Final REPORT
November 2003

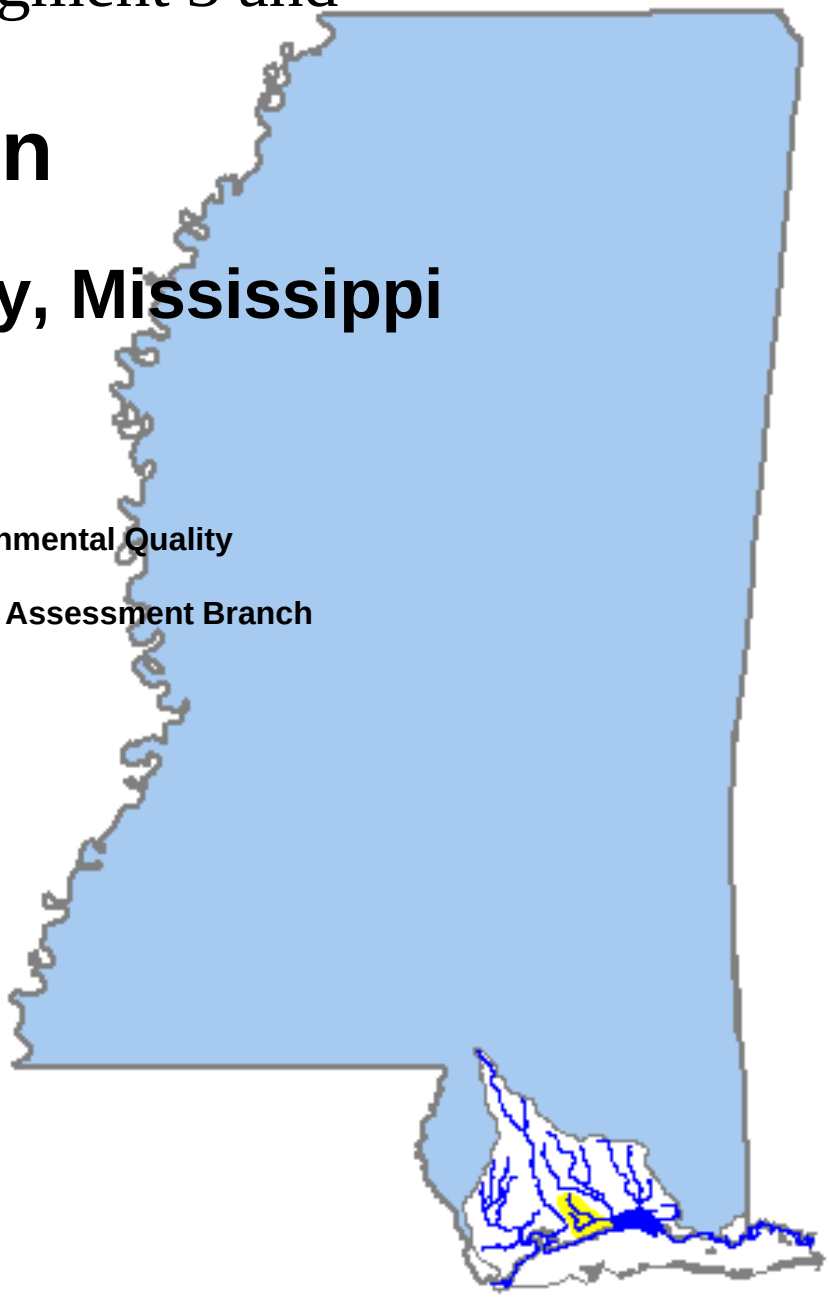
Phase 1 Total Maximum Daily Load

For Total Toxics

Bernard Bayou Segment 3 and
Industrial Seaway

Coastal Basin

Harrison County, Mississippi



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FOREWORD

This report contains one or more Total Maximum Daily Loads (TMDLs) for water body segments found on Mississippi's 1996 Section 303(d) List of Impaired Water Bodies. Because of the accelerated schedule required by the consent decree, many of these TMDLs have been prepared out of sequence with the State's rotating basin approach. The implementation of the TMDLs contained herein will be prioritized within Mississippi's rotating basin approach.

The amount and quality of the data on which this report is based are limited. As additional information becomes available, the TMDLs may be updated. Such additional information may include water quality and quantity data, changes in pollutant loadings, or changes in landuse within the watershed. In some cases, additional water quality data may indicate that no impairment exists.

Prefixes for fractions and multiples of SI units

Fraction	Prefix	Symbol	Multiple	Prefix	Symbol
10^{-1}	deci	d	10	deka	da
10^{-2}	centi	c	10^{2}	hecto	h
10^{-3}	milli	m	10^{3}	kilo	k
10^{-6}	micro	µ	10^{6}	mega	M
10^{-9}	nano	n	10^{9}	giga	G
10^{-12}	pico	p	10^{12}	tera	T
10^{-15}	femto	f	10^{15}	peta	P
10^{-18}	atto	a	10^{18}	exa	E

