

PART III: SURFACE WATER ASSESSMENT

Chapter 1: Surface Water Monitoring Program

The surface water monitoring program of the OEA of LDEQ is designed to measure progress towards achieving water quality goals at the state and national levels, to gather baseline data used in establishing and reviewing the state water quality standards, and to provide a data base for use in determining the assimilative capacity of the waters of the state. Information is also used to establish permit limits for wastewater discharges.

The surface water monitoring program consists of a fixed station long-term network, intensive surveys, special studies, and wastewater discharge compliance sampling. Each of these components of the state monitoring program is addressed below.

Fixed Station Long-Term Surface Water Quality Network and Comprehensive Monitoring Strategy

Louisiana's Department of Environmental Quality and its predecessor agencies have maintained a surface water quality monitoring program since the 1950's. This program has consisted of collecting water samples from designated points on waters across the state on a monthly or bimonthly basis. These samples are analyzed for 29 different conventional parameters and for fecal coliform. In addition to the conventional parameters, volatile organic compounds (VOCs) are sampled at some sites. A priority pollutant scan is run quarterly on samples from Mississippi River sites. All parameters monitored for water quality purposes are listed in Table 3.1.1. The purposes of this program are to provide baseline or background data on a water body and to monitor long-term trends in water quality. Over the years, monitoring stations have been discontinued or added as needs or conditions changed.

The U.S. EPA has recommended that states take a watershed approach with their water quality programs. In light of these issues, the LDEQ has focused its water quality monitoring efforts on water bodies where there is a lack of water quality data within target watersheds or basins.

LDEQ revised its monitoring program in May of 1998 to operate on a five-year cycle with monthly sample collections occurring in two or three basins each year and rotating from year to year (calendar year). In this manner, the entire state had been covered at the end of 2002. Although the five-year cycle completed the goal of collecting water quality data from every subsegment in the state, it did not correspond with the even year §305(b) reporting cycle and placed a disproportionate amount of responsibility on the regional field staff during the one-year surveys. Additionally, LDEQ prefers to use two cycles of monitoring data for a more accurate assessment. When two cycles of data are used, the five-year rotating cycle causes large time gaps in the datasets used for some water bodies in each assessment cycle. In an effort to equalize the number of basins assessed every two years, balance the field staff work load, and minimize data gaps, LDEQ implemented a four-year rotating sampling plan in January, 2004. The new plan will be evident in the 2006 Integrated Report, although the assessment information contained in this 2004 report is based on the five-year sampling regime. Water quality monitoring at selected long-term trend sites on larger rivers, bayous, and Lake Pontchartrain will be continued statewide. The former five-year and current four-year monitoring schedules are represented in Tables 3.1.2 and 3.1.3.

Samples collected from the stations are analyzed in the LDEQ laboratory (conventionals and organics), Louisiana Department of Health and Hospitals laboratory (fecal coliform), or a contract lab (fecal coliform and metals) using procedures outlined in the state and U.S. EPA approved Quality Assurance Project Plan (LDEQ, 2003). A listing of ambient water quality monitoring stations is provided in Appendix F.

Table 3.1.1

Parameters monitored under Louisiana's ambient water quality monitoring network. Not all parameters are monitored at all sites. As of March 2004.

Conventional analysis

alkalinity	hardness
ammonia nitrogen	total Kjeldahl nitrogen
arsenic*	cadmium*
battery	gage height
chromium*	copper*
fecal coliform bacteria	zinc*
dissolved oxygen	salinity
dissolved oxygen – percent saturation	oil sheen
mercury*	lead*
nickel*	nitrate and nitrite nitrogen
pH	temperature
Secchi disk	sodium
specific conductance	true color
sulfates	chlorides
total dissolved solids	total suspended solids
total phosphorous	total organic carbon
turbidity	field conductivity

*Metals sampling and analysis is done quarterly

Volatile organic analysis

1,1,1-Trichloroethane	1,2-Dichlorobenzene
1,1,2,2-Tetrachloroethane	trans-1,2-Dichloroethene
1,1-Dichloroethane	1,1,2-Trichloroethane
1,2 Dichloropropane	Bromochloromethane
1,2-Dichloroethane (EDC)	Bromoform
1,2-Dichloropropane	1,4-Dichlorobenzene
1,3-Dichlorobenzene	cis-1,3-Dichloropropene
1-chloro-2-Bromopropane	Toluene
Benzene	Chloroethane
Bromodichloromethane	Carbon Tetrachloride
Chloroform	Chlorobenzene
Chloromethane	Trichlorofluoromethane
Dibromochloromethane	Bromomethane
Ethylbenzene	Methylene Chloride
Methyl Tertiary Butyl Ether (MTBE)	Fluorobenzene
Tetrachloroethene	1,1-Dichloroethene
trans-1,3-Dichloropropene	Trichloroethene
Vinyl Chloride	1,1,1-Trifluorotoluene

Table 3.1.2

Five-year sampling schedule for Louisiana’s ambient water quality monitoring network implemented May 1998 and discontinued January 2004.

Basin	First Rotation	Second Rotation
Mermentau River	1998	2003
Vermilion-Teche	1998	2003
Calcasieu River	1999	N/A
Ouachita River	1999	N/A
Barataria	2000	N/A
Terrebonne	2000	N/A
Mississippi River	2001	N/A
Lake Pontchartrain	2001	N/A
Pearl River	2001	N/A
Red River	2002	N/A
Sabine River	2002	N/A
Atchafalaya River	2002	N/A

Table 3.1.3

First four-year sampling schedule for Louisiana’s ambient water quality monitoring network implemented January 2004.

Watershed Basins	Year Completed	Number of Subsegments
Calcasieu, Ouachita, Terrebonne, Barataria, Mississippi, Atchafalaya	2005	216
Pontchartrain, Pearl, Red, Sabine, Mermentau, Vermillion-Teche	2007	257
Calcasieu, Ouachita, Terrebonne, Barataria, Mississippi, Atchafalaya	2009	216
Pontchartrain, Pearl, Red, Sabine, Mermentau, Vermillion-Teche	2011	257

Water Quality Data Storage

Following water quality sample collection and laboratory analysis, the resulting data is recorded in an Access database by personnel with the Environmental Planning Division, Planning and Assessment Section. Personnel with the regional offices, Surveillance Section, conduct all ambient sample collection. Data from the LDEQ laboratory is currently transferred electronically to an Access database developed by the Office of Environmental Assessment. The current Access database will soon be converted into an Oracle system with Access front-end and query features. Fecal coliform data is currently hand entered into the Access database, but it is hoped this can be converted to electronic data transfer in the near future. Data is retrieved using Access queries; SAS, Access, or Excel programs are used for data analysis. All data is checked and verified twice during entry to assure accuracy.

Toxic Substances Monitoring Program

Environmental Surveillance Division (ESD) activities include collection of environmental samples for analyses of toxic substances. Samples analyzed to date encompass various environmental matrices including ambient water, industrial and municipal effluents, fish, shellfish, and sediments. Due to limited state funding, emphasis is placed on areas of known contamination and the basins in the current rotation. Other areas with potential toxic substance concerns are also included as part of special studies.

LDEQ also maintains an ambient water monitoring network of three sites on the Mississippi River. This network tests samples of Mississippi River water for the presence of volatile organic compounds, polychlorinated biphenyls (PCBs), acid/base neutrals (ABNs), chlorinated organics, and phenols at all three sites on a quarterly basis. From January 2000 to August 2003, 116 sites across the state were sampled for the above classes of compounds, including the three Mississippi River sites.

Fish Tissue Monitoring Activities

With the exception of a statewide mercury study, the ESD does not maintain a regular fish tissue monitoring program. However, fish are frequently sampled in response to significant complaints, as a result of enforcement actions, or in response to other problems as they occur. Results of tissue analyses are forwarded to the LDEQ and LDHH for statistical and risk assessment analysis.

The LDEQ is currently conducting a statewide study to locate water bodies where some fish species have been contaminated with mercury. Up-to-date water quality advisory information can be found on the LDEQ Website at <http://www.deq.state.la.us/> or by calling 1-888-293-7020. Please refer to Part II, Chapter 4 for more information on Louisiana mercury contaminant study.

In addition to the sampling efforts described above, the LDEQ keeps abreast of fish contamination research done in Louisiana and other states. The current mercury study is a prime example of this. In this instance, research done in Wisconsin and Florida was used to assist in setting priorities for which water bodies are to be sampled and in what order. This enabled LDEQ to target those water bodies that are both popular fishing areas and most at risk to contain mercury contaminated fish.

Intensive Water Quality Surveys

The Environmental Evaluation Division (EED) of the OEA conducts intensive stream surveys to provide physical, chemical, and some biological data necessary to define water quality problems and to calibrate and verify mathematical models for development of TMDLs and wasteload allocations (WLAs). Data acquired through these surveys is also used to assess and revise water quality standards. These surveys provide a part of the basic water quality data required for the development and revision of the state water quality management plan. The LDEQ has set up a program of reference stream sampling to provide data to assist in the assessment and revision of water quality standards and to provide background data for TMDLs and WLAs on impacted streams. The LDEQ began conducting intensive surveys for Barataria Basin water bodies in the summer of 2002, completed them in the summer of 2003, and began intensive surveys for Terrebonne Basin water bodies in the summer of 2003.

Total Maximum Daily Load Status

The Environmental Technology Division (ETD) has focused on TMDL development for water bodies listed on the §303(d) list and will continue to do so until all water bodies requiring a TMDL have been addressed. By May 2002, LDEQ completed the oxygen demand and metals TMDLs for the Calcasieu and Ouachita River Basin water bodies listed on the §303(d) and reported in the 2002 *Water Quality Inventory*. TMDLs for the listed water bodies in the Barataria Basin have been completed and are to be sent to the U.S. EPA for review. The LDEQ has begun work on TMDL models for the Terrebonne Basin water bodies listed for dissolved oxygen. Based upon an agreement between LDEQ and U.S. EPA, some TMDLs are developed by U.S. EPA and/or U.S. EPA contractors. These TMDLs are submitted to LDEQ for review. TMDL progress is shown in Table 3.1.4.

Table 3.1.4

Louisiana Department of Environmental Quality total maximum daily load progress from February 5, 2000 to February 6, 2004.

Subsegment Number	Substance	Status	Status Date
060201	Copper	Final	2/25/2000
030101	Lead	Final	5/31/2002
030102	Lead	Final	5/31/2002
030103	Lead	Final	5/31/2002
030503	Lead	Final	12/19/2003
030504	Lead	Final	12/19/2003
030506	Lead	Final	12/19/2003
030507	Lead	Final	12/19/2003
030803	Lead	Final	12/19/2003
030807	Lead	Final	12/19/2003
081606	Lead	Final	12/19/2003
050101	Nutrients	Final	2/25/2000
050103	Nutrients	Final	2/25/2000
050201	Nutrients	Final	2/25/2000
050401	Nutrients	Final	2/25/2000
050501	Nutrients	Final	2/25/2000
060205	Nutrients	Final	2/25/2000
060301	Nutrients	Final	2/25/2000
060401	Nutrients	Final	2/25/2000
060501	Nutrients	Final	2/25/2000
060702	Nutrients	Final	9/2/2003
080101	Nutrients	Final	7/1/2002
080102	Nutrients	Final	5/31/2002
080701	Nutrients	Final	9/30/2002
080901	Nutrients	Final	7/1/2002
080903	Nutrients	Final	5/31/2002
020301	Oxygen Demand	Draft	2/6/2004
020501	Oxygen Demand	Draft	1/8/2004
020701	Oxygen Demand	Draft	1/19/2004
030101	Oxygen Demand	Final	9/2/2003
030104	Oxygen Demand	Final	9/2/2003
030305	Oxygen Demand	Final	7/1/2002
030601	Oxygen Demand	Final	5/31/2002
030602	Oxygen Demand	Final	5/31/2002
030603	Oxygen Demand	Final	7/1/2002
030701	Oxygen Demand	Final	5/31/2002
030801	Oxygen Demand	Final	7/1/2002
030804	Oxygen Demand	Final	3/15/2002
030805	Oxygen Demand	Final	3/25/2002
030806	Oxygen Demand	Final	7/1/2002
030807	Oxygen Demand	Final	9/30/2002
030901	Oxygen Demand	Final	7/1/2002
031001	Oxygen Demand	Final	7/1/2002
050101	Oxygen Demand	Final	2/25/2000
050103	Oxygen Demand	Final	2/25/2000
050201	Oxygen Demand	Final	2/25/2000
050301	Oxygen Demand	Final	2/25/2000

Subsegment Number	Substance	Status	Status Date
050302	Oxygen Demand	Final	2/25/2000
050303	Oxygen Demand	Final	2/25/2000
050304	Oxygen Demand	Final	2/25/2000
050401	Oxygen Demand	Final	2/25/2000
050501	Oxygen Demand	Final	2/25/2000
050601	Oxygen Demand	Final	9/1/2000
060101	Oxygen Demand	Final	9/2/2003
060102	Oxygen Demand	Final	9/2/2003
060201	Oxygen Demand	Final	9/2/2003
060202	Oxygen Demand	Final	9/2/2003
060203	Oxygen Demand	Final	9/2/2003
060204	Oxygen Demand	Final	2/25/2000
060205	Oxygen Demand	Final	2/25/2000
060208	Oxygen Demand	Final	2/25/2000
060301	Oxygen Demand	Final	2/25/2000
060401	Oxygen Demand	Final	2/25/2000
060501	Oxygen Demand	Final	2/25/2000
060702	Oxygen Demand	Final	9/2/2003
060801	Oxygen Demand	Final	4/5/2001
060802	Oxygen Demand	Final	4/5/2001
080101	Oxygen Demand	Final	7/1/2002
080102	Oxygen Demand	Final	5/31/2002
080603	Oxygen Demand	Final	7/1/2002
080609	Oxygen Demand	Final	7/1/2002
080610	Oxygen Demand	Final	7/1/2002
080701	Oxygen Demand	Final	9/30/2002
080901	Oxygen Demand	Final	7/1/2002
080903	Oxygen Demand	Final	5/31/2002
080909	Oxygen Demand	Final	7/1/2002

Special Studies

The OEA and OEC plan or conduct special studies in reported or known problem areas or concerning particular issues. Some of these studies have included fish tissue contamination with mercury, nonpoint source pollution studies, a study of the closure of oyster harvesting areas, acid deposition, and studies of toxics-contaminated water bodies. No studies of particular note were conducted during the past two years.

Biotoxicity Monitoring Summary

Ambient water samples are collected as a result of fish kills, complaints, spills, or special studies. Generally, a chronic vertebrate test and a chronic invertebrate test are initiated on fresh water samples. A chronic vertebrate test and an acute vertebrate test are usually initiated on saline samples. The test species utilized and the methods used follow U.S. EPA protocols as closely as possible. Acute testing, utilizing both a vertebrate and an invertebrate species, are initiated on most fish kills, complaints, and spills. Acute and chronic tests are initiated in special studies depending on the scope of the study. Acute tests can be either static renewal, in which the sample water is replaced daily; or static non-renewal, in which the organisms are exposed to the same water for the entire testing period. Acute tests run for 24, 48, or 96 hours. Chronic tests are static renewal and run for approximately one week.

Limited data is available for the present assessment cycle. One sample in 2002 and six samples in 2003 from each site (St. Francisville, Plaquemine, Belle Chasse) from the Mississippi River were used for chronic toxicity testing upon *Pimephales promelas* (flathead minnow) and *Ceriodaphnia dubia*. However, due to the statistical limitations of the data and the analyses, assessments based on this data may not be

reliable and are, therefore, not included in this report. Caution should be exercised when interpreting bioassay data. If a test result is positive for toxicity it does not by itself indicate that a water body is toxic to aquatic organisms. Problems in some streams may be incidental in nature. Every effort is made to retest sites where toxicity has been found. Also, Regional personnel are contacted, as they have the most knowledge about activities and problems in their regions. The LDEQ recognizes that a potential for false readings exists. On occasion, samples may be found to be toxic when in actuality outside factors caused the test to fail. Factors such as stress on the organisms, poor synthetic water quality conditions, or environmental factors that act synergistically with certain elements can cause water quality degradation in the sample. This degradation may lead to false toxicity results. For example, the toxicity threshold of metals has a linear response in relation to the hardness of water. As hardness is lowered the toxicity of many metals increases and can directly impact the organisms in the lab.

It is important to note that biotoxicity monitoring cannot be utilized as the *only* determinant of the existence of pollution in a water body. Rather, biotoxicity monitoring must be considered along with other reliable data sources such as water quality monitoring, sources of pollution, and water sample test results for organic and inorganic contaminants. The LDEQ will continue to perform biotoxicity monitoring as an additional tool for the determination of water quality.

