_dem_ps_wstld2_bod_cal(cirr)=1*ps_WSTLD2_BOD_cal(cirr
     &)
       oxy_dem_ps_wstld2_org_cal(cirr)=ammoxy_rat*ps_wstld2_org_cal(cirr
     &)
       oxy_dem_ps_wstld2_nh3_cal(cirr)=ammoxy_rat*ps_wstld2_nh3_cal(cirr
     &)
       mod_tot_oxy_dem_ps(cirr)=oxy_dem_ps_wstld2_bod_cal(cirr)+oxy_dem_
     &ps_wstld2_org_cal(cirr)+ oxy_dem_ps_wstld2_nh3_cal(cirr)

       wla_ps_wstld2_bod_cal(cirr)=ps_wstld2_bod_cal(cirr)*(1-ps_mos-ps_
     &FG)
       wla_ps_WSTLD2_ORG_cal(cirr)=oxy_dem_ps_WSTLD2_Org_cal(cirr)*(1-ps
     &_mos-ps_FG)
       wla_ps_wstld2_nh3_cal(cirr)=oxy_dem_ps_WSTLD2_NH3_cal(cirr)*(1-ps
     &_mos-ps_FG)
       wla_mod_tot_oxy_dem_ps(cirr)=mod_tot_oxy_dem_ps(cirr)*(1-ps_mos-p
     &s_FG)

C     rounding functions (uisng the anint function)

       wla_ps_wstld2_bod_cal(cirr)=wla_ps_wstld2_bod_cal(cirr)*100
       wla_ps_wstld2_bod_cal(cirr)=anint(wla_ps_wstld2_bod_cal(cirr))
       wla_ps_wstld2_bod_cal(cirr)=wla_ps_wstld2_bod_cal(cirr)/100

       wla_ps_wstld2_org_cal(cirr)=wla_ps_wstld2_org_cal(cirr)*100
       wla_ps_wstld2_org_cal(cirr)=anint(wla_ps_wstld2_org_cal(cirr))
       wla_ps_wstld2_org_cal(cirr)=wla_ps_wstld2_org_cal(cirr)/100

       wla_ps_wstld2_nh3_cal(cirr)=wla_ps_wstld2_nh3_cal(cirr)*100
       wla_ps_wstld2_nh3_cal(cirr)=anint(wla_ps_wstld2_nh3_cal(cirr))
       wla_ps_wstld2_nh3_cal(cirr)=wla_ps_wstld2_nh3_cal(cirr)/100

       wla_mod_tot_oxy_dem_ps(cirr)=wla_mod_tot_oxy_dem_ps(cirr)*100
       wla_mod_tot_oxy_dem_ps(cirr)=anint(wla_mod_tot_oxy_dem_ps(cirr))
       wla_mod_tot_oxy_dem_ps(cirr)=wla_mod_tot_oxy_dem_ps(cirr)/100

C**************** nps wasteload calculations
194   continue
      do 196 cirr=1,nps_num_wstld
      nps_WSTLD2_BOD_con(cirr)=nps_wstld2_bod(cirr)
      nps_WSTLD2_ORG_con(cirr)=nps_wstld2_org(cirr)
      nps_WSTLD2_NH3_con(cirr)=nps_wstld2_nh3(cirr)
      nps_WSTLD2_NO3_con(cirr)=nps_wstld2_no3(cirr)

      nps_WSTLD2_BOD_cal(cirr)=nps_WSTLD_Flow(cirr)*nps_WSTLD2_BOD_con(c
     &irr)*con3
      nps_WSTLD2_Org_cal(cirr)=nps_WSTLD_FLow(cirr)*nps_WSTLD2_Org_con(c
     &irr)*con3
      nps_WSTLD2_NH3_cal(cirr)=nps_WSTLD_FLow(cirr)*nps_WSTLD2_NH3_con(c
     &irr)*con3
      nps_WSTLD2_NO3_cal(cirr)=nps_WSTLD_Flow(cirr)*nps_WSTLD2_NO3_con(c
     &irr)*con3
```

```
      nps_WSTLD2_BOD_cal_tot=nps_WSTLD2_BOD_cal_tot+nps_WSTLD2_BOD_cal(c
     &irr)
      nps_WSTLD2_Org_cal_tot=nps_WSTLD2_Org_cal_tot+nps_WSTLD2_Org_cal(c
     &irr)
      nps_WSTLD2_NH3_cal_tot=nps_WSTLD2_NH3_cal_tot+nps_WSTLD2_NH3_cal(c
     &irr)
      nps_WSTLD2_NO3_cal_tot=nps_WSTLD2_NO3_cal_tot+nps_WSTLD2_NO3_cal(c
     &irr)

      nps_WSTLD2_BOD_cal_tot=nps_WSTLD2_BOD_cal_tot*100
      nps_WSTLD2_BOD_cal_tot=anint(nps_WSTLD2_BOD_cal_tot)
      nps_WSTLD2_BOD_cal_tot=nps_WSTLD2_BOD_cal_tot/100

      nps_WSTLD2_Org_cal_tot=nps_WSTLD2_Org_cal_tot*100
      nps_WSTLD2_Org_cal_tot=anint(nps_WSTLD2_Org_cal_tot)
      nps_WSTLD2_Org_cal_tot=nps_WSTLD2_Org_cal_tot/100

      nps_WSTLD2_NH3_cal_tot=nps_WSTLD2_NH3_cal_tot*100
      nps_WSTLD2_NH3_cal_tot=anint(nps_WSTLD2_NH3_cal_tot)
      nps_WSTLD2_NH3_cal_tot=nps_WSTLD2_NH3_cal_tot/100

      nps_WSTLD2_NO3_cal_tot=nps_WSTLD2_NO3_cal_tot*100
      nps_WSTLD2_NO3_cal_tot=anint(nps_WSTLD2_NO3_cal_tot)
      nps_WSTLD2_NO3_cal_tot=nps_WSTLD2_NO3_cal_tot/100



c**********only wasteloads can be divided into point source and non point sources
196   continue

      do 198 cirr= 1, num_wstld
      WSTLD2_BOD_con(cirr)=WSTLD2_BOD(cirr)
      WSTLD2_ORG_con(cirr)=WSTLD2_Org(cirr)
      WSTLD2_NH3_con(cirr)=WSTLD2_NH3(cirr)
      WSTLD2_NO3_con(cirr)=WSTLD2_NO3(cirr)

      WSTLD2_BOD_cal(cirr)=WSTLD_Flow(cirr)*WSTLD2_BOD_con(cirr)*con3
      WSTLD2_Org_cal(cirr)=WSTLD_FLow(cirr)*WSTLD2_Org_con(cirr)*con3
      WSTLD2_NH3_cal(cirr)=WSTLD_FLow(cirr)*WSTLD2_NH3_con(cirr)*con3
      WSTLD2_NO3_cal(cirr)=WSTLD_Flow(cirr)*WSTLD2_NO3_con(cirr)*con3

      WSTLD2_BOD_cal_tot=WSTLD2_BOD_cal_tot+WSTLD2_BOD_cal(cirr)
      WSTLD2_Org_cal_tot=WSTLD2_Org_cal_tot+WSTLD2_Org_cal(cirr)
      WSTLD2_NH3_cal_tot=WSTLD2_NH3_cal_tot+WSTLD2_NH3_cal(cirr)
      WSTLD2_NO3_cal_tot=WSTLD2_NO3_cal_tot+WSTLD2_NO3_cal(cirr)

      wstld2_bod_cal_tot=wstld2_bod_cal_tot*100
      wstld2_bod_cal_tot=anint(wstld2_bod_cal_tot)
      wstld2_bod_cal_tot=wstld2_bod_cal_tot/100

      wstld2_org_cal_tot=wstld2_org_cal_tot*100
      wstld2_org_cal_tot=anint(wstld2_org_cal_tot)
      wstld2_org_cal_tot=wstld2_org_cal_tot/100

      wstld2_NH3_cal_tot=wstld2_NH3_cal_tot*100
      wstld2_NH3_cal_tot=anint(wstld2_NH3_cal_tot)
      wstld2_NH3_cal_tot=wstld2_NH3_cal_tot/100

      wstld2_NO3_cal_tot=wstld2_NO3_cal_tot*100
      wstld2_NO3_cal_tot=anint(wstld2_NO3_cal_tot)
      wstld2_NO3_cal_tot=wstld2_NO3_cal_tot/100
198   continue

      cir=num_hdwt

      DO 199 cirr=1,cir

      HDWT_BOD_cal(cirr)=HDWT1_Flow(cirr)*HDWT2_BOD_con(cirr)*con3
      HDWT_Org_cal(cirr)=HDWT1_FLow(cirr)*HDWT2_Org_con(cirr)*con3
      HDWT_NH3_cal(cirr)=HDWT1_FLow(cirr)*HDWT2_NH3_con(cirr)*con3
      HDWT_NO3_cal(cirr)=HDWT1_Flow(cirr)*HDWT2_NO3_con(cirr)*con3

      HDWT_BOD_cal_tot=HDWT_BOD_cal_tot+HDWT_BOD_cal(cirr)
```

```
      HDWT_Org_cal_tot=HDWT_Org_cal_tot+HDWT_Org_cal(cirr)
      HDWT_NH3_cal_tot=HDWT_NH3_cal_tot+HDWT_NH3_cal(cirr)
      HDWT_NO3_cal_tot=HDWT_NO3_cal_tot+HDWT_NO3_cal(cirr)

      HDWT_bod_cal_tot=HDWT_bod_cal_tot*100
      HDWT_bod_cal_tot=anint(HDWT_bod_cal_tot)
      HDWT_bod_cal_tot=wstld2_bod_cal_tot/100

      HDWT_org_cal_tot=HDWT_org_cal_tot*100
      HDWT_org_cal_tot=anint(HDWT_org_cal_tot)
      HDWT_org_cal_tot=HDWT_org_cal_tot/100

      HDWT_NH3_cal_tot=HDWT_NH3_cal_tot*100
      HDWT_NH3_cal_tot=anint(HDWT_NH3_cal_tot)
      HDWT_NH3_cal_tot=HDWT_NH3_cal_tot/100

      HDWT_NO3_cal_tot=HDWT_NO3_cal_tot*100
      HDWT_NO3_cal_tot=anint(HDWT_NO3_cal_tot)
      HDWT_NO3_cal_tot=HDWT_NO3_cal_tot/100



199   Continue


C*************** total up NPS values from incremetnal flow, tribs and headwaters
      nps_BOD_tot=incr_CBODu_tot+nps_WSTLD2_BOD_cal_tot+
     &HDWT_BOD_cal_tot
      nps_Org_N_tot=incr_Org_N_tot+nps_WSTLD2_Org_cal_tot+
     &HDWT_Org_cal_tot
      nps_NH3_N_tot=incr_Amm_N_tot+nps_WSTLD2_NH3_cal_tot+HDWT_NH3
     &_cal_tot
      nps_NO3_tot=incr_Nitrate_tot+nps_WSTLD2_NO3_cal_tot+HDWT_NO3_cal_t
     &ot

