APPENDIX C

NAVIGATION STUDY REPORT

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MRB SOUTH

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284

NAVIGATION STUDY ENGINEERING REPORT

June 2021

Prepared By:

GTS ENGINEERING LLC

EXECUTIVE SUMMARY

This report is a component of the Louisiana Department of Transportation & Development's Mississippi River Bridge LA 1 to LA 30 Connector study. Its purpose is to conduct a navigation study aiming to identify and exclude potential corridor alternative locations or pier placements in the Mississippi River between River Miles 167.4 and 229.3 (above the Head of Passes), on the basis of navigation issues.

The 1972 Waterways Safety Act placed responsibility for establishing bridge clearances with the United States Coast Guard (USCG). Therefore, initial project planning of new corridor alternatives has been coordinated with the local Coast Guard District Office, and final design requires their approval.

The USCG has advised that no corridor alternative should be located over any of the three federally designated ship anchorage areas. For all other locations within the study area, this study assumed a bridge pier span over the main navigation channel of 2,000 feet to conform to the current state of bridge design practice in North America. Even with 2,000 ft maximum span, piers could not be placed in locations that could obstruct commercial navigation.

The No Bridge Pier locations are as follows:

- All utility crossings (submerged pipelines and cables) and revetments were identified as a no bridge pier zone due to potential relocation and construction issues, respectively.
- Bridge piers could not be allowed within any of the nine river reaches containing a United States Army Corps of Engineers (USACE) designated channel crossing of the Mississippi River Ship Channel.
- Bridge piers would not be allowed within the USACE's permitted mooring areas.
- Bridge piers should not be allowed within river bends due to potential navigation issues.
- Bridge piers should not be allowed within any existing fleeting areas in the project area.

All of these features, including river bends, fleeting areas, channel crossings, mooring and anchorage locations, utility crossings, and revetments, are exhibited within the 2015 Flood Control and Navigation Maps, Mississippi River; US Army Corps of Engineers, Mississippi Valley Division.

In addition to identifying the aforementioned navigation restrictions, it was necessary to determine the required offsets, or "buffer distances", from the proposed bridge piers to each. Inquiries were made with the USACE, USCG, New Orleans-Baton Rouge Steamship Pilots Association, Port of Greater Baton Rouge, American Waterways Operators, and the Greater New Orleans Barge Fleeting Association. Only suggested distances were provided which are deemed sufficient for this level of effort. For the nine channel crossings located within the study area, a 250-foot buffer on each side of the federally defined Mississippi River Ship Channel was used to define no bridge pier areas. Buffer distances of 500 feet, compliant with pilot recommendations, were applied to mooring and fleeting areas, while a buffer of 1,000 feet from the river bank was applied along revetment areas.

The buffer distances and prohibited areas described above were overlaid onto aerial photos defining the recommended areas of no pier placement within the study area. These maps are provided in *Appendix A* of this report.

Socio-economic, environmental, real estate, structural and landside issues were not considered. Precise final locations for bridge piers will need to be tested using physical or numeric models for both safety and sediment transport concerns.

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Acronyms

DOTD – Department of Transportation and Development

USCG – United States Coast Guard

USACE – United States Army Corps of Engineers

EIS – Environmental Impact Statement

AHP – Ahead of Passes

LWRP – Low Water Reference Plane

RM – River Miles

NGVD – Navigational Geodetic Vertical Datum

1.0 BACKGROUND

This section looks at the authorization of this navigation study for the Mississippi River Bridge (MRB) Louisiana Highway 1 (LA 1) to LA 30 Connector. It clarifies the purpose of the navigation investigation and describes previous studies in regard to navigation factors involved in the siting of a potential corridor alternative of the proposed Mississippi River Bridge, which will serve as the LA 1 to LA 30 connector.

1.1 Study Authorization

The Louisiana Department of Transportation and Development (DOTD) has initiated a study for the MRB LA 1 to LA 30 Connector project, identified with State Project No. H.013284 and F.A.P No. H013284. The study area is located in the Mississippi River between River Miles 167.4 and 229.3 (above the Head of Passes)

This report is being conducted under LADOTD Contract No. 44-17438, and the scope of services to be delivered by GIS Engineering, LLC (GISE) in regards to this navigation study portion includes the following main tasks:

- Review Previous Navigation Analyses for corridor between Horace Wilkinson Bridge and Sunshine Bridge
- Meet and Coordinate with the United States Coast Guard (USCG) to determine horizontal and vertical clearance envelopes within the study area
- Coordinate with the United States Army Corps of Engineers (USACE) to define federally authorized channel limits
- Coordinate with river pilots to determine navigational restrictions for pier placements for shallow draft including tows, tugs, and barges
- Coordinate with river pilots to determine navigational restrictions for pier placements for deep draft vessels
- Develop “No Pier Zones” map for the study area, based on information gathered and learned from coordination with the USACE, USCG and other navigation interests.
- Prepare Navigation Analysis Memorandum
- Perform internal QA on Navigation Analysis Memorandum
- Submit draft and final Navigation Study report to DOTD for review

1.2 Study Purpose

The purpose of this study is to identify corridor alternative locations from LA1 to LA30 that would interfere with ship and tow vessel traffic. Conversely, it is important to note this study does not account for economic, environmental, real estate, vehicular traffic, landside features, or bridge design concerns. These are considered elsewhere in the Enhanced Planning / Environmental Evaluation documentation.

Once a corridor alternative location is selected, normally there would be physical or numerical studies on specific navigability refinement issues such as pier locations, training works, etc. This study does not address model studies that may be performed at a later date as part of the final design.

To put this into context, this study identifies all locations within the 62 river-mile study area that, for navigational reasons, would prohibit the placement of piers within the Mississippi River.

1.3 Prior Studies, Reports and Projects

The following is a summary of previous Mississippi River bridge placement studies that relate to navigation issues within or near the study area. There are other studies concerning an additional Mississippi River Bridge in the study area; however, the listed studies are the only ones that considered navigational issues. Furthermore, previous studies cannot be directly adopted for this project because the purpose and the need, the goals, and the constraints for the prior studies differ from this study. Of these studies, only those portions that relate to navigation are summarized in this section, or it is noted if they did not address navigation in relation to corridor alternative location determination. These corridor alternatives are also known as bridge crossings when referenced in previous studies. The purpose of this review is to benefit from previous efforts.

1.3.1 LA 1 to LA 30 Connector Stage 0 (August 2016)

The purpose of this effort performed under State Project No. H.004100 was to conduct a feasibility and environmental inventory study to provide an additional Mississippi River crossing connecting LA 1 to LA 30.

Five different locations for the proposed Mississippi River crossing were evaluated. Navigational considerations in relation to a new river crossing location were not addressed.

1.3.2 Baton Rouge Loop Tier 1 Final EIS (December 2015)

The purpose of this effort performed under State Project No. H.008732 (700-17-0212) and F.A.P. No. H008732 was to develop an Environmental Impact Statement (EIS) for the proposed Baton Rouge Loop toll facility.

In regards to navigation, the study highlighted that coordination with the USCG, the USACE, and other navigation interests was critical and key in determining viable river crossing locations. Factors such as proximity to river bends, presence of ship anchorage areas, barge fleeting areas and docks, and navigational concerns due to bridge pier placement were specified in the study as part of the navigational elements that were investigated in relation to selecting the new bridge location. It was determined that three of the potential river crossings identified in the study required navigation modeling, due to river conditions and existing facilities which presented challenges to navigation at those specific locations. The navigation modeling and simulations were performed at two facilities, the Maritime Pilots Institute and the Seaman's Church Institute.

Table 1-1 below summarizes two of the three potential Mississippi River crossings proposed in the Baton Rouge Loop Study located within the study area of this navigation study. The table below shows the location, bridge spans, and final input provided by the maritime industry following the modeling and pilot simulations runs for each crossing. A fourth Mississippi River crossing south of Plaquemine (S12 Crossing) was also evaluated but did not require modeling the location was deemed fully acceptable to the maritime groups.

Table 1-1: Baton Rouge Loop Project – Modeling and Simulation Runs for Potential Mississippi River Crossings

Mississippi River Crossing	Location	Modeled Bridge Crossing Description	Maritime Industry Input
Section S14 Crossing	Near Brusly, LA, just north of the Missouri Bend at the Red Eye Crossing, near MM 224.1	Three-span cable stayed bridge with spans of 765, 1,700, and 765 feet (east to west)	Tow operators considered it fully acceptable and the deep draft operators acceptable but not advantageous
Section S13 Crossing	Addis, LA at the Missouri Bend near MM 222.5	Four-span cable stayed bridge with spans of 855, 1,900, 1,900, and 855 feet (east to west)	The tow industry considered it acceptable but not advantageous whereas the deep draft industry found it fully acceptable

1.3.3 Feasibility Study for the Northern Bypass for Baton Rouge (November 2004)

The purpose of this study was to determine a potentially reasonable and feasible alignment and financing plan for a North Baton Rouge Bypass alignment.

Due to the preliminary level of this study, navigational considerations in relation to a new river crossing were not addressed. The study did clearly state that a model study would be required for the new river crossing alternative.

2.0 STUDY AREA

2.1 General Description

The study area is that portion of the Mississippi River between River Miles (RMs) 167. 4 and 229.3 (above Head of Passes[1] (AHP)), essentially between the I-10 Bridge (Horace Wilkinson Bridge) at Baton Rouge, LA and the Sunshine Bridge (LA 70) just downstream from Donaldsonville, LA. The navigation study area is shown in *Figure 2-1* below and is delineated by the yellow lines which represent the upstream and downstream limits of the area.

Figure 2-1: Aerial Photo of the Navigation Study Area of the Mississippi River as bounded by the two yellow lines.

[1] All mileage references in the text are Above Head of Passes.