Early Warning Organics Compound Detection System

The Early Warning Organics Compound Detection System (EWOCDS), a collaboration between LDEQ, LSU, and various municipal and industrial facilities along the Mississippi, was established in 1986. Since its inception, the program has been considered a success and has shown the number of detections of compounds in the Mississippi River to drop dramatically over the past 15 years. The purpose of the program is to warn downstream water suppliers of high levels of problematic organic compounds. EWOCDS sample sites were originally located at 10 locations between Baton Rouge and St. Bernard Parish, including 5 drinking water intakes and 5 industrial water intakes (LDEQ, 1996). In 2001, the Monte Sano site experienced equipment failure and did not collect samples. Public Water Supply Company (PWSCO) withdrew from the program entirely after a lawsuit over a benzene barge incident leaving the number of sample sites at 7. Table 3.1.5 lists the 26 compounds analyzed by this program. In 2002, 3,997 samples were collected and analyzed for the 26 compounds. *Of the samples analyzed no compounds were detected.* For more information about the EWOCDS program, contact the Office of Environmental Compliance, Surveillance Division at (225) 219-3615 or send mail to deqsurveillance@la.gov

Table 3.1.5

Compounds tested for as part of Louisiana's Early Warning Organic compounds Detection System.

Vinyl Chloride	1,2-Dichloropropane	Bromoform
Trichloroethene	Bromodichloromethane	1-1-Dichloroethene
Dichloromethane	Toluene	Benzene
trans-1-2-Dichloroethene	1,1,2-Trichloroethane	Styrene
cis-1-2-Dichloroethene	Tetrachloroethene	1,2,4-Trichlorobenzene
Chloroform	Dibromochloromethane	1,2-Dichloroethane
1,1,1-Trichloroethane	Chlorobenzene	Ethylbenzene
1,3-Dichlorobenzene (m-Dichlorobenzene)	Dimethylbenzene(s) (m,o, and p Xylenes)	Carbon Tetrachloride
1,4-Dichlorobenzene (p-Dichlorobenzene)	1,2-Dichlorobenzene (o-Dichlorobenzene)	

Chapter 2: Assessment Method and Summary Data

The information contained in this chapter was derived largely from the Integrated Report Rationale, first developed for the public notice phase of the Integrated Report process. As a result, the following information replaces the Integrated Report Rationale for §303(d) List purposes.

Assessment Method

General Assessment Procedures

Assessment procedures follow U.S. EPA guidance documents for §305(b) assessments, U.S. EPA's Consolidated Assessment and Listing Methodology (CALM) guidance (U.S. EPA, 2002), U.S. EPA's Integrated Report guidance (found within CALM guidance), as well as Louisiana's surface water quality standards, and ERC 33:IX.1101-1123. Sampling and assessment for the 2004 IR focused on water body subsegments in three watershed basins and 21 statewide long-term sites. The three basins targeted for monitoring during the 2002 monitoring rotation were the Atchafalaya, Red and Sabine Basins. Monitoring in these basins ended in December 2002. Because these three basins were the only ones for which new data was available on nearly all subsegments, these were the only basins for which updated assessments were developed. Subsegments with long-term trend stations were also updated for the 2004 IR. All data for the two basins (Mermentau and Vermilion-Teche) sampled in 2003 was not available in time to include in the 2004 IR. This data will be used for the 2006 IR cycle.

For the 2004 IR assessment, field staff collected monthly field analysis and laboratory samples. Laboratory samples were sent to LDEQ's water laboratory in Baton Rouge (conventional parameters), one of several Louisiana Department of Health and Hospitals (LDHH) laboratories (fecal coliforms), or a contract lab (metals). In order for water quality or other related data to be utilized for §305(b) reporting and §303(d) listing, sample collection, handling, and laboratory analysis must be in accordance with LDEQ's Quality Assurance Project Plan (LDEQ 2003) developed by LDEQ and approved by U.S. EPA Region 6. Data from the LDEQ laboratory as well as field data was entered into a LIMS system by laboratory staff. After receiving electronic data deliverables from the laboratory, data was electronically entered into the Access based Louisiana Environmental Access Utility (L'EAU), maintained on a central LDEQ server by the Standards, Assessment and Nonpoint Source (SAN) Section, Office of Environmental Assessment. Data from LDHH and the contract laboratory was also entered into L'EAU by SAN staff. All ambient water quality data used for this assessment is available on the LDEQ Website at <http://www.deq.state.la.us/surveillance/wqdata/wqdata.aspx>, or by calling LDEQ at (225) 219-3590. The Web access portion of L'EAU is currently undergoing upgrades. As a result, data collected from January 2002 to the present (March 2004) is not available on the Website. This data can be obtained by calling the number provided above.

In addition to water quality data collected by LDEQ, additional data were also solicited from the public and considered during preparation of the Integrated Report. Over 170 letters were sent to universities, state and federal agencies, industry representatives, and environmental groups requesting data for consideration when making water quality assessments. Two groups, Bayou Vermilion District (BVD) based in Lafayette and Lake Pontchartrain Basin Foundation (LPBF) based in New Orleans submitted data for consideration in the 2004 IR process. Data from both groups were determined to be adequate in terms of quality assurance/quality control requirements. Data submitted by BVD was found to be collected from tributaries of the water body subsegment to be assessed (Based on ERC 33:IX.1123, Table 3). Because tributary data may not be representative of ambient conditions in the named and assessed water body subsegment, the data could not be used for the 2004 IR process. However, the data will be placed on file and provided to the LDEQ Engineering group responsible for development of TMDLs. The Engineering group may then consider this data in development of TMDLs in the area. Data submitted by LPBF was primarily collected on water body subsegments subject to LDEQ's assessment process. However, most of the subsegments in the Lake Pontchartrain Basin were not scheduled for assessments in 2004; therefore, the data was not used at this time. As has been noted, new assessments were only developed for the three basins monitored in 2002, along with the long-term trend station subsegments. LPBF data did correspond to two subsegments with long-term trend stations and was, therefore, considered for assessment purposes. These two

subsegments were 040802 – Lower Tchefuncte River, and 041001 – Lake Pontchartrain. Data from these LPBF sites was considered and found to corroborate assessments conducted by LDEQ. As with the BVD data, LPBF data not used for the 2004 IR process will be provided to the LDEQ Engineering group responsible for TMDL development.

At the beginning of this assessment cycle, L'EAU and SAS programs were reviewed and updated as necessary to reflect changes in time frame, subsegments assessed, criteria, and assessment methods. A SAS statistical program was then utilized to compare ambient numerical data to criteria for each water body subsegment and designated use. Designated uses and criteria for each water body subsegment are listed in the ERC 33:IX.1123. Each designated use has a specific suite of ambient water quality parameters used to assess support of that use. Links between designated uses and water quality parameters can be found in Table 3.2.1. Using data and information collected from within or immediately downstream of a water body subsegment, each subsegment was evaluated as fully supporting or not supporting each of its designated uses, using the decision process shown in Table 3.2.1. Where more than one parameter and criteria defines a designated use, support for each designated use was defined by its poorest performing (most severely impaired) parameter. Likewise, where data from more than one sample station was available, the most severely impaired station was used to make the assessment.

Numerical data collected between 1 January 1997 and 31 December 2002 was compiled for each assessment. This represents a change from the normal five-year sampling period used in the past. Due to LDEQ's change to a five-year rotating basins monitoring program, LDEQ determined to extend the sampling period to allow for two full years of data, where available, for each basin assessed during a given assessment cycle. The Atchafalaya, Red, and Sabine Basins were first monitored under the rotating basins program in 2002. Because statewide monitoring concluded in May 1998, it was necessary to extend the sampling period back to January 1997 in order to ensure two full calendar years of sampling for these three basins. For many sampling sites, however, (e.g. new sites added under the rotating basins monitoring plan), only six to twelve months of data were available at reporting time. As basins are sampled for the second time in the rotation, it will become possible to use data from two monitoring rotations for each basins assessment update. For most parameters and criteria, at least five samples were required for the assessment to be considered valid. Ambient data used for analysis depended on designated use(s) for each water body and the availability of numerical water quality criteria. Parameters used could include any or all of the following: dissolved oxygen, temperature, pH, turbidity, fecal coliform bacteria, chloride, sulfate, total dissolved solids, and metals.

Data assessment procedures used for the 2004 IR were the same as those used in the 2002 and previous §305(b) reports. Table 3.2.1 describes the statistical process used to determine water body designated use support based on the parameters outlined above and their respective criteria found in Louisiana's Environmental Regulatory Code (ERC 33:IX.1102 et seq.).

Table 3.2.1

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's 2004 Integrated Report.

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially ²	Not Supporting
Primary Contact Recreation (PCR) (Designated swimming months of May-October, only.)	Fecal coliform ¹	0-25% do not meet criteria	-	>25% do not meet criteria
	Temperature	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
Secondary Contact Recreation (SCR) (All months)	Fecal coliform ¹	0-25% do not meet criteria	-	>25 % do not meet criteria

Table 3.2.1

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana's 2004 Integrated Report.

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially ²	Not Supporting
Fish and Wildlife Propagation (FWP)	Dissolved oxygen ³	0-10% do not meet minimum of 3.0 ppm and median > criteria of 5.0 ppm	-	>10% do not meet minimum of 3.0 ppm or median < criteria of 5.0 ppm
	Dissolved oxygen ⁴	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
	Temperature, pH, chloride, sulfate, TDS, turbidity	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals ⁵ and Toxics	< 2 exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters	-	2 or more exceedances of chronic or acute criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters
Drinking Water Source (DWS)	Color, Fecal coliform	0-30% do not meet criteria	>30-75% do not meet criteria	>75% do not meet criteria
	Metals and Toxics	< 2 exceedances of drinking water criteria in most recent consecutive 3-year period, or 1-year period for newly tested waters		2 or more exceedances of drinking water criteria in the most recent consecutive 3-year period, or 1-year period for newly tested waters
Outstanding Natural Resource (ONR)	Turbidity	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria
Agriculture (AGR)	None	-	-	-
Oyster Production (SFP) ⁶	Fecal coliform ¹	Median fecal coliform ≤ 14 MPN/100 mL; and ≤ 10% of samples ≤ 43 MPN/100 mL	-	Median fecal coliform > 14 MPN/100 mL; and > 10% of samples > 43 MPN/100 mL
Limited Aquatic and Wildlife (LAW)	Dissolved oxygen ⁴	0-10% do not meet criteria	>10-25% do not meet criteria	>25% do not meet criteria

Table 3.2.1

Decision process for evaluating use support, showing measured parameters for each designated use; Louisiana’s 2004 Integrated Report.

Designated Use	Measured Parameter	Support Classification for Measured Parameter		
		Fully Supporting	Partially ²	Not Supporting
<ol style="list-style-type: none"> For most water bodies, criteria is as follows: PCR, 400 colonies/100 mL; SCR, 2,000 colonies/100 mL; DWS, 2,000 colonies/100 mL, SFP, 43 colonies/100 mL (see ERC 33:IX.1123). While the assessment category of “Partially Supporting” is included in the SAS statistical assessment programming, any use support failures were recorded in ADB as “Not Supporting.” This procedure was first adopted for the 2002 305(b) cycle because “partially supported” uses receive the same TMDL treatment as “not supported” uses. Water bodies with a D.O. criterion of 5.0 mg/L. This assessment method differs from U.S. EPA guidance. Estuarine waters with a D.O. criterion of 4.0 mg/L and water bodies for which a special study has been conducted to establish site specific criteria for D.O. Marine metals criteria were used for all water bodies with an average salinity greater than or equal to 16.0 ppt. Freshwater metals criteria were used for all other water bodies. Oyster propagation (SFP) was previously assessed using an assessment method of $\leq 25\%$ of samples shall exceed 43 MPN/100 mL in order to be fully supporting. This method was not in accordance with ERC 33:IX.1113.C.5.iv. The assessment shown in Table 3.2.1 is the correct method. All subsegments previously assessed for oyster propagation were reassessed using the correct method, and the ADB system was updated as needed. 				

Following statistical determination of a water body’s designated use support (Table 3.2.1), and what chemical parameters in that water body may be impaired, a determination was then made as to what Integrated Report category the suspected water body impairment combination (WIC) should be placed in. The Clean Water Act, implementing regulations, and U.S. EPA guidance make allowances for States to delist WICs from their §303(d) Lists based on “good cause” (40 CFR 130.7(b)(6)(iv)). This regulation states, “Good cause includes, but is not limited to, more recent or accurate data; more sophisticated water quality modeling; flaws in the original analysis that led to the water being listed in the categories in §130.7(b)(5); or changes in conditions, e.g., new control equipment, or elimination of discharges.” U.S. EPA guidance also permits the placement of suspected WICs into one of seven categories. These categories are defined in Table 3.2.2.

Table 3.2.2

Environmental Protection Agency Integrated Report Methodology guidance categories used to categorize water body/pollutant combinations for Louisiana’s 2004 Integrated Report.

IR Category	IR Category Description
Category 1	Specific Water body Impairment Combination (WIC) cited on a previous 303(d) list is now attaining all uses and standards.
Category 2	Water body is meeting some uses and standards but there is insufficient data to determine if uses and standards <i>associated with the specific WIC</i> cited are being attained.
Category 3	There is insufficient data to determine if uses and standards <i>associated with the specific WIC</i> cited are being attained.
Category 4a	WIC exists but a TMDL has been completed for the <i>specific WIC</i> cited.
Category 4b	WIC exists but control measures other than a TMDL are expected to result in attainment of designated uses <i>associated with the specific WIC</i> cited.
Category 4c	WIC exists but a pollutant does not cause the <i>specific WIC</i> cited.
Category 5	WIC exists for one or more uses, and a TMDL is required for the <i>specific WIC</i> cited. This represents Louisiana’s 303(d) List.

Status of Historical Evaluative Assessments

Section 305(b) reporting for Louisiana began in approximately 1982. In approximately 1988 regional field staff with LDEQ began providing evaluative assessments to supplement assessments made based on ambient water quality data. These evaluative assessments were based strictly on the best professional judgment of the field staff, and were often made in the absence of any numerical data or water quality criteria. As a result, Louisiana used these evaluative assessments only as a management or screening tool to determine where additional investigation may have been required. Because evaluative assessments were not made on a quantitative, statistical basis, at no time did Louisiana intend for these evaluative assessments to be used for §303(d) listing purposes. Evaluative assessments were first included for §303(d) listing at the insistence of U.S. EPA, as a result of the §303(d)/TMDL lawsuit against U.S. EPA Region 6. These WICs were eventually placed on U.S. EPA's Consent Decree §303(d) List.

In order to address WICs based solely on evaluative assessments and later placed on U.S. EPA's Consent Decree §303(d) List, Louisiana expanded its water quality monitoring program to include virtually all water bodies defined in Louisiana's Administrative Code and assessed under IR reporting. Due in part to this additional data collection effort, Louisiana has been able to remove from §303(d) listings the vast majority of WICs previously listed as having insufficient data to make an assessment. Additional data has also been useful in determining if earlier evaluative assessments were accurate or not. If data supported an evaluative assessment's determination that impairment was occurring, the associated WIC was kept on the 2004 IR as Category 5 (The §303(d) List). If new data indicated that impairment was occurring but natural conditions were suspected to be the source of the impairment, the WIC was placed in IR Category 3. If new data indicated the evaluative assessment was incorrect, then the WIC was removed from IR Category 5 and placed in Category 1.

This process was begun during the 2002 reporting cycle and continued for the 2004 cycle. For the 2004 IR cycle, 199 WICs either remained in or were added to Category 3. These 199 WICs consist of water bodies that lack numerical criteria; for which data is not available for making a valid, quantitative assessment; or where unusual natural conditions are suspected of having caused the criteria impairment. Louisiana will endeavor to collect the required data for making valid assessments, and where required develop additional criteria. Where unusual natural conditions are suspected, Louisiana will continue to evaluate the water bodies to determine if more normal conditions result in criteria support or if revisions to the criteria are warranted.

Dissolved Oxygen Assessment Procedures

In order to get assessment results more representative of Louisiana waters, LDEQ's modified assessment procedure was used when assessing dissolved oxygen (DO) in most water bodies (water bodies with a DO criterion of 5 mg/L). To allow for natural fluctuations in DO concentrations, a two-value assessment procedure was used for IR assessment. As shown in Table 3.2.1, both a minimum value and the median value (the 5 mg/L criterion) were utilized. In this manner, water bodies were checked for sufficient dissolved oxygen to sustain aquatic life, yet were allowed to exhibit natural fluctuations characteristic of Louisiana waters. These natural fluctuations are permitted under Louisiana's narrative criteria for DO. A more detailed discussion of this assessment method can be found in Louisiana's 2000 §305(b) Report. For water bodies that have been studied individually in order to set site-specific DO criteria, the assessment method found in U.S. EPA guidance was utilized.