C************* total up oxygen demand for NPS
      oxy_dem_nps_org_N_tot=ammoxy_rat*nps_org_N_tot
      oxy_dem_nps_nh3_tot=ammoxy_rat*nps_nh3_N_tot
      oxy_dem_mldt19_tot_org=ammoxy_rat*mldt19_tot_org


C************* create the element and reach column, as well as other columns for
C************* for SOD and benthic ammonia
      DO 201 I=1,num
          DO 200 J=elem_begin(I), elem_end(I)
               elem_benthis(J)= C2_NH3SR (I)
               elem_sod(J)=SOD_temp_cor(I)
               elem_temp(J)=temp(I)
200            continue
201   continue



      do 202 I=1,total_elem
c               sod_temp_cor(I)=elem_sod(I)*1.065**(elem_temp(I)-20)
               sod_load(I)=sod_temp_cor(I)*s_area_int(I)*1.00/1000.00
               benthic(I)=elem_benthis(I)*s_area_int(I)*1.00/1000.00
               nps_sod_load_tot=nps_sod_load_tot+sod_load(I)
               nps_benthic_tot=nps_benthic_tot+benthic(I)
202   continue


C*****************calculate values for PS and NPS summary sections
      oxy_dem_nps_benthic_tot=ammoxy_rat*nps_benthic_tot

      nps_inflows_tot_oxy_demand=nps_BOD_tot+oxy_dem_nps_org_N_tot+oxy_d
     &em_nps_nh3_tot
      mldt19_tot_oxy_dem=mldt19_tot_cbodu+oxy_dem_mldt19_tot_org
      tot_oxy_dem_sod_ben=nps_sod_load_tot+oxy_dem_nps_benthic_tot

      tot_oxy_dem_nps=nps_inflows_tot_oxy_demand+mldt19_tot_oxy_dem+tot_
     &oxy_dem_sod_ben

      oxy_dem_ps_WSTLD2_Org_cal_tot=ps_WSTLD2_Org_cal_tot*ammoxy_rat
```

```
 oxy_dem_ps_WSTLD2_NH3_cal_tot=ps_WSTLD2_NH3_cal_tot*ammoxy_rat

 nps_summary_cbodu=nps_bod_tot+mldt19_tot_cbodu
 nps_summary_org=oxy_dem_nps_org_N_tot+oxy_dem_mldt19_tot_org
 nps_summary_ammon=oxy_dem_nps_nh3_tot+oxy_dem_nps_benthic_tot

 nps_mos_sod_load_tot=nps_sod_load_tot*nps_mos
 nps_mos_sod_load_tot=nps_mos_sod_load_tot*100
 nps_mos_sod_load_tot=anint(nps_mos_sod_load_tot)/100

 nps_mos_summary_cbodu=nps_summary_cbodu*nps_mos
 nps_mos_summary_cbodu=nps_mos_summary_cbodu*100
 nps_mos_summary_cbodu=anint(nps_mos_summary_cbodu)/100

 nps_mos_summary_org=nps_summary_org*nps_mos
 nps_mos_summary_org=nps_mos_summary_org*100
 nps_mos_summary_org=anint(nps_mos_summary_org)/100

 nps_mos_summary_ammon=nps_summary_ammon*nps_mos
 nps_mos_summary_ammon=nps_mos_summary_ammon*100
 nps_mos_summary_ammon=anint(nps_mos_summary_ammon)/100

 nps_FG_sod_load_tot=nps_sod_load_tot*nps_FG
 nps_FG_sod_load_tot=nps_FG_sod_load_tot*100
 nps_FG_sod_load_tot=anint(nps_FG_sod_load_tot)/100


 nps_FG_summary_cbodu=nps_summary_cbodu*nps_FG
 nps_FG_summary_cbodu=nps_FG_summary_cbodu*100
 nps_FG_summary_cbodu=anint(nps_FG_summary_cbodu)/100

 nps_FG_summary_org=nps_summary_org*nps_FG
 nps_FG_summary_org=nps_FG_summary_org*100
 nps_FG_summary_org=anint(nps_FG_summary_org)/100

 nps_FG_summary_ammon=nps_summary_ammon*nps_FG
 nps_FG_summary_ammon=nps_FG_summary_ammon*100
 nps_FG_summary_ammon=anint(nps_FG_summary_ammon)/100


 nps_mos_tot_oxy_dem=tot_oxy_dem_nps*nps_mos
 nps_mos_tot_oxy_dem=nps_mos_tot_oxy_dem*100
 nps_mos_tot_oxy_dem=anint(nps_mos_tot_oxy_dem)/100


 nps_FG_tot_oxy_dem=tot_oxy_dem_nps*nps_FG
 nps_FG_tot_oxy_dem=nps_FG_tot_oxy_dem*100
 nps_FG_tot_oxy_dem=anint(nps_FG_tot_oxy_dem)/100


 nps_mos_nps_NO3_tot=nps_NO3_tot*nps_mos
 nps_mos_nps_NO3_tot=nps_mos_nps_NO3_tot*100
 nps_mos_nps_NO3_tot=anint(nps_mos_nps_NO3_tot)/100


 nps_FG_nps_NO3_tot=nps_NO3_tot*nps_FG
 nps_FG_nps_NO3_tot=nps_FG_nps_NO3_tot*100
 nps_FG_nps_NO3_tot=anint(nps_FG_nps_NO3_tot)/100


 nps_LA_sod_load_tot=nps_sod_load_tot-nps_MOS_sod_load_tot-nps_FG_s
&od_load_tot
 nps_LA_summary_cbodu=nps_summary_cbodu-nps_MOS_summary_cbodu-nps_F
&G_summary_cbodu
 nps_LA_summary_org=nps_summary_org-nps_MOS_summary_org-nps_FG_summ
&ary_org
 nps_LA_summary_ammon=nps_summary_ammon-nps_MOS_summary_ammon-nps_F
&G_summary_ammon
 nps_LA_nps_NO3_tot=nps_NO3_tot-nps_MOS_nps_NO3_tot-nps_FG_nps_NO3_
&tot

 nps_LA_tot_oxy_dem=tot_oxy_dem_nps-nps_mos_tot_oxy_dem-nps_fg_tot_
&oxy_dem
```

```
c these values are from reading data from La_qual output (and thus ARE NOT minor point sources)
      ps_BOD_tot=ps_WSTLD2_BOD_cal_tot
      ps_Org_N_tot=ps_WSTLD2_Org_cal_tot
      ps_NH3_N_tot=ps_WSTLD2_NH3_cal_tot
      ps_NO3_tot=ps_WSTLD2_NO3_cal_tot

c this produces the "values for tmdl calculations table"
      do 204 I =1, num_pt_sour
               cbodu_tmdl_val(I)=2.30*cbod5_perm(I)
               if (CBOD5_perm(I).EQ.0.OR.CBOD5_perm(I).EQ.-999)then
                  cbodu_tmdl_val(I)=1.00*cod_perm(I)
                  if (cod_perm(I).EQ.0.OR.Cod_perm(I).EQ.-999)then
                  cbodu_tmdl_val(I)=0
               end if
               end if

               ammon_tmdl_val(I)=ammon_perm(I)
               if (ammon_perm(I) .EQ.-999) then
                  ammon_tmdl_val(I)=2*cbod5_perm(I)
                  if (cbod5_perm(I).EQ.-999) then
                     ammon_tmdl_val(I)=0
               end if
               end if

               no3_tmdl_val(I) = 0

               org_N_tmdl_val(I)=ammon_tmdl_val(I)*2.00

               if (cbod5_perm(I).EQ.0.AND.ammon_perm(I).EQ.0) then
               org_N_tmdl_val(I)=0
               ammon_tmdl_val(I)=0
               no3_tmdl_val(I) = 0
               end if

204   continue

C *** caluculate tmdl vlues for tmdl load chart
      do 206 I=1,num_pt_sour
         tmdl_cal_flow(I)=perm_flow(I)*fac_mos_FG
         cbodu_tmdl_cal(I) = tmdl_cal_flow(I)*cbodu_tmdl_val(I)*con4
         org_N_tmdl_cal(I) = tmdl_cal_flow(I)*org_N_tmdl_val(I)*con4
         ammon_tmdl_cal(I) = tmdl_cal_flow(I)*ammon_tmdl_val(I)*con4
         no3_tmdl_cal(I) = tmdl_cal_flow(I)*no3_tmdl_val(I) *con4

         cbodu_tmdl_tot=cbodu_tmdl_tot+cbodu_tmdl_cal(I)
         org_N_tmdl_tot=org_N_tmdl_tot+org_N_tmdl_cal(I)
         ammon_tmdl_tot=ammon_tmdl_tot+ammon_tmdl_cal(I)
         no3_tmdl_tot=no3_tmdl_tot+no3_tmdl_cal(I)

         oxy_dem_org_N_tmdl= org_N_tmdl_tot*ammoxy_rat
         oxy_dem_ammon_tmdl= ammon_tmdl_tot*ammoxy_rat


206   continue
c*********calculate tmdl values for summary chart (using ammox multiplier



c first term is read in from La-qual second is from User supplied data
c more summary calculations
      ps_summary_cbodu=ps_bod_tot+cbodu_tmdl_tot
      ps_summary_org= oxy_dem_ps_wstld2_org_cal_tot+ oxy_dem_org_N_tmdl

      ps_summary_nh3_n=oxy_dem_ps_WSTLD2_NH3_cal_tot+oxy_dem_ammon_tmdl

      tot_oxy_dem_summary=ps_summary_cbodu+ps_summary_org+ps_summary_nh3
     &_n

      mos_ps_summary_cbodu=ps_summary_cbodu*ps_mos
      mos_ps_summary_org=ps_summary_org*ps_mos
      mos_ps_summary_nh3_n= ps_summary_nh3_n*ps_mos

      FG_ps_summary_cbodu=ps_summary_cbodu*ps_FG
      FG_ps_summary_org=ps_summary_org*ps_FG
```

```
      FG_ps_summary_nh3_n= ps_summary_nh3_n*ps_FG


      min_ps_summary_tot=cbodu_tmdl_tot+oxy_dem_org_N_tmdl+oxy_dem_ammon
     &_tmdl

      mos_tot_oxy_dem_summary=tot_oxy_dem_summary*ps_mos
      FG_tot_oxy_dem_summary=tot_oxy_dem_summary*ps_FG

c WLA for minor point sources
      wla_ps_cbodu_tmdl_tot=cbodu_tmdl_tot*(1-ps_mos-ps_FG)
      wla_ps_org_N_tmdl_tot=oxy_dem_org_N_tmdl*(1-ps_mos-ps_FG)
      wla_ps_ammon_tmdl_tot=oxy_dem_ammon_tmdl*(1-ps_mos-ps_FG)
      wla_min_ps_summary_tot=min_ps_summary_tot*(1-ps_mos-ps_FG)