Conversion Factors

To convert from	To	Multiply by	To Convert from	To	Multiply by
Acres	Sq. miles	0.0015625	Days	Seconds	86400
Cubic feet	Cu. Meter	0.028316847	Feet	Meters	0.3048
Cubic feet	Gallons	7.4805195	Gallons	Cu feet	0.133680555
Cubic feet	Liters	28.316847	Hectares	Acres	2.4710538
cfs	Gal/min	448.83117	Miles	Meters	1609.344
cfs	MGD	.6463168	mg/l	ppm	1
Cubic meters	Gallons	264.17205	µg/l * cfs	Gm/day	2.45

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Table i. Listing Information

Name	ID	County	HUC	Cause	Mon/Eval
Bernard Bayou Segment 3	MS118BBM3	Harrison	03170009	Total Toxics	Evaluated
Near Gulfport: From Highway 49 to Industrial Seaway at the entrance to the Bernard Bayou Natural Channel					
Industrial Seaway	MS118BBM5	Harrison	03170009	Total Toxics	Evaluated
Near Gulfport: from Gulfport Lake to Mouth at Big Lake					

Table ii. Water Quality Standard

Parameter	Beneficial use	Water Quality Criteria
Total Toxics	Aquatic Life Support	Waters shall be free from materials attributable to municipal, industrial, agricultural, or other dischargers producing color, odor, taste, total suspended solids, or other conditions in such degree as to create a nuisance, render the waters injurious to public health, recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses

Table iii. NPDES Facilities

NPDES ID	Facility Name	Receiving Water	Flow (MGD)
MS0023345	Harrison County Wastewater Management District/Gulfport South	Bernard Bayou	10.5 (summer) 16.0 (winter)
MS0027537	Bernard Bayou Industrial Park	Bernard Bayou	0.6
MS0051756	Harrison County/Gulfport POTW – North #2	Bernard Bayou (Gulfport Lake)	5.5
MS0044580	Cavenham Forest Industries	Bernard Bayou	0.05
MS0051373	Homestead Trailer Village	Flat Branch thence Bernard Bayou	Minor discharge
MS0046086	Walters Trailer Village	Flat Branch thence Bernard Bayou	Minor discharge
MS0023523	Total Environmental Solutions	Unnamed Creek to Bernard Bayou	Minor discharge

iv. Total Maximum Daily Load

Pollutant of Concern	WLA	LA	MOS	TMDL
Toxicity Unit, Chronic	1 TUc	1 TUc	Implicit	1 TUc*
Toxicity Unit, Acute	1 TUa	1 TUa	Implicit	1 TUa*

*This expression of zero toxicity in the receiving water is applicable to each discharger and runoff area separately.

EXECUTIVE SUMMARY

Bernard Bayou Segment 3 and Industrial Seaway were placed on the Mississippi 1998 Section 303(d) List of Water Bodies as impaired due to total toxics. These segments were originally listed for total toxics on the 303(d) List based on data reported in *Pollutant Transport in Mississippi Sound* Study (Lytle and Lytle, 1985).

Because of the complexity of the estuary system and the limited data available for some of the pollutants, a phased approach has been used for the development of this TMDL. In a phased TMDL, the state uses the best information available at the time to establish the TMDL at levels necessary to implement applicable water quality standards and to make allocations to pollution sources. The phased TMDL approach recognizes that additional data, information, and modeling may be necessary to validate the assumptions of the TMDL and to provide greater certainty that the TMDL will achieve the applicable water quality standard. Thus, Phase 1 identifies levels needed to protect the water body at the present time based on existing data and information. In Phase 2, additional data and information are collected to determine the specific cause and effect relationships that exist and the appropriate levels of pollutant reduction needed to achieve the applicable water quality standards. The Phase 2 TMDL will include targeted pollution allocation strategies for specific causes of impairment and a margin of safety (MOS) that addresses uncertainty about the relationship between load allocations and receiving water quality.

EPA guidance states that TMDLs under the phased approach include allocations that confirm existing limits or would lead to new limits or new controls while allowing for additional data collection to more accurately determine assimilative capacities and pollution allocations (USEPA, 1991). Therefore, no new or additional loading of pollutants from any of the cited classes of respective impairments shall be introduced into these segments until:

- actual impairment status is known;
- specific pollutants causing impairment are determined; and
- the Phase 2 TMDLs are developed for individual pollutants in these segments; or
- these segments are determined not to be impaired based on toxicity or water quality monitoring to be conducted.

Table 1. TMDL Summaries

Water Body	Pollutant of Concern	TMDL
Bernard Bayou Segment 3 and Industrial Seaway	Toxicity Unit, Chronic	1 TUc *
Bernard Bayou Segment 3 and Industrial Seaway	Toxicity Unit, Acute	1 TUa *

* (This expression of zero toxicity in the receiving water is applicable to each discharger and runoff area separately.)

INTRODUCTION

Section 303(d) of the Clean Water Act (CWA) and the United States Environmental Protection Agency's (USEPA/EPA) Water Quality Planning and Management Regulations [Title 40 of the Code of Federal Regulation (40 CFR), Part 130] require each State to identify those waters within its boundaries not meeting water quality standards applicable to the water's designated uses. Total maximum daily loads (TMDLs) for all pollutants violating or causing violation of applicable water quality standards are established for each identified water. Such loads are established at levels necessary to implement the applicable water quality standards with consideration given to seasonal variations and margins of safety. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a water body, based on the relationship between pollution sources and in-stream water quality conditions, so that states can establish water-quality based controls to reduce pollution from both point and nonpoint sources and restore and maintain the quality of their water resources (USEPA, 1991).