Figure 2-2 below shows the view of the I-10 Bridge across the Mississippi River, which defines the upstream limit of this navigation study area.

Figure 2-2: Horace Wilkinson (I-10) Bridge is the upstream limit of the study area.

Figure 2-3 shows an aerial view of the Sunshine Bridge, which defines the downstream limit of the study area. This figure depicts the three pier structures across the river.

Figure 2-3: Aerial View of the LA 70 Sunshine Bridge.

The study area for navigation concerns do not account for landside features such as existing roads, buildings and levees and are therefore are not addressed in this report.

2.2 Authorized Ship Channel

The 62-river-mile reach of the river within this study area consists of the federally authorized ocean-going ship channel (Mississippi River Ship Channel) which starts in the Gulf of Mexico and ends at Baton Rouge/Port Allen, Louisiana.

2.2.1 Authorization Legislation

Through the years there have been a number of congressional authorizations for deepening and widening the Mississippi River Ship Channel navigation channel from the Gulf of Mexico to Baton Rouge. The more recent ones include:

The River and Harbor Act of 1962, Public Law 87-874: This Act authorized the channel from Baton Rouge to the upper limits of the Port of New Orleans to a depth of 40 feet and construction of a 40 foot by 500 foot channel within the existing 35 foot by 1,500 foot

channel within the limits of the Port of New Orleans and through the upper limit of the project located at RM 233.0 AHP.

The 1985 Supplemental Appropriations Act: This Act authorized the project for construction as follows:

"…the Secretary of the Army acting through the Chief of Engineers is authorized and directed to proceed with planning, design, engineering, and construction of the following projects substantially in accordance with the individual report describing such project as reflected in the Joint Explanatory Statement of the Committee of Conference accompanying the Conference Report for H.R. 2577…Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana…"

The 1985 authorization allowed deepening the channel (with certain exceptions) to 55 feet which was to be completed in phases. The first phase deepened the channel to 45 feet from the Gulf of Mexico to Donaldsonville, and the second phase deepened the channel to 45 feet from Donaldsonville to Baton Rouge. The third phase planned to deepen the entire channel from the Gulf to Baton Rouge to 55 feet. At this time the third phase has not been constructed. However, the United States Congress has approved deepening the ship channel to 50 feet but the width will remain at 500 feet.

2.2.2 Navigable Channel Dimensions

A depth of 50 feet Low Water Reference Plane[2] (LWRP) and a width of 500 feet constitute the authorized dimensions of the federal channel within the study area.

2.2.3 Existing Channel Maintenance

The Mississippi River is subject to constant change in channel morphology and the river channel must be maintained at a minimum depth to ensure ship traffic does not run aground. Channel depths are maintained as measured from the LWRP.

The federal government, through the USACE, maintains the authorized Mississippi River Ship Channel depth and width by dredging as needed. Nine USACE designated channel crossings[3] (Smoke Bend, Philadelphia, Alhambra, Bayou Goula, Granada, Medora, Sardine Point, Red Eye, and Baton Rouge Front) lie within the study area and most of these locations are dredged annually.

[2] The Low Water Reference Plane (LWRP) is a hydraulic-based, statistical vertical datum for channel depths. The 2007 LWRP for the study area is based on a 97% stage exceedance of daily lows for the period of record all historic readings from official sites within the study area. (See Figure 3-4)

[3] In this context, "crossings" is a river engineering term. It is the location where the main channel crosses sides of the river as it leaves the outside of one bend to the outside of the subsequent downriver bend.

This frequency could change once the channel is deepened and maintained at 50 feet. Dredging is not limited to these named channel crossing locations. Additional areas may be dredged as channel conditions necessitate. The areas between the channel crossings are considered naturally deep and do not require maintenance dredging.

Dustpan dredges are used at the channel crossings. Dredged material is discharged unconfined at the surface or below the surface of the river in areas adjacent to or downriver from the channel crossings. River currents transport this dredged material downriver from each placement site.

The USACE has also constructed dykes to direct the force of the scouring current to various navigable portions of the river in an attempt to reduce the need for dredging. Revetment has also been placed along vulnerable banks to prevent bank caving which could destabilize the channel.

2.2.4 Channel Markings

Buoys are placed to delineate the 50' deep Mississippi River Ship Channel. Frequently changing river stages and river currents often necessitate the repositioning, discontinuance and establishment of floating aids to navigation.

2.3 Towboat Operating Area

Due to towboat drafts of generally 12 feet or less, they can operate both within the Mississippi River Ship Channel as well as to the flanking areas. The areas of the river where they can operate increase with higher stages.

2.4 Artificial Features

The following is a list and description of 1) below the bed of the river, 2) in the river or 3) above the river features that could influence the placement of bridge piers.

2.4.1 Locks and Canals

The Gulf Intracoastal Waterway Port Allen to Morgan City Alternate Route connects to the Mississippi River at Port Allen at RM 228.5 immediately downstream from the I-10 Bridge.

2.4.2 Bridges

There are no bridges crossing the Mississippi River between the LA 70 Sunshine Bridge and the I-10 Horace Wilkinson Bridge.

2.4.3 Docks, and Mooring Areas

There are various docks and mooring facilities along both banks of the river within the study area. These serve several terminals along the banks of the river and are permitted by the USACE but are not located nor allowed within the confines of the federal navigation channel.

2.4.4 Fleeting Areas

These are defined boundaries used to provide barge mooring service and to accommodate ancillary harbor towing under care of a fleet operator.

2.4.5 Restricted Anchorage Areas

There are a number of restricted anchorage areas within the study area. These are areas where the mooring of vessels is prohibited due to underground utility crossings. They are identified by mileage and ownership and marked on the USACE's navigation charts.

2.4.6 Anchorages

Anchoring in the Mississippi River below Baton Rouge is prohibited outside of established anchorages except in cases of emergency. The three anchorages listed below are federal "navigation features" and are congressionally authorized. These are areas where deep-draft ships and towboats can anchor to avoid interference with traffic. These are specified in 33 CFR § 110.19.

> (29) ***White Castle Anchorage.*** An area, 0.84 miles in length, along the right descending bank of the river extending from RM 190.3 to RM 191.14 AHP. The width of the anchorage is 300 feet. The inner boundary of the anchorage is a line parallel to the nearest bank 400 feet from the water's edge into the river as measured from the LWRP. The outer boundary of the anchorage is a line parallel to the nearest bank 700 feet from the water's edge into the river as measured from the LWRP.
>
> (30) ***Baton Rouge General Anchorage.*** An area 1.5 miles in length along the right descending bank of the river, 1,400 feet wide, extending from RM 225.8 to RM 227.3 AHP.
>
> (31) ***Lower Baton Rouge Anchorage.*** An area 0.5 miles in length near mid-channel between mile 228.5 and mile 229.0 above Head of Passes with the west limit 1,100 feet off the right descending bank and having the width of 700 feet at both the upper and lower.

2.5 Geopolitical Boundaries

RM 168.5 to the south (LA 70 Sunshine Bridge) and RM 253 to the north (ExxonMobil Refinery) fall within the Port of Greater Baton Rouge jurisdiction. It stretches along 85 miles of the Mississippi River and hosts both deep-draft and shallow-draft terminals.

3.0 RIVER CHARACTERISTICS

This section discusses some of the river hydraulics attributes of the study area as they relate to commercial navigation.

3.1 Gage Locations

There are two river gage locations within the study area. One is at RM 228.4 at Baton Rouge, and the other is at RM 174.4 at Donaldsonville. These gages allow for real time measurements of the river stage. The river stage readings at the gage sites coupled with the transverse cross-sectional area allow for determining the river discharge and velocity at that location.

3.2 Bends and Crossings

The Mississippi River, even though somewhat "locked" into place by levees and revetments, meanders like all other rivers. There are nine official "channel crossings" within the study area as discussed in Section 7.1.3 Existing Channel Maintenance. These are located between bends where the thalweg or main channel of the river shifts from one side to the other. The crossings are as marked and shown in the "No-Pier Zone" and "No Bridge Zone" in the maps included in *Appendix A* of this report.

3.3 River Hydraulics

The river's depth varies both longitudinally and transversely and is a function of the water level or stage which also varies by location throughout the year. During the course of any given year the stage ranges about 25 feet Navigational Geodetic Vertical Datum (NGVD) at both Baton Rouge and Donaldsonville.

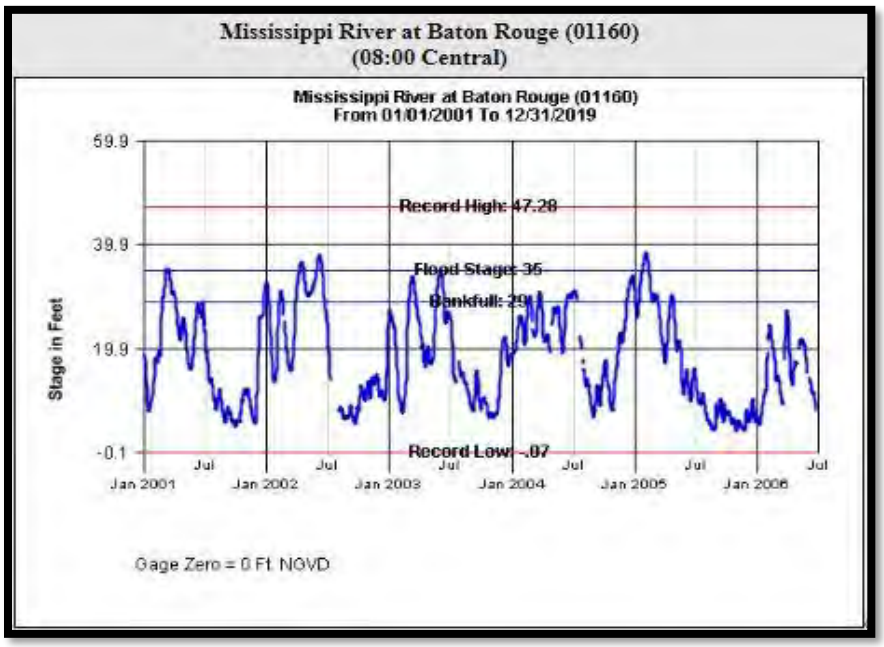


Figure 3-1: Hydrograph at Baton Rouge, LA. Source: USACE.