C*********** Nutrient TMDL calucaltions (a lot of the NPS calcualatiosn are done above
C********* in lines 677-684
C just need to take nps_org_N_tot from
C the first equtaion (which has org_N from heads, tribs and increments)
C and add mass loads data type 19
C (seen in last term),


C******** the loop below should be with the section "calcualtions for point sources explicitly modeled
C*since the loop below is all PS stuff but oh well I do not want to risk moving it

      if (ps_num_wstld .EQ.0) then
      go to 207
      end if



      do 208 cir=1,ps_num_wstld
             ps_total_nitrogen_load(cir)=ps_WSTLD2_ORG_cal(cir)+ps_WSTLD
     &2_Nh3_cal(cir)+ps_WSTLd2_NO3_cal(cir)
             ps_total_P(cir)=ps_total_nitrogen_load(cir)/nat_rat

             ps_tot_sum_total_nitrogen_load=ps_tot_sum_total_nitrogen_lo
     &ad+ps_total_nitrogen_load(cir)
             ps_tot_sum_total_P=ps_tot_sum_total_P+ps_total_P(cir)

             wla_ps_total_nitrogen_load(cir)=ps_total_nitrogen_load(cir)
     &*(1-ps_mos-ps_FG)
             wla_ps_total_P(cir)=ps_total_P(cir)*(1-ps_mos-ps_FG)

208   continue




207   nut_tmdl_nps_Org_N_tot=nps_org_N_tot+mldt19_tot_org
      nps_tot_nitrogen_load= nut_tmdl_nps_org_N_tot+nps_nh3_n_tot+
     &nps_NO3_tot

      nps_total_P=nps_tot_nitrogen_load/nat_rat

      nps_mos_nut_tmdl_nps_Org_N_tot=nut_tmdl_nps_Org_N_tot*nps_mos
      nps_mos_nps_nh3_n_tot=nps_nh3_n_tot*nps_mos
      nps_mos_nps_NO3_tot=nps_NO3_tot*nps_mos
      nps_mos_tot_nitrogen_load=nps_tot_nitrogen_load*nps_mos
      nps_mos_total_p=NPS_total_p*nps_mos

      nps_FG_nut_tmdl_nps_Org_N_tot=nut_tmdl_nps_Org_N_tot*nps_FG
      nps_FG_nps_nh3_n_tot=nps_nh3_n_tot*nps_FG
      nps_FG_nps_NO3_tot=nps_NO3_tot*nps_FG
      nps_FG_tot_nitrogen_load=nps_tot_nitrogen_load*nps_FG
      nps_FG_total_p=NPS_total_p*nps_FG

      nps_la_nut_tmdl_nps_Org_N_tot=nut_tmdl_nps_Org_N_tot*(1-nps_mos-np
     &s_FG)
      nps_la_nps_nh3_n_tot=nps_nh3_n_tot*(1-nps_mos)
      nps_la_nps_NO3_tot=nps_NO3_tot*(1-nps_mos)
      nps_la_tot_nitrogen_load=nps_tot_nitrogen_load*(1-nps_mos)
```

```
      nps_la_total_p=npS_total_p*(1-nps_mos)

      min_ps_total_nitrogen_load=org_N_tmdl_tot+ammon_tmdl_tot+no3_tmdl_
     &tot
      min_ps_total_P=min_ps_total_nitrogen_load/nat_rat

      ps_nut_tmdl_summary_org_N_tot=ps_WSTLD2_Org_cal_tot+org_N_tmdl_tot
      ps_nut_tmdl_summary_nh3_N_tot=ps_WSTLD2_NH3_cal_tot+ammon_tmdl_tot
      ps_nut_tmdl_summary_no3_N_tot=ps_WSTLD2_NO3_cal_tot+no3_tmdl_tot

      ps_tot_nitrogen_final_load=min_ps_total_nitrogen_load+ps_tot_sum_t
     &otal_nitrogen_load
      ps_tot_P_final=min_ps_total_P+ps_tot_sum_total_P

      mos_ps_nut_tmdl_sum_org_N_tot=ps_nut_tmdl_summary_org_N_tot*ps_mos
      mos_ps_nut_tmdl_sum_nh3_N_tot=ps_nut_tmdl_summary_nh3_N_tot*ps_mos
      mos_ps_nut_tmdl_sum_no3_N_tot=ps_nut_tmdl_summary_no3_N_tot*ps_mos

      FG_ps_nut_tmdl_sum_org_N_tot=ps_nut_tmdl_summary_org_N_tot*ps_FG
      FG_ps_nut_tmdl_sum_nh3_N_tot=ps_nut_tmdl_summary_nh3_N_tot*ps_FG
      FG_ps_nut_tmdl_sum_no3_N_tot=ps_nut_tmdl_summary_no3_N_tot*ps_FG

      mos_ps_tot_nitrogen_final_load=ps_tot_nitrogen_final_load*ps_mos
      mos_ps_tot_P_final=ps_tot_P_final*ps_mos

      FG_ps_tot_nitrogen_final_load=ps_tot_nitrogen_final_load*ps_FG
      FG_ps_tot_P_final=ps_tot_P_final*ps_FG

      wla_min_ps_nut_tmdl_sum_org=org_N_tmdl_tot*(1-ps_mos-ps_FG)
      wla_min_ps_nut_tmdl_sum_nh3=ammon_tmdl_tot*(1-ps_mos-ps_FG)
      wla_min_ps_nut_tmdl_sum_no3=no3_tmdl_tot*(1-ps_mos-ps_FG)

      wla_min_ps_nitrogen_final_load=min_ps_total_nitrogen_load*(1-p
     &s_mos-ps_FG)
      wla_min_ps_P_final=min_ps_total_P*(1-ps_mos-ps_FG)

c590   write(11,6090)'Calculated load for minor point sources   ',org_N_t
c     &mdl_tot,ammon_tmdl_tot,no3_tmdl_tot,min_ps_total_nitrogen_load,min
c     &_ps_total_P



c      write(11,6090)'Total for all point source loads             ',ps_n
c     &ut_tmdl_summary_org_N_tot,ps_nut_tmdl_summary_nh3_N_tot,ps_nut_tmd
c     &l_summary_no3_N_tot,ps_tot_nitrogen_final_load,ps_tot_P_final






C***********Output File Write Statements

C*****SECTION: "TMDL CALCULATIONS FOR SUBSEGMENT:"

990   format(A33,2x,A10,2x,A20)
      Write (11,990)'TMDL CALCULATIONS FOR SUBSEGMENT:',subsegnumber,sub
     &segname
      Write(11,*)'FTN ASSOCIATES, LTD.'
      Write(11,*)'Program:Pr20m6f'
      Write(11,*)' '
      Write(11,*)'INFO FOR INPUT FILE WITH USER SPECIFIED DATA AND OPTIO
     &NS:'
      Write(11,*)'File name:',userfilename
      write(11,*)' '
      write(11,*)'INFO FOR LA-QUAL OUTPUT FILE:'
      Write(11,*)'File name:',laqualfilename
      Write(11,*)'Date/Time:',pertime
      write(11,*)LAQUAL_version
      write(11,*)'  '
      Write(11,*)'LIST OF ALL REACHES IN LA-QUAL OUTPUT FILE:'
      DO 209 numm=1, num
1000      Format(A7,1x,I3,1x,A10,1x,I3,1x,A1,1x,I3,A18,2x,A6,1x,A15)
209       WRITE(11,1000)'Reach',np_Reach(numm),'(Elements',Elem_begin(nu
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```
     &mm),'-',elem_end(numm),') is in subsegment',reach_subseg_num(numm)
     &,reach_name(numm)
      write(11,*)' '


C***** SECTION:"CALCULATIONS FOR LOADS FROM NPS INFLOWS (HEADWATERS, TRIBUTARIES, AND INCREMENTAL INFLOW):"

      Write(11,3030)
      write(11,*)' '
3030  FORmat(102('='))
      Write(11,*)'CALCULATIONS FOR LOADS FROM NPS INFLOWS (HEADWATERS, T
     &RIBUTARIES, AND INCREMENTAL INFLOW):'
      Write(11,*)' '
      write(11,*)'Equation used: (Load, kg/day) = (Inflow rate, m3/sec)
     &* (Conc., mg/L) * 1.0E-6 kg/mg * 1.0E3 L/m3 *'
      write(11,*)'
     &                              86400 sec/day'
      write(11,*)' '
      Write(11,*)'Values from LA-QUAL output:'
      write(11,*)' '
      Write(11,*)'Reach or   Inflow      CBODu     Organic N   Ammonia N
     &        NO2+NO3 N'
      write(11,*)'Element     rate        conc.       conc.       conc.
     &          conc.'
      write(11,*)'number    (m3/sec)     (mg/L)      (mg/L)      (mg/L)
     &          (mg/L)     Name of inflow'
      write(11,*)'------    --------    --------    --------    --------
     &        --------     --------------------'
3050  Format(I3,5x,f10.5,4x,f8.2,4x,f8.2,4x,f8.2,8x,f8.2,5x,A25)
      do 210 cir=1,num_hdwt
210      write(11,3050) HDWT1_elem(cir), HDWT1_Flow(cir), HDWT2_BOD_con(
     &cir),HDWT2_ORG_con(cir),HDWT2_NH3_con(cir), HDWT2_NO3_con(cir),
     &hdwt1_name(cir)
      do 220 cir=1,nps_num_wstld
220   write(11,3050)nps_elem_wstld(cir),nps_WSTLD_Flow(cir), nps_WSTL
     &D2_BOD_con(cir),nps_WSTLD2_ORG_con(cir), nps_WSTLD2_NH3_con(cir),
     &nps_WSTLD2_NO3_con(cir),NPS_wstld_name(cir)
      do 222 cir=1,num_incr
222   write(11,3050)incr_reach(cir),incr_inFlow(cir), incr2_CBODu_con(ci
     &r),incr2_ORG_N_con(cir),incr2_Amm_N_con(cir),incr2_Nitrate_con(cir
     &),'Incremental Reach flow   '
      write(11,*)'  '
c      write(11,*)'------    --------    --------    --------    --------
c     &        --------     --------------------'
      write(11,*)'  '
      write(11,*)'Calculated values:'
      write(11,*)' '
      write(11,*)'                          CBODu     Organic N   Ammonia
     &N   NO2+NO3 N'
      write(11,*)'             Element     load        load        load
     &     load'
      write(11,*)'             number    (kg/day)    (kg/day)    (kg/day
     &)    (kg/day)'
      write(11,*)'             ------    --------    --------    --------
     &    --------'
3060  Format(13x,I3,5x,f10.2,2x,f10.2,1x,f10.2,2x,f10.2)
      cir=num_hdwt
      do 224 cirr=1,cir
224      write(11,3060) HDWT1_elem(cirr), HDWT_BOD_cal(cirr),
     &HDWT_ORG_cal(cirr),HDWT_NH3_cal(cirr), HDWT_NO3_
     &cal(cirr)
      cir=nps_num_wstld
      do 226 cirr=1,cir
226      write(11,3060)nps_elem_wstld(cirr),nps_WSTLD2_BOD_cal(cirr)
     &, nps_WSTLD2_ORG_cal(cirr), nps_WSTLD2_NH3_cal(cirr), nps_WSTLD2_N
     &O3_cal(cirr)
      do 228 cirr=1,num_incr
228      write(11,3060)incr_reach(cirr),incr_CBODu(cirr)
     &, incr_Org_N(cirr), incr_Amm_N(cirr),incr_NITrate(cirr)
      write(11,*)'             ------    --------    --------    --------
     &    --------'
3070  Format(A19,f12.2,2x,f10.2,1x,f10.2,2x,f10.2)
      write(11,3070)'Subsegment totals:',nps_BOD_tot,nps_Org_N_tot,nps_
     &NH3_N_tot,nps_NO3_tot
```