1.1 Note on Toxic Units

The load (LA) and wasteload (WLA) allocations are set to zero chronic and zero acute toxicity, which is equivalent to one chronic toxic unit from each source or one acute toxic unit, with any future potential LA or WLA also being set at 1 chronic or 1 acute toxic unit. (These units are not additive.) The LA includes the contributions from surface runoff, also set at 1 chronic toxic unit.

Toxicity (see EPA 1991) involves an inverse relation to the Effective Concentration (EC), which is the lowest percentage (greatest dilution) of effluent or runoff that would still cause the minimum specified effect upon a given fraction of the test organisms, (e.g. EC_{10} or EC_{50}). The lower the EC is, the higher the toxicity. The number of toxicity units in an effluent is defined as 100 divided by the EC (expressed as a percentage):

$TUa = 100/LC_{50}$
$TUc = 100/NOEC$

Where:
TUa = toxic unit acute
TUc = toxic unit chronic
LC_{50} = the concentration that is lethal to 50% of the test organisms
NOEC = No Observed Effect Concentration = the highest tested concentration (%) of an effluent or a toxicant (or of runoff) at which no adverse effects are observed on the aquatic test organisms at a specific time of observation

A chronic or acute toxic unit of 1 means that a 100% concentration of the runoff produces no more than the specified effect on the organisms tested (NOEC or LC_{50}, respectively).

1.2 Problem Definition

The Consent Decree between the Environmental Protection Agency (EPA) and the Sierra Club in the Mississippi Total Maximum Daily Load (TMDL) Lawsuit requires development of TMDLs for waters included on Mississippi's 1996 303(d) List of Impaired Water Bodies, according to a prescribed schedule. The 1996 Section 303(d) List includes all waters determined to be impaired based on monitored or evaluated assessments, and shows cause(s) of impairment for each listed water body. The more recent 1998 Section 303(d) List differentiated monitored causes from evaluated causes. Causes are identified as evaluated because there are little or no data available to verify the actual causes of impairment. Bernard Bayou Segment 3 and Industrial Seaway have been placed on the Mississippi 1998 Section 303(d) List of Water Bodies as evaluated segments due to total toxics.

1.3 Applicable Water Body Segment Use

The water use classification for Bernard Bayou Segment 3 and Industrial Seaway, as established by the State of Mississippi in the *Water Quality Criteria for Intrastate, Interstate and Coastal Waters* regulation, is Fish and Wildlife Support. Waters with this classification are intended for fishing and propagation of fish, aquatic life, and wildlife. Waters that meet the Fish and Wildlife Support criteria should also be suitable for secondary contact recreation, which is defined as incidental contact with water including wading and occasional swimming.

1.4 Applicable Water Body Segment Standard

The water quality standard applicable to the use of the water body and the pollutant of concern is defined in the *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*. The standard states the following.

> "Waters shall be free from materials attributable to municipal, industrial, agricultural, or other dischargers producing color, odor, taste, total suspended solids, or other conditions in such degree as to create a nuisance, render the waters injurious to public health, recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses."

BACKGROUND INFORMATION

2.1 Background

2.1.1 Location

The listed segments of Bernard Bayou Segment 3 and Industrial Seaway are in the Coastal Basin Hydrologic Unit Code (HUC) 03170009 in south Mississippi. The drainage area of the listed segments is approximately 51,000 acres; and lies within Harrison County. Figure 1 shows the location of the watershed, and Figure 2 shows the individual reaches and local features in the area.

The 51,000-acre drainage area of Bernard Bayou and Industrial Seaway contains many different landuse types, including urban, forest, cropland, pasture, barren, and wetlands. The landuse information is based on the State of Mississippi's Automated Resource Information System (MARIS 1997). This data set is based on Landsat Thematic Mapper digital images taken between 1992 and 1993. Figure 3 and Table 2 show the landuse distribution for the watershed. Forest and wetland areas represent the largest percentage of landuses within the watershed. However, a significant portion of the watershed is occupied by urban areas. The watershed includes the metropolitan area of Gulfport. Gulfport's major industries include fishing, seafood processing, glass making, chemicals, pharmaceuticals, steel products, iron and machine works, and aluminum extrusions. Waterborne commerce includes fertilizers, chemicals, seafood, and pulpwood products.