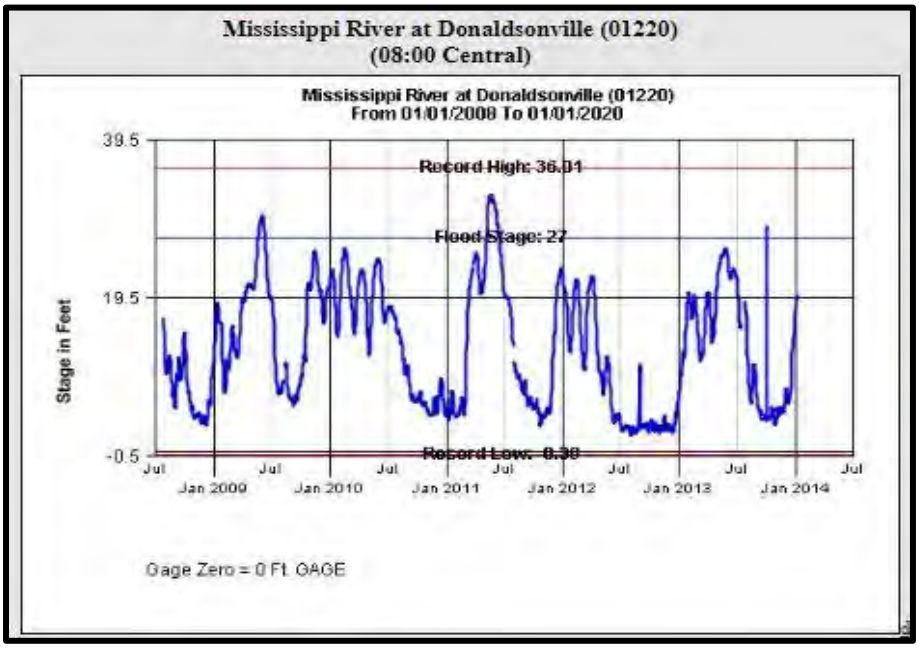


Figure 3-2: Hydrograph at Donaldsonville, LA. Source: USACE.

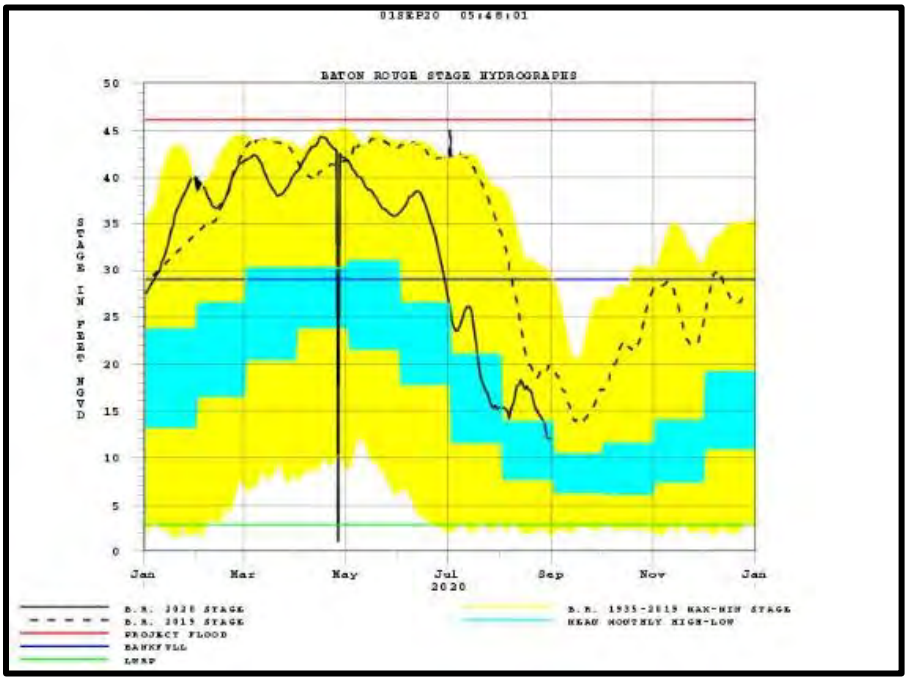


Figure 3-3: Combination hydrograph at Baton Rouge, LA. Source: USACE.

In general, the navigable river depths are the deepest on the outside of a bend and are shallowest in the channel crossings. It is during low stages that channel crossings generally need to be dredged to maintain the current federally authorized dimensions of 45-foot-deep by 500-foot-wide channel for ocean-going ships that call at the Port of Greater Baton Rouge. The channel crossing located between RMs 197 and 198 does not need as much dredge maintenance in comparison with the other eight channel crossings.

The towboats draw far less water and can often operate outside the deep draft ship channel especially during higher river stages.

The river stage is an indication of the interrelated river discharge and the river velocity. The higher the stage is, the higher the discharge is and thus river velocity. The velocity varies by depth and width of the river. For example, bank full stage at Baton Rouge is at 29 feet on the gage (see *Figures 3-1 and 3-3*). At that stage the maximum surface velocity is 5 miles per hour. This is the surface current velocity that propels tows and ships downstream and impedes going upstream. *Table 3-1* below gives the mean and maximum river velocities at the surface and at 60% depth.

Table 3-1: River Velocities Observed at the Baton Rouge Gage

RIVER VELOCITIES[4,5] AT BATON ROUGE, LA. (RIVER MILE 228.4 AHP[6])								
GAGE HEIGHT IN FEET NGVD[7] (83 ADJ)	VELOCITY							
	MEAN				MAXIMUM			
	AT 60% DEPTH		AT SURFACE		AT 60% DEPTH		AT SURFACE	
	FT/SEC	MI/HR[8]	FT/SEC	MI/HR	FT/SEC	MI/HR	FT/SEC	MI/HR
2	1.6	1.1	1.8	1.2	2.0	1.4	2.3	1.6
4	2.1	1.4	2.4	1.6	2.8	1.9	3.2	2.2
6	2.5	1.7	2.8	1.9	3.3	2.3	3.7	2.5
8	2.8	1.9	3.2	2.2	3.8	2.6	4.3	2.9
10	3.0	2.0	3.4	2.3	4.2	2.9	4.8	3.3
12	3.2	2.2	3.6	2.5	4.4	3.0	5.0	3.4
14	3.4	2.3	3.8	2.6	4.7	3.2	5.3	3.6
16	3.6	2.5	4.1	2.8	5.1	3.5	5.8	4.0
18	3.8	2.6	4.3	2.9	5.3	3.6	6.0	4.1
20	4.0	2.7	4.5	3.1	5.6	3.8	6.3	4.3
22	4.2	2.9	4.8	3.3	5.8	4.0	6.6	4.5
24	4.4	3.0	5.0	3.4	6.2	4.2	7.0	4.8
26	4.7	3.2	5.3	3.6	6.5	4.4	7.3	5.0
28	4.9	3.3	5.5	3.8	6.8	4.6	7.7	5.3
30	5.2	3.5	5.9	4.0	7.2	4.9	8.1	5.5
32	5.5	3.8	6.2	4.2	7.6	5.2	8.6	5.9
34	5.8	4.0	6.6	4.5	8.2	5.6	9.3	6.3

[4] River velocities are related to the Baton Rouge Gage and are based on observations from 1975-1983 at the Baton Rouge discharge range.
[5] Data published by the USACE in January 1991.
[6] AHP = Above Head of Passes
[7] National Geodetic Vertical Datum (1983 Adjustment)
[8] MILES PER HOUR = 0.682 X VELOCITY IN FT/SEC
KNOTS PER HOUR = 0.592 X VELOCITY IN FT/SEC
MILES PER HOUR = 1.152 X SPEED IN KNOTS
KNOTS PER HOUR = 0.868 X VELOCITY IN MI/HR

36	6.2	4.2	7.0	4.8		8.7	5.9	9.8	6.7
38	6.6	4.5	7.5	5.1		9.4	6.4	10.6	7.2
40	7.2	4.9	8.1	5.5		10.2	7.0	11.5	7.8

The following shows the longitudinal hydrographic profiles within the study area. One can observe that the River drops slightly over 10 feet in the 62 miles of the study area.