```
      write(11,*)' '


C***** SECTION:"CALCULATIONS FOR NONPOINT SOURCE MASS LOADS IN DATA TYPE 19:"

      Write(11,3030)
      write(11,*)' '
      write(11,*)'CALCULATIONS FOR NONPOINT SOURCE MASS LOADS IN DATA TY
     &PE 19:'
      write(11,*)' '
      write(11,*)'Values from LA-QUAL output:'
      write(11,*)' '
      write(11,*)'                                      CBODu       Orga
     &nic N'
      write(11,*)'                         Reach      mass load     mass
     & load'
      write(11,*)'                         number      (kg/day)      (kg
     &/day)'
      write(11,*)'                         ------      --------    -----
     &------'
      DO 230 numm=1,num
3080  Format(26X,I3,6x,F10.2,5x,F10.2)
230      Write(11,3080)NP_reach(numm),NP_BOD(numm), NP_Org(numm)
      write(11,*)'                         ------      --------    -----
     &------'
3090  format(A33,F12.2,3x,F12.2)
      write(11,3090)'Subsegment totals                ',MLDT19_tot_CBODu
     &,MLDT19_tot_org
      write(11,*)' '


C***** SECTION:"CALCULATIONS FOR LOADS FROM SOD AND BENTHIC AMMONIA:"

      ctr=1
      write(11,3030)
      write(11,*)'  '
      write(11,*)'CALCULATIONS FOR LOADS FROM SOD AND BENTHIC AMMONIA:'
      write(11,*)'  '
      write(11,*)'SOD temperature correction factor used in LA-QUAL mode
     &l: 1.065 (default)'
      write(11,*)' '
      write(11,*)'Equations used: SOD temp. corrected = (SOD at 20 C) *
     &1.065^(Water temp - 20 C)'
      write(11,*)'                SOD load = (SOD temp. corrected, g/m2/
     &day) * (Surface area, m2) * 1.0E-3 kg/g'
      write(11,*)'                Benthic NH3-N load = (Benthic ammonia
     &N, g/m2/day) * (Surface area, m2) * 1.0E-3 kg/g'
      write(11,*)' '
      write(11,*)' '
      write(11,*)'                            Values from LA-QUAL output
     &:                    Calculated values:'
      write(11,*)'                   ----------------------------------
     &---------    --------------------------------'
      write(11,*)'                    Water     Surface      SOD at
     &Benthic      SOD temp.     SOD       Benthic'
      write(11,*)'Reach    Element     temp.       area        20 C
     &ammonia N    corrected     load     NH3-N load'
      write(11,*)'number   number     (deg C)      (m2)     (g/m2/day)
     &(g/m2/day)  (g/m2/day)   (kg/day)    (kg/day)'
      write(11,*)'------   ------    --------    --------    --------
     &--------     --------    --------    ---------'
      DO 300 cir=1, total_elem
4000  format(I3,7x,I3,4x,f10.2,1x,f10,3x,f10.3,1x,f10.2,5x,f6.3,3x,f10.2
     &,6x,f6.2)
4001  if (cir.LT.elem_begin(ctr)) then

      ctr=ctr-1
      go to 4001
      end if

4002  if (cir.GT.elem_end(ctr)) then
      ctr=ctr+1
      go to 4002
      end if
```

```
4009  FORMAT(I3,2x,I3,2x,I3,2x,F6.2,2x,I3,2x,I3,2x,F8.4)
C      write(13,4009)cir,elem_begin(ctr),elem_end(ctr),elem_col(cir),ctr,
C     &np_reach(ctr),elem_sod(cir)

      write (11,4000)np_reach(ctr),cir,elem_temp(cir),
     &s_area_int(cir),elem_sod(cir), elem_benthis(cir),sod_temp_cor(cir)
     &,sod_load(cir),benthic(cir)

300   continue
      write(11,*)'
     &                         --------    ---------'
4010  format(A60,16x,F10.2,2x,f10.2)
      write(11,4010)'Subsegment totals:',nps_sod_load_tot,nps_benthic_to
     &t
      write(11,*)' '


C***** SECTION:"CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES EXPLICITLY MODELED:"

      write(11,3030)
      write(11,*)' '
      write(11,*)'CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES EX
     &PLICITLY MODELED:'
      write(11,*)' '
      if (ps_num_wstld.EQ.0) then
      WRITE(11,*)'For this subsegment, there are no point source dischar
     &ges explicitly modeled.'
      go to 335
      end if
      write(11,*)'Equation used: (Load, kg/day) = (Inflow rate, m3/sec)
     &* (Conc., mg/L) * 1.0E-6 kg/mg * 1.0E3 L/m3 *'
      write(11,*)'
     &                                86400 sec/day'
      write(11,*)'  '
      write(11,*)'Values from LA-QUAL output:'
      write(11,*)'  '
      write(11,*)'          Inflow      CBODu     Organic N   Ammonia N
     &   NO2+NO3 N'
      write(11,*)'Element     rate        conc.       conc.       conc.
     &     conc.'
      write(11,*)'number    (m3/sec)     (mg/L)      (mg/L)      (mg/L)
     &      (mg/L)     Name of discharge'
      write(11,*)'------    --------    --------    --------    --------
     &    --------    --------------------'
      DO 330 cir=1,ps_num_wstld
4020  Format(I3,5x,f10.5,5x,f7.3,5x,f7.3,5x,f7.3,5x,f7.3,6x,A20)
        write(11,4020)ps_elem_wstld(cir),ps_WSTLD_Flow(cir), ps_WSTL
     &D2_BOD_con(cir),ps_WSTLD2_ORG_con(cir), ps_WSTLD2_NH3_con(cir),
     &ps_WSTLD2_NO3_con(cir),PS_wstld_name(cir)
330   continue
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'Calculated values:'
      write(11,*)' '
      write(11,*)'  '
      write(11,*)'                        CBODu     Organic N   Ammonia N
     & NO2+NO3 N'
      write(11,*)'            Element     load        load        load
     &       load'
      write(11,*)'            number    (kg/day)    (kg/day)    (kg/day)
     &    (kg/day)'
      write(11,*)'            ------    --------    --------    --------
     &    --------'
      cir=ps_num_wstld
      if (ps_num_wstld .EQ.0) then
      write(11,*)'             NONE         0.00        0.00        0.00
     &        0.00'
      go to 342
      end if
      do 340 cirr=1,cir
4030  Format(13x,I3,4x,f10.2,4x,f8.2,4x,f8.2,4x,f8.2)
340      write(11,4030)ps_elem_wstld(cirr),ps_WSTLD2_BOD_cal(cirr)
```

```
     &, ps_WSTLD2_ORG_cal(cirr), ps_WSTLD2_NH3_cal(cirr), ps_WSTLD2_N
     &O3_cal(cirr)
342   write(11,*)'            ------    --------    --------    --------
     &    --------'
4040  Format(A16,4x,f10.2,2x,f10.2,2x,f10.2,2x, f10.2)
      write(11,4040)'Subsegment totals:',ps_BOD_tot,ps_Org_N_tot,ps_
     &NH3_N_tot,ps_NO3_tot
      write(11,*)'  '
      write(11,*)'  '


C*****SECTION:"CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES NOT EXPLICITLY MODELED:"

335   write(11,3030)
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'CALCULATIONS FOR LOADS FROM POINT SOURCE DISCHARGES NO
     &T EXPLICITLY MODELED:'
      write(11,*)'  '
      if (num_pt_sour.EQ.0) THEN
         WRITE(11,*)'For this subsegment, there are no point source disc
     &harges not explicitly modeled.'
         write(11,*)' '
         GO TO 431
         END IF
4045  format (A62,f6.3,A33)
      write(11,4045)'Equations used: Flow rate from TMDL calcs = Permit
     &flow rate * ',fac_mos_FG,' (to incorporate MOS and FG) '
      write(11,*)'                (Load, kg/day) = (Flow rate, MGD) * (C
     &onc., mg/L) * 3.785 L/gal * 1.0E6 gal/MG * 1.0E-6 kg/mg'
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'Assumptions: Ratio of CBODu to CBOD5 for point source
     & dissharges = 2.3 (guidance from LTP).'
      write(11,*)'             For permits with BOD or ammonia limits, N
     &O2+NO3 = 10 mg/L (drinking water criteria).'
      write(11,*)'             For permits with COD limits, assume that
     &CBODu is about the same magnitude as COD and'
      write(11,*)'                        that discharges of nitrogen (o
     &rganic, ammonia, and NO2+NO3) are negligible.'
      write(11,*)' '
      write(11,*)'  '
      write(11,*)'                         Permit    Factor to      Flow
     &'
      write(11,*)'NPDES                    flow    incorporate   rate fo
     &r'
      write(11,*)'permit      Outfall      rate     MOS and FG   TMDL ca
     &lcs             '
      write(11,*)'number      number       (MGD)     into flow       (MG)
     &D      Comments'
      write(11,*)'--------    --------    --------    --------    ------
     &--    ----------------------------------------'
      do 400 I= 1,num_pt_sour
         tmdl_cal_flow(I)=perm_flow(I)*fac_mos_FG
4050     Format(A10,4x,A3,5x,F10.3,3x,F6.3,4x,f10.3,5x,A40)
         write (11,4050)permit_number(I), outfall_num(I),perm_flow(I),fa
     &c_mos_FG,tmdl_cal_flow(I), comment(I)
400     continue
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'                          User specified permit limits
     &:'
      write(11,*)' NPDES                  -------------------------------
     &-'
      write(11,*)' permit      Outfall     CBOD5        COD       Ammoni
     &a'
      write(11,*)' number      number      (mg/L)      (mg/L)      (mg/L
     &)     Comments'
      write(11,*)'--------    --------    --------    --------    ------
     &--    ---------------------------------------'
      do 410 I= 1,num_pt_sour
4060     Format(A10,4x,A3,5x,F10.1,2x,F10.1,2x,F10.1,4x,A40)
410      write (11,4060)permit_number(I), outfall_num(I),CBOD5_perm(I),
```