Nutrient Assessment Procedures

While water quality data is collected for nitrogen and phosphorus, numerical criteria have not yet been established for these nutrients. Therefore, direct numerical assessment of nutrients could not be conducted on those water bodies suspected of having nutrient impairments. However, based on the established connection between nutrient and dissolved oxygen (DO) concentrations LDEQ determined to use DO assessment results as an indicator of narrative nutrient criteria support. This was done in order to address the large number of nutrient related WICs on the IR. LDEQ and U.S. EPA commonly develop TMDLs for the reduction of biological oxygen demand (BOD) in order to address conditions of low DO in water

bodies. This reduction in BOD is directed at the reduction of nutrients. Based on this TMDL protocol, if DO criterion were found to be fully supported then nutrients are assumed to be at levels that preclude impairment of the water body. Likewise, if DO criterion were found to be not supported then nutrients *may* be one of the suspected causes of the impairment. Therefore, if a specific nutrient (nitrogen, phosphorus, ammonia) was previously listed on the 2002 §303(d) list then these listings were included on the 2004 IR. If only the general category of nutrients was listed in 2002, then the ADB impairment classifications of nitrate/nitrogen and total phosphorus were included on the 2004 IR. If nutrients were not listed in 2002, but DO was found to be impaired, only DO was included on the 2004 IR. In this case, as noted above nutrients will still be addressed through a DO TMDL.

The legal status for this position is based on a ruling in a lawsuit regarding water quality criteria for nutrients (*Sierra Club v. Givens*, 710 So.2d 249 (La. App. 1st Cir. 1997), writ denied, 705 So.2d 1106 (La. 1998). U.S. EPA supports LDEQ's position as shown in their report, *Texas River TMDLs for Dissolved Oxygen and Nutrients* (May 28, 2002) where they stated,

In addition, LDEQ issued a declaratory ruling on April 29, 1996, concerning this language and stated, "(that) DO directly correlates with overall nutrient impact is a well-established biological and ecological principle (U.S. EPA Region 6. 2002). Thus, when the LDEQ maintains and protects DO, the LDEQ is in effect also limiting and controlling nutrient concentrations and impacts." DO serves as the indicator for the water quality criteria and for assessment of use support. For the TMDLs in this report, the nutrient loading required to maintain the DO standard is the nutrient TMDL.

Turbidity Assessment Procedures

With regard to these impairments Louisiana has taken the position that a clear correlation exists between turbidity, siltation, and total suspended solids. U.S. EPA Region 6 has defined this position in its document, *Justification for Delisting for Suspended Sediments (TSS) and Siltation*. In U.S. EPA's justification they state, "a review of TSS and turbidity data from several water quality stations from the Ouachita River Basin show that there is a demonstrated relationship between average turbidity and average TSS values in these watersheds." U.S. EPA goes on to say, "Where waters meet their established turbidity criterion it is interpreted that they are meeting any water quality concerns related to TSS as well. Conversely, if a water body is not meeting for its turbidity criterion a delisting for TSS will not be proposed based on the premise established here that there is a relationship between the two." Regarding siltation U.S. EPA states, "Suspended sediment (TSS) has been widely used as a surrogate for the potential for sediment accumulation. Suspended sediment may be used as an indirect water column indicator of sediment load and can be used to assess sedimentation potential." The concept of "sedimentation potential" refers to siltation as an impact on water quality.

Based on the relationship among turbidity, siltation, and TSS, IR categorization of WICs with one or more of these three suspected causes of impairment also experienced a significant number of changes in 2002. These changes were carried forward in 2004. Water bodies with the designated use of outstanding natural resource (ONR) must meet a turbidity criterion of 25 nephelometric turbidity units (NTU) (ERC 33:IX.1113.B.9.v). There are 51 water bodies in Louisiana designated as an ONR. However, a careful review of turbidity data for other, non-ONR, water bodies found that many of them met the turbidity criterion for ONRs. In addition, some WICs classified as estuarine or lakes, a class of water bodies that have numerical criterion for turbidity (ERC 33:IX.1113.B.ii and iv), but which were previously not assessed using this criterion were properly assessed during review. As a result, Louisiana was able to assess many of these water bodies as fully supporting turbidity criterion and by extension siltation and total suspended solids (TSS).

Finally, LDEQ used turbidity criteria for downstream water bodies or water bodies considered as source water for a stream as a surrogate. For example, Bayou Lafourche near Donaldsonville (020401) was assessed using the Mississippi River turbidity criteria of 150 NTU. This subsegment receives most of its headwaters via pump station from the Mississippi River (U.S. EPA Region 6, 1998). Therefore, turbidity is primarily affected by Mississippi River water. Bayou Lafourche is meeting the 150 NTU criterion for the Mississippi River.

Metals, Organics, and Inorganics Assessment Procedures

Metals, organics, and inorganics data were assessed using U.S. EPA guidance for toxic substances. U.S. EPA guidance recommends that if more than one exceedance of a criterion occurs in a three-year period then the water body is considered impaired due to that substance. Metals are assessed using one of two possible sets of criteria: marine water or freshwater. In order to determine the criteria used, the prior three years of salinity values were averaged for each subsegment. Marine criteria were used for any subsegment with a salinity average greater than or equal to 16 parts per thousand (ppt). Freshwater criteria were used for all subsegments with an average salinity less than 16 ppt. Use of 16 ppt is based on definitions found in Louisiana's ERC (ERC 33.IX.708.B.Saline Marshes and ERC 33.IX.1105.Saline Marshes). A minimum of four ambient samples was required to make an assessment of full support. However, if two criterion exceedances occurred for the same metal and only two or three samples were taken during the year, the water body was considered potentially impaired. If only three samples were collected with less than or equal to one criterion exceedance for the same metal, the water body was considered as having insufficient data to make a metals assessment. These water bodies will be resampled for metals during their next rotation of ambient sampling, or sooner if resources permit. Procedures are being developed and implemented to ensure all water bodies sampled for metals have at least four samples collected and analyzed during the ambient sampling rotation for that water body.

If two or more metals criterion exceedances were noted using the ambient screening techniques, the water body was considered potentially impaired. If the samples using clean metals techniques also failed to meet the water quality criteria, then the subsegment was placed on the §303 (d) list. For those water bodies first identified as potentially impaired for one or metals in the 2004 IR, clean metals sampling will occur in the near future. These water bodies will then be delisted at a later date if the additional data warrants their removal.

Due to earlier limitations in laboratory detection capabilities, some historical metals data may contain sample results for which the criterion is below the laboratory detection level. When this occurs, for determination of criteria attainment where the criteria were below the detection limit, then no detectable concentrations will be allowed (ERC 33:IX.1113.C.6.e.). Based on this provision of Louisiana regulation, samples found to be below detection level, even if the detection level is above the criteria, are deemed to be meeting the criteria and are acceptable for assessment purposes. Recent sampling and laboratory advances and LDEQ's switch to the use of laboratories utilizing clean-technique analysis has reduced current laboratory detection limits to concentrations below the most stringent criteria for all metals. Therefore, because metals assessments are limited to the most recent three-year period, as additional metals data is collected it will no longer be necessary to use metals data where the detection level is greater than the criteria.

As noted above, data collected and analyzed using clean metals techniques was used to reevaluate subsegments that showed a potential impairment after assessing data collected during the rotating ambient monitoring program. This procedure was agreed upon, followed by LDEQ, and approved by U.S. EPA Region 6 numerous times in recent years. For example, U.S. EPA Region 6's website at http://www.epa.gov/earth1r6/6wq/ecopro/latmdl/feb14_ouacalcdelist.pdf contains delistings for numerous metals based on the use of clean-technique metals data to override LDEQ's ambient sampling. The final delisting found at this website was dated June 13, 2002. The text includes the following statement, "LDEQ completed new evaluations using clean methods sampling and analysis procedures in 2000/01. All values were less than the state criterion. The water body is currently meeting WQS." Based on this information, it is apparent that U.S. EPA Region 6 approved of the procedure. LDEQ will continue using clean-technique sampling to verify suspected metals impairments identified during the routine ambient screening process.

Pesticide Assessment Procedures

With regard to changes in §303(d) listings for pesticides, Louisiana determined that in most cases the original basis for these listings was a *presumption* that pesticides *may* be present because of agricultural land uses in the area. Until recently, no quantitative pesticide data was available with which to determine if

pesticides were present, or present in harmful concentrations. Therefore, based on provisions of the CWA, Louisiana has revised many of its listings for pesticides based on more recent and accurate data.

IR categorization of this suspected cause of impairment has changed in recent years due to the identification of an additional dataset. The Louisiana Department of Agricultural and Forestry (LDAF) maintains this dataset. The dataset was not used during earlier assessment cycles because few pesticides have numerical criteria for assessment purposes and few water bodies had been adequately sampled. However, as a result of U.S. EPA's development of pesticide TMDLs in recent years, LDAF has increased the scope of its pesticide-monitoring program. In addition, U.S. EPA developed a method of calculating endpoints used for assessment and TMDL development. This allowed for a more accurate assessment of the potential for pesticide related impairments. Both TMDL development for pesticides and delisting due to additional pesticide data are represented in the 2004 IR.

Organic Compound Assessment Procedures

As with pesticides, many §303(d) listings for these impairments were originally based on a presumption of presence, not on quantitative data. In other cases, quantitative data was available based on studies of produced water discharges. In cases where there was a lack of quantitative data, IR listings for priority organics and nonpriority organics were affected by the identification of additional data collected over a number of years. This organic and inorganic compound data was not incorporated into the SAS assessment programs described above. However, where available this type of information was considered in the assessments. Although most water bodies only had one year of data available for assessment purposes, some long-term trend sites had additional data. U.S. EPA guidance recommends the use of up to three years of data, when available, for assessing metals and organic or inorganic compounds. Therefore, where additional data for organic or inorganic compounds was available the range of data used in the 2004 IR was January 2001 to December 2003. This range differs slightly from that used for the conventional parameter data because the data was obtained from the database at a later date.

With regard to organic compounds associated with produced water discharges, a review of WICs previously listed in connection with produced water discharges found that many of these impairments might now be delisted. These WICs could be readily identified because they were typically associated with another listing for radiation due to produced water discharges. Because produced water discharges are no longer permitted under Louisiana regulation, Louisiana determined that TMDLs are not required since the source of these impairments has already been eliminated (ERC 33:IX.708 et seq.). Under provisions of the CWA the "elimination of discharges" is considered "good cause" for delisting a particular WIC. Elimination of these discharges is enforced through provisions of Louisiana's Environmental Regulatory Code (ERC 33:IX).

Determination of Suspected Sources of Impairment

In addition to use of numerical data, LDEQ regional staff members were asked for input regarding significant suspected sources of impairment, or if impairment due solely to natural sources was occurring. It was anticipated that numerical data alone might suggest impairment for some Louisiana water bodies when in fact there was no impairment, or the impairment was due exclusively to natural causes. In all cases, regional staff more familiar with the area would be able to suggest one or more suspected sources for a water body's impairment. Using the best professional judgment of regional staff provides valuable input regarding the quality of individual water bodies.

Data Management of Assessment Results

All resulting assessment information, including water body name, size, type, designated uses, use support, suspected causes, and suspected sources of impairment were entered into a database developed for the U.S. EPA by Research Triangle Institute. IR Categories for each WIC were included in the "Comments" field of the suspected impairments screen. States are being encouraged by U.S. EPA to use this Assessment Database (ADB) in order to provide more consistent reporting at a national level.

2004 §303(d) List Development and Other IR Categorizations

The 2004 §303(d) List represents a compilation of four different sources of information. The starting point for the 2004 List was Louisiana's final 2002 §303(d) list submitted to EPA Region 6 on 10 December 2003. Second, new data assessments for the Atchafalaya, Red, and Sabine Basins, along with the long-term trend water bodies, were accounted for. Third, all recent TMDL activities occurring after or during development of the 2002 §303(d) List were taken into account. Fourth, all water bodies under fish consumption or swimming advisories were noted. In rectifying these various sources and assigning IR Categories to the suspected sources of impairment, U.S. EPA's current guidance on IR methodology was used to determine what water bodies were formally included on Louisiana's 2004 List. Using EPA's IR guidance, all suspected WICs identified in the 2004 IR were assigned to one of seven categories (Table 3.2.2).

For the 2004 IR, many water body subsegments in the Mermentau, Vermilion-Teche, Calcasieu and Ouachita Basins were included in the IR for the first time. These previously missing subsegments were not included in the 2002 IR because they were not present on EPA's Consent Decree List due to the fact that EPA Region 6 and plaintiffs in the TMDL lawsuit agreed to remove all of these water bodies from its Consent Decree Attachment A. Removal of these water bodies by EPA was based on the fact that they had either been determined to be fully supporting, or a TMDL or other water improvement action had already been developed. Therefore, there was no need to include these water bodies on the Consent Decree Attachment A or the subsequent Draft 2002 IR. Because of improvements in ADB reporting capabilities, all subsegments in these four basins are now included in the IR. As a result, the 2004 IR is Louisiana's first, truly comprehensive report using IR guidance.

It is important to note that removal of a water body from the List, for any reason, does not remove water quality protections from that water body. All water bodies in Louisiana, listed or not listed, are subject to the same protections under the Clean Water Act and Louisiana's Environmental Quality Act (LEQA, 1995). Permitted facilities are still subject to conditions of their permits. Unpermitted point source dischargers are still required to obtain a permit or face enforcement actions. Violators of permit conditions are still subject to enforcement action. Nonpoint sources of pollution are still encouraged to follow best management practices as developed by LDEQ's Nonpoint Source Program and its many collaborators. Discharges to water bodies removed from the List because TMDLs have been developed are still required to meet permit limits based on the TMDL that was developed for that water body.

EPA's IR guidance was used to categorize specific suspected WICs in order to narrow the focus on what impairments require development of a TMDL for each assessed water body subsegment. If necessary, suspected WICs placed in IR Categories 3 and 4b will be addressed with additional monitoring to determine if use impairment is occurring, or if the suspected impairment can be addressed by corrective actions other than development of a TMDL. In the case of known impairments, usually fish consumption or swimming advisories, to small water bodies lying within a larger regulatory subsegment, the smaller water body was also named in the 2004 IR. Impairments of this nature are water body specific issues not directly related to the overall subsegment. These smaller water bodies not named as a regulatory subsegment were not assessed for any other purposes besides the specific advisory in question.

Use of IR Categories 1-4c by Louisiana is not meant to imply that a *water body subsegment* placed in these categories for specific WICs is explicitly *excluded* from IR Category 5 (the List). To the contrary, a water body with one or more specific WICs assigned to an IR Category of 1-4c will be included in IR Category 5 as well, provided one or more WICs for that water body have been placed in IR Category 5. Therefore, according to EPA IR guidance water bodies with one or more WICs assigned to IR Category 5 are *explicitly on the §303(d) List*. **However, these water bodies are only on the §303(d) List for WICs assigned by Louisiana specifically to IR Category 5.** IR Categories 1-4c were used by Louisiana in its Integrated Report as a means to classify and account for WICs found on EPA's Consent Decree §303(d) List. These categories were also used to account for newly identified impairments not assigned to IR Category 5 that are caused by natural sources or for which control activities other than TMDLs are in place.

All assessment information was ultimately placed in EPA's ADB for use as part of Louisiana's 2004 IR submittal to EPA. A query was developed to output the necessary IR information into an Excel spreadsheet format for public and EPA review of the 2004 IR. Two additional Excel spreadsheets (2004 IR Addendum and 2004 Category 1 Addendum) were also developed to allow categorization of previously identified impairments from the 2002 §303(d) List that could not be included in the ADB system. The IR Addendum contains WICs previously identified on the 2002 §303(d) List, but which cannot be included in the ADB system because the WIC is not identified in ADB. The Category 1 Addendum contains WICs that have been changed to fully supporting criteria and uses. These required a separate tracking system because ADB does not permit tracking of impairments moved to IR Category 1. WICs found to be in Categories 3-5, and for which ADB had a listing, were placed in ADB. For tracking purposes, the appropriate IR Category was noted in the comments field of the impairment input screen in ADB. Louisiana's 2004 §303(d) List consists of only those WICs found in Category 5 of the ADB system, as shown in the 2004 Integrated Report Excel spreadsheet.

Louisiana's full 2004 IR assessments for all assessed water bodies can be found in Appendix A. The 2004 IR Addendum can be found in Appendix B, and the 2004 IR Category 1 Addendum can be found in Appendix C. A public comment period for the 2004 Integrated Report was held from February 20 – March 22, 2004, concluding with a public hearing on March 22, 2004. A summary of comments received and LDEQ's response to those comments is provided in Appendix G.