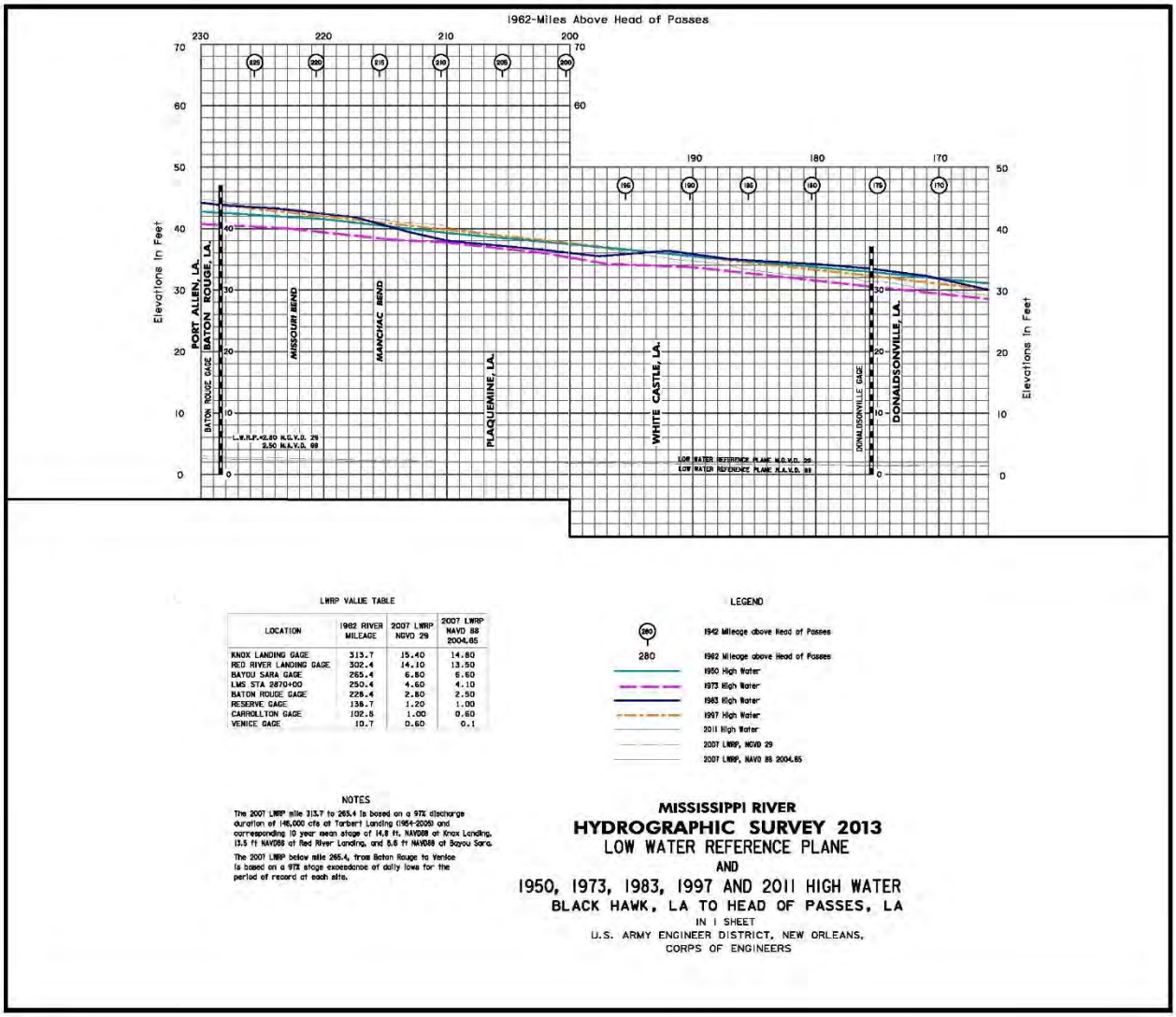


Figure 3-4: The longitudinal profile and Low Water Reference Plane of the Mississippi River within the study area Source: USACE.

3.4 Sediment Transport with Respect to Dredging

There are two basic types of sediment transport. Bed load transport is the erosion or scour of the river bottom by the "bulldozer" effect of the river's strong current. Suspended load transport is the sediment

that is suspended by turbulence in the flowing water for periods of time without contact with the stream bed. This sediment is suspended until the current water velocity is insufficient to keep it in suspension.

As the stage of the river rises, the velocity of the river increases. At the same time the river tends to "straighten" out. Conversely, as the river begins to fall, the velocity decreases, accretion takes place and meanders accentuate. During this seasonal process, the natural realignment of the channel often occurs and the ship channel crossings require dredging and the navigable width of the river tends to shrink.

3.5 Vessel Users

The type of commercial vessels that operate in the study area and the volume of traffic are discussed below.

3.5.1 Vessel Sizes, Drafts and Operating Characteristics

Both ocean-going ships and river towboats share the navigable portions of the study area.

3.5.1.1 Ships

The present channel can accommodate ocean-going ships with lengths of 950 feet and beams of 165 feet, and these are the largest vessels that are projected to call on the ports within the study area in future years even if channel depths are to be deepened to 50 feet. The 2018 USACE's feasibility study notes that deepening the channel is not expected to attract larger vessels; the current fleet would simply be able to better utilize their ships' capacities.

Less than 10% of the ships operating within the study area have bow thrusters. All ships use tugboat assistance. The number of tugs that are used on each ship relate to the size, draft and tonnage or by dock requirements.

Two-way ship traffic depends on the size of the ships, draft and channel conditions. During extreme low water, if one of the ships is heavily loaded or of significant size, two-way traffic might be suspended in a channel crossing. However, during normal river stages this is generally not an issue. The Pilots make judgement calls on what is safe and prudent. There are no measurements used because all vessels vary in size and river conditions change with stage.

There are no rules that restrict two-way traffic under the bridges between New Orleans and Baton Rouge.

3.5.1.2 Tows

Tows require much less water depth than ships and therefore can operate outside of the confines of the 45-foot deep Mississippi River Ship Channel.

Barge tows consist of a towboat pushing one or more barges. Multiple barges are rigidly connected by wires or chains causing them to react to river conditions as one unit. Towboats can run the study area segment of the River with the maximum tow size of 42 barges southbound and 40+

northbound. A typical River tow might be 35 to 42 barges, each about 200 foot long by 35 foot wide, configured in a rectangular shape, 5 to 7 barges long and 5 to 8 barges wide.

The towboats pushing the barges can be approximately 200 feet long, and 56 feet wide. Thus the "tow" (towboat and barges) can be 280 feet wide and over 1,500 feet long.

The tow speed and direction are controlled by the towboat, which is normally positioned behind the barge(s) being pushed. The amount of control maintained by the towboats depends on their size, power, and maneuverability. Long tows often use some type of bow thruster or control units. These are independent power units located in the bow or stern of the towboat or attached to the lead barge. These units help control the direction of the bow or front ends of the tows. Most towboats are also equipped with twin propellers and large flanking rudders to assist in maneuvering through sharp bends and narrow bridge openings.

Depending on river conditions, the USCG can restrict the number of barges in a tow.

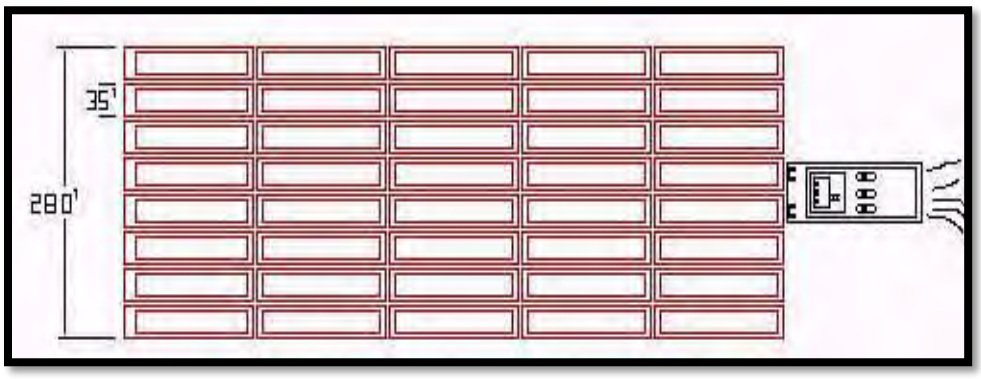


Figure 3-5: Typical Tow Layout

3.5.2 High Water Restrictions

Due to faster river currents associated with higher river stages, the USCG may issue traffic restrictions.

3.5.3 Study Area River Traffic by Tow and by Ship.

The ship and tow traffic through the study area is similar to that going under the bridges between Donaldsonville and New Orleans.

Ocean-going ships. USACE projections for ship calls to the Port of Greater Baton Rouge are 593 for 2025, 649 for 2035, and 711 for 2045. Since Baton Rouge is the upstream end of the Mississippi River Ship Channel there would be no additional ship passages.

Tows. There are no projections for future tow traffic in the study area. Significant tow traffic passes through the study area without using any of the terminals. Tow traffic is cyclical--particularly heavy in the fall and light in mid-summer.

4.0 DESCRIPTION OF STUDY METHODOLOGY

The purpose of this chapter is to explore where bridge piers and/or potential corridor alternatives would be prohibited in the study area from a navigational perspective. Certain assumptions have been made.

From a bridge engineering and constructability point of view, construction techniques and existing technology allow for bridges to span the entire length of the River within the study area. However, placing piers within the river cannot impede or endanger navigation. So, for practical reasons, even though the span width did not play a part in the identification of the no pier locations, this study designated a maximum reasonable main span length of approximately 2,000 ft. This span length is consistent with the current state of bridge design practice in North America.

Interviews were conducted with the USACE, USCG, New Orleans-Baton Rouge Steamship Pilots Association, Port of Greater Baton Rouge, American Waterways Operators, and the Greater New Orleans Barge Fleeting Association. The purpose of these meetings was to learn navigation techniques, determine possible constraints within the study area, coordinate with key stakeholders and industry traversing the river, and identify locations within the river that would or should be off limits to bridge piers. Meeting reports were developed to assist with the development of the "No Pier Zone" Maps and are submitted to LADOTD as an administrative record.

USACE navigation and bathymetric maps and aerial photographs[9] available in the ArcGIS computer software were used to identify locations of concern including pipeline crossings, channel crossings, and fleeting, mooring, and anchorage areas. In addition, USACE Engineering Manuals provided further recommendations and guidance, as stated in the subsections below.

Daily visual observations as well as videos and photos were made from the 15th floor of the Chase Building North Tower, located at 450 Laurel St. in Baton Rouge, LA, to document vessel traffic behavior in the River.

The 1972 Waterways Safety Act placed responsibility for establishing bridge clearances with the USCG. Therefore, initial project planning of new corridor alternatives has been coordinated with the local Coast Guard District Office, and final design and permitting requires their approval. The USACE would review the final candidate locations and coordinate with the USCG whom would require model studies for both safety and local impacts on erosion and accretion.