```
     &COD_perm(I), ammon_perm(I),comment_con(I)
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'                                 Values for TMDL calcul
     &ations:'
      write(11,*)' NPDES                  -----------------------------
     &--------------'
      write(11,*)' permit      Outfall     CBODu     Organic N   Ammonia
     & N   NO2+NO3 N'
      write(11,*)'  number      number      (mg/L)      (mg/L)      (mg/
     &L)      (mg/L)     Comments'
      write(11,*)'--------    --------    --------    --------    ------
     &--    --------    ---------------------------'
      do 420 I= 1,num_pt_sour
         tmdl_cal_flow(I)=perm_flow(I)*fac_MOS_fg
4070     Format(A10,4x,A3,5x,F10.2,2x,F10.2,2x,F10.2,2x,F10.2)
420      write (11,4070)permit_number(I), outfall_num(I),CBODu_tmdl_val(
     &I),org_N_tmdl_val(I),ammon_tmdl_val(I), no3_tmdl_val(I)
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'                                       Calculated loads
     &:'
      write(11,*)' NPDES                  -----------------------------
     &--------------'
      write(11,*)' permit      Outfall     CBODu     Organic N   Ammonia
     &N   NO2+NO3 N'
      write(11,*)' number      number     (kg/day)    (kg/day)    (kg.da
     &y)   (kg.day)     Comments'
      write(11,*)'--------    --------    --------    --------    ------
     &--    --------    ---------------------------'
      DO 430 I= 1,num_pt_sour
4080     Format(A10,4x,A3,5x,F10.2,2x,F10.2,2x,F10.2,2x,F10.2)
         write(11,4080)permit_number(I), outfall_num(I),cbodu_tmdl_cal(I
     &), org_n_tmdl_cal(I),ammon_tmdl_cal(I),no3_tmdl_cal(I)
430   continue
      write(11,*)'                        --------    --------    ------
     &--    --------'
4090  format(A20,2x,f10.2,2x,f10.2,2x,f10.2,2x, f10.2)
      write(11,4090)'Subsegment total',cbodu_tmdl_tot,org_N_tmdl_tot,amm
     &on_tmdl_tot,no3_tmdl_tot


C*****SECTION:"SUMMARY OF NONPOINT SOURCE OXYGEN DEMAND FOR THIS SUBSEGEMENT:"

431   write(11,3030)
      write(11,*)' '
      write(11,*)'SUMMARY OF NONPOINT SOURCE OXYGEN DEMAND FOR THIS SUBS
     &EGEMENT:'
      write(11,*)' '
      write(11,*)' '
4093  format(A52,f6.4,A30)
      write(11,4093)'Equations used:  Organic N oxygen demand, kg/day =
     &',ammoxy_rat,' * Organic N load, kg/day of N'
4094  format(A52,F6.4,A30)
      write(11,4094)'                 Ammonia N oxygen demand, kg/day =
     &',ammoxy_rat,' * Ammonia N load, kg/day of N'
4095  format(A37,f4.1,A24)
      write(11,4095)'                 Margin of safety = ',nps_mos_per,'
     &% * nonpoint source load'
4097  format(A34,f4.1,A24)
      write(11,4097)'                 Future Growth = ',nps_FG_per,'% *
     &nonpoint source load'
4099  format(A36,f4.1,A24)
      write(11,4099)'                 Load Allocation = ',100-nps_mos_pe
     &r-ps_FG_per,'% * nonpoint source load'
      write(11,*)' '
      write(11,*)'Values from calculations above'
      write(11,*)' '
      write(11,*)'
     &    Nitrogen loads (kg/day of N):'
      write(11,*)'
     &---------------------------------'
```

```
      write(11,*)'                                    SOD       CBODu
     &Organic      Ammonia     NO2+NO3 N'
      write(11,*)'                                 (kg/day)    (kg/day)   (
     &kg/day)     (kg/day)     (kg/day)'
      write(11,*)'                                 --------    --------   -
     &-------     --------     ---------'
5000  format(A36,4x,f10.2,1x,f10.2,3x,f10.2,4x,f10.2)
      write(11,5000)'NPS inflows                        N/A ',nps_bod_tot,n
     &ps_org_N_tot,nps_nh3_n_tot,nps_NO3_tot
5010  format(A36,4x,f10.2,1x,f10.2,4x,A20)
      write(11,5010)'Mass LOads (data type 19)       N/A ',mldt19_tot_cb
     &odu,mldt19_tot_org,'N/A         N/A'
5020  format(A15,13x,f10.2,1x,A20,5x,f10.2,7x,A4)
      write(11,5020)'SOD and Benthic ammonia',nps_sod_load_tot,'N/A
     &   N/A',nps_benthic_tot,'N/A'
c      write(11,*)'                                 --------    --------   -
c     &-------     --------     ---------'
      write(11,*)'  '
      write(11,*)'Calculated loads of oxygen demand:'
      write(11,*)'
     & Oygen demand loads:     Total'
      write(11,*)'
     & -------------------     Oxygen'
      write(11,*)'                                    SOD       CBODu
     &Organic      Ammonia     demand'
      write(11,*)'                                 (kg/day)    (kg/day)   (
     &kg/day)     (kg/day)     (kg/day)'
      write(11,*)'                                 --------    --------   -
     &-------     --------     ---------'
c5000  format(A36,4x,f10.5,2x,f10.5,2x,f10.5,3x,f10.5)

      write(11,5000)'NPS inflows                        N/A ',nps_bod_tot,
     &oxy_dem_nps_org_N_tot,oxy_dem_nps_nh3_tot,nps_inflows_tot_oxy_dema
     &nd
5011  format(A36,4x,f10.2,1x,f10.2,8x,A3,6x,f10.2)
      write(11,5011)'Mass LOads (data type 19)       N/A ',mldt19_tot_cb
     &odu,oxy_dem_mldt19_tot_org,'N/A',mldt19_tot_oxy_dem
5021  format(A15,13x,f10.2,1x,A20,5x,f10.2,4x,f10.2)
      write(11,5021)'SOD and Benthic ammonia',nps_sod_load_tot,'N/A
     &   N/A',oxy_dem_nps_benthic_tot,tot_oxy_dem_sod_ben
      write(11,*)' '
5030  format(A23,5x,f10.2,2x,f10.2,1x,f10.2,3x,f10.2,4x,f10.2)
      write(11,5030)'Total for all NPS loads',nps_sod_load_tot,nps_summa
     &ry_cbodu,nps_summary_org,nps_summary_ammon, tot_oxy_dem_nps
      write(11,*)' '
5035  format(A22,f4.1,A2,f10.2,2x,f10.2,1x,f10.2,3x,f10.2,4x,f10.2)
      write(11,5035)'NPS future growth    (',nps_FG_per,'%)    ',nps_FG_
     &sod_load_tot,nps_FG_summary_cbodu,nps_FG_summary_org,nps_FG_s
     &ummary_ammon,nps_FG_tot_oxy_dem
5040  format(A22,f4.1,A2,f10.2,2x,f10.2,1x,f10.2,3x,f10.2,4x,f10.2)
      write(11,5040)'NPS margin of safety (',nps_mos_per,'%)    ',nps_mo
     &s_sod_load_tot,nps_mos_summary_cbodu,nps_mos_summary_org,nps_mos_s
     &ummary_ammon,nps_mos_tot_oxy_dem
5050  format(A22,f4.1,A2,f10.2,2x,f10.2,1x,f10.2,3x,f10.2,4x,f10.2)
      write(11,5050)'NPS load allocation  (',100-nps_MOS_PER-nps_FG_PER
     &,'%)    ',npS_LA_sod_load_tot,nps_LA _summary_cbodu,nps_LA_summary
     &_org,nps_La_summary_ammon,nps_LA_tot_oxy_dem
      write(11,*)' '
      write(11,*)'  '


C*****SECTION:"SUMMARY OF POINT SOURCE OXYGEN DEMAND FOR THIS SUBSEGEMENT"

      write(11,3030)
      write(11,*)' '
      Write(11,*)'SUMMARY OF POINT SOURCE OXYGEN DEMAND FOR THIS SUBSEGE
     &MENT'
      write(11,*)' '
      if (num_pt_sour+ps_num_wstld.EQ.0) THEN
         WRITE(11,*)'For this subsegment, there are no point source disc
     &harges either modeled or unmodeled in this subsegment.'
         write(11,*)' '
         GO TO 561
         end if
```

```
      write(11,*)'  '
      write(11,4093)' Equations used: Organic N oxygen demand, kg/day =
     & ',ammoxy_rat,' * Organic N load, kg/day of N'
      write(11,4093)'                 Ammonia N oxygen demand, kg/day =
     & ',ammoxy_rat,' * Ammonia N load, kg/day of N'
5052  format(A36,f4.1,A21)
      write(11,5052)'                 Margin of Safety = ',ps_mos_per,'%
     & * point source load'
5053  format(A33,F4.1,A24)
      write(11,5053)'                 Future Growth = ',nps_FG_per,'% *
     &nonpoint source load'
5054  format(A71,f4.1,A16)
      write(11,5054)'                 Wasteload Allocation (WLA) for mod
     &eled point source = ',100-ps_mos_per-ps_FG_per,'% * modeled load'
5056  format(A70,f4.1,A19)
      write(11,5056)'                 Wasteload Allocation (WLA) for min
     &or point sources = ',100-ps_mos_per-ps_FG_per,'% * calculated load
     &'
      write(11,*)' '
      write(11,*)'Values from calculations above'
      write(11,*)'
     & Nitrogen loads (kg/day of N):'
      write(11,*)'                                                     -
     &--------------------------------'
      write(11,*)'                                            CBODu    O
     &rganic N   Ammonia N    NO3+NO2'
      write(11,*)'                                           (kg/day)
     &(kg/day)    (kg/day)    (kg/day)'
      write(11,*)'                                           -------   -
     &--------    --------    --------'
      if (ps_num_wstld .EQ.0) then
      go to 470
      end if
      DO 450 cir=1,ps_num_wstld
5060  Format(A17,1x,A20,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,5060)'Modeled load for:' ,ps_wstld_name(cir),
     &ps_WSTLD2_Bod_cal(cir),ps_WSTLD2_ORG_cal(cir), ps_WSTLD2_N
     &h3_cal(cir),ps_WSTLd2_NO3_cal(cir)
450   continue
5080  format(A38,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
470   write(11,5080)'Calculated load for minor point sources   ',cbodu_t
     &mdl_tot,org_N_tmdl_tot,ammon_tmdl_tot,no3_tmdl_tot
      write(11,*)'  '
      write(11,*)'  '
      write(11,*)'Calculated loads of oxygen demand'
      write(11,*)' '
      write(11,*)'
     & Oygen demand loads:     Total'
      write(11,*)'
     & -------------------     Oxygen'
      write(11,*)'                                            CBODu    O
     &rganic N   Ammonia N     demand'
      write(11,*)'                                           (kg/day)
     &(kg/day)    (kg/day)    (kg/day)'
      write(11,*)'                                           -------   -
     &--------    --------    --------'
      if (ps_num_wstld .EQ.0) then
      go to 540
      end if
      DO 490 cir=1,ps_num_wstld
      write(11,5060)'Modeled load for:',ps_wstld_name(cir),
     &oxy_dem_ps_WSTLD2_Bod_cal(cir),oxy_dem_ps_WSTLD2_ORG_cal(cir),oxy_
     &dem_ps_WSTLD2_Nh3_cal(cir),mod_tot_oxy_dem_ps(cir)
490   continue
540   write(11,5080)'Calculated load for minor point sources   ',cbodu_t
     &mdl_tot,oxy_dem_org_N_tmdl, oxy_dem_ammon_tmdl,min_ps_summary_tot
      write(11,5080)'Total for all point source loads             ',ps_s
     &ummary_cbodu, ps_summary_org,ps_summary_nh3_n,tot_oxy_dem_summary
      write(11,*)' '
5090  Format(A31,f4.1,A3,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,5090)'MOS for all point Sources     (',ps_mos_per,'%)  ',
     &mos_ps_summary_cbodu, mos_ps_summary_org,mos_ps_summary_nh3_n,mos_
     &tot_oxy_dem_summary
5092  Format(A31,f4.1,A3,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
```