Decision Process for 2004 Integrated Report

1. All impairments and IR categorizations found in the 2002 §303(d) List and IR were carried forward for the 2004 IR cycle, unless new data indicated full support had been obtained, or a TMDL had been completed.
2. 2004 impairment and IR categorizations were recorded using EPA's Assessment Database (ADB).
3. A limited number, approximately eighty WICs, could not be placed in ADB because the appropriate impairment category was not present in the system. These WICs were placed in the "2004 Integrated Report Addendum" Excel Spreadsheet.
4. Assessments and IR categorizations for the Mermentau, Vermilion-Teche, Calcasieu and Ouachita Basins not found in the 2002 §303(d) and IR, but present in the 2002 ADB system were carried forward for the 2004 IR cycle. Beginning in 2004, the ADB system contains assessment and IR categorization for *all* water body subsegments as defined in Louisiana's Environmental Regulatory Code (ERC 33:IX.1123, Table 3). In addition, ADB now tracks small water bodies not defined in the ERC, but considered impaired due to fish consumption or swimming advisories. These small water bodies, while tracked in ADB, are not to be considered water body subsegments as defined in Louisiana's ERC for full assessment purposes.
5. If an impairment was suspected **without** supporting data or criteria on which to base the listing, that impairment was reported in ADB as IR Category 3 for insufficient data. ADB does not contain a field for IR Categories for each individual impairment; therefore, the IR Category number was placed in the comments field under impairments.
6. WICs identified in the 2002 §303(d) List and IR that have now been found to be fully supported were placed in the "2004 Category 1 Addendum" Excel spreadsheet. This was done for tracking purposes only. ADB does not have a mechanism for tracking WICs that have been changed from impaired to fully supported.
7. If "mercury" was reported as an impairment based on the presence of a fish consumption advisory, fish and wildlife propagation (FWP) use was recorded as "Not Supported" with IR Category 5. Sources of impairment were recorded as "atmospheric deposition" and "source unknown." In some cases the Louisiana Department of Health and Hospitals (LDHH) placed a tributary to a named subsegment under an advisory, but not the entire named subsegment. In such cases, LDEQ reported the tributary in ADB using the subsegment number plus the Geographic Names Information System (GNIS) number for the tributary. This was done to numerically differentiate between the two water bodies. In some cases GNIS numbers were not available, requiring use of a placeholder number of -001 following the LDEQ subsegment number.
8. If Attachment A impairments were reported as generic "metals", "organics", "priority organics", "nonpriority organics", "nutrients", "toxics", etc., available water chemistry data was used to

determine if any of the potential chemicals in the generic group were present *and causing impairment* to a designated use. If none of the potential chemicals in a generic group were present or causing impairment, the listing was placed in IR Category 1. If insufficient data for the generic group was available to make an assessment, the suspected impairment or generic group was reported as IR Category 3. This IR category was used because there was insufficient data to make a determination of what specific impairment, if any, was present in the water body. Additional study will be conducted to determine what, if any, specific impairment is occurring as part of Louisiana's rotating ambient monitoring program. (Also, please see item 3 above.)

9. The assessment process for organics and inorganics, described above in the body of the text, was used when reviewing organics and inorganics data. While this data is not available on the LDEQ Website, anyone interested in viewing this documentation is asked to write LDEQ at the address found at the end of this rationale.
10. All impairments due to specific metals such as "mercury", "cadmium", "copper" and "lead" were listed as "source unknown" unless the impairment is due to a mercury advisory or a known industrial discharge is suspected of causing the impairment.
11. If a previous §303(d) list reported a generic category along with a specific category, i.e. "nutrients" along with "nitrogen" and or "phosphorus", then "nitrogen" or "phosphorus", respectively, was recorded in ADB, and "nutrients" was removed as a WIC. Whenever possible DO data, as described under "Nutrient Procedures", above, was used to make a quantitative determination regarding nutrient impairment.
12. Drought related sources of impairment, as determined by regional personnel, were recorded as Category 3 in ADB. In ADB the impairment question of "Pollutant?" was answered "NO". Drought related criteria exceedances for "sulfates", "chlorides", and "total dissolved solids" (TDS) do not require a TMDL to correct. ADB sources and IR comment noted drought as the source of impairment. This is consistent with the Louisiana water quality standards, which make exceptions for natural conditions.

LDEQ and EPA have determined to keep these WICs in Category 3 in order to determine if more normal natural conditions result in support of the appropriate criteria. Alternatively, revision of the criteria may be considered, if necessary, to more accurately assess the water body. A limited number of WICs listed for impairments suspected to be drought related could not be adequately supported with additional documentation. These WICs were placed in Category 5, but will continue to be investigated prior to development of a TMDL. If drought or other natural conditions are not found to be causing the impairment, a TMDL will be developed according to the Consent Decree schedule.
13. "Non-native aquatic plants", "noxious aquatic plants" and "exotic species" were reported as Category 4b in ADB and IR. All three historical references were standardized as "non-native aquatic plants" for the 2004 IR. The Louisiana Department of Wildlife and Fisheries (LDWF) has regulations and programs in place to address this problem. R.S. 56:10.1 established the Aquatic Plant Control Fund. Money from this fund is to be used by LDWF to fund the aquatic plant control program and to fund cooperative research and education between LDWF and the LSU Agricultural Center. Up to fifteen percent of the appropriation is to be used to fund research and education relative to aquatic weed control and eradication. Another Louisiana law directed at non-native aquatic plants is R.S. 56:323. This law includes provisions banning the importation of these plants without a permit from LDWF. Permits are issued only for purposes of research. Recently, the Louisiana legislature created the Nuisance Aquatics Task Force for Louisiana. This task force, which includes representation from LDEQ, is charged with developing a management plan aimed at reducing or eliminating the impact of all aquatic invasive species, both plants and animals.
14. "Oil and grease" was recorded as fully supporting, in the 2004 IR Category 1 Addendum unless specific visual inspections have shown oil and grease to be present and causing impairment of fish and wildlife propagation. All assessed water bodies in the Mermentau and Vermilion-Teche Basins previously identified for oil and grease problems have been inspected for the presence of oil and grease and found to be meeting the narrative Louisiana criteria for oil and grease. All assessed water bodies in Louisiana have been visually inspected for oil and grease as part of the rotating basins monitoring program. Results of these visual inspections are accounted for in the 2004 IR or the 2004 IR Category 1 Addendum.

15. Impairments reported by regional LDEQ staff as coming exclusively from “natural sources” or “natural conditions requiring a UAA” were recorded as IR Category 3. This was done in order to allow for more normal natural conditions to return, with the expectation that criteria will once again be fully supported. Alternatively, a use attainability analysis may be conducted to develop more appropriate site-specific criteria. The distinction between “natural sources” and “natural conditions requiring a UAA” are not clearly defined; therefore, additional investigation will be conducted to help determine the exact nature of the impairment and its sources.
16. If EPA completed a TMDL for a WIC *considered fully supported* by an LDEQ assessment, the impairment was not reported in ADB and was recorded in the 2004 Category 1 Addendum. LDEQ acknowledges that EPA has developed a TMDL, but considers EPA’s assessment and TMDL to be based on inappropriate information or data.
17. Water bodies previously listed for the impairments of salinity, TDS, chlorides, and/or sulfates, and either classified as estuarine in Louisiana’s ERC or clearly estuarine in nature (i.e. Pass Manchac and the Mississippi River Gulf Outlet) were changed to Category 1 (fully supported). This was done on the basis that estuarine water bodies, by nature, have high, and highly fluctuating levels of these parameters, making water quality assessment irrelevant. In addition, estuarine waters do not normally have chloride, sulfate, and TDS criteria (ERC 33:IX.1123); therefore, they should not be assessed and cannot be considered impaired for these parameters. Where these criteria do exist for estuarine waters normal assessment procedures were used.
18. For WICs classified as IR Category 4b (remediation or other control mechanisms in place) LDEQ, EPA, or both are working on enforcement, remediation, or other control mechanisms that have or are expected to result in full support of designated uses of the water body. Summary statements covering remediation activities for each of these water bodies are included in Part III, Chapter 7, Toxics and Non-toxics Related Concerns.

Overview of Significant Differences between Louisiana’s 2002 303(d) List And IR Category 5 of the 2004 Integrated Report

A summary of the numerical differences between the 2002 303(d) List and the 2004 303(d) List, as presented in Louisiana’s 2004 IR can be found in Table 3.2.3. IR Categories 1, 3, and 4a all showed net increases to varying degrees between the 2002 and 2004 cycles. The reason for this increase is generally due to inclusion of reporting information for the Mermentau, Vermilion-Teche, Calcasieu and Ouachita Basins. As has been noted, most water body subsegments in these four basins were not included for the 2002 IR cycle because they were not present on EPA’s Consent Decree 303(d) List, which was used as the starting point for the 2002 303(d) list and IR. Other changes, both additions and deletions from each category, were the result of additional data, new considerations in appropriate IR categorization, or completion of additional TMDLs. There were net decreases in categories 4b and 5, also due to a series of additions and deletions to these two categories. Category 4b decreased by 2 WICs, while Category 5 decreased by 17 WICs. Due to the complexity of the IR assessment process all changes cannot be summarized in the rationale. However, documentation of assessment factors for each WIC can be found in the 2004 IR, 2004 IR Addendum, or 2004 Category 1 Addendum spreadsheets.

Due to improvements in ADB reporting and query capabilities, all water body subsegments found in Louisiana’s Environmental Regulatory Code (ERC 33:IX.1123, Table 3) are now present on the IR or IR Addendum. This includes both impaired and fully supported water body subsegments. Also present are smaller water bodies included due to advisories or site-specific remediation activities. These are included only for the specific impairment noted, and were not assessed for other uses because they are not specifically defined for assessment purposes in Louisiana’s Environmental Regulatory Code (ERC 33:IX.1123, Table 3).

Table 3.2.2

Summary of differences between Louisiana's 2002 and 2004 Integrated Report category totals.

		IR Category 1 ¹	IR Category 2	IR Category 3 ²	IR Category 4a ²	IR Category 4b ²	IR Category 4c	IR Category 5 ² (§303(d) List)
Total number of water body/ impairment combinations in each IR Category	Final 2002 Integrated Report	849	0	155	95	60	0	443
	Draft 2004 Integrated Report	956	0	216	488	58	0	426

1. All Category 1, formerly suspected impairments, are in the Category 1 Addendum not in the IR itself. EPA's Assessment Database system (ADB) from which the IR is derived cannot track water body impairment combinations that have been delisted from earlier §303(d) cycles.
2. Most suspected impairments listed in these categories are present in the IR. However, some listings from previous §303(d) cycles had to be placed in the IR Addendum due to limitations of EPA's ADB system, because these impairments are not included in ADB.

Chapter 3: River and Stream Water Quality Assessment

Summary of River and Stream Water Quality Assessments

The figures reported in Table 3.3.1 are based upon the level of use support for all applicable designated uses, as determined through monitored assessments. The miles of impaired water bodies identified as being affected by various suspected causes of impairment are shown in Table 3.3.2. The miles affected by various suspected sources of impairment are shown in Table 3.3.3. Tables 3.3.2 and 3.3.3 refer only to those water bodies that were assessed as not supporting designated uses. The tables are not ranked by order of impact. Assessment results for all water body subsegments, as defined in ERC 33:IX.1123, Table 3, can be found in Appendices A, B, and C.

Table 3.3.1

Summary of designated use support for Louisiana rivers and streams, 2004 Integrated Report assessment. (Reported in miles (water body count)).

Designated Use	Size Fully Supporting	Size Not Supporting	Insufficient Data	Not Assessed	Total Size for Designated Use
Primary Contact Recreation	6,252 (227)	3,048 (102)	14 (3)	54 (8)	9,368 (340)
Secondary Contact Recreation	8,758 (309)	568 (28)	139 (6)	64 (9)	9,529 (352)
Fish and Wildlife Propagation	2,789 (95)	6,547 (248)	138 (5)	40 (6)	9,514 (354)
Drinking Water Source	870 (17)	441 (7)	0	0	1,311 (24)
Outstanding Natural Resource	1,115 (36)	417 (19)	8 (2)	47 (4)	1,587 (61)
Shellfish Propagation	182 (11)	234 (17)	131 (4)	0	547 (32)
Agriculture	2,007 (55)	0	0	34 (5)	2,041 (60)
Limited Aquatic Life/Wildlife	55 (2)	13 (1)	14 (2)	0	82 (5)

Suspected Causes of Non-Support of Designated Uses

Table 3.3.2

Total sizes of Louisiana rivers and streams not fully supporting designated uses due to various suspected causes of impairment, 2004 Integrated Report. (Reported in miles (water body count)).

Impairment (Cause) Name	Total Miles
1,1,1,2-Tetrachloroethane	12 (1)
1,1,2-Trichloroethane	7 (1)
1,2-Dichloroethane	15 (2)
Atrazine	103 (4)
Bromoform	12 (1)
Cadmium	48 (1)
Carbofuran	969 (24)
Chloride	650 (36)
Chlorine	6 (1)
Chloroform	7 (1)
Color	441 (7)
Copper	98 (2)
DDT	749 (6)
Dioxin (including 2,3,7,8-TCDD)	337 (4)
Fipronil	215 (5)
Hexachlorobenzene	12 (1)
Hexachlorobutadiene	12 (1)
Lead	383 (11)
Mercury	1,600 (68)
Methoxychlor	8 (1)
Methyl Parathion	43 (1)
Nitrate/Nitrite (Nitrite + Nitrate as N)	2,484 (75)
Nitrogen, ammonia (Total Ammonia)	220 (8)
Non-Native Aquatic Plants	498 (27)
Oil and Grease	34 (2)
Oxygen, Dissolved	4,143 (152)
pH	295 (16)
Phenols	8 (1)
Polychlorinated biphenyls	41 (3)
Polycyclic Aromatic Hydrocarbons (PAHs)	29 (2)
Sedimentation/Siltation	1,313 (39)
Sulfates	996 (40)
Taste and Odor	69 (3)
Temperature, water	23 (1)
Total Dissolved Solids	1,338 (58)
Total Fecal Coliform	3,265 (116)
Total Phosphorus	2,127 (71)
Total Suspended Solids (TSS)	2,067 (59)
Toxaphene	420 (2)
Turbidity	2,208 (64)

Suspected Sources of Non-Support of Designated Uses

Table 3.3.3

Total sizes of Louisiana rivers and streams not fully supporting designated uses due to various suspected sources of impairment, 2004 Integrated Report. (Reported in miles (water body count)).

Source Name	Total Miles
Atmospheric Deposition - Toxics	1,385 (61)
Channelization	250 (1)
Dairies (Outside Milk Parlor Areas)	66 (2)
Dam or Impoundment	103 (1)
Discharges from Municipal Separate Storm Sewer Systems (MS4)	148 (7)
Drainage/Filling/Loss of Wetlands	194 (5)
Drought-related Impacts	473 (27)
Flow Alterations from Water Diversions	211 (8)
Forced Drainage Pumping	71 (6)
Impacts from Hydrostructure Flow Regulation/modification	135 (3)
Industrial Point Source Discharge	484 (13)
Irrigated Crop Production	2,192 (59)
Managed Pasture Grazing	303 (11)
Marina/Boating Sanitary On-vessel Discharges	59 (4)
Mine Tailings	30 (1)
Municipal (Urbanized High Density Area)	156 (6)
Municipal Point Source Discharges	708 (31)
Natural Conditions - Water Quality Standards Use Attainability Analyses Needed	1,684 (74)
Natural Sources	635 (16)
Naturally Occurring Organic Acids	259 (14)
Non-irrigated Crop Production	1,834 (56)
On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	1,707 (63)
Package Plant or Other Permitted Small Flows Discharges	417 (24)
Petroleum/natural Gas Activities (Legacy)	118 (3)
Residential Districts	99 (4)
Sand/gravel/rock Mining or Quarries	59 (2)
Sanitary Sewer Overflows (Collection System Failures)	314 (13)
Sediment Resuspension (Clean Sediment)	21 (2)
Silviculture Harvesting	107 (3)
Silviculture Plantation Management	61 (3)
Site Clearance (Land Development or Redevelopment)	61 (5)
Source Unknown	3,947 (167)
Sources Outside State Jurisdiction or Borders	384 (6)
Streambank Modifications/destabilization	10 (1)
Total Retention Domestic Sewage Lagoons	86 (8)
Unpermitted Discharge (Domestic Wastes)	68 (1)
Upstream Source	382 (5)
Waterfowl	80 (3)
Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)	12 (1)
Wildlife Other than Waterfowl	564 (18)

Chapter 4: Lake Water Quality Assessment

Summary of Lake Water Quality Assessments

The figures reported in Table 3.4.1 are based upon the level of use support for all applicable designated uses, as determined through monitored assessments. The acres of impaired water bodies identified as being affected by various suspected causes of impairment are shown in Table 3.4.2. The acres affected by various suspected sources of impairment are shown in Table 3.4.3. Tables 3.4.2 and 3.4.3 refer only to those water bodies that were assessed as not supporting designated uses. The tables are not ranked by order of impact. Assessment results for all water body subsegments, as defined in ERC 33:IX.1123, Table 3, can be found in Appendices A, B, and C.

Table 3.4.1

Summary of designated use support for Louisiana lakes, 2004 *Integrated Report*. (Reported in acres (water body count)).