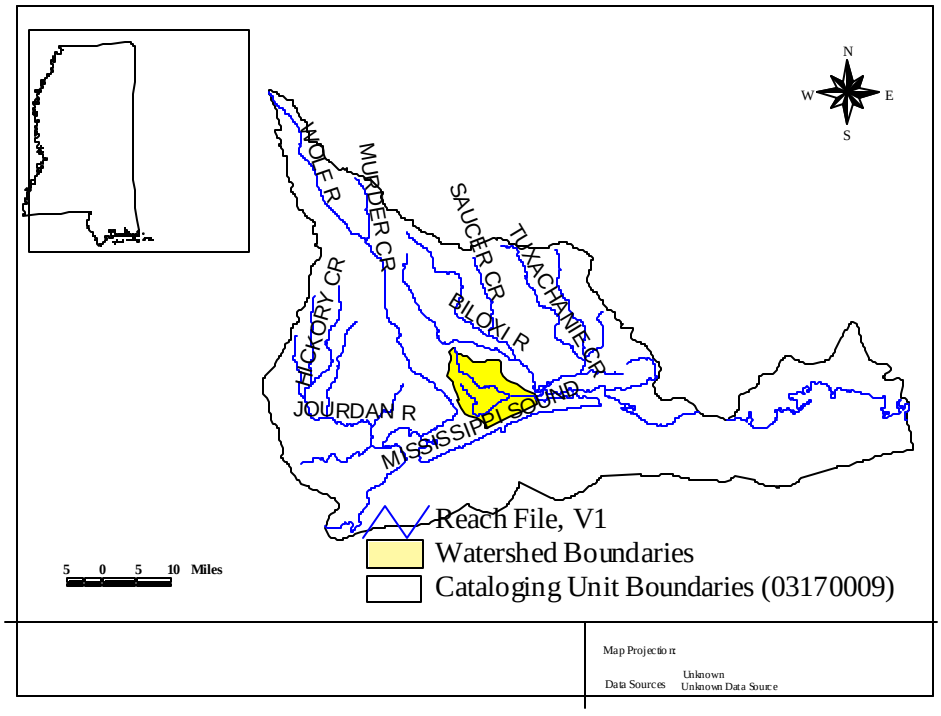

Figure 1: Bernard Bayou and Industrial Seaway Watershed and HUC Location Map

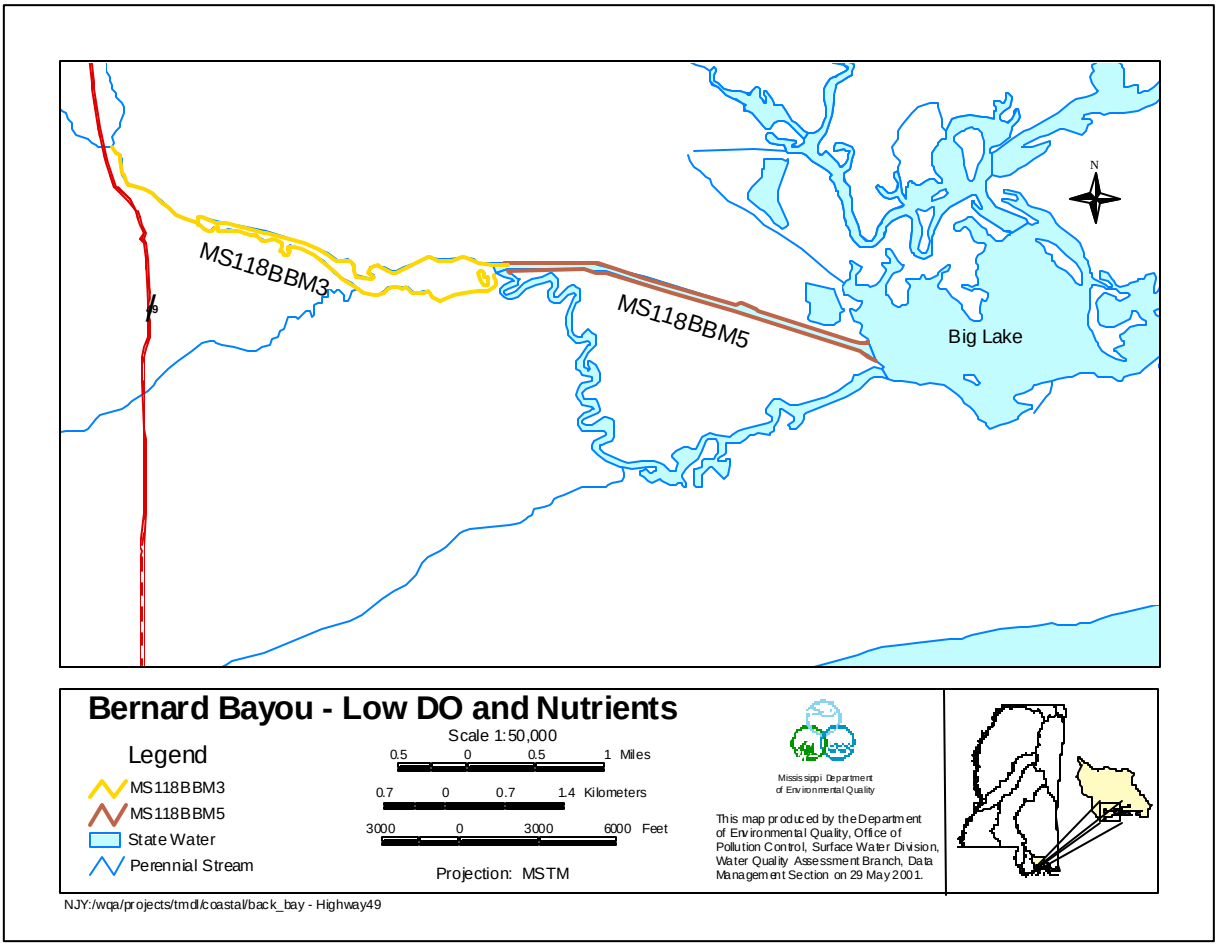

Figure 2: Bernard Bayou Segment 3 (MS118BBM3) and Industrial Seaway (MS118BBM5)