```
      write(11,5092)'FG for all point Sources      (',ps_FG_per,'%)  ',
     &FG_ps_summary_cbodu,FG_ps_summary_org,FG_ps_summary_nh3_n,FG_
     &tot_oxy_dem_summary

      if (ps_num_wstld .EQ.0) then
      go to 560
      end if
      DO 550 cir=1,ps_num_wstld
5095  Format(A8,1x,A21,A1,f4.1,A2,3x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,5095)'WLA for:',ps_wstld_name(cir),'(',100-ps_mos_per-ps_
     &FG_per,'%)',wla_ps_WSTLD2_BOD_cal(cir),wla_ps_WSTLD2_ORG_cal(cir),
     &wla_ps_WSTLd2_nH3_cal(cir),wla_mod_tot_oxy_dem_ps(cir)
550   continue
6000  format(A31,f4.1,A2,3x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
560   write(11,6000)'WLA for minor point sources   (',100-ps_mos_per-ps_
     &FG_per,'%)   ',wla_ps_cbodu_tmdl_tot,wla_ps_org_N_tmdl_tot, wla_ps
     &_ammon_tmdl_tot,wla_min_ps_summary_tot


      if (nut_tmdl_need .EQ. 'YES') then
         goto 561
      else
         go to 605
      end if


C*****SECTION:"NUTRIENT TMDL CALCULATIONS:"

561   write(11,3030)
      write(11,*)' '
      write(11,*)' '
      write(11,*)'NUTRIENT TMDL CALCULATIONS:'
      write(11,*)'  '
      if(nut_tmdl_need.EQ.'NO') then
      write(11,*)'No nutrient TMDL is needed for this subsegment'
      go to 605
      end if
      write(11,*)'Assumptions: Naturally occurring ratio of total N to t
     &otal P = ',nat_rat
      write(11,*)' '
      write(11,*)'Equations used: Total N = (Organic N) + (Ammonia N) +
     &(NO2+NO3 N)'
      write(11,*)'                Total P = (Total N) / (Naturally occur
     &ring ratio of total N to total P)'
6010  format(A39,f4.1,A24)
      write(11,6010)'              NPS margin of safety = ',nps_mos_per,
     &'% * nonpoint source load'
6015  format(A36,f4.1,A24)
      write(11,6015)'              NPS Future Growth = ',nps_FG_per,
     &'% * nonpoint source load'
6020  format(A38,f4.1,A24)
      write(11,6020)'                NPS load allocation = ',100-nps_mos
     &_per-nps_FG_per,'% * nonpoint source load'
6030  format(A57,f4.1,A27)
      write(11,6030)'                Margin of safety for all point sour
     &ces = ',ps_mos_per,'% * total point source load'
6035  format(A53,F4.1,A24)
      write(11,6035)'                Future Growth for all point soures
     &= ',nps_FG_per,'% * nonpoint source load'
6040  format(A70,f4.1,A16)
      write(11,6040)'                Wasteload allocation (WLA) for mode
     &led point source = ',100-ps_mos_per-ps_FG_per,'% * modeled load'
6050  format(A69,f4.1,A19)
      write(11,6050)'                Wasteload allocation (WLA) for mino
     &r point sources = ',100-ps_mos_per-ps_FG_per,'% * calculated load'
      write(11,*)'  '
      write(11,*)' '
      write(11,*)'Nonpoint sources:'
      write(11,*)'                                          Organic N
     &Ammonia N   NO2+NO3 N    Total N     Total P'
      write(11,*)'                                           (kg/day)
     & (kg/day)    (kg/day)    (kg/day)    (kg/day)'
      write(11,*)'                                           --------
     & --------    --------    --------    --------'
```

```
6060  format(A25,16x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,6060)'Total for all NPS loads                    ',nut_tm
     &dl_nps_org_N_tot,nps_nh3_n_tot,nps_NO3_tot,nps_tot_nitrogen_load,n
     &ps_total_P
      write(11,*)'  '
6070  format(A22,f4.1,A2,13x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,6070)'NPS margin of safety (',nps_mos_per,'%)    ',nps_mo
     &s_nut_tmdl_nps_Org_N_tot,nps_mos_nps_nh3_n_tot,nps_mos_nps_NO3_tot
     &,nps_mos_tot_nitrogen_load,nps_mos_total_p
6075  format(A22,f4.1,A2,13x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,6075)'NPS Future Growth    (',nps_mos_per,'%)    ',nps_FG
     &_nut_tmdl_nps_Org_N_tot,nps_FG_nps_nh3_n_tot,nps_FG_nps_NO3_tot
     &,nps_FG_tot_nitrogen_load,nps_FG_total_p
6080  format(A22,f4.1,A2,13x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,6080)'NPS load allocation  (',100-nps_mos_per-nps_FG_per,
     &'%)    ',nps_la_nut_tmdl_nps_Org_N_tot,nps_la_nps_nh3_n_tot,nps_la
     &_nps_NO3_tot,nps_la_tot_nitrogen_load,nps_la_total_p
      write(11,*)' '
      write(11,*)'  '
      write(11,*)'Point sources:'
      write(11,*)' '
      write(11,*)'                                            Organic N
     &Ammonia N   NO2+NO3 N    Total N     Total P'
      write(11,*)'                                             (kg/day)
     & (kg/day)    (kg/day)    (kg/day)    (kg/day)'
      write(11,*)'                                             --------
     & --------    --------    --------    --------'
      if (ps_num_wstld .EQ.0) then
      go to 590
      end if
      DO 585 cir=1,ps_num_wstld
6085  Format(A17,1x,A14,8x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
        write(11,6085)'Modeled load for:',ps_wstld_name(cir),
     &ps_WSTLD2_ORG_cal(cir),ps_WSTLD2_Nh3_cal(cir),ps_WSTLd2_NO3_cal(c
     &ir),ps_total_nitrogen_load(cir),ps_total_P(cir)

585   continue
c5080  format(A38,2x,f10.5,2x,f10.5,2x,f10.5,2x,f10.5)
6090  format(A38,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
590   write(11,6090)'Calculated load for minor point sources   ',org_N_t
     &mdl_tot,ammon_tmdl_tot,no3_tmdl_tot,min_ps_total_nitrogen_load,min
     &_ps_total_P
      write(11,*)'                                             --------
     & --------    --------    --------    --------'
      write(11,6090)'Total for all point source loads             ',ps_n
     &ut_tmdl_summary_org_N_tot,ps_nut_tmdl_summary_nh3_N_tot,ps_nut_tmd
     &l_summary_no3_N_tot,ps_tot_nitrogen_final_load,ps_tot_P_final
      write(11,*)' '
7000  Format(A31,f4.1,A2,3x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,7000)'MOS for all point Sources     (',ps_mos_per,'%)',
     &mos_ps_nut_tmdl_sum_org_N_tot,mos_ps_nut_tmdl_sum_nh3_N_tot,
     &mos_ps_nut_tmdl_sum_no3_N_tot,mos_ps_tot_nitrogen_final_load,
     &mos_ps_tot_P_final
7005  Format(A31,f4.1,A2,3x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)
      write(11,7005)'FG for all point Sources      (',ps_mos_p
     &er,'%)',FG_ps_nut_tmdl_sum_org_N_tot,FG_ps_nut_tmdl_sum_nh3_N_to
     &t,FG_ps_nut_tmdl_sum_no3_N_tot,FG_ps_tot_nitrogen_final_load,
     &FG_ps_tot_P_final
      if (ps_num_wstld .EQ.0) then
      go to 610
      end if
      DO 600 cir=1,ps_num_wstld
7010  Format(A9,1x,A20,A1,f4.1,A2,3x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2
     &x,f10.2)
600   write(11,7010)'WLA for: ',ps_wstld_name(cir),'(',100-ps_mos_per-ps
     &_FG_per,'%)',wla_ps_WSTLD2_ORG_cal_sum(cir),wla_ps_WSTLd2_nH3_cal_
     &sum(cir),wla_ps_wstLD2_NO3_cal_sum(cir),wla_ps_total_nitrogen_load
     &(cir),wla_ps_total_P(cir)
610   continue
7020  format(A31,f4.1,A2,3x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2,2x,f10.2)

      write(11,7020)'WLA for minor point sources   (',100-ps_mos_per-ps_
     &FG_per,'%)   ',wla_min_ps_nut_tmdl_sum_org,wla_min_ps_nut_tmdl_sum
     &_nh3,wla_min_ps_nut_tmdl_sum_no3,wla_min_ps_nitrogen_final_load
```