Designated Use	Size Fully Supporting	Size Not Supporting	Insufficient Data	Not Assessed	Total for Designated Use
Primary Contact Recreation	625,599 (54)	30,430 (7)	0	4,255 (4)	660,284 (65)
Secondary Contact Recreation	629,089 (59)	26,940 (2)	0	4,255 (4)	660,284 (65)
Fish and Wildlife Propagation	78,890 (17)	586,298 (48)	0	2,284 (3)	667,472 (68)
Drinking Water Supply	249,027 (9)	2,690(1)	0	0	251,717 (10)
Agriculture	425,672 (15)	0	0	326 (1)	425,998 (16)

Suspected Causes of Non-Support of Designated Uses

Table 3.4.2

Total sizes of Louisiana lakes not fully supporting designated uses due to various suspected causes of impairment, 2004 *Integrated Report*. (Reported in acres (water body count)).

Impairment (Cause) Name	Total Acres
Cadmium	24 (1)
Carbofuran	83,840 (1)
Chloride	132,839 (6)
Color	2,690 (1)
Copper	8,838 (1)
Hexachlorobenzene	24 (1)
Hexachlorobutadiene	24 (1)
Lead	18,987 (3)
Mercury	256,449 (15)
Nitrate/Nitrite (Nitrite + Nitrate as N)	126,032 (12)
Nitrogen, ammonia (Total Ammonia)	89,939 (2)
Non-Native Aquatic Plants	319,163 (16)
Oil and Grease	26,904 (2)
Oxygen, Dissolved	178,593 (22)
pH	28,166 (3)
Polychlorinated biphenyls	2,260 (3)
Sedimentation/Siltation	164,346 (6)
Sulfates	77,075 (5)
Temperature, water	2,250 (1)
Total Dissolved Solids	136,212 (8)
Total Fecal Coliform	28,180 (6)
Total Phosphorus	126,032 (12)
Total Suspended Solids (TSS)	156,343 (7)
Turbidity	189,824 (13)

Suspected Sources of Non-Support of Designated Uses

Table 3.4.3

Total sizes of Louisiana lakes not fully supporting designated uses due to various suspected sources of impairment, 2004 *Integrated Report*. (Reported in acres (water body count)).

Source Names	Total Acres
Atmospheric Deposition - Toxics	246,939 (12)
Contaminated Sediments	24 (1)
Discharges from Municipal Separate Storm Sewer Systems (MS4)	1,125 (2)
Drought-related Impacts	74,900 (4)
Forced Drainage Pumping	2,112 (1)
Impacts from Hydrostructure Flow Regulation/modification	27,981 (2)
Industrial Point Source Discharge	2,200 (2)
Industrial/Commercial Site Stormwater Discharge (Permitted)	84 (2)
Irrigated Crop Production	84,048 (2)
Managed Pasture Grazing	26,880 (1)
Natural Conditions - Water Quality Standards Use Attainability Analyses Needed	124,002 (14)
Natural Sources	20,614 (4)
Naturally Occurring Organic Acids	16,646 (2)
Non-irrigated Crop Production	101,460 (3)
On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	3,280 (3)
Package Plant or Other Permitted Small Flows Discharges	4,890 (3)
Petroleum/natural Gas Production Activities (Permitted)	26,880 (1)
Sanitary Sewer Overflows (Collection System Failures)	24 (1)
Source Unknown	410,166 (35)
Upstream Source	24 (1)
Waterfowl	27,840 (2)

Chapter 5: Estuary and Coastal Water Quality Assessment

Summary of Estuary and Coastal Water Quality Assessments

The figures reported in Table 3.5.1 are based upon the level of use support for all applicable designated uses, as determined through monitored assessments. The square miles of impaired water bodies identified as being affected by various suspected causes of impairment are shown in Table 3.5.2. The square miles affected by various suspected sources of impairment are shown in Table 3.5.3. Tables 3.5.2 and 3.5.3 refer only to those water bodies that were assessed as not supporting designated uses. The tables are not ranked by order of impact. Assessment results for all water body subsegments, as defined in ERC 33:IX.1123, Table 3, can be found in Appendices A, B, and C.

Table 3.5.1

Individual use support summary for Louisiana estuaries, 2004 Integrated Report. (Reported in square miles (water body count)).

Designated Use	Size Fully Supporting	Size Not Supporting	Insufficient Data	Not Assessed	Total for Designated Use
Primary Contact Recreation	4,104 (49)	759 (2)	91 (1)	0	4,954 (52)
Secondary Contact Recreation	4,754 (51)	0	200 (1)	0	4,954 (52)
Fish and Wildlife Propagation	3,049 (34)	1,905 (18)	0	0	4,954 (52)
Shellfish Propagation	3,305 (31)	963 (9)	0	0	4,268 (40)

Suspected Causes of Non-Support of Designated Uses

Table 3.5.2

Total sizes of Louisiana estuaries not fully supporting designated uses due to various suspected causes of impairment, 2004 Integrated Report. (Reported in square miles (water body count)).

Impairment (Cause) Name	Total Square Miles
Carbofuran	187 (1)
Mercury	1,657 (9)
Nitrate/Nitrite (Nitrite + Nitrate as N)	297 (5)
Nitrogen, ammonia (Total Ammonia)	6 (1)
Non-Native Aquatic Plants	91 (1)
Oil and Grease	5 (1)
Oxygen, Dissolved	299 (6)
Sedimentation/Siltation	193 (2)
Total Fecal Coliforms	1,613 (11)
Total Phosphorus	297 (5)
Total Suspended Solids (TSS)	193 (2)
Turbidity	624 (5)

Suspected Sources of Non-Support of Designated Uses

Table 3.5.3

Total sizes of Louisiana estuaries not fully supporting designated uses due to various suspected sources of impairment, 2004 *Integrated Report*. (Reported in square miles (water body count)).

Source Names	Total Square Miles
Atmospheric Deposition - Toxics	1,657 (9)
Discharges from Municipal Separate Storm Sewer Systems (MS4)	2 (1)
Irrigated Crop Production	193 (2)
Marina/Boating Sanitary On-vessel Discharges	55 (1)
Natural Conditions - Water Quality Standards Use Attainability Analyses Needed	2 (1)
Natural Sources	20 (1)
Non-irrigated Crop Production	193 (2)
On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	7 (1)
Package Plant or Other Permitted Small Flows Discharges	7 (1)
Sanitary Sewer Overflows (Collection System Failures)	561 (2)
Sediment Resuspension (Clean Sediment)	20 (1)
Source Unknown	2,179 (13)
Total Retention Domestic Sewage Lagoons	7 (1)
Upstream Source	44 (1)
Waterfowl	20 (1)
Wildlife Other than Waterfowl	56 (2)

Chapter 6: Wetlands Water Quality Assessment

Summary of Wetland Water Quality Assessments

The figures reported in Table 3.6.1 are based upon the level of use support for all applicable designated uses, as determined through monitored assessments. The acres of impaired water bodies identified as being affected by various suspected causes of impairment are shown in Table 3.6.2. The acres affected by various suspected sources of impairment are shown in Table 3.6.3. Tables 3.6.2 and 3.5.3 refer only to those water bodies that were assessed as not supporting designated uses. The tables are not ranked by order of impact. Assessment results for all water body subsegments, as defined in ERC 33:IX.1123, Table 3, can be found in Appendices A, B, and C.

Table 3.6.1

Individual use support summary for Louisiana wetlands, 2004 Integrated Report. (Reported in acres (water body count)).

Designated Use	Size Fully Supporting	Size Not Supporting	Insufficient Data	Not Assessed	Total for Designated Use
Primary Contact Recreation	1,025,280 (6)	0	0	0	1,025,280 (6)
Secondary Contact Recreation	1,032,320 (8)	0	0	3,968 (2)	1,036,288 (10)
Fish and Wildlife Propagation	543,360(4)	488,960 (4)	0	3,968 (2)	1,036,288 (10)
Drinking Water Supply	464,00 (1)	0	0	0	464,000 (1)

Suspected Causes of Non-Support of Designated Uses

Table 3.6.2

Total sizes of Louisiana wetlands not fully supporting designated uses due to various suspected causes of impairment, 2004 Integrated Report. (Reported in acres (water body count)).

Impairment (Cause) Name	Total Acres
Chloride	7,680 (1)
Mercury	394,880 (2)
Oxygen, Dissolved	282,240 (2)
Sulfates	7,680 (1)
Total Dissolved Solids	7,680 (1)

Suspected Sources of Non-Support of Designated Uses

Table 3.6.3

Total sizes of Louisiana wetlands not fully supporting designated uses due to various suspected sources of impairment, 2004 Integrated Report. (Reported in acres (water body count)).

Source Names	Total Acres
Atmospheric Deposition - Toxics	394,880 (2)
Drought-related Impacts	7,680 (1)
Natural Conditions - Water Quality Standards Use Attainability Analyses Needed	86,400 (1)
Non-irrigated Crop Production	282,240 (2)
Petroleum/natural Gas Production Activities (Permitted)	195,840 (1)
Source Unknown	394,880 (2)

Development of Wetland Water Quality Standards

LDEQ is in the process of developing a designated use category for wetlands. This designated use would carry with it specific water quality criteria to protect certain types of wetlands. Currently, before a site is classified as a wetland in the water quality standards, a study or Use Attainability Analysis (UAA) must be performed, and site-specific criteria developed to protect the specific wetland use.

In Louisiana there is also an interest in the use of natural wetland systems for wastewater management. Wetland systems may address one problem facing small south Louisiana communities – that of having to meet very stringent wastewater treatment levels in order to discharge into receiving streams already approaching their assimilative capacity. Many of these Louisiana communities are surrounded by subsiding wetlands. Wetland loss due to subsidence occurs when the water level rises faster than the rate at which sediment and organic matter are added to the soil. A wetland can be cut off from its natural source of sediment and nutrient-laden water with the construction of levees and spoil banks. Wetland vegetation that would normally trap sediment and add organic matter to the soil becomes less productive. In Louisiana this condition is compounded by the subsidence of the sediments relative to the rise of sea level. The discharge of treated sanitary wastewater into subsiding wetlands has the potential to counteract this type of wetland loss. This activity can provide stressed wetlands with increased loadings of nutrients. Addition of wastewater also provides an increase in wetland elevation through increased plant production. While the addition of sediments can also increase elevation, the sediment contribution from wastewater is minor since most of the suspended solids have already been removed.

Currently, discharges to wetlands are evaluated by LDEQ on a case-by-case, site-specific basis. Past projects are outlined in the 1996 and 2000 305(b) reports (available at <http://www.deq.state.la.us/planning/305b/>).

Integrity of Wetland Resources

Louisiana's wetland acreage has declined significantly since the beginning of the century. However, it has been difficult to accurately assess the historical wetland acreage and how much has been lost to date. Very few studies have been done on fresh water wetland loss, but nationwide freshwater wetlands have declined 4.8% between 1974 and 1983. One study estimates Louisiana's fresh and forested wetland losses during the ten-year period from the mid-1970s to mid-1980s at around 628,000 acres (Hefner et al., 1994). These losses are primarily related to wetland clearing and draining for agricultural production.

Considerably more data is available on Louisiana's coastal wetland loss. The factors causing wetland loss in coastal Louisiana are complex and both natural and anthropogenic. The coastal wetlands developed as a result of delta formation and channel switching of the Mississippi River, which deposited an abundant supply of fresh water, nutrients, and sediments in the shallow coastal waters. Extensive leveeing of the river for flood control has reduced this area of active delta building by cutting off the flow of water, nutrients,

and sediment to the delta wetlands and channeling the Mississippi River's flow directly into the Gulf of Mexico. The dredging of navigation and pipeline canals, as well as spoil disposal has caused further impact by interrupting flow patterns and accelerating saltwater intrusion. Draining and filling of coastal wetlands for urban, industrial, and agricultural development have also contributed to coastal wetland loss. Other factors contributing to the wetland loss include nutria herbivory, wind-induced shoreline erosion, high subsidence rates, excessive water on the marsh, and hurricane damage (LDNR, 2004).

From the available studies, it is clear that Louisiana's coastal wetland loss has been substantial. One study showed that coastal wetland loss increased from 14.6 square miles per year (9,000 ac/yr) prior to the late 1950s (using 1932 data as a bench mark) to an extreme peak value of about 42 square miles per year (27,000 ac/yr) by the mid-1970s (Dunbar et al., 1992). By 1990, annual loss had dropped to 25 square miles per year (16,000 ac/yr). The aggregate coastal land loss for the last 60 years has totaled nearly a million acres for an average loss rate of about 27 square miles per year (17,000 ac/yr). The present loss rate is 25 to 35 square miles per year (LDNR, 2004). The region encompassing the Breton Sound, Barataria, and Mississippi River Delta basins experiences the highest amount of land loss in the coastal region. The Atchafalaya basin is the only coastal basin showing a net wetland gain due to the delta building activity of the Atchafalaya River.

Despite these significant wetland losses, the Louisiana coastal plain remains the largest expanse of coastal wetlands in the contiguous United States. It comprises 25% and 69% of the fresh and salt marshes, respectively, found along the Gulf of Mexico, and 15% and 40% of these wetland types remaining in the contiguous United States. Because of this, the future of Louisiana's coastal wetlands, which support a billion-dollar annual seafood industry, is vitally important to the nation (LDNR, 2004).

Extent of Wetland Resources

Louisiana's wetlands are nationally and internationally recognized for both their extent and productivity. They support large renewable recreational and commercial uses as well as provide important storm and flood protection. In Louisiana wetlands comprise approximately 7.8 million acres. Data in Table 3.6.4 indicate that Louisiana contains approximately 6.4 million acres of fresh water wetlands. Areas of Louisiana estuarine wetlands add up to approximately 1.4 million acres. Together, these wetlands cover 28% of Louisiana's surface area (Hefner et al., 1994). By most estimates, this accounts for at least 25% of the nation's wetlands, and over 40% of the nation's salt marshes. The Louisiana Department of Wildlife and Fisheries (2000) reported Louisiana's coastal wetlands annually provide habitat for over 5 million wintering waterfowl (including endangered species) and supported an alligator harvest valued at approximately \$25 million and fur trapping that generated approximately \$1 million (LDWF, 2002).

Historically, Louisiana's wetland acreage was much higher but has been significantly reduced by floodplain clearing, draining and leveeing inland, and a combination of leveeing, canal dredging, saltwater intrusion, and natural processes in coastal areas. Inland wetlands consist primarily of cypress-tupelo gum swamp, freshwater marsh and deciduous bottomland hardwood forest. Inland wetlands are found in all inland water quality management basins and ecoregions from the Atchafalaya River Basin in south Louisiana to the upper Red and Ouachita River basins in north Louisiana. Coastal wetlands are distributed among all or part of 20 parishes and nine coastal basins from Calcasieu/Sabine to Pontchartrain.

Table 3.6.4

Acreege and percentage of Louisiana's wetlands, by wetland type.

Wetland Type	Acres	Percentage of Total
Forested Wetland	5,174,722	66.5%
Scrub Wetland	275,530	3.5%
Fresh Marsh	935,958	12%
Intermediate Marsh	344,714	4.4%
Brackish Marsh	690,826	8.9%
Saline Marsh	362,450	4.7%

Additional Wetland Protection Activities

The Louisiana Department of Natural Resources (LDNR) has published a comprehensive report on coastal restoration and management efforts in Louisiana. The *Coastal Restoration Division Annual Project Reviews: December 2003* (available at <http://www.savelawetlands.org/>) (LDNR 2003) provides the public with information about projects constructed to date as well as current and ongoing efforts to address Louisiana's coastal land loss problems.

The report documents 90% of the coastal wetland loss in the lower 48 states, an average rate of 25-35 square miles per year, occurs in Louisiana. To offset this dramatic wetland loss, a series of programs have been initiated. The Louisiana State and Local Coastal Resources Management Act (1978) resulted in the Louisiana Coastal Resources Program (1980). In 1989, the Louisiana Legislature passed Act 6 of the second extraordinary session and a subsequent constitutional amendment that created the Coastal Restoration Division within LDNR. Act 6 also established the Wetland Trust Fund that provides revenues from oil and gas activities to wetland restoration in Louisiana and the first Wetland Restoration Plan (1993) for the state of Louisiana. In 1990, the Coastal Wetlands Planning, Protection, and Restoration Act (called CWPPRA or the "Breux Act") was passed to contribute federal monies to state restoration activities. The Breux Act created partnerships between Louisiana and 5 federal agencies: U.S. Departments of Army, Agriculture, Commerce, and Interior and the U.S. EPA. The state of Louisiana and these federal partners worked together to create a comprehensive restoration plan which has recently been replaced by "Coast 2050" which is discussed later in this section. The Breux Act program includes project monitoring depending on the type and goals of each project. Also mandated by the Breux Act is a Coastal Wetlands Conservation Plan with the goal of no net loss of coastal wetlands from developmental activities. The plan also provides a supplement to the federal Wetland Reserve Program, encouraging farmers to convert farmland back into wetlands. Other state funded and Breux Act-funded programs have been created focusing on specific components of Louisiana's wetland loss problem.