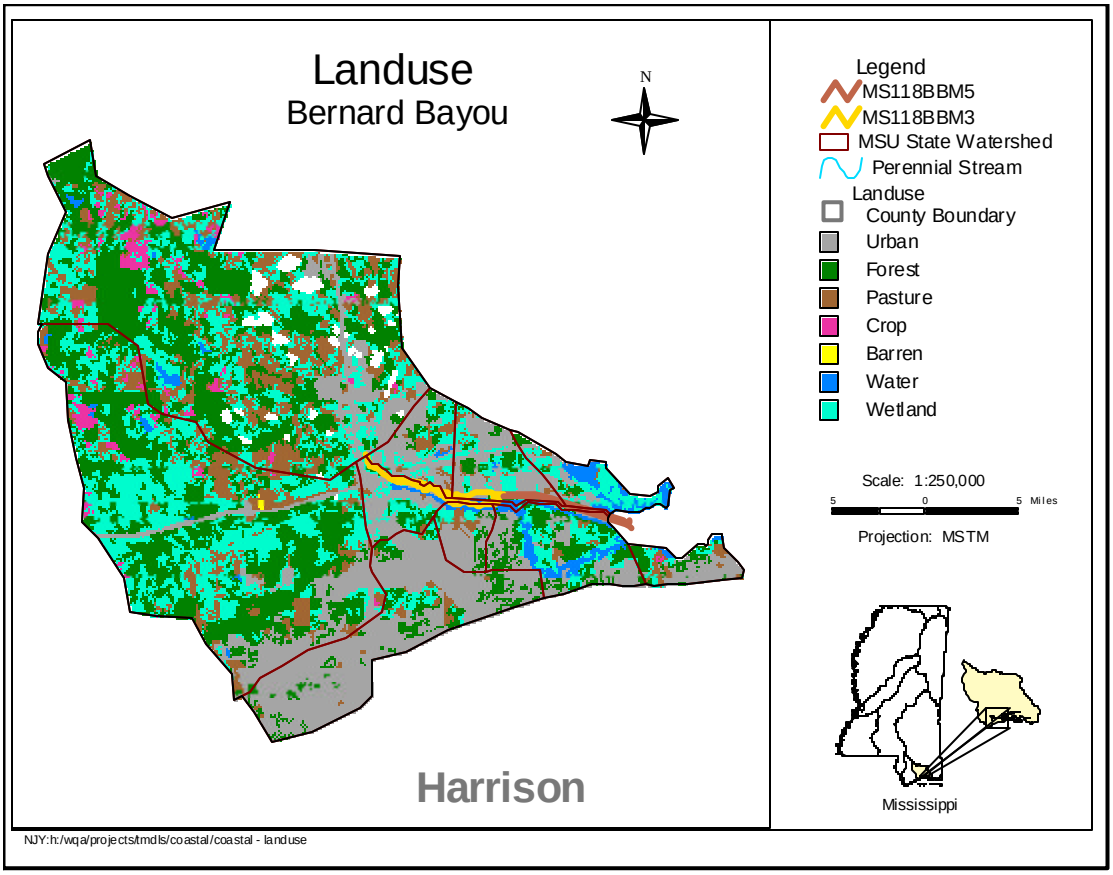

Figure 3. Landuse Distribution

Table 2. Landuse Distribution in Acres for the Bernard Bayou Segment 3 and Industrial Seaway Watershed

	Urban	Forest	Cropland	Pasture	Barren	Water	Wetland	Total
Area (acres)	11,956	16,474	1,038	6,811	16	1,374	13,340	51,009
Percent	23	32	2	13	1	3	26	100.00

2.1.2 Past Listing Decision:

Bernard Bayou Segment 3 and Industrial Seaway were listed based on sediment toxicity and sediment chemical data in the "Pollutant Transport in Mississippi Sound" report (Lytle, 1985).

2.2 TMDL Development

2.2.1 303(d) List – Pollutants of Concern

Bernard Bayou Segment 3 and Industrial Seaway are on the Mississippi 1996 303(d) list of impaired waters for total toxics. Specific pollutants for this listed cause, which are needed for a TMDL analysis, were not identified. In addition, Bernard Bayou Segment 3 was listed for priority organics, nutrients, organic enrichment/low dissolved oxygen, and pathogens. Industrial

Seaway was also listed for priority organics, nutrients, and organic enrichment/low dissolved oxygen. These causes have been addressed by separate TMDLs developed for these water bodies.