```
     &,wla_min_ps_P_final
605   Print*,'Program has made the output file!!!'
606   STOP
      END
```

APPENDIX M

Ammonia Toxicity Calculations

AMMONIA TOXICITY CALCULATIONS FOR BOGGY BAYOU (SUBSEGMENT 100602)

Equations from 1999 Update of Ambient Water Quality Criteria for Ammonia, EPA-822-R-99-014, Dec. 1999.

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^{o}C)

CCC, in mg N/L = [0.0577/(1+10$^{7.688\text{-pH}}$) + 2.487/(1+10$^{\text{pH-}7.688}$)] * MIN [2.85, 1.45*10$^{0.028*(25\text{-T})}$]

Note: CCC is the Chronic Criterion Concentration

CCC calculations below use seasonal average pH from LDEQ ambient monitoring data at station 1207 (Boggy Bayou southwest of Shreveport):

Summer (May-Oct)	
Date	pH (su)
05/07/02	7.16
06/04/02	7.35
07/09/02	7.07
08/06/02	6.98
09/10/02	6.97
05/05/04	6.86
06/29/04	6.71
07/27/04	7.23
08/24/04	6.93
09/14/04	7.39
05/10/05	7.04
05/24/05	7.02
06/07/05	7.16
06/21/05	7.31
07/05/05	6.50
07/19/05	6.97
08/09/05	7.32
08/23/05	7.11
09/27/05	6.04
Average =	7.01

Winter (Nov-Apr)	
Date	pH (su)
01/07/02	7.33
02/05/02	7.00
03/05/02	7.23
04/02/02	6.66
11/06/02	6.66
12/03/02	6.66
01/13/04	6.81
02/03/04	6.81
03/09/04	6.46
04/07/04	6.87
11/16/04	7.16
03/22/05	7.11
04/12/05	5.78
04/26/05	7.03
Average =	6.83

Model Element	Summer				Winter			
	Temp. in projection run (ºC)	Calculated CCC (mg N/L)	Predicted NH3-N conc. in projection (mg N/L)	Toxic ?	Temp. in projection run (ºC)	Calculated CCC (mg N/L)	Predicted NH3-N conc. in projection (mg N/L)	Toxic ?
1	32.0	1.91	0.03	No	22.9	3.64	0.05	No
2	32.0	1.91	0.04	No	22.9	3.64	0.05	No
3	32.0	1.91	0.04	No	22.9	3.64	0.05	No
4	32.0	1.91	0.04	No	22.9	3.64	0.05	No
5	32.0	1.91	0.04	No	22.9	3.64	0.06	No
6	32.0	1.91	0.05	No	22.9	3.64	0.06	No
7	32.0	1.91	0.05	No	22.9	3.64	0.06	No
8	32.0	1.91	0.05	No	22.9	3.64	0.06	No
9	32.0	1.91	0.05	No	22.9	3.64	0.06	No
10	32.0	1.91	0.05	No	22.9	3.64	0.06	No
11	32.0	1.91	0.05	No	22.9	3.64	0.06	No
12	32.0	1.91	0.05	No	22.9	3.64	0.06	No

Model Element	Summer				Winter			
	Temp. in projection run (ºC)	Calculated CCC (mg N/L)	Predicted NH3-N conc. in projection (mg N/L)	Toxic ?	Temp. in projection run (ºC)	Calculated CCC (mg N/L)	Predicted NH3-N conc. in projection (mg N/L)	Toxic ?
13	32.0	1.91	0.05	No	22.9	3.64	0.07	No
14	32.0	1.91	0.05	No	22.9	3.64	0.07	No
15	32.0	1.91	0.05	No	22.9	3.64	0.07	No
16	32.0	1.91	0.05	No	22.9	3.64	0.07	No
17	32.0	1.91	0.05	No	22.9	3.64	0.07	No
18	32.0	1.91	0.05	No	22.9	3.64	0.07	No
19	32.0	1.91	0.05	No	22.9	3.64	0.07	No
20	32.0	1.91	0.05	No	22.9	3.64	0.07	No
21	32.0	1.91	0.05	No	22.9	3.64	0.07	No
22	32.0	1.91	0.05	No	22.9	3.64	0.07	No
23	32.0	1.91	0.05	No	22.9	3.64	0.08	No
24	32.0	1.91	0.05	No	22.9	3.64	0.08	No
25	32.0	1.91	0.05	No	22.9	3.64	0.08	No
26	32.0	1.91	0.05	No	22.9	3.64	0.08	No
27	32.0	1.91	0.05	No	22.9	3.64	0.08	No
28	32.0	1.91	0.05	No	22.9	3.64	0.08	No
29	32.0	1.91	0.05	No	22.9	3.64	0.08	No
30	32.0	1.91	0.05	No	22.9	3.64	0.08	No
31	32.0	1.91	0.05	No	22.9	3.64	0.08	No
32	32.0	1.91	0.05	No	22.9	3.64	0.08	No
33	32.0	1.91	0.05	No	22.9	3.64	0.08	No
34	32.0	1.91	0.05	No	22.9	3.64	0.09	No
35	32.0	1.91	0.05	No	22.9	3.64	0.09	No
36	32.0	1.91	0.05	No	22.9	3.64	0.09	No
37	32.0	1.91	0.05	No	22.9	3.64	0.09	No
38	32.0	1.91	0.05	No	22.9	3.64	0.09	No
39	32.0	1.91	0.05	No	22.9	3.64	0.09	No
40	32.0	1.91	0.05	No	22.9	3.64	0.09	No
41	32.0	1.91	0.05	No	22.9	3.64	0.09	No
42	32.0	1.91	0.05	No	22.9	3.64	0.09	No
43	32.0	1.91	0.05	No	22.9	3.64	0.09	No
44	32.0	1.91	0.05	No	22.9	3.64	0.09	No
45	32.0	1.91	0.05	No	22.9	3.64	0.09	No
46	32.0	1.91	0.05	No	22.9	3.64	0.10	No
47	32.0	1.91	0.05	No	22.9	3.64	0.10	No
48	32.0	1.91	0.05	No	22.9	3.64	0.10	No
49	32.0	1.91	0.04	No	22.9	3.64	0.07	No
50	32.0	1.91	0.04	No	22.9	3.64	0.07	No
51	32.0	1.91	0.04	No	22.9	3.64	0.07	No
52	32.0	1.91	0.04	No	22.9	3.64	0.08	No
53	32.0	1.91	0.04	No	22.9	3.64	0.08	No
54	32.0	1.91	0.05	No	22.9	3.64	0.08	No
55	32.0	1.91	0.05	No	22.9	3.64	0.08	No
56	32.0	1.91	0.05	No	22.9	3.64	0.08	No
57	32.0	1.91	0.05	No	22.9	3.64	0.08	No
58	32.0	1.91	0.05	No	22.9	3.64	0.08	No
59	32.0	1.91	0.05	No	22.9	3.64	0.08	No
60	32.0	1.91	0.05	No	22.9	3.64	0.08	No
61	32.0	1.91	0.05	No	22.9	3.64	0.08	No
62	32.0	1.91	0.05	No	22.9	3.64	0.08	No
63	32.0	1.91	0.05	No	22.9	3.64	0.08	No

Model Element	Summer: Temp. in projection run (ºC)	Summer: Calculated CCC (mg N/L)	Summer: Predicted NH3-N conc. in projection (mg N/L)	Summer: Toxic ?	Winter: Temp. in projection run (ºC)	Winter: Calculated CCC (mg N/L)	Winter: Predicted NH3-N conc. in projection (mg N/L)	Winter: Toxic ?
64	32.0	1.91	0.05	No	22.9	3.64	0.08	No
65	32.0	1.91	0.05	No	22.9	3.64	0.08	No
66	32.0	1.91	0.05	No	22.9	3.64	0.08	No
67	32.0	1.91	0.05	No	22.9	3.64	0.08	No
68	32.0	1.91	0.05	No	22.9	3.64	0.08	No
69	32.0	1.91	0.05	No	22.9	3.64	0.08	No
70	32.0	1.91	0.05	No	22.9	3.64	0.08	No
71	32.0	1.91	0.05	No	22.9	3.64	0.08	No
72	32.0	1.91	0.05	No	22.9	3.64	0.08	No
73	32.0	1.91	0.05	No	22.9	3.64	0.08	No
74	32.0	1.91	0.05	No	22.9	3.64	0.09	No
75	32.0	1.91	0.05	No	22.9	3.64	0.09	No
76	32.0	1.91	0.05	No	22.9	3.64	0.09	No
77	32.0	1.91	0.05	No	22.9	3.64	0.09	No
78	32.0	1.91	0.05	No	22.9	3.64	0.09	No
79	32.0	1.91	0.05	No	22.9	3.64	0.09	No
80	32.0	1.91	0.05	No	22.9	3.64	0.09	No
81	32.0	1.91	0.05	No	22.9	3.64	0.09	No
82	32.0	1.91	0.05	No	22.9	3.64	0.09	No
83	32.0	1.91	0.05	No	22.9	3.64	0.09	No
84	32.0	1.91	0.05	No	22.9	3.64	0.09	No
85	32.0	1.91	0.05	No	22.9	3.64	0.09	No
86	32.0	1.91	0.05	No	22.9	3.64	0.09	No
87	32.0	1.91	0.05	No	22.9	3.64	0.09	No
88	32.0	1.91	0.05	No	22.9	3.64	0.09	No
89	32.0	1.91	0.05	No	22.9	3.64	0.09	No
90	32.0	1.91	0.05	No	22.9	3.64	0.09	No
91	32.0	1.91	0.05	No	22.9	3.64	0.09	No
92	32.0	1.91	0.05	No	22.9	3.64	0.09	No
93	32.0	1.91	0.05	No	22.9	3.64	0.09	No
94	32.0	1.91	0.05	No	22.9	3.64	0.09	No
95	32.0	1.91	0.05	No	22.9	3.64	0.09	No
96	32.0	1.91	0.05	No	22.9	3.64	0.09	No
97	32.0	1.91	0.05	No	22.9	3.64	0.09	No
98	32.0	1.91	0.05	No	22.9	3.64	0.09	No
99	32.0	1.91	0.05	No	22.9	3.64	0.10	No
100	32.0	1.91	0.05	No	22.9	3.64	0.10	No
101	32.0	1.91	0.05	No	22.9	3.64	0.10	No
102	32.0	1.91	0.05	No	22.9	3.64	0.10	No
103	32.0	1.91	0.05	No	22.9	3.64	0.10	No
104	32.0	1.91	0.05	No	22.9	3.64	0.10	No
105	32.0	1.91	0.05	No	22.9	3.64	0.10	No
106	32.0	1.91	0.05	No	22.9	3.64	0.10	No
107	32.0	1.91	0.05	No	22.9	3.64	0.10	No
108	32.0	1.91	0.05	No	22.9	3.64	0.10	No
109	32.0	1.91	0.05	No	22.9	3.64	0.10	No
110	32.0	1.91	0.05	No	22.9	3.64	0.10	No
111	32.0	1.91	0.05	No	22.9	3.64	0.10	No
112	32.0	1.91	0.05	No	22.9	3.64	0.10	No
113	32.0	1.91	0.05	No	22.9	3.64	0.10	No
114	32.0	1.91	0.05	No	22.9	3.64	0.10	No