In 1997 a planning effort was initiated to combine elements of the previous initiatives called "Coast 2050." Coast 2050 combined the efforts of private citizens, local governments, state and federal agencies, and the scientific community to modify the 1993 Restoration Plan and align programs toward a common goal of sustainability for wetlands in Louisiana. More than 270 projects have been implemented throughout coastal Louisiana, and they are making a difference. These projects are reducing coastal erosion, providing improved habitat for coastal fisheries and wildlife species, and in some cases are actually building new wetlands. The Coast 2050 projects are summarized in the *Coastal Restoration Division Annual Project Reviews: December 2003* (LDNR, 2003) for each of the four regions. They include utilizing hydrologic restoration, beneficial use of dredge material, shoreline protection, freshwater diversions, Christmas tree fences, and vegetation and sediment fences.

Chapter 7: Public Health/Aquatic Life Concerns

Fishing and Swimming Advisories Currently in Effect

The LDEQ currently issues fish consumption and swimming advisories in conjunction with the Louisiana Department of Health and Hospitals (LDHH). Fish consumption advisories are set using a risk assessment based method that establishes consumption levels designed to prevent adverse effects on public health. Risk assessments are used to determine safe consumption levels for different segments of the population. For example, children and pregnant or breastfeeding women are often considered separately in developing risk assessments because this population is generally considered to be at greater risk from consumption of contaminated seafood. Therefore, limited consumption advisories will often be stricter for this population.

Swimming advisories are generally established due to fecal coliform contamination of a water body. However, a limited number of swimming advisories have been based on chemical contamination of water or sediments. Fecal coliform contamination of a water body can be caused by a number of possible sources including absent or inadequate sewage systems, poorly maintained septic tanks, direct sewage discharges from camps, and pasture and animal holding area runoff. Efforts are being made to correct these problems statewide, particularly in the Tangipahoa River basin. Table 3.7.1 provides a complete listing of fishing and swimming advisories currently in effect. Fishing and swimming advisory information was correct at the time of report preparation in March 2004. For the latest information on advisories, please contact the Department of Environmental Quality, Environmental Planning Division at (225) 219-3590. You can also refer to LDEQ's website <http://www.deq.state.la.us/surveillance/mercury/fishadvi.htm>.

Table 3.7.1

Louisiana's Fish Consumption and Swimming Advisories, as of March 2004.

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Organic Compound Related Advisories					
Calcasieu River, Estuary to Gulf of Mexico (Calcasieu and Cameron)	Hexachlorobenzene, Hexachloro-1,3- butadiene, PCBs	Informational advisory fish contamination	Caution advised on fish consumption due to low levels of chemical contamination.	37.0 miles	04/07/92 reviewed 10/94 and 1995
Bayou d'Inde (Calcasieu)	Hexachlorobenzene, Hexachloro-1,3- butadiene, PCBs	Advisory fish consumption, advisory swimming	Limit fish and seafood consumption to TWO MEALS PER MONTH. Avoid swimming and sediment contact	6.0 miles	04/07/92 reviewed 10/94 and 1995
Bayou Olsen at Lake Charles (Calcasieu)	Priority organics	Advisory sediment contamination	Avoid swimming and sediment contact.	0.5 mile	01/17/89 reviewed 10/94
Bayou Bonfouca (St. Tammany)	Priority organics (creosote)	Advisory swimming	Avoid swimming or sediment contact	7.0 miles	11/24/87 revised 12/10/98
Devil's Swamp, Devil's Swamp Lake, and Bayou Baton Rouge (East Baton Rouge)	Hexachlorobenzene, Hexachloro-1,3- butadiene, PCBs, lead, mercury, arsenic	Advisory fish consumption, advisory swimming	Avoid swimming, limit fish consumption to TWO MEALS PER MONTH.	7.0 sq. miles	07/09/93
Capitol Lake (East Baton Rouge)	Priority organics (PCBs)	Advisory fish consumption, sediment contamination	No fish consumption.	0.12 sq. mile	08/24/83
Wham Brake (Morehouse)	Dioxin	Advisory fish consumption	No fish consumption.	7.2 sq. miles	11/23/87 reviewed 3/94, 11/96, and 11/01

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Sibley Lake (Natchitoches)	Priority organics (PCBs)	Advisory fish consumption	No consumption of gar, shad, carp. Skin and trim fat from other fish. Broil, grill or bake fish. Do not fry fish. Within any one month period consumption should be limited to ONLY one of the following: One meal/week of largemouth bass or crappie. OR one meal/month of channel catfish, striped bass.	3.4 sq. miles	02/16/89 revised 01/31/96
Tensas River (Madison, Tensas, Catahoula)	DDT, Toxaphene	Advisory fish consumption	Long-term fish consumption may cause health risk.	83 miles	02/19/92
Bayou Lafourche: from Hwy. 80 overpass to I-20 (Ouachita)	Dioxin	Advisory fish consumption	Limit consumption to TWO MEALS PER MONTH for all species.	2 miles	Revised 11/96, Reviewed 11/01
Mercury Related Advisories					
Gulf of Mexico off Louisiana Coast (Parish not applicable)	Mercury	Advisory fish consumption	For king mackerel 39 inches or less in total length: Pregnant/breast-feeding women and children less than 7 years of age should eat no more than ONE MEAL PER MONTH. 1 Non-pregnant women, men, and children 7 years of age and older should limit consumption to TWO MEALS PER MONTH. For king mackerel greater than 39 inches in total length: No consumption for all individuals. There is no consumption limit on other species of fish.	1,191 sq. miles	9/4/97
Bayou DeSiard from headwaters to confluence with Ouachita River (Ouachita)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of all other species combined from the advisory area. Other adults and children seven years of age and older SHOULD NOT CONSUME BOWFIN and should consume no more than FOUR MEALS PER MONTH of all other species combined from the advisory area.	Not determined	5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Lake Louis (Lovelace Lake) and Bayou Louis Includes Lake Louis (Lovelace Lake) and Bayou Louis from its headwaters to its confluence with the Ouachita River (Catahoula)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of all other species combined from the advisory area. Other adults and children over seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than FOUR MEALS PER MONTH of all other species combined from the advisory area. Please see general statement above.	Not determined	5/29/03
Big Alabama Bayou Includes Big Alabama Bayou from boat landing at Hwy 975 to southern end near the Atchafalaya River Pilot Channel (Point Coupee, Iberville, St. Martin)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of any species combined from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of catfish species and no more than FOUR MEALS PER MONTH of other species combined from the advisory area. Please see general statement above.	Not determined	5/29/03
Black Bayou Lake (Ouachita)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN from the advisory area. Other adults and children seven years of age and older should consume no more than ONE MEAL PER MONTH of bowfin from the advisory area. Please see general statement above.	Not determined	5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Boeuf River from confluence with Lake Lafourche to confluence with Ouachita River (Franklin, Richland, Catahoula)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of all other species combined from the advisory area. Other adults and children seven years of age and older SHOULD NOT CONSUME BOWFIN and should consume no more than FOUR MEALS PER MONTH of all other species combined from the advisory area. Please see general statement above.	Not determined	5/29/03
Bogue Falaya and Tchefuncte Rivers Includes Bogue Falaya River from headwaters to confluence with Tchefuncte River, and Tchefuncte River from headwaters to Lake Pontchartrain. All oxbow lakes associated with these sections of the Bogue Falaya and Tchefuncte Rivers are included in this advisory. (Washington, St. Tammany, Tangipahoa)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME largemouth bass and crappie and should consume no more than ONE MEAL PER MONTH of freshwater drum, spotted bass, or catfish combined from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of largemouth bass and crappie and no more than FOUR MEALS PER MONTH of freshwater drum, spotted bass, or catfish combined from the advisory area. Please see general statement above.	Not determined	5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Corney Lake (Claiborne)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of largemouth bass or bowfin combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of largemouth bass or bowfin combined from the advisory area. Please see general statement above.	1,920 acres	5/29/03
Grand Bayou Reservoir Includes only Grand Bayou Reservoir. (Red River)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of largemouth bass. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of largemouth bass or bowfin combined from the advisory area. Please see general statement above.	Not determined	5/29/03
Kepler Creek Lake (Bienville)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN from the advisory area. Other adults and children seven years of age and older should consume no more than ONE MEAL PER MONTH of bowfin from the advisory area. Please see general statement above.	1,926 acres	5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Tangipahoa River from state line to Lake Pontchartrain (Tangipahoa)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of largemouth bass, spotted bass, flathead catfish, freshwater drum, or bowfin combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of largemouth bass, spotted bass, flathead catfish, freshwater drum, or bowfin from the advisory area. Please see general statement above.	79 miles	5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
<p>Catahoula Lake, Little River, Old River, Black River, Saline Lake, Larto Lake (Saline/Larto Complex), Shad Lake and Associated Water Bodies.</p> <p>Includes all water bodies mentioned in advisory within the parishes of Avoyelles, Catahoula, Concordia, Grant, Lasalle, and Rapides, including the following associated streams and their tributaries: Big Bushley Creek; Big Creek; Big Saline Bayou; Brushley Bayou; Bushley Creek; Catahoula Lake Diversion Canal; Cross Bayou; Muddy Bayou; Open Bayou; Saline Bayou (Avoyelles, Catahoula, Concordia, Grant, Lasalle, Rapides)</p>	Mercury	Advisory fish consumption	<p>Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME largemouth bass, white bass, freshwater drum, flathead catfish, or bowfin and should consume no more than TWO MEALS PER MONTH of white crappie from the advisory area.</p> <p>Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of largemouth bass, white bass, freshwater drum, flathead catfish, or bowfin and no more than FOUR MEALS PER MONTH of white crappie from the advisory area.</p> <p>Please see general statement above.</p>	Not determined	<p>5/29/03</p> <p>This advisory supersedes a previous advisory issued for Catahoula Lake and the Little River by the state on November 20, 2000</p>

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Bayou Bartholomew from state line to confluence with Ouachita River (Morehouse)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of all other species combined from the advisory area. Other adults and children seven years of age and older SHOULD NOT CONSUME BOWFIN and should consume no more than FOUR MEALS PER MONTH of all other species combined from the advisory area. Please see general statement above.	Not determined	Issued: 1/21/1999 Revised: 5/29/03
Bayou De Loutre and Associated Lakes from Hwy. 33 to Ouachita River, including Phillips Lake, Hatley Lake, and Hudson Lake (Union)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME ANY SPECIES from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of all species of fish combined from the advisory area. Please see general statement above.	Not determined	Issued: 11/20/2000 Revised: 5/29/03
Bayou des Cannes Origin near Ville Platte to Mermentau River (Evangeline)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of bowfin, black crappie, or freshwater drum combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of bowfin, black crappie, or freshwater drum combined from the advisory area. Please see general statement above.	54 miles	Issued: 10/97 Revised: 5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Bayou Liberty Origin to Lake Pontchartrain (St. Tammany)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of largemouth bass, crappie, freshwater drum, or redear sunfish combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of largemouth bass, crappie, freshwater drum, or redear sunfish combined from the advisory area. Please see general statement above.	10 miles	Issued: 2/97 Revised: 5/29/03
Bayou Plaquemine Brule Origin near Opelousas to Mermentau River (St. Landry, Acadia)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME bowfin and should consume no more than ONE MEAL PER MONTH of largemouth bass, crappie, or freshwater drum combined from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of bowfin and no more than FOUR MEALS PER MONTH OF largemouth bass, crappie, or freshwater drum combined from the advisory area. Please see general statement above.	40 miles	Issued: 10/96 Revised: 5/29/03
Black Lake (Red River, Natchitoches)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of largemouth bass, white bass, crappie, or freshwater drum combined from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of bowfin and no more than FOUR MEALS PER MONTH of largemouth bass, white bass, crappie, or freshwater drum combined from the advisory area. Please see general statement above.	8 square miles	Issued: 10/96 Revised: 5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Blind River Origin to Lake Maurepas (St. John the Baptist, St. James)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of bowfin from the advisory area. Other adults and children seven years of age or older should consume no more than FOUR MEALS PER MONTH of bowfin from the advisory area. Please see general statement above.	25 miles	Issued: 04/27/98 Revised: 5/29/03
Bogue Chitto River from state line to Pearl River Navigation Canal (Washington, St. Tammany)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of bass (all species) or bowfin combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of bass (all species) or bowfin combined from the advisory area. Please see general statement above.	35 miles	Issued: 8/96 Revised: 5/29/03
Chicot Lake (Evangeline)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of largemouth bass from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of bowfin and no more than FOUR MEALS PER MONTH of largemouth bass from the advisory area. Please see general statement above.	2.54 square miles	Issued: 5/27/97 Revised: 5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Henderson Lake Area Includes Henderson Lake, Lake Bigeux, and all waters within the area bounded on the north by the St. Landry-St. Martin Parish Line, on the east by the West Atchafalaya River levee (Hwy. 3177), on the south by Hwy. 3177 and on the west by the West Atchafalaya Basin levee. (St. Martin)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of largemouth bass, crappie, or freshwater drum combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of largemouth bass, crappie, or freshwater drum combined from the advisory area. Please see general statement above.	37.8 square miles	Issued: 03/04/96 Revised: 5/29/03
Ivan Lake (Bossier)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of largemouth bass from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of bowfin and no more than FOUR MEALS PER MONTH of largemouth bass from the advisory area. Please see general statement above.	369 acres	Issued: 11/20/00 Revised: 5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Lake Vernon (Vernon)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of largemouth bass, flathead catfish, redear or bluegill sunfish combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of largemouth bass, flathead catfish, redear or bluegill sunfish combined from the advisory area. Please see general statement above.	4,224 acres	Issued: 8/5/97 Revised: 5/29/03
Ouachita River Includes Ouachita River from State line to confluence of Tensas River; including any lakes that are inside the levee system or within the Ouachita River floodplain. (Morehouse, Ouachita, Union, Catahoula, and Caldwell)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of all other species combined from the advisory area. Other adults and children seven years of age and older SHOULD NOT CONSUME BOWFIN and should consume no more than FOUR MEALS PER MONTH of all other species combined from the advisory area. Please see general statement above.	Not determined	Issued: 07/29/92 Reviewed: 8/94 Revised: 5/29/03
Pearl River Includes entire Pearl River and associated swamp basin. (Washington, St. Tammany)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of bass (all species), bigmouth buffalo, or freshwater drum combined from the advisory area. Other adults and children seven years of age and older SHOULD NOT CONSUME BOWFIN and should consume no more than FOUR MEALS PER MONTH of bass (all species), bigmouth buffalo, or freshwater drum combined from the advisory area. Please see general statement above.	57 miles	Issued: 3/1/97 Revised: 5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
Seventh Ward Canal Only includes Seventh Ward Canal southwest of Abbeville. (Vermilion)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of flathead catfish, whit crappie, freshwater drum or bowfin combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEALS PER MONTH of flathead catfish, white crappie, freshwater drum or bowfin combined from the advisory area. Please see general statement above.	11.5 miles	Issued: 6/25/97 Revised: 05/29/03
Toledo Bend Reservoir Includes the entire Louisiana side of Toledo Bend Reservoir. (Sabine, De Soto)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN and should consume no more than ONE MEAL PER MONTH of largemouth bass or freshwater drum combined from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of bowfin and no more than FOUR MEALS PER MONTH of largemouth bass or freshwater drum combined from the advisory area. Please see general statement above.	Not determined	Issued: 11/17/97 Revised: 7/19/01 Revised: 5/29/03
Tickfaw River Drainage Basin Includes: Tickfaw River from State line to Lake Maurepas; Natalbany River; Blood River; Lizard Creek; and Ponchatoula Creek. (Livingston, Tangipahoa, and St. Helena)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of freshwater drum, largemouth bass, bowfin, or white crappie combined from the advisory area. Other adults and children seven years of age and older should consume no more than FOUR MEASL PER MONTH of freshwater drum, largemouth bass, bowfin, or white crappie combined from the advisory area. Please see general statement above.	Not determined	Issued: 7/8/02 Revised: 5/29/03

Water Body Name (Parish)	Cause of Advisory	Advisory Type	Recommendations	Water Body Size	Date Established or Revised
West Fork Calcasieu River Includes: West Fork Calcasieu River from junction of Hickory Creek and Beckwith Creek to confluence with Calcasieu River. (Calcasieu)	Mercury	Advisory fish consumption	Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME LARGEMOUTH BASS, FRESHWATER DRUM, OR BOWFIN from the advisory area. Other adults and children seven years of age and older should consume no more than TWO MEALS PER MONTH of largemouth bass, freshwater drum, or bowfin combined from the advisory area. Please see general statement above.	16.5 miles	Issued: 11/20/00 Revised: 5/29/03
Swimming Advisories Based on Fecal Coliforms					
Tchefuncte River	Fecal Coliforms	Swimming Advisory	Avoid swimming and other water related activities with a high level of water contact (primary contact recreation).	18 miles	02/04/91
Bogue Falaya	Fecal Coliforms	Swimming Advisory	Avoid swimming and other water related activities with a high level of water contact (primary contact recreation).	12 miles	02/04/91
Lake Pontchartrain	Fecal Coliforms	Swimming Advisory	Avoid swimming and other water related activities with a high level of water contact (primary contact recreation).	South shore beaches	06/01/85
Tangipahoa River	Fecal Coliforms	Swimming Advisory	Avoid swimming and other water related activities with a high level of water contact (primary contact recreation), as well as activities with a limited level of water contact such as boating and fishing (secondary contact recreation).	79 miles	03/22/88

Molluscan Shellfish Restrictions/Closures Currently In Effect

Within the Louisiana Department of Health and Hospitals, Office of Public Health (LDHH, OPH), the Molluscan Shellfish Program is responsible for establishing and maintaining a classification system that determines the suitability of molluscan shellfish growing areas for harvest and human consumption. The National Shellfish Sanitation Program (NSSP) establishes the criteria.