The following discussion will address areas where piers could impede or endanger traffic.

4.1 Anchorages

Anchorages are congressionally defined and authorized deep areas for ships to moor and not impede moving traffic. Piers would not be allowed within the anchorages nor between them and the navigation channel. There should also be an upstream and downstream buffer distance of 500 ft allowing

[9] World Imagery Sources: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

movement into and out of the anchorage. In addition, and based on input gathered during the meetings held with various navigation interests, potential corridor alternatives over anchorage areas would not be permitted.

4.2 Mooring Structures and Mooring and Fleeting Areas

A buffer distance would be required. This study used a conservative clearance distance of 500 feet based on information learned for maneuverability during meetings with stakeholders.

4.3 Channel Crossings

There are nine 500-foot wide USACE named channel crossings or reaches between river bends within the Mississippi River Ship Channel. These 9 channel crossings are dredged annually to maintain the authorized channel depth. traveling from one river bend to the next. Pilot meetings indicate that sufficient buffer distance should be maintained to allow adequate maneuverability during navigation through the channel crossings. For this study, a 250-foot buffer on each side of the channel crossing limits was used to define the no bridge pier areas, resulting in a total 1,000-foot-wide No Pier Zone for each channel crossing.

4.4 Revetments

The USACE has placed revetment along vulnerable banks to prevent bank caving which could destabilize the channel. Most of these are along the outsides of the river bends. For this study revetments are being avoided and no piers would be placed within a buffer distance of 1,000 feet from the river bank along the revetment. Due to the variability of water elevation, the buffer distance was established based on the approximate river bank location in the USACE's 2015 Flood Control and Navigation Maps for the Mississippi River.

4.5 Canal Entrance

The Gulf Intracoastal Waterway Port Allen to Morgan City Alternate Route connects to the Mississippi River at Port Allen at RM 228.5 immediately downstream from the I-10 Bridge. There should not be a bridge pier near the entrance to the canal. A buffer distance of 500 feet is used at the canal entrance.

4.6 Submarine Cables and Submerged Pipelines

There are a number of pipeline and cable crossings within the study area. While not a navigation issue, there should not be a bridge pier in these areas. The buffer distance for this will be 500 ft.

4.7 Bridge Approach Distance

The USACE's Hydraulic Design of Deep Draft Navigation Projects, EM 1110-2-1613, 31 May 06 recommended:

> The navigation approach to bridges should preferably be straight and normal or nearly normal to the bridge alignment. Crosscurrent alignment and magnitude have a significant effect on navigation conditions and may require an increase in channel width as well as possible channel or bridge realignment. The length of the straight reach of the approach channel on each side of the bridge [upstream and downstream] should be five times the design ship length.

The 2004 USCG's Bridge Administration Manual elaborates:

> Bridge crossings should be designed to be a minimum distance from bends in a waterway equal to five times the design vessel length for the waterway. Experiments conducted by the USACE have determined that this distance is needed to allow a tow or large vessel to align itself with the designated channel for safe passage through a bridge opening.[10]

Assuming vessels are 1,000 feet long or more, the USACE recommends that about a mile of straight channel should precede the bridge, both upstream and downstream. Because many of these straight sections in the study area are candidates for corridor alternative crossings, complying with this recommendation would compress or eliminate some reaches of the river as possible corridor crossing. Therefore, the recommended bridge location and span width will be modeled to confirm navigational functionality and safety.

4.8 River Bends

Since the swept path of a vessel making a turn in a bend of the river is wider than the path in a straight channel reach, a wider clearance is required in turns and bends. Thus, the USCG recommends that proposed bridges should be designed to fully span waterways, if they are in a bend. If a full span is not feasible, then consultation with the USACE would be necessary to determine the exact pier placement

4.9 How Data Was Used

Locations within the study area for pier avoidance were based on the criteria above. There are three anchorages in the study area and nine federal channel crossings that must be avoided. Submerged pipelines and cables should also be avoided. Buffers were designated around permitted mooring, fleeting and anchorage areas. Refer to the maps in *Appendix A* for the locations discussed above.

[10] Page 2-10 of the USCG's Bridge Administration

5.0 SUMMARY AND CONCLUSIONS

Input from the USCG, USACE, and river navigation interests is critical in determining a viable corridor alternative location. Various potential corridor alternative locations and pier placement locations were considered unacceptable due to a variety of factors including: proximity to a bend in the river or the mouth of the Intracoastal Waterway; presence of ship anchorage areas, barge fleeting and mooring areas, docks; or, navigational concerns due to bridge pier placement in relation to the navigation channel.

Much of the Mississippi River along the Baton Rouge/Port Allen riverfront was eliminated due to the close proximity of the Port Allen Lock connecting the Mississippi River to the Intracoastal Canal Waterway, anchorage areas, mooring areas and traffic due to navigation concerns expressed by the USGS, USACE and other navigation interests.

Bridge pier span widths did not play a part in eliminating pier locations although they do impact navigation. The 2,000-foot pier span suggested was primarily to be consistent with the current state of bridge design practice in North America. In reality, the minimum pier span width could be about 750 feet to accommodate the 500-foot wide federally designated Mississippi River Ship Channel. As mentioned earlier, ships can have beams of around 200 feet and tows up to 280 feet. However, localized river currents can influence vessel steerage which means the vessel's length has to be considered. Ships are about 1,000 feet long and tows can be around 1,500 feet long so their lengths could factor in as well as two-way traffic.

Precise final locations for bridge piers will need to be tested using physical or numeric models for both safety and sediment transport concerns. There are nine channel crossings in the study area. Buffer distances of 500 feet, compliant with pilot recommendations, were applied to fleeting and mooring areas.

Detailed maps showing the No Pier Zones and the No Bridge Zones are presented in *Appendix A*.

6.0 REFERENCES

U.S. Department of Transportation Federal Highway Administration, Louisiana Department of Transportation and Development, and Capital Area Expressway Authority (2015). *Baton Rouge Loop, Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge Parishes, Louisiana: Tier 1 Final Environmental Impact Statement, Section 4(f) and 6(f) Evaluation* (State Project No. H.005201 (700-96-0011), Federal Aid Project No. STP-9609(504)).

Hunter, Cr., Flanagin, M., Marino, K. (2014). *Mississippi River Navigation Book Gets an Updated Low Water Reference Plane*. ESRI International User Conference, July 14-18, 2014.

Providence (2016). *Louisiana Department of Transportation and Development, LA 1 to LA 30 Connector Stage 0 Feasibility Study* (State Project No. H.004100, Federal Aid Project No. H.004100).

URS Corporation (2004). *Capital Region Planning Commission, Feasibility Study for the Northern Bypass for Baton Rouge East Baton Rouge, West Baton Rouge, and Livingston Parishes* (Final Report, State Project No. 736-17-0335, Federal Aid Project No. PI-0011(027)

U.S. Army Corps of Engineers, Mississippi Valley Division (2015). *2015 Flood Control and Navigation Maps: Mississippi River*.

U.S. Army Corps of Engineers (2013). *2013 Hydrographic Survey Maps, Black Hawk Louisiana to the Gulf of Mexico, Mile 324 A.P.H. to mile 23 B.H.P.*

U.S. Army Corps of Engineers, Mississippi Valley Division, New Orleans District (2018). *Mississippi River Ship Channel Gulf to Baton Rouge, LA, Integrated General Reevaluation Report and Supplemental Environmental Impact Statement, Final Report.*

U.S. Army Corps of Engineers (2006). *Hydraulic Design of Deep Draft Navigation Projects* (EM 1110-2-1613, May 31 2006).

Department of Homeland Security (2004). *Bridge Administration Manual COMMANDANT INSTRUCTION* (M16590.5C, March 26, 2004). Retrieved from: http://www.uscgaan.com/cd/bridge/NS-BP06-Bridge%20Administration%20Manual%20COMDTINST%20M16590

7.0 APPENDICES OVERVIEW

Appendix A – No Pier Zone and No Bridge Zone Location Maps: this appendix includes the "No Pier Zone" and "No Bridge Zone Location" maps developed as part of this Navigational Study, with the objective of displaying locations within the study area where the construction of bridges or bridge piers would be prohibited. Detailed description of the methodology used to develop this map is also included in this appendix.

Appendix B – 2015 USACE Navigation Charts: this appendix includes a portion of the USACE's 2015 Flood Control and Navigation Maps for the Mississippi River that is specific to the study area. These navigation maps show significant features such as anchorages, mooring facilities, channel crossings, submerged pipelines and cables, etc. all of which influence the potential location of a bridge pier.

Appendix C – 2013 USACE Bathymetric Maps: this appendix includes a copy of the USACE's 2013 bathymetric charts used as a guide to develop the "No Pier Zones Map" presented under Appendix A. While these maps are dated and the river bathymetry is in consent flux, they serve as a reasonable preliminary guide.