2.2.2 Point Source Assessment

Harrison County Wastewater Management District/Gulfport South; Permit #: MS0023345; Location: Bernard Bayou:

- Flow: 10.5 MGD in summer; 16 MGD in winter
- No known major industrial facilities
- Chlorine toxicity removed by sulfur dioxide treatment
- Toxicity screen – no toxics believed present

Bernard Bayou Industrial Park; Permit #:MS0027537; Location: Bernard Bayou:

- Flow: 0.6 MGD
- Industrial facilities required pretreatment
- Chlorine toxicity removed by dechlorinization
- Toxicity screen – no toxics believed present

Harrison County/Gulfport POTW – North #2; Permit #: MS0051756; Location: Bernard Bayou (Gulfport Lake):

- Flow: 5.5 MGD
- No known major industrial facilities
- Chlorine toxicity removed by dechlorination
- Toxicity screen –toxics believed absent

Cavenham Forest Industries; Permit #: MS0044580; Location Bernard Bayou:

- Flow: 0.05 MGD (groundwater remediation)
- Toxicity Screen
    - Total phenols (0.02 mg/l)
    - Total iron (0.3 mg/l)
    - Total manganese (0.07 mg/l)
    - Pentachlorophenol (below detection, but believed present)
    - Remaining toxics - believed absent

Homestead Trailer Village; Permit #: MS0051373; Location: Flat Branch thence Bernard Bayou:

- Minor discharge, no toxicity believed present

Walters Trailer Village; Permit #: MS0046086; Location: Flat Branch thence to Bernard Bayou:

- Minor discharge, no toxicity believed present

Total Environment Solutions; Permit # MS0023523; Location unnamed creek to Bernard Bayou:

- Minor discharge, no toxicity believed present

Chemfax Incorporation; Permit # MS0003298:

- No longer discharging

Avondale Industries, Inc.; Permit # MS0003271:

- No longer discharging

2.2.2 Other Potential Sources

To evaluate the combined effect of all potential sources including point sources and nonpoint source runoff impacts on Bernard Bayou Segment 3 and Industrial Seaway, EPA Region 4 and MDEQ conducted toxicity tests on surface water samples from four points in the water body. Due to the wide range of salinities, two different fish were used for the toxicity tests. The freshwater fathead minnow was used on samples with less than 2 parts salinity and the estuarine silverside minnow was used for 2 to 22 parts salinity. Sampling occurred in May 2001. This is a representative time of springtime nonpoint source runoff and fairly high water temperature (25 to 27 degrees C). The results of the samples in Bernard Bayou Segment 3 and Industrial Seaway showed no mortality in the 40 organisms tested, therefore no toxicity is believed present from the nonpoint sources or from point sources at these high flows.

2.2.3 TMDL Pollutants of Concern

Based on the TMDL source assessment and the May 2001 toxicity tests in Bayou Bernard Segment 3 and Industrial Seaway, no specific pollutants could be identified with toxicity problems, therefore this TMDL will not address specific pollutants but will address the general problem of toxicity through the development of a TMDL for Total Toxicity.

2.2.4 Critical Conditions

The freshwater 7Q10 low flow is the critical condition for water bodies where the major pollutant contributors are point sources. The 7Q10 is the minimum freshwater flow expected for seven consecutive days during a period of ten years. In Bernard Bayou Segment 3 and Industrial Seaway the 7Q10 flow is 1.29 cfs at the most upstream point in Bernard Bayou (MDEQ, 2002).

Tidal dilution also occurs in these coastal systems. A 6 to 1 dilution ratio is the assumed mixing zone accounting for tidal dilution. This assumption is defined in Mississippi Wastewater Regulations. Reference Chapter VI – Toxicity Paragraph D.4 of the State's Wastewater Regulations. "In the absence of a site specific evaluation, dilution at the edge of the mixing zone will be assumed to be one part effluent to six parts receiving stream." This mixing zone assumption will be applied to the TMDL calculated based on the State's water quality standards. Following MDEQ's regulations, a mixing zone that would allow for a zone of initial dilution must be individually and carefully evaluated on a case-by-case basis. The mixing zone assumption for the application of chronic criteria is 6 to 1.

For this TMDL, point source dischargers are assumed to be discharging at their design flow. The total discharge design flow is 16.65 MGD in the summer and 22.15 MGD in the winter.

2.2.5 Margin of Safety and Seasonality

The 7Q10 flow and 6:1 dilution for chronic toxicity and case-by-case zone of initial dilution values are reasonable worst-case assumptions and are consistent with the conservative assumptions that are used as a basis of a margin of safety (MOS). Seasonality and MOS are addressed by establishing the limits at the 7Q10 low flow and conservative dilution tidal mixing.

Total Toxicity TMDL

The target for the Total Toxicity TMDL is that waters shall be free from substances attributable to municipal, industrial, agricultural, or other discharges in concentrations, which are toxic or harmful to humans, animals, or aquatic life. Specific requirements for toxicity are found in Section II. 9, *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters - 1995*.

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while maintaining water quality standards. For some pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). In accordance with 40 CFR Part 130.2(i), "TMDLs can be expressed in terms of ... mass per time, toxicity, or other appropriate measure." In addition, NPDES permitting regulations in 40 CFR 122.45(f) state that, "All pollutants limited in permits shall have limitations...expressed in terms of mass except ... pollutants which cannot appropriately be expressed by mass." For the toxicity TMDL for waters in the Coastal Basin, the Total Maximum Daily Load is expressed in terms of chronic and acute toxicity units (TU_cs and TU_as).