To provide for the classification of all actual or potential molluscan shellfish growing areas, the basic division of these areas as used by LDHH have been divided into 28 sub-areas, plus two conditionally approved river stage managed areas located in Calcasieu Lake/Cameron Parish. For the last ten years the seasonal and conditional management classification lines have been fairly stable, with minor seasonal fluctuations. Presently, all growing areas in the Atchafalaya, Mermentau, Mississippi Delta, Pearl and Sabine Basins have been classified prohibited for the harvest of molluscan shellfish. Classifications of Molluscan Shellfish Waters are issued by LDHH, OPH on a seasonal basis: November through February, March through April, May through August, and September through October. Maps showing the closed areas are made publicly available for each season. Molluscan shellfish cannot be harvested from such areas for any purposes. Areas may be classified as prohibited based on either actual bacteriological data analysis or the potential for a pollution source to affect the harvest area. Also, the state Health Officer has established a 150 foot closure area around all man-made habitable structures that have a waste discharge. The harvest of shellfish is not allowed from these waters for any purposes.

LDHH, OPH has also classified some waters as restricted. Molluscan shellfish within waters which are classified as restricted may be used only for relay or transplant purposes and are not allowed to be used for direct market harvest. Special permits must be obtained prior to conducting relay or transplant operations. The necessary permits may be obtained from the OPH Commercial Sanitary Seafood Program.

Incidence of Waterborne Illnesses

Physicians are required by state law to report to the parish health unit any confirmed or suspected cases of reportable disease that he or she is attending or has examined. In addition, all other health care professionals are now required to report confirmed cases of reportable diseases to their local health units. The reportable disease list includes illnesses that are caused by waterborne bacteria and viruses. In 2002, six cases of *Giardia lamblia* and ten cases of *Cryptosporidium* were reported to the Infectious Disease Epidemiology Section, Office of Public Health. In 2003, fourteen cases of *Giardia lamblia* and five cases of *Cryptosporidium* were reported.

Water Body Case Histories

Bayou Trepagnier, Subsegment 041202

Bayou Trepagnier is located in the Lake Pontchartrain Basin in southeastern Louisiana, near Norco in St. Charles Parish. The bayou has an overall length of approximately 3.5 miles and flows in a northeast direction through a tidally influenced cypress-tupelo gum, freshwater swamp to join Bayou Labranche. Bayou Labranche then continues through freshwater marshlands into Lake Pontchartrain. Since 1973, Bayou Trepagnier has been a designated "natural and scenic stream" under the State's Natural and Scenic Rivers System. In 1984, in accordance with the Louisiana Water Quality Standards, the water uses of Bayou Trepagnier were designated as primary contact recreation, secondary contact recreation, fish and wildlife propagation, and as outstanding natural resource water.

Through the years, the hydrology of the Bayou Trepagnier - Bayou Labranche system has been altered by anthropogenic activities. During construction of the Bonnet Carré Spillway from 1929 to 1931 by the U.S. Army Corps of Engineers, a segment of Bayou Trepagnier was filled in and all flow was stopped. Flow was diverted to the east through the Airline Highway (U.S. Hwy. 61) Canal to Bayou Labranche and thence to Lake Pontchartrain. During the 20-year period from 1931 to 1951 there was little or no flow in Bayou Trepagnier. From 1951 to 1966 Bayou Trepagnier received municipal and industrial storm water and

wastewater from the town of Norco and nearby industries. Since 1966 the only substantial source of dry weather flow has been the treated wastewater and storm water from Shell Oil Company's Norco Refinery, located at the headwaters of the bayou. Average flow from the facility to Bayou Trepagnier was approximately 15 million gallons per day. The bayou also received some flow from the surrounding wetlands during rainfall events.

LDEQ conducted a survey on Bayou Trepagnier in July 1985 after receiving a report concerning the presence of odorous black sludge deposits on the bayou bottom. Preliminary analytical results of sediment samples collected during the survey indicated relatively high concentrations of oil and grease, chromium, and lead. Strong to slight sulfide odors was noted during sediment sampling. Further monitoring and additional sampling were conducted from May 1986 to March 1987.

In 1989, results of a survey of water and sediment samples showed very low dissolved oxygen concentrations and the presence of zinc and chromium. Levels of these metals were not high, but did demonstrate a tendency to have a lower concentration further downstream. Analysis for volatile organic compounds indicated the presence of very low levels of chloroethane, methylene chloride, and toluene.

Sediment core samples were analyzed and the results showed the presence of elevated levels of chromium, zinc, lead, oil and grease when compared to sediments from the Mississippi River and Bayou LaBranche. The sediment samples showed that chromium and zinc concentrations were higher upstream than downstream. Metals concentrations decreased with distance from Shell's Norco Refinery outfall, while increasing with depth from the surface. Oil and grease concentrations showed similar patterns, with higher concentrations at upstream stations and in deeper layers of the cores. These results indicated that there was a correlation between contaminant concentration and distance from the refinery discharge. It also indicated that the heaviest contamination occurred prior to 1980.

Biological assessments of Bayou Trepagnier conducted by LDEQ included macroinvertebrate and fisheries surveys; ambient water, sediment and effluent toxicity tests; and fish tissue analyses. Results of these assessments were all indicative of a pollution problem within Bayou Trepagnier and again showed that the greatest impact occurs at upstream stations closer to the refinery discharge.

Following completion of the Bayou Trepagnier study, LDEQ met with representatives of Shell Oil Company's Norco Refinery and other state agencies to discuss findings of the study and issues involved in remediation of the bayou. In April 1991, Shell submitted to LDEQ, under order, a report entitled *Remedial Investigation of Bayou Trepagnier* (RI). The objective of this investigation was to further document the extent of contamination in and around Bayou Trepagnier. After LDEQ's approval of the RI in July 1993, Shell submitted a work plan entitled *Feasibility Study on Bayou Trepagnier* to study the alternatives for remediation. In October 1993, the Work Plan for the Feasibility Study was approved for Bayou Trepagnier and Shell rerouted its process wastewater discharge to the Mississippi River. Currently, LDEQ's Inactive and Abandoned Sites Division is supervising a Feasibility Study to determine what the best plan of action for the remediation of Bayou Trepagnier will be. The remediation plan has been revised several times as of late but it is probable that the plan currently proposed is close to what they will follow. According to LDEQ's Remediation Group, the next step is for remediation to review the work plan before giving concurrence. The remediation project is expected to begin early spring 2005.

A hurricane protection levee is being constructed in the area by the U.S. Corps of Engineers. The project is designed to provide hurricane storm surge protection to St. Charles Parish. The Corps first constructed a haul road bridge over the spoils bank for access, and sand for the base of the levee has been laid up to the banks of Bayou Trepagnier. When completed, the levee will bisect the bayou just north of U.S. Highway 61 near its headwaters; however, drainage structures will be provided for Bayou Trepagnier and the nearby Engineers Canal. It is hoped that locating the levee at this point will provide for both hurricane protection and preservation of the marshes and swamps downstream to Lake Pontchartrain. LDEQ will continue to coordinate with Shell and other agencies involved so that all potential benefits and impacts to both Bayou Trepagnier and the adjacent wetland will be considered.

Old Inger

The Old Inger site is located between U.S. Highway 75 and the Mississippi River in Ascension Parish, midway between Baton Rouge and New Orleans. In 1967, the Old Inger site began operations as an oil refinery and by 1976 the site was obtained by Old Inger Oil Refinery for use as an oil reclamation plant for refinery waste. Waste oil was brought to the site by barge and truck. A large spill occurred in 1978 and the site was sold. Shortly thereafter in 1980 the site was abandoned. Between April 1983 and August 1988, five emergency removal actions were conducted to stabilize the site. These actions included: site security, migration control, excavation and containment of consolidated soils, sampling and analysis. The site was on hold while resolving land ban issues with U.S. EPA Headquarters.

On October 29, 1987, U.S. EPA headquarters submitted an approval with revisions to the original design. LDEQ was awarded a Cooperative Agreement in June 1988 for the addition of a liner, expanded ground water study, and associated engineering. Additional remedial action (RA) funds were awarded to LDEQ on September 29, 1989 for construction of the land treatment bioremediation unit. This first phase, Phase IV-A, started in 1990 and was completed in 1992. Supplemental ground water study began March 1990 under an Interagency Agreement Grant (IAG) with the U.S. Corps of Engineers (USACE). The U.S. EPA met with the state in February 1997 to expedite the schedule for proceeding with contract bids an implementation of the soils remedy (Second Phase or Phase IV-B and IV-C). The remedy includes on-site land treatment of heavily contaminated soils and sludge. On May 6, 1998, LDEQ faxed a Notice to Proceed to OHM Remediation Services, to act as the Waste Application Contractor. On May 7, 1998, LDEQ faxed a letter tentatively awarding Rust Environment & Infrastructure the new engineering oversight contract. Mobilization and start-up of remedial action (Phase IV-B and IV-C) started in fall 1998. This included setting up equipment, air monitoring, excavation, screening of soils, and removal of tanks. Application of the first layer or lift of contaminated soils to the bioremediation or Land Treatment Unit (LTU) started in December 1998. Soil mixing, tilling and operational activities also started on the LTU in December 1998. August 18, 1999, fifty-eight thousand tons of soils were excavated and screened or processed through the Trommel screen system.

As of March 2000, the majority of the excavated soils were treated on the LTU. Dismantling and removal of the on-site water treatment plant was completed in 2002. This unit was designed to handle surface runoff water and leachate collected under the LTU. After bioremediation of the oil, oil contaminated water, oily sludge, and oil contaminated soil has been treated and the area has been covered with 2 feet of clean clay and 6 inches of topsoil. Microorganisms that are naturally present in the environment have cleaned up the oil, oily water, sludge, and contaminated soil. The treatment goals of less than 0.5% total petroleum hydrocarbon and risk based criteria for carcinogenic polycyclic hydrocarbon compounds have all been achieved. The treated soil has been used to fill all of the excavations. The site has been covered with clean clay and topsoil and a good stand of vegetation has been produced. Remedial activities under Phase VI-B and VI-C were completed in October 2001. Other environmental risks consist of contaminated ground water to a depth of 40 feet, and soils contaminated to a depth of +6 feet by organic chemicals.

Devil's Swamp Lake, Subsegment 070203

The Petro Processors, Inc. site consists of two locations near Scotlandville, East Baton Rouge Parish, Louisiana, about ten miles north of the city of Baton Rouge. The Petro Processors sites comprise two former petrochemical disposal areas situated about 1.5 miles apart: the Scenic Highway and Brooklawn areas totaling 77 acres. The Scenic Highway location is just west of US Highway 61 and north of the intersection of Scenic Highway 964 and U.S. Highway 61. The Brooklawn location is west, southwest of the Scenic Highway location. Adjacent to the Brooklawn location are portions of Devil's Swamp and Bayou Baton Rouge. Devil's Swamp Lake, a man-made lake excavated from Devil's Swamp in 1973, has an approximate surface area of 24 acres. The lake is surrounded by low-lying bottomlands and receives drainage from the adjacent swamp. It also receives discharges and storm water runoff from a hazardous waste facility and some industrial facilities. The lake also receives floodwater from the Mississippi River during high flow periods. Baton Rouge Bayou drains through Devil's Swamp and flows into the Mississippi River just above the Baton Rouge Harbor Canal.

Since 1980, repeated water, sediment and fish tissue sampling have demonstrated the presence of organic compounds, including PCBs, in Devil's Swamp, Devil's Swamp Lake and tributaries to the system. Testing in March 1986 confirmed the presence of PCBs in lake sediments and the Rollins effluent channel. Following these analyses, both LDEQ and LDHH tested for toxic substance residues in edible tissues of fish samples collected from the lake. The tissue analyses revealed PCB concentrations below the FDA action level. However, concentrations of HCB and HCBd were found at levels considered potentially health threatening from the standpoint of long-term chronic exposure. In addition, hazardous levels of lead, mercury and arsenic were present. Following review of these analytical results, the state epidemiologist recommended a swimming and fish consumption advisory be issued for Devil's Swamp Lake. The advisory was issued in October 1987, revised in July 1993, and remains in effect.

LDEQ's Inactive and Abandoned Sites Division, advising the public of chemical contamination associated with the abandoned Petro Processors hazardous waste disposal facility, had previously posted a major portion of Devil's Swamp north of the lake. This site was determined to be the source of the HCB and HCBd found in the sediment and fish tissue samples. A cleanup plan was established for the Petro Processors site under a settlement agreement between U.S. EPA, the state and several industries identified as having disposed of waste at the site. The Petro Processors site preparation and earthwork began in October 1989. The site has now been capped and the major source of discharge to surface water has been curtailed. Waste will be pumped from wells and then incinerated at various commercial facilities located in the United States. In the near future, it is probable that waste pumped from the site will be incinerated onsite. Contaminated ground water will be collected and, after contaminants have been removed, discharged to the Mississippi River in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. The responsible parties are currently redesigning the pump and treatment system in response to U.S. EPA and to meet new wastewater standards. To date, a system of drains known as a recovery system has been installed onsite in the area known as Cypress Swamp.

In July 1991, LDEQ's Inactive and Abandoned Sites Division, Remediation Section completed all required work on the sampling program. DEQ was conducting investigations of Devil's Swamp to determine if the site was a potential candidate for the Superfund National Priorities List. However, in July 1991 LDEQ decided to turn over the Devil's Swamp project to U.S. EPA, Region 6 because of unresolved legal complications and the inability to complete the project by the end of 1991.

In June 1993, LDHH and LDEQ issued a revised health advisory for the Devil's Swamp and Bayou Baton Rouge areas. The area of concern is bounded on the north by Hall Buck Marina Road, on the east by the bluffs and the Baton Rouge Barge Harbor and on the south and west by the Mississippi River. This advisory modified a previous advisory in response to more recent sampling and analysis of water and sediment from south of the Petro Processors site. The new analysis indicated that the concentrations of arsenic, lead, mercury, HCB and HCBd were at levels that pose risks to public health. The advisory recommends no swimming or other primary water contact sports in the area of concern. Also, based on elevated levels of HCB, HCBd and mercury in fish from this area, the agencies are advising that consumption of all fish species from these waters be limited to two meals per month. (One meal is considered to be one-half pound of fish.) The boundaries of this advisory may be adjusted in the future to reflect results of new information. This site is considerably complex, and is divided into five areas.

1. North and west of Petro-Processors: This area has not been extensively studied and is situated where it is unlikely that wastes from industrial activities reached it.
2. Immediately south to about 3,000 feet south of the "former Haul-Buck Marine Road": Wastes released from pits during operation of the Petro-Processors site extensively impacted the northeast corner of this area. This area has been extensively investigated. Four remedial processes have been applied. The most contaminated channel was excavated to the maximum depth that could safely be achieved. A second channel has been diverted and the original course filled with clean soil. The remaining slightly contaminated sediments are being allowed to continue to naturally attenuate. The sediments are naturally anoxic enough that the chlorinated contaminants are being

dechlorinated. Finally the groundwater is also undergoing remediation by natural attenuation. This area is also reducing enough to readily dechlorinate the contaminants.

3. Area bounded by the southern boundary of the area described in #2 above and the northern end of "Devil's Swamp Lake": This area is virtually un-impacted. There are scattered detections of chlorinated organics at concentrations that are well below risk levels.
4. Devil's Swamp Lake: The lake and the swamp immediately adjacent have been shown to be contaminated by some of the chlorinated compounds present in area #1, above, and PCB's. The probable source of these contaminants is the former Rollin's site. U.S. EPA is going through the process of getting this site on the National Priorities List (NPL). Louisiana has agreed with this action.
5. "Southern Swamp": This is the area to the south and west of Devil's Swamp Lake that has not been impacted by either site. On the U.S. EPA Internet pages photographs are available showing current and past conditions before remedial actions <http://www.epa.gov/earth1r6/6sf-la.htm>.