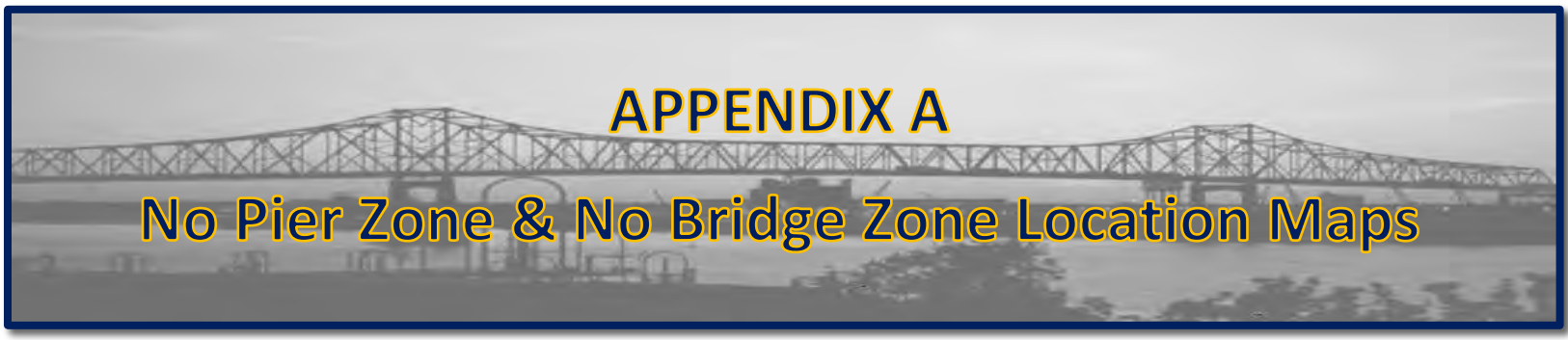
Appendix D – Mississippi River Bridges: this appendix includes schematic bridge cross sectional elevations for those bridges located from just North of Baton Rouge to New Orleans. The intent is to show the main navigation span distances serving tows and ships that would operate within the study area.

Appendix E - Anchorage Locations: this appendix lists the names and locations of federally authorized anchorages located within the study area.

Appendix F - Revetment Locations: this appendix tabularizes the locations of revetments within the study area. While a bridge pier could be located within a revetment location, special conditions are required by the USACE.

Appendix G – Terminal Facility Locations: this appendix tabularizes the names and locations of facilities found within the study area.

Appendix H – Utility Crossing Locations: this appendix tabularizes the names and locations of utilities found within the study area.



APPENDIX A

No Pier Zone & No Bridge Zone Location Maps

DESCRIPTION OF MAP METHODOLOGY

The purpose of this Map is to display where bridge piers would be prohibited in the study area from a navigational perspective. Certain assumptions have to be made. The first is that pier spans would be consistent with the current state bridge design practiced in North America. Wider spans are achievable but economics is involved which is not addressed in this effort.

From a structural engineering point of view, there is no location within the study area where a bridge could not be built. However, placing piers within the river cannot impede or endanger navigation.
Therefore, this study will use a maximum of a 2,000 foot span to conform to the larger ship sizes now using and anticipated to use the river.

The following Map will address areas where piers could impede or endanger traffic. If necessary, model studies could define the distances. The National Oceanic and Atmospheric Administration (NOAA) Electronic Navigational Charts (ENC) along with the US Army Corps of Engineer's 2015 Flood Control and Navigation Maps, Mississippi River were referenced for all data displayed on this map.

Areas Designated as No Bridge Pier Zone.

The following areas are considered off limits to bridge piers. Various potential corridor alternative locations and pier placement locations were considered unacceptable due to a variety of factors including: proximity to a bend in the river or the mouth of the Intracoastal Waterway; presence of ship anchorage areas, barge fleeting and mooring areas, docks; or, navigational concerns due to bridge pier placement in relation to the navigation channel. Each area includes a discussion of the reasons and how these areas are treated on the maps.

Submarine Cables and Submerged Pipelines. Submarine Cables and Submerged Pipelines cross many of the navigable waterways used by both large and small vessels. Normally warning signs are posted on the banks where submerged cables or a pipeline exists to warn mariner of their existence; in some areas, warning signs are not always present.

Terminal Access Channels. These are the access channels connecting Mississippi River ship channels to mooring facilities.

Mooring Structures and Mooring Areas. A mooring structure or area is any permanent structure to which a vessel may be secured. A clearance of 500 ft. from mooring structure/area is represented as no pier zone.

Channel Crossings. There are nine 500-foot wide USACE named channel crossings or reaches between river bends within the Mississippi River Ship Channel. These 9 channel crossings are dredged annually to maintain the authorized channel depth. traveling from one river bend to the next. Pilot meetings indicate that sufficient buffer distance should be maintained to allow adequate maneuverability during navigation through the channel crossings. For this study, a 250-foot buffer on each side of the channel crossing limits was used to define the no bridge pier areas, resulting in a total 1,000-foot-wide No Pier Zone for each channel crossing.

Canal Entrance. The Gulf Intracoastal Waterway Port Allen to Morgan City Alternate Route connects to the Mississippi River at Port Allen at mile 228.5 immediately downstream from the I-10 Bridge. There should not be a bridge pier in the general vicinity of the entrance to the canal.

Fleeting Areas. Fleeting Area is an area within defined boundaries used to provide barge mooring service and to accommodate ancillary harbor towing under care of a fleet operator. A 500 ft clearance from the closest riverbank is represented as no pier zone.

Revetments. The USACE has placed revetments along vulnerable banks to prevent bank caving which could destabilize the channel. Most of these are along the outside of the riverbends. While the USACE would permit bridge piers to be placed within a revetment, they would have to be approved by the USACE. For this study, revetments are avoided for pier placements and a buffer of 1,000 ft is assumed from the river bank along the revetment.

Bridge Approach Distance. The USACE's Hydraulic Design of Deep Draft Navigation Projects, EM 1110-2-1613, 31 May 06 recommended "The length of the straight reach of the approach channel on each side of the bridge [upstream and downstream] should be five times the design ship length." Therefore, assuming vessels are 1000 feet long or more, the USACE recommends that about a mile of straight channel should precede the bridge, both upstream and downstream.

River Bends. Since the swept path of a vessel making a turn in a bend of the river is wider than the path in a straight channel reach, a wider clearance is required in turns and bends. Thus, the USCG recommends that proposed bridges should be designed to fully span waterways, if they are in a bend. If a full span is not feasible, then consultation with the USACE would be necessary to determine the exact pier placement

How data was used. The map set provided indicates the No Pier zones within the study area. No Pier Zones avoid ship and tow traffic areas and mooring areas based upon federal government maps and aerial photographs. To refine prohibited areas, interviews were conducted with port authority leadership, ship and towboat operators, the U.S. Army Corps of Engineers and the U.S. Coast Guard.

Areas Designated as No Bridge Zone.

The following areas are considered off limits to corridor alternatives. Each area includes a discussion of the reasons and how these areas are treated on the maps.

No Bridge Zones (Anchorage). These zones show locations where no corridor alternative will be located due to the federally authorized anchorage locations. Anchorages are congressionally defined and authorized deep areas for ships to moor and not impede moving traffic. Based on input gathered during the meetings held with various navigation interests, potential corridor alternatives over anchorage areas would not be permitted. There should also be an upstream and downstream buffer distance of 500 ft allowing movement into and out of the anchorage.

No Bridge Zones (Span Length Exceeded). These zones show locations where the maximum span length of 2,000 ft is exceeded, therefore no corridor alternative will be placed within the No Bridge Zones (Span Length Exceeded). The bridge pier span of 2,000 ft is a pragmatic distance based upon recently constructed cable-stayed bridges in North America.

MRB South GBR: LA 1 to LA 30 Connector Restriction/Descriptions

River Mile	Restriction Names/Descriptions	Restriction Notes
231-229	Port Allen Revetment	No pier zone approximately 1000 ft off of the Western bank.
230.6-231	Upper Baton Rouge Anchorage	No pier zone along Congressionally defined and authorized anchorage as per USACE 2015 Flood Control and Navigation Maps and NOAA Electronic Navigation Charts, and recommendation of NOBRA deep draft ship board member. A 500 ft buffer is assumed on either side of the anchorage location.
229.6	Middle Baton Rouge Anchorage	No pier zone along Congressionally defined and authorized anchorage as per USACE 2015 Flood Control and Navigation Maps and NOAA Electronic Navigation Charts, and recommendation of NOBRA deep draft ship board member. A 500 ft buffer is assumed on either side of the anchorage location.
230-231.5	Fleeting Area	No pier zone approximately 500 ft. from the eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
228.5-229	Lower Baton Rouge Anchorage	No pier zone along Congressionally defined and authorized anchorage as per USACE 2015 Flood Control and Navigation Maps and NOAA Electronic Navigation Charts, and recommendation of NOBRA deep draft ship board member. A 500 ft buffer is assumed on either side of the anchorage location.
225.8-227.3	Baton Rouge General Anchorage	No pier zone along Congressionally defined and authorized anchorage as per USACE 2015 Flood Control and Navigation Maps and NOAA Electronic Navigation Charts, and recommendation of NOBRA deep draft ship board member. A 500 ft buffer is assumed on either side of the anchorage location.
165-167	Sunshine Anchorage	No pier zone along Congressionally defined and authorized anchorage as per USACE 2015 Flood Control and Navigation Maps and NOAA Electronic Navigation Charts, and recommendation of NOBRA deep draft ship board member. A 500 ft buffer is assumed on either side of the anchorage location.
228.1-228.5	Port Allen Lock	No pier zone approximately 500 ft from entrance to Port Allen Lock Structure on the Western river bank to maintain navigation entering and exiting of lock structure or impeding upon nearby fleeting area.
228-225.5	Arlington Revetment	No pier zone approximately 1000 ft from Eastern river bank to ensure safe travel entering and exiting the Red Eye Crossing.
228.1-226	Fleeting Area	No pier zone approximately 500 ft from the western river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
225.2-223.9	Fleeting Area	No pier zone approximately 500 ft from the western river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
225-223.3	Red Eye Crossing	As recommended by both NOBRA shallow and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Red Eye Crossing and Missouri Bend Revetment on the Western bank also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.
224.2-219	Missouri Bend Revetment	No pier zone approximately 1000 ft from Western river bank along revetment to allow adequate clearance for mooring and deep draft vessels. Additional no pier zone extended to island as recommended by NOBRA shallow draft pilots to allow for adequate maneuverability when navigating around the Missouri Bend.