Model Element	Summer				Winter			
	Temp. in projection run (ºC)	Calculated CCC (mg N/L)	Predicted NH3-N conc. in projection (mg N/L)	Toxic ?	Temp. in projection run (ºC)	Calculated CCC (mg N/L)	Predicted NH3-N conc. in projection (mg N/L)	Toxic ?
115	32.0	1.91	0.05	No	22.9	3.64	0.10	No
116	32.0	1.91	0.05	No	22.9	3.64	0.10	No
117	32.0	1.91	0.05	No	22.9	3.64	0.10	No
118	32.0	1.91	0.05	No	22.9	3.64	0.10	No
119	32.0	1.91	0.05	No	22.9	3.64	0.10	No
120	32.0	1.91	0.05	No	22.9	3.64	0.10	No
121	32.0	1.91	0.05	No	22.9	3.64	0.10	No
122	32.0	1.91	0.05	No	22.9	3.64	0.10	No
123	32.0	1.91	0.05	No	22.9	3.64	0.10	No
124	32.0	1.91	0.05	No	22.9	3.64	0.10	No
125	32.0	1.91	0.05	No	22.9	3.64	0.10	No
126	32.0	1.91	0.49	No	22.9	3.64	0.15	No
127	32.0	1.91	0.47	No	22.9	3.64	0.15	No
128	32.0	1.91	0.45	No	22.9	3.64	0.15	No
129	32.0	1.91	0.43	No	22.9	3.64	0.15	No
130	32.0	1.91	0.42	No	22.9	3.64	0.15	No
131	32.0	1.91	0.40	No	22.9	3.64	0.15	No
132	32.0	1.91	0.39	No	22.9	3.64	0.15	No
133	32.0	1.91	0.37	No	22.9	3.64	0.15	No
134	32.0	1.91	0.36	No	22.9	3.64	0.15	No
135	32.0	1.91	0.35	No	22.9	3.64	0.15	No
136	32.0	1.91	0.34	No	22.9	3.64	0.15	No
137	32.0	1.91	0.33	No	22.9	3.64	0.15	No
138	32.0	1.91	0.31	No	22.9	3.64	0.15	No
139	32.0	1.91	0.30	No	22.9	3.64	0.15	No
140	32.0	1.91	0.29	No	22.9	3.64	0.15	No
141	32.0	1.91	0.28	No	22.9	3.64	0.15	No
142	32.0	1.91	0.28	No	22.9	3.64	0.15	No
143	32.0	1.91	0.27	No	22.9	3.64	0.15	No
144	32.0	1.91	0.26	No	22.9	3.64	0.15	No
145	32.0	1.91	0.25	No	22.9	3.64	0.15	No
146	32.0	1.91	0.24	No	22.9	3.64	0.15	No
147	32.0	1.91	0.24	No	22.9	3.64	0.15	No
148	32.0	1.91	0.23	No	22.9	3.64	0.15	No
149	32.0	1.91	0.22	No	22.9	3.64	0.15	No
150	32.0	1.91	0.22	No	22.9	3.64	0.15	No
151	32.0	1.91	0.21	No	22.9	3.64	0.15	No
152	32.0	1.91	0.20	No	22.9	3.64	0.15	No
153	32.0	1.91	0.20	No	22.9	3.64	0.15	No
154	32.0	1.91	0.19	No	22.9	3.64	0.15	No
155	32.0	1.91	0.19	No	22.9	3.64	0.15	No
156	32.0	1.91	0.18	No	22.9	3.64	0.15	No
157	32.0	1.91	0.18	No	22.9	3.64	0.15	No
158	32.0	1.91	0.43	No	22.9	3.64	0.19	No
159	32.0	1.91	0.42	No	22.9	3.64	0.19	No
160	32.0	1.91	0.40	No	22.9	3.64	0.19	No
161	32.0	1.91	0.39	No	22.9	3.64	0.19	No
162	32.0	1.91	0.37	No	22.9	3.64	0.19	No
163	32.0	1.91	0.36	No	22.9	3.64	0.19	No
164	32.0	1.91	0.35	No	22.9	3.64	0.19	No
165	32.0	1.91	0.34	No	22.9	3.64	0.19	No

Model Element	Summer: Temp. in projection run (ºC)	Summer: Calculated CCC (mg N/L)	Summer: Predicted NH3-N conc. in projection (mg N/L)	Summer: Toxic ?	Winter: Temp. in projection run (ºC)	Winter: Calculated CCC (mg N/L)	Winter: Predicted NH3-N conc. in projection (mg N/L)	Winter: Toxic ?
166	32.0	1.91	0.33	No	22.9	3.64	0.19	No
167	32.0	1.91	0.32	No	22.9	3.64	0.19	No
168	32.0	1.91	0.31	No	22.9	3.64	0.19	No
169	32.0	1.91	0.30	No	22.9	3.64	0.19	No
170	32.0	1.91	0.29	No	22.9	3.64	0.19	No
171	32.0	1.91	0.28	No	22.9	3.64	0.19	No
172	32.0	1.91	0.27	No	22.9	3.64	0.19	No
173	32.0	1.91	0.26	No	22.9	3.64	0.19	No
174	32.0	1.91	0.25	No	22.9	3.64	0.19	No
175	32.0	1.91	0.25	No	22.9	3.64	0.19	No
176	32.0	1.91	0.24	No	22.9	3.64	0.19	No
177	32.0	1.91	0.23	No	22.9	3.64	0.19	No
178	32.0	1.91	0.23	No	22.9	3.64	0.19	No
179	32.0	1.91	0.22	No	22.9	3.64	0.19	No
180	32.0	1.91	0.21	No	22.9	3.64	0.19	No
181	32.0	1.91	0.21	No	22.9	3.64	0.19	No
182	32.0	1.91	0.20	No	22.9	3.64	0.19	No
183	32.0	1.91	0.20	No	22.9	3.64	0.19	No
184	32.0	1.91	0.19	No	22.9	3.64	0.19	No
185	32.0	1.91	0.19	No	22.9	3.64	0.18	No
186	32.0	1.91	0.18	No	22.9	3.64	0.18	No
187	32.0	1.91	0.18	No	22.9	3.64	0.18	No
188	32.0	1.91	0.18	No	22.9	3.64	0.18	No
189	32.0	1.91	0.17	No	22.9	3.64	0.18	No
190	32.0	1.91	0.17	No	22.9	3.64	0.18	No
191	32.0	1.91	0.16	No	22.9	3.64	0.18	No
192	32.0	1.91	0.16	No	22.9	3.64	0.18	No
193	32.0	1.91	0.16	No	22.9	3.64	0.18	No
194	32.0	1.91	0.15	No	22.9	3.64	0.18	No
195	32.0	1.91	0.15	No	22.9	3.64	0.18	No
196	32.0	1.91	0.15	No	22.9	3.64	0.18	No
197	32.0	1.91	0.15	No	22.9	3.64	0.18	No
198	32.0	1.91	0.14	No	22.9	3.64	0.18	No
199	32.0	1.91	0.14	No	22.9	3.64	0.18	No
200	32.0	1.91	0.14	No	22.9	3.64	0.18	No
201	32.0	1.91	0.14	No	22.9	3.64	0.18	No
202	32.0	1.91	0.13	No	22.9	3.64	0.18	No
203	32.0	1.91	0.11	No	22.9	3.64	0.15	No
204	32.0	1.91	0.11	No	22.9	3.64	0.15	No
205	32.0	1.91	0.11	No	22.9	3.64	0.15	No
206	32.0	1.91	0.12	No	22.9	3.64	0.15	No
207	32.0	1.91	0.12	No	22.9	3.64	0.15	No
208	32.0	1.91	0.12	No	22.9	3.64	0.15	No
209	32.0	1.91	0.12	No	22.9	3.64	0.15	No

Number of elements with toxicity = 0 Number of elements with toxicity = 0

FILE: R:\PROJECTS\2110-616\TECH\LA-QUAL\BOGGY\NH3_TOXICITY_BOGGY.XLS

APPENDIX N

Nutrient TMDL Calculations

NUTRIENT TMDL CALCULATIONS FOR BOGGY BAYOU (SUBSEGMENT 100602)

Total allowable loads (TMDL):

Drainage area at downstream end of subsegment = 79.4 square miles
Average annual runoff for this area (USGS 1986) = 0.9 cfs per square mile

Average annual flow at d/s end of subsegment = 71.46 cfs
= 46.19 MGD

Ecoregion reference stream data:

Waterbody	Total P (mg/L)	NO2+NO3 (mg/L)	TKN (mg/L)	Total N (mg/L)
Saline Bayou near Saline in Beinville Parish	0.04	0.08	0.53	0.61
Kisatchie Bayou in the Red Dirt Management Campground in Natchitoches Parish	0.03	0.68	0.04	0.72
Kisatchie Bayou in the Red Dirt Management Campground in Natchitoches Parish	0.085	<0.02	0.705	0.725
Kisatchie Bayou in the Red Dirt Management Campground in Natchitoches Parish	0.075	<0.02	0.695	0.715
Averages =	0.058			0.692

TMDL for total phosphorus = 46.19 MGD × 0.058 mg/L × 8.345 = 22.36 lbs/day
TMDL for total nitrogen = 46.19 MGD × 0.692 mg/L × 8.345 = 266.74 lbs/day

Margin of safety (MOS) and future growth (FG):

	Total P (lbs/day)	Total N (lbs/day)	
Margin of safety =	0	0	(MOS is implicit)
Future growth = 10% of TMDL =	2.24	26.67	

Wasteload allocation (WLA):

Point source discharge	Flow (gal/day)	Total P mg/L)	Total N mg/L)	Total P (lbs/day)	Total N (lbs/day)
LAG480011 LA Lift and Equip. Inc. FKA L	1,800	6	16	0.09	0.24
LAG480284 Jack Cooper Transport Co In	2,600	6	16	0.13	0.35
LAG530693 KEH Property Ltd., Fud's III E	675	6	16	0.03	0.09
LAG541012 Grawood Baptist Church	6,000	6	16	0.30	0.80
LAG560089 Wildwood Estates	33,000	6	16	1.65	4.41
LAG570220 Eagle Water Inc - LaLaurie L	60,000	6	16	3.00	8.01
LAG750459 Norwell Equip. Co. Shrevepo	5,000	6	16	0.25	0.67
LAG750449 Deep South Equip. Co. Shrev	5,000	6	16	0.25	0.67
Total loads:				5.70	15.24

Load allocation (LA):

LA for total P = TMDL – MOS – FG – WLA = 22.36 – 0.00 – 2.24 – 5.70 = 14.42 lbs/day
LA for total N = TMDL – MOS – FG – WLA = 266.74 – 0.00 – 26.67 – 15.24 = 224.83 lbs/day

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