Bayou Bonfouca, Subsegments 040907 and 040908

The Bayou Bonfouca Superfund site is located in Slidell, Louisiana, on the north shore of Lake Pontchartrain and includes the former American Creosote Works Plant and a portion of Bayou Bonfouca. The site encompasses more than 54 acres and there were eight highly contaminated creosote or polynuclear aromatic hydrocarbon (PAH) areas on site. Bayou Bonfouca, which is located in St. Tammany Parish, was placed on the NPL due to contamination by creosote, a chemical commonly used as a wood preservative. The NPL, which is issued by U.S. EPA, is a list of hazardous waste sites eligible for investigation and cleanup under the federal Superfund program.

In 1970, several thousand cubic yards of creosote spilled into Bayou Bonfouca and onto an adjacent land area following a fire and tank explosion at the American Creosote Works plant. Contamination of the area also occurred through a legacy of poor plant operating procedures. The creosote plant had been operating for almost 100 years prior to its closure after the fire. The contamination of Bayou Bonfouca has been categorized as a nonpoint source residual waste problem. A record of decision (ROD) signed in March 1987 outlined a selected remediation plan for the site. In June 1988, it was discovered that the extent and depth of the contamination was much greater than previously estimated. This led to an amendment to the original ROD under the February 1990 explanation of significant difference.

Beginning in January 1996, U.S. EPA and LDEQ began working to correct contamination problems at Bayou Bonfouca under provisions of the federal Superfund program. Both the U.S. EPA and LDEQ are jointly providing funds for cleanup of the site, with U.S. EPA as lead agency in charge of remediation. There was concern that attempts to remediate the contamination in Bayou Bonfouca will stir up the creosote and the overlying sediment. Therefore, LDHH and LDEQ issued an advisory against swimming and consumption of fish from the stream. The area posted extends from one-quarter mile upstream of the American Creosote Works site to one mile south of Louisiana Highway 443. Remediation of the abandoned facility involves the dredging of 169,000 cubic yards of contaminated sediments from Bayou Bonfouca and removal of 8,000 cubic yards of surface waste materials.

The selected remediation and disposal methods for the contaminated site included excavation; capping the site; incineration of creosote waste piles and heavily contaminated bayou sediment; and pumping, treating and monitoring contaminated ground water. A design phase for groundwater remediation was completed in October 1989, and the *in situ* operation began in mid-1991. In November 1993, a cleanup contractor moved an incinerator to the site and completed a trial burn. In early 1994, excavation and incineration of the contaminated sediments was begun. The ash was placed under a RCRA cap onsite and incineration completed in the summer of 1995. The Source Control Operable Unit conducted this part of the cleanup. The second phase of remediation, which will be handled by the Ground Water Operable Unit, will address dense nonaqueous phase liquids (DNAPLs) in the surficial aquifer. A statutory 5-year review of ground

water cleanup activity was completed in September 1996, which recommended continued ground water recovery and treatment and an evaluation of treatment performance. In September 1997, U.S. EPA made modifications in the current groundwater recovery and treatment where needed to protect the integrity of the Source Control remedy based on a Performance Evaluation Report. In the spring of 2000, additional groundwater remedial activity began and additional groundwater recovery wells were installed. On July 11, 2001 a second 5-year Review was signed and LDEQ took over operations and maintenance.

Bayou Olsen/Olsen Bayou, Subsegment 030304

Bayou Olsen is approximately ½ mile long and lies within a larger water quality subsegment, Moss Lake (030304). Adjacent to Bayou Olsen is the Carlyss Pit Remediation site. In the past, Bayou Olsen received overflow from waste ponds at Carlyss Pit. Carlyss Pit consists of a series of hazardous waste ponds, and is located east of Highway 27 and 8.5 miles south of Sulphur, Louisiana. An Interim Agreement was entered on February 6, 1985 with Browning-Ferris Industries (BFI), Conoco Inc. and LDEQ to perform specific work at the site. A preliminary Interim Remedial Action Plan occurred in August 1987 directing the companies to develop and implement remedial activities. The sequence presented a recommended removal of liquid chlorinated hydrocarbons (LCH) from Bayou Olsen.

In February 1990, BFI and Conoco, Inc. submitted the LCH Reclamation Work Plan, which was approved by LDEQ. Work began in June 1990 and was substantially completed by February 1992. A total of approximately 1.5 million gallons of LCH were removed from the waste ponds. Next, the Pond Closure Work Plan was submitted to close the Carlyss Pit waste ponds and approved in May 1994. Upon the receipt of approval of the plan, work began in 1994 with the treatment of 6.9 million gallons of water from the Carlyss Pit waste ponds. Following water treatment, the waste ponds were filled with 185,000 cubic yards of clay and very low permeability soil. Lastly, the ponds were covered with topsoil and vegetation established. Natural attenuation of Bayou Olsen sediments was determined to be the best option for sequestration of remaining contaminants in the bayou. The Pond Closure Certification Report was submitted to LDEQ in October 1995 and in February 1998 LDEQ indicated the all companies had met all requirements for remediation of the site.

Sibley Lake, Subsegment 101001

Sibley Lake is a large fresh water impoundment located west of the city of Natchitoches in Natchitoches Parish. Sibley Lake is a man-made impoundment constructed in 1958 as a water supply for the City of Natchitoches and the surrounding area, in addition to serving as a recreational area. The city's public water intake structure is located on the southeast side of the lake.

Since 1946 Tennessee Gas Pipeline Company (TGP) has operated a natural gas compressor station in the northwest corner of the uppermost major branch of the lake. TGP maintains three compressor buildings with 20 compressor engines, which compress natural gas to be transported through a pipeline stretching from Texas to northern markets. In August 1988, TGP officials notified LDEQ that analysis of wastewater from one of their outfalls revealed the presence of PCBs. These trace concentrations are believed to be present due to residual amounts of PCBs at various locations in the facility resulting from the use of Pydraul, a lubricant containing PCBs, that was used at this facility from 1955 to 1968. LDEQ issued a compliance order and imposed civil penalties against TGP for this excursion and past unreported excursions. The compliance order required TGP, among other things, to sample lake sediments, fish tissue, effluent and lake water; and to take any and all measures necessary to cease discharge of wastewater containing PCBs. They were also required to submit a written report describing circumstances of cited violations of the discharge permit, remedial actions taken thus far to mitigate any impacts resulting from violations, and actions taken to achieve compliance with the compliance order.

TGP has since ceased direct discharge of their wastewater and has rerouted wastewater through an activated carbon treatment system prior to discharge into Sibley Lake. During 1989, TGP submitted the results of water, sediment and fish analyses to LDEQ for review. Results indicated non-detectable amounts of PCBs in water sampled throughout the lake. However, PCBs were found in lake sediment taken from the

area around the TGP outfall and in fish taken from a limited area. PCB levels in some species of fish exceeded the FDA alert level of 2 ppm for Aroclor 1254. Based on the results of laboratory data, it was determined that a potential health risk to the public existed; therefore, in February 1989, LDHH and LDEQ issued a joint advisory against the sale and consumption of fish taken from Sibley Lake. LDEQ issued a compliance order to Tennessee Gas Pipeline Company (TGPL) on July 12, 1989. Part of the compliance order authorized a long-term fish sampling program for Sibley Lake near Natchitoches, Louisiana

In February 1990, TGP officials agreed to conduct a fine-tuned study of the sediment in a targeted area around their outfall to help LDEQ determine what remediation plan should be implemented. Based on results of the study, LDEQ requested that TGP submit a remedial action plan for the physical removal of PCBs at and adjacent to the discharge pipe in Sibley Lake. In June 1991, LDEQ issued a compliance order to TGP due to lack of response to requests for a remediation plan. The compliance order also specified an annual fish monitoring program and ordered the submittal of a remedial action plan. A request for a hearing was filed by TGP in July 1991, and in October 1991, TGP submitted a remedial action plan and alternative evaluation report for Sibley Lake.

In October 1992, LDEQ and TGP reached a settlement agreement. The agreement, based on a remediation plan, required the installation of a rain water control structure; the excavation of sediments from the lake near the facility's wastewater outfall; and the backfilling, grading and restoration of the excavated areas. Remediation work started in October 1992 after LDEQ's Secretary signed the agreement. Excavation and removal of sediments started in November 1992. The remediation work activated a post-remediation fish monitoring program pursuant to the 1992 settlement agreement between TGP and LDEQ. The settlement agreement set forth three phases of remediation: Phase I, obtaining permits to conduct remediation; Phase II, remediation of Sibley Lake; and Phase III, post-construction monitoring of fish and water, which was to commence upon LDEQ's acceptance of the completion of Phase II.

Excavated material was sent off-site to a hazardous waste disposal site. After removal of the contaminated sediments, TGP backfilled the area with clean soil. In January 1993 TGP completed the excavation and backfilling required by the agreement. TGP will conduct a post-remediation monitoring plan and will sample water, fish and sediment within the lake for the next several years.

The first set of monitoring data was collected in May 1994, from Sibley Lake. The results of that data have indicated that the level of PCBs in fish has declined by more than 50% within the last three years. This process is gradually reducing the bioavailability of PCBs. However, in June 1994 the advisory for Sibley Lake was reviewed and continued. At this time, PCBs have not been detected in the water at Sibley Lake. These trends are expected to continue. The next monitoring was scheduled for spring 1996 and 2000.

In January 1996, the advisory against the sale and consumption of fish from Sibley Lake was lifted. However, a new advisory was placed into effect at that time. The new advisory recommends no consumption of gar, shad and carp. For other species, within any one month time period, eating fish from Sibley Lake should be limited to only one of the following two options: 1) One meal per week of largemouth bass or crappie; or 2) one meal per month of channel catfish, striped bass or other species (excluding gar, shad and carp). All fish consumed should be skinned and trimmed of fat then broiled, grilled or baked. These fish should not be fried because this traps the contaminants in the fish. A meal is considered half a pound of fish for adults and children.

The purpose of the monitoring program at Sibley Lake was to document the success of the selected remediation measure. Natural sedimentation is currently remediating Sibley Lake by depositing new sediments over older sediments that may still contain PCBs. As a result, PCB's have not been detected in Sibley since 2000.

Capitol Lake, Subsegment 070503

Capitol Lake is a small man-made lake formed between 1901 and 1908 when the lower reach of Grass Bayou was dammed approximately one-quarter mile east of the Mississippi River. The lake is located in

downtown Baton Rouge adjacent to the State Capitol and the Governor's Mansion. It has a surface area of approximately 60 acres, and its depth varies from one foot in the northern arm to a maximum of eight feet in the southwestern arm. The average depth ranges between four and six feet. Capitol Lake drains an area of approximately 4.5 square miles, consisting primarily of residential, commercial and industrial land uses. The lake receives drainage from two unnamed canals, which are subsurface storm sewers in their upper reaches. At the southwest end of the lake there is a pumping station, which is the only outlet for the lake. The East Baton Rouge City Parish government operates this pumping station. It is usually turned on only during storm events and discharges to the Mississippi River. Thus, Capitol Lake is a fairly stagnant system that is only flushed during storm events, functioning much like a holding pond for any contaminant, which might enter from the drainage area.

As of March 2004, Capitol Lake is still under a no fish consumption advisory issued by LDEQ and LDHH. The advisory was initiated in 1983 due to the presence of polychlorinated biphenyls (PCBs) in the sediment. Documented as early as 1972, Capitol Lake has a long history of pollution problems such as oil contamination and nutrient enrichment. Pollutant sources include both point and nonpoint sources, specifically, discharges, spills and urban storm water runoff. Investigations were conducted in Capitol Lake by LDEQ in 1972, 1973 and 1981 for oil contamination. In 1981 Kansas City Southern Railroad was found to be a significant source of pollution. Later, enforcement actions against responsible industries were issued and corrective measures taken. However, oil and other pollutants continue to accumulate in the lake system, running off from urban surfaces such as streets, parking lots, gasoline stations, industrial and commercial facilities, and residences. In 1983 LDEQ investigated a complaint concerning the discharge of oily wastes into the northern tributary of the lake system. The investigation revealed that oily wastewater, primarily from oil spillage and an underground storage tank leak, was draining into the canal from a Westinghouse Electric Corporation facility. Analysis of water samples revealed that PCBs were present in runoff water, canal water, and water from the center of the lake.

Analytical results confirmed that Westinghouse Electric Corporation was at least a major contributor of PCBs to the northern part of the lake (Schurtz and Albritton, 1986). A compliance order was issued to Westinghouse Electric Corporation requiring the facility to stop all oil-contaminated discharges, to submit plans for evaluation of the extent of PCB contamination in surface and subsurface soils at and surrounding the property, and for the removal and/or containment of PCB contamination. Westinghouse Electric Corporation signed a settlement agreement with LDEQ establishing the framework and timetable for cleanup and containment of PCB contamination at the facility and establishing automatic monetary penalties if the company failed to fulfill any provision.

Investigation of other sources of pollution resulted in the issuance of enforcement actions and compliance orders requiring the cessation of discharge of oily waste or contaminated wastewater and control of discharges in excess of permit limits against Furlow-Laughlin Equipment Company Inc.; American Asphalt Corporation; City of Baton Rouge and Parish of East Baton Rouge; Comet Distribution Services Inc.; Kansas City Southern Railroad; and Road Runner Motor Re-builder Inc. It was also determined that none of these facilities were contributing PCBs. Other facilities that were possible sources of nonpoint PCB contaminated storm water runoff, due to the storage of transformers, electric motors and heavy equipment, included the Louisiana Division of Administration Surplus Property Yard, U.S. Government Surplus Property Yard and the Louisiana National Guard Armory, all located west of the lake (Schurtz and Albritton, 1986).

In February 1991 an additional report on the chemical contamination of Capitol Lake sediments was submitted to LDEQ. The report concluded that no additional PCB contamination was occurring. Later in this same month LDEQ's Inactive and Abandoned Sites Division issued compliance orders against Kansas City Southern Railroad and Louisiana Oil and Re-refining Company, Inc. The compliance orders required these companies to submit to LDEQ a work plan for remedial investigation and feasibility studies and to begin execution of the work plans no later than 90 days after its approval. In May 1991, the Kansas City Southern Railroad was also issued a compliance order by LDEQ for violating their water discharge permit. In June 1992, LDEQ issued a cease and desist order shutting down the Louisiana Oil and Re-refining

Company, and the owner pleaded guilty to federal charges of conspiracy to illegally discharge pollutants. The owner was sentenced to prison and fined.

In 1993, due to the presence of PCBs in the lake, LDEQ initiated an extensive survey of Capitol Lake with the objectives of: 1) determining whether any exposure risk existed for people consuming fish from the lake system; 2) determining the extent and levels of contamination in the lake system; 3) determining any impacts upon the lake system's biological community; 4) confirming the extent and levels of contamination at the Westinghouse Electric Corporation facility; and 5) determining whether other sources of oil contamination were contributing PCBs to the lake system.

Because concentrations of PCBs in the lake sediment are below the 50 ppm level required for designation as a hazardous waste, Capitol Lake did not rank as a high priority for cleanup funding. Under the federal Superfund Program, this level of contamination is not considered an environmental emergency. Therefore, cleanup will have to be funded from sources other than federal monies. Estimated costs for removal, transportation and disposal of the contaminated sediment are in the millions of dollars. However, with issuance of specific compliance orders and settlement agreements, some responsible parties will be held accountable for the remediation work. Data indicate that the contaminated sediments do not pose a direct threat to the public or to area ground water. However, the advisory on consumption of fish from the lake system will remain in effect indefinitely.

In 1988 the Louisiana Legislature created the Capitol Lake Task Force with the purpose of studying and making recommendations on how to preserve and enhance the qualities of Capitol Lake. This task force found that Capitol Lake was seriously contaminated and requested the governor to create a commission to begin implementing the long-term solutions proposed in their recommendations. In January 1993 the governor signed an executive order creating the Governor's Commission on the Capitol Lake Rehabilitation Project and designated the LDEQ Secretary as chairman of this commission. In order to start the cleanup, LDEQ met with the appropriate parties in November 1995 to discuss how a cleanup plan should be implemented. The first step is to conduct a Remedial Investigation/Feasibility Study on the site. The Work Plan for this study is in the initial stages and must be approved by LDEQ before implementation.

LDEQ Office of the Secretary designed and conducted an environmental assessment of the Capitol Lakes system in 1997-1998. This assessment collected and examined representative water, sediment, and fish tissue samples in sufficient quantity and quality to properly answer questions about human health risk posed by long-term exposure to any and all toxic substances present in the lake system. The agency released a draft RECAP risk assessment document in November 1998 that calculated and reported health risk. The health risk assessments included all possible pathways of human exposure to the constituents of concern at the concentrations found in the lake system's fish tissues and sediments. Over the next three years this RECAP risk assessment was formally amended, once in May 1999, and again in February 2000. Each revision responded to issues that were raised during the review of the draft RECAP risk assessment document. The risk assessment for the lake system concluded that the human health risks posed by exposure to the lake system, including consumption of edible fish, are within regulatory limits. In May 2002, the Remediation Services Division issued a statement of No Further Action, concluding that the Capitol Lakes system does not require any further management for protection of human health and environment.