MRB South GBR: LA 1 to LA 30 Connector Restriction/Descriptions

220-218.4	Sardine Point Crossing	As recommended by both NOBRA shallow and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Sardine Point Crossing and both Missouri Bend Revetment and Manchac Revetment also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.
218.5-212.2	Manchac Revetment	No pier zone approximately 1000 ft from Eastern river bank along revetment to allow adequate clearance for mooring and deep draft vessels.
212.8-211	Medora Crossing	As recommended by both NOBRA shall and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Medora Crossing and both Manchac Bend Revetment and Plaquemine Bend Revetment also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.
211.6-204	Plaquemine Bend Revetment	No pier zone approximately 1000 ft from Western river bank along revetment to allow adequate clearance for moorings and deep draft vessels. Additional no pier zone extended to nearby island as recommended by NOBRA shallow draft pilots to allow for adequate maneuverability when navigating around the Plaquemine Bend.
204.5-203.55	Granada Crossing	As recommended by both NOBRA shallow and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Granada Crossing and both Plaquemine Bend Revetment and St. Gabriel Revetment also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.
211-210.5	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
210.6-209.9	Fleeting Area	No pier zone approximately 500 ft from the Eastern Island bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
209.2-208.8	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
208-207.8	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
203.1-202.9	Fleeting Area	No pier zone approximately 500 ft from the Western river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
203.4-198	St. Gabriel Revetment	No pier zone approximately 1000 ft from Eastern river bank along revetment to allow adequate clearance for moorings and deep draft vessels. Additional no pier zone extending the width of the river near Mile 200 as recommended by NOBRA shallow draft pilots to allow for adequate maneuverability when navigating around the bend.
198.4-197.5	Bayou Goula Crossing	As recommended by both NOBRA shallow and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Bayou Goula Crossing and both St. Gabriel Revetment and White Castle Revetment also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.
199.5-190.4	White Castle Revetment	No pier zone approximately 1000 ft from Western river bank along revetment to allow adequate clearance for moorings and deep draft vessels. Additional no pier zone extended to nearby island as recommended by NOBRA shallow draft pilots to allow for adequate maneuverability when navigating around the Bayou Goula Bend.

MRB South GBR: LA 1 to LA 30 Connector Restriction/Descriptions

191.1-190.4	White Castle Anchorage	No pier zone along Congressionally defined and authorized anchorage as per USACE 2015 Flood Control and Navigation Maps and NOAA Electronic Navigation Charts, and recommendation of NOBRA deep draft ship board member. A 500 ft buffer is assumed on either side of the anchorage location.
191.7-189.5	Alhambra Crossing	As recommended by both NOBRA shallow and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Alhambra Crossing and both White Castle Revetment and New River Bend Revetment also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.
191.5-183.5	New Rive Bend Revetment	No pier zone approximately 1000 ft from Eastern river bank along revetment to allow adequate clearance for moorings and deep draft vessels.
187.2-186	Fleeting Area	No pier zone approximately 500 ft from the Western river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
183.5-182.5	Philadelphia Point Crossing	As recommended by both NOBRA shallow and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Philadelphia Crossing and both New River Bend Revetment and Philadelphia Point Revetment also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.
182.9-181.9	Philadelphia Point Revetment	No pier zone approximately 1000 ft from Western river bank along revetment to allow adequate clearance for moorings and deep draft vessels.
182.8-182	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
182-179	Marchand Revetment	No pier zone approximately 1000 ft from Eastern river bank along revetment to allow adequate clearance for moorings and deep draft vessels.
180-179	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
178-.9-179.2	Fleeting Area	No pier zone approximately 500 ft from the Wastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
178.4-175.2	Smoke Bend Revetment	No pier zone approximately 1000 ft from Wastern river bank along revetment to allow adequate clearance for moorings and deep draft vessels.
177.1-175.5	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
175.6-174.1	Smoke Bend Crossing	As recommended by both NOBRA shallow and deep draft board members, USACE named channel crossings are to be avoided by bridge piers. Area between Smoke Bend Crossing and both Smoke Bend Revetment and St. Elmo Revetment also avoided to allow for shallow draft vessels to maintain distance from deep draft ships in the channel. A 250 ft buffer is assumed on all sides.

MRB South GBR: LA 1 to LA 30 Connector Restriction/Descriptions

175.1-174	Fleeting Area	No pier zone approximately 500 ft from the Wastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
175.5-173	St. Elmo Revetment	No pier zone approximately 1000 ft from Eastern river bank along revetment to allow adequate clearance for moorings and deep draft vessels.
173.4-171.1	Aben Revetment	No pier zone approximately 1000 ft from Western river bank along revetment to allow adequate clearance for moorings and deep draft vessels.
171.6-166	Burnside Revetment	No pier zone approximately 1000 ft from Eastern river bank along revetment to allow adequate clearance for moorings and deep draft vessels.
172.1-171.1	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
170.1-167.9	Fleeting Area	No pier zone approximately 500 ft from the Eastern river bank. Restriction as per recommendation of NOBRA shallow draft tugboat board member.
167-165	Sunshine Anchorage	No pier zone along Congressionally defined and authorized anchorage as per USACE 2015 Flood Control and Navigation Maps and NOAA Electronic Navigation Charts, and recommendation of NOBRA deep draft ship board member. A 500 ft buffer is assumed on either side of the anchorage location.

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

N W E S

2.5 1.25 0 2.5 5 7.5 10 Miles

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

- Page Matchline
- No Bridge Pier Zones
- No Bridge Zones (Anchorages)
- No Bridge Zones (Span Length Exceeded)
- Anchorage Area Symbol
- Mooring Facility Symbol
- Fleeting Area Symbol

I-10 HORACE WILKINSON BRIDGE

LA HWY 70 - SUNSHINE BRIDGE

1 2 3 4 5 6 7

225 220 215 210 205 200 195 190 185 180 175 170

Rosedale, Grosse Tete, Windsor Place, Millerville, Wickland Terrace, Inniswold, Shenandoah, Old Jefferson, Oak Hills Place, Arlington, Livingston, Frost, Port Vincent, French Settlement, Whitehall, Maurepas, Denson, Duplessis, Dutch Town, Duckroost, Gonzales, Ascension, Sorrento, Hillaryville, Annadale, Iberville, Choctaw, Goldridge, Pigeon, Helvetia

Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, Esri China (Hong Kong)

SHEET INDEX

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

N W E S

3,000 1,500 0 3,000 6,000 9,000 12,000
US Feet US Feet

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

- Page Matchline
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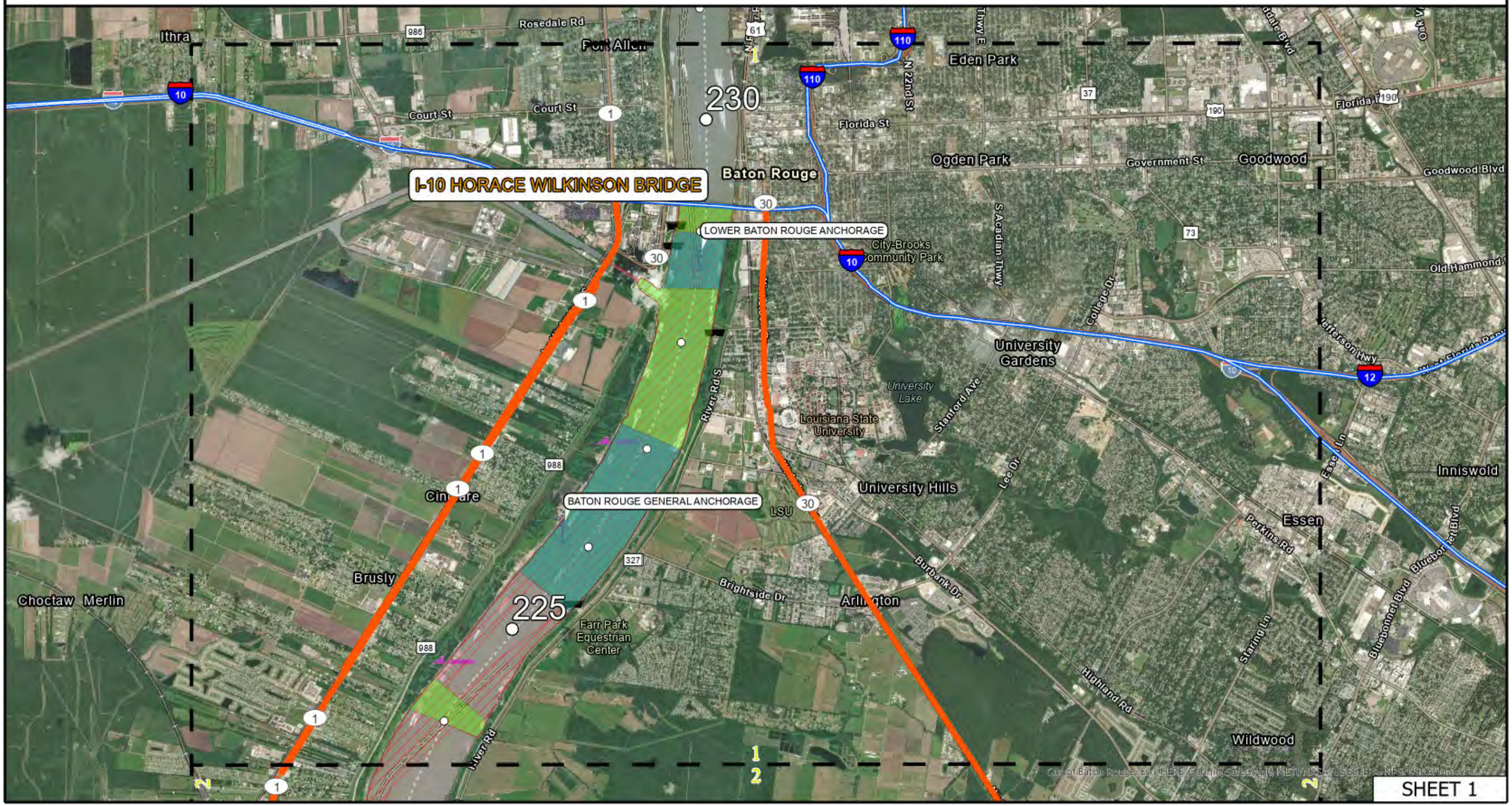