Through its National Pollutant Discharge Elimination System (NPDES) permitting process, MDEQ will determine whether any permitted dischargers to these segments of Bernard Bayou Segment 3 and Industrial Seaway have a reasonable potential of discharging chronically toxic effluent. An allocation to an individual point source discharger does not automatically result in a permit limit or a monitoring requirement. The MDEQ NPDES permitting group will use its professional judgment to determine whether a reasonable potential exists for these facilities to discharge chronically or acutely toxic effluent. If the NPDES permitting group determines that such a reasonable potential exists, effluent monitoring requirements or limitations will be established as appropriate.

3.1 Toxic Units (Chronic and Acute)

Chronic and acute toxic units are not additive, and they both must be met separately. Toxicity (see EPA 1991) involves an inverse relation to the Effective Concentration (EC), which is the lowest percentage (greatest dilution) of effluent or runoff that would still cause the minimum specified effect upon a given fraction of the test organisms, (e.g. EC_{10} or EC_{50}). The lower the EC is, the higher the toxicity. The number of toxic units in an effluent (or runoff) is defined as 100 divided by the EC (expressed as a percentage):

$TUa = 100/LC_{50}$
$TUc = 100/NOEC$

Where:
TUa = toxic unit acute
TUc = toxic unit chronic
LC_{50} = the concentration that is lethal to 50% of the test organisms
NOEC = No Observed Effect Concentration = the highest tested concentration (%) of an effluent or a toxicant (or of runoff) at which no adverse effects are observed on the aquatic test organisms at a specific time of observation

Note: The terms TUa and TUc are indicated as the plural simply by adding an "s" as in TU_as and TU_cs.

3.2 Chronic Toxicity

Based on MDEQ's mixing zone policy, the dilution in the tidal system has been established at a ratio of six to one (6:1). The chronic toxicity wasteload allocation (WLA) for any discharger to this segment of Bernard Bayou Segment 3 and Industrial Seaway will be determined as follows:

Toxicity from each point source = 6 TU_cs (max) / 6 = 1 TU_c in the receiving water

Based on the previously described surface water toxicity testing, nonpoint toxicity, which includes surface runoff, is believed to be absent and therefore the LA for total toxicity is zero or 1 TUc.

The load (LA) and wasteload (WLA) allocations are set to zero chronic toxicity (1 chronic toxic unit) in the receiving water, which is equivalent to six chronic toxic units at the end-of-the-pipe from each source, with any future potential LA or WLA also being set at 1 chronic toxic unit in the receiving water. The TMDL expression, in terms of chronic toxicity at the end of the mixing zone, then becomes:

TMDL = 1 TUc: WLA = 1 TUc: LA = 1 TUc: MOS is implicit

3.3 Acute Toxicity

MDEQ regulations require a case-by-case evaluation for establishing NPDES permit limits related to acute toxicity in the zone of initial dilution. For this TMDL the acute toxicity load (LA) and wasteload (WLA) allocations are set to zero acute toxicity (1 acute toxic unit). The TMDL expression, in terms of acute toxicity, then becomes:

TMDL = 1 TUa: WLA = 1 TUa: LA = 1 TUa: MOS is implicit

CONCLUSION

4.1 Future Monitoring

Additional monitoring should be completed to better define the interaction of the various coastal bays and bayous in the Mississippi coastal area. A holistic monitoring and modeling approach should be developed for the coast in a cooperative effort between MDEQ, EPA Region 4, and EPA's Gulf of Mexico Program. Specific monitoring requirements for Bernard Bayou Segment 3 and Industrial Seaway could include a chemical toxic screen, further sediment testing, and dilution mixing zone studies for the dischargers.

4.2 Phase 2 TMDLs

This is a Phase 1 TMDL based on limited information, yet on sufficient information to suggest that toxicity is not a problem at high flows. If future monitoring demonstrates toxicity at any flow, then a source assessment study should be conducted and attempts should be made to identify the particular pollutant(s) involved. If the compliance program is not sufficient to correct the problem, then additional TMDLs should be developed to set limits on the individual toxicants involved.

4.3 Public Participation

This TMDL will be published for a 30-day public notice. During this time, the public will be notified by publication in the statewide newspaper. The public will be given an opportunity to review the TMDL and submit comments. MDEQ also distributes all TMDLs at the beginning of the public notice to those members of the public who have requested to be included on a TMDL mailing list. TMDL mailing list members may request to receive the TMDL reports through either email or the postal service. Anyone wishing to become a member of the TMDL mailing list should contact Greg Jackson at (601) 961-5062 or Greg_Jackson@deq.state.ms.us.

All comments received during the public notice period and at any public hearings become a part of the record of this TMDL. All comments will be considered in the submission of this TMDL to EPA Region 4 for final approval.

REFERENCES

MDEQ. 1995. State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters. Office of Pollution Control.

MDEQ. 2002. Total Maximum Daily Load, Bernard Bayou and Industrial Seaway for Phenol. Proposed March 15, 2002. (Since approved by EPA on June 13, 2002.)

Sierra Club v. EPA & Hankinson USDC-ND-GA Atlanta Div. #1: 97-CV-3683

USEPA. Guidance for Water Quality-based Decisions: The TMDL Process. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA/440/4-91-001, April 1991.

Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Freshwater), EPA440/5-86-003, April 1986.

Lytle, Thomas F. and Julia S. "Pollutant Transport in Mississippi Sound". Gulf Coast Research Laboratory- Mississippi-Alabama Sea Grant Consortium Publication No. MASGP-82-038. July 1985.

DEFINITIONS

Assimilative Capacity: The capacity of a body of water or soil-plant system to receive wastewater effluents or sludge without violating the provisions of the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters and Water Quality regulations.

Background: The condition of waters in the absence of man-induced alterations based on the best scientific information available to MDEQ. The establishment of natural background for an altered water body may be based upon a similar, unaltered or least impaired, water body or on historical pre-alteration data.

Critical Condition: Hydrologic and atmospheric conditions in which the pollutants causing impairment of a water body have their greatest potential for adverse effects.

Daily Discharge: The "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily average" is calculated as the average.

Designated Use: Use specified in water quality standards for each water body or segment regardless of actual attainment.

Effluent Standards and Limitations: All State or Federal effluent standards and limitations on quantities, rates, and concentrations of chemical, physical, biological, and other constituents to which a waste or wastewater discharge may be subject under the Federal Act or the State law. This includes, but is not limited to, effluent limitations, standards of performance, toxic effluent standards and prohibitions, pretreatment standards, and schedules of compliance.

Effluent: Treated wastewater flowing out of the treatment facilities.

Impaired Water Body: Any water body that does not attain water quality standards due to an individual pollutant, multiple pollutants, pollution, or an unknown cause of impairment.

Land Surface Runoff: Water that flows into the receiving stream after application by rainfall or irrigation. It is a transport method for nonpoint source pollution from the land surface to the receiving stream.

Load Allocation (LA): The portion of a receiving water's loading capacity attributed to or assigned to nonpoint sources (NPS) or background sources of a pollutant

Loading: The total amount of pollutants entering a stream from one or multiple sources.

Nonpoint Source: Pollution that is in runoff from the land. Rainfall, snowmelt, and other water that does not evaporate become surface runoff and either drains into surface waters or soaks into the soil and finds its way into groundwater. This surface water may contain pollutants that come from land use activities such as agriculture; construction; silviculture; surface mining; disposal of wastewater; hydrologic modifications; and urban development.

NPDES Permit: An individual or general permit issued by the Mississippi Environmental Quality Permit Board pursuant to regulations adopted by the Mississippi Commission on Environmental Quality under Mississippi Code Annotated (as amended) §§ 49-17-17 and 49-17-29 for discharges into State waters.

Point Source: Pollution loads discharged at a specific location from pipes, outfalls, and conveyance channels from either wastewater treatment plants or industrial waste treatment facilities. Point sources can also include pollutant loads contributed by tributaries to the main receiving stream.

Pollution: Contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the State, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance, or leak into any waters of the State, unless in compliance with a valid permit issued by the Permit Board.

Publicly Owned Treatment Works (POTW): A waste treatment facility owned and/or operated by a public body or a privately owned treatment works which accepts discharges which would otherwise be subject to Federal Pretreatment Requirements.

Storm Runoff: Rainfall that does not evaporate or infiltrate the ground because of impervious land surfaces or a soil infiltration rate than rainfall intensity, but instead flows into adjacent land or water bodies or is routed into a drain or sewer system.

Total Maximum Daily Load or TMDL: The calculated maximum permissible pollutant loading to a water body at which water quality standards can be maintained.

Waste: Sewage, industrial wastes, oil field wastes, and all other liquid, gaseous, solid, radioactive, or other substances which may pollute or tend to pollute any waters of the State.

Wasteload Allocation (WLA): The portion of a receiving water's loading capacity attributed to or assigned to point sources of a pollutant.

Water Quality Standards: The criteria and requirements set forth in *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*. Water quality standards are standards composed of designated present and future most beneficial uses (classification of waters), the numerical and narrative criteria applied to the specific water uses or classification, and the Mississippi antidegradation policy.

Water Quality Criteria: Elements of State water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports the present and future most beneficial uses.

Waters of the State: All waters within the jurisdiction of this State, including all streams, lakes, ponds, wetlands, impounding reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, situated wholly or partly within or bordering upon the State, and such coastal waters as are within the jurisdiction of the State, except lakes, ponds, or other surface waters which are wholly landlocked and privately owned, and which are not regulated under the Federal Clean Water Act (33 U.S.C.1251 et seq.).

Watershed: The area of land draining into a stream at a given location.

ABBREVIATIONS

7Q10.....Seven-Day Average Low Stream Flow with a Ten-Year Occurrence Period

BMP .....Best Management Practice

CWA .....Clean Water Act

DMR.....Discharge Monitoring Report

DO.....Dissolved Oxygen

EPA.....Environmental Protection Agency

HUC .....Hydrologic Unit Code

LA .....Load Allocation

MARIS.....Mississippi Automated Resource Information System

MDEQ.....Mississippi Department of Environmental Quality

MGD .....Million Gallons per Day

MOS.....Margin of Safety

NPDES .....National Pollution Discharge Elimination System

USGS .....United States Geological Survey

WLA.....Waste Load Allocation

WWTP ..... Wastewater Treatment Plant