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

N W E S

3,000 1,500 0 3,000 6,000 9,000 12,000
US Feet US Feet

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

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- No Bridge Zones (Anchorages)
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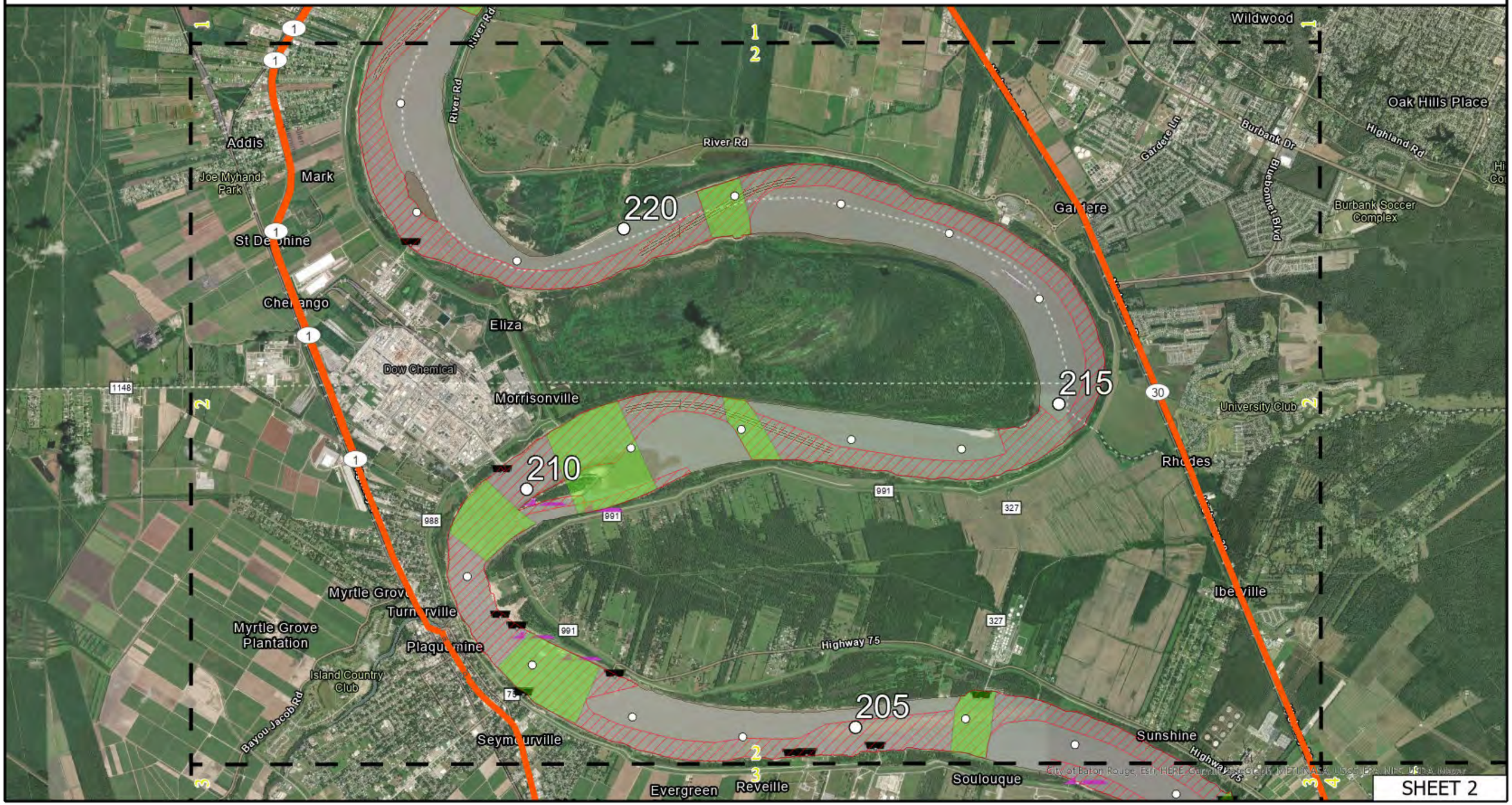


SHEET 2

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

N W E S

3,000 1,500 0 3,000 6,000 9,000 12,000
US Feet US Feet

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

- Page Matchline
- No Bridge Pier Zones
- No Bridge Zones (Anchorages)
- No Bridge Zones (Span Length Exceeded)
- Anchorage Area Symbol
- Mooring Facility Symbol
- Fleeting Area Symbol

SHEET 3

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

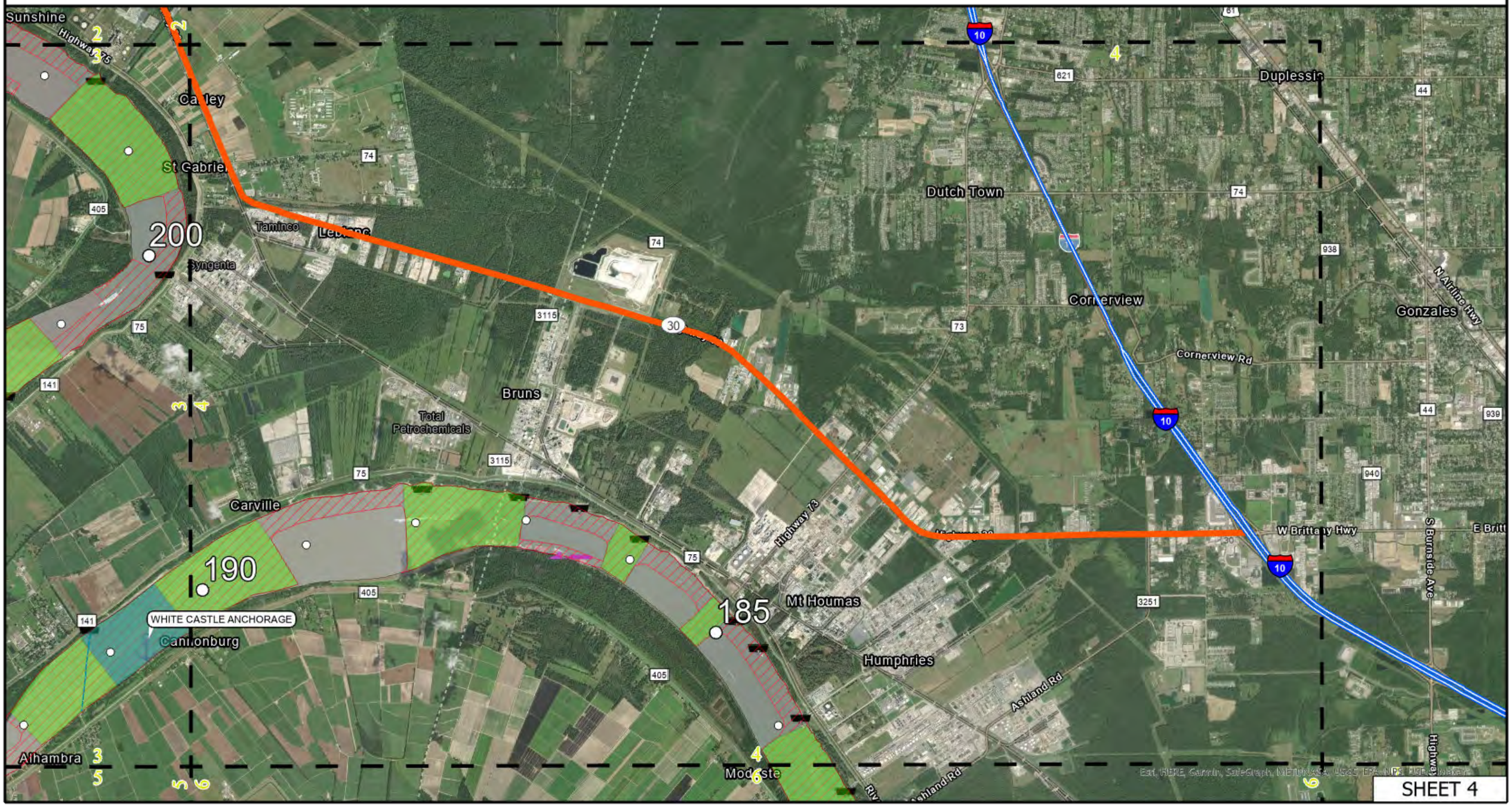
N W E S

3,000 1,500 0 3,000 6,000 9,000 12,000
US Feet US Feet

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

- Page Matchline
- No Bridge Pier Zones
- No Bridge Zones (Anchorages)
- No Bridge Zones (Span Length Exceeded)
- Anchorage Area Symbol
- Mooring Facility Symbol
- Fleeting Area Symbol



MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

N W E S

3,000 1,500 0 3,000 6,000 9,000 12,000
US Feet US Feet

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

- Page Matchline
- No Bridge Pier Zones
- No Bridge Zones (Anchorages)
- No Bridge Zones (Span Length Exceeded)
- Anchorage Area Symbol
- Mooring Facility Symbol
- Fleeting Area Symbol

SHEET 5

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

N W E S

3,000 1,500 0 3,000 6,000 9,000 12,000
US Feet US Feet

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

- Page Matchline
- No Bridge Pier Zones
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- No Bridge Zones (Span Length Exceeded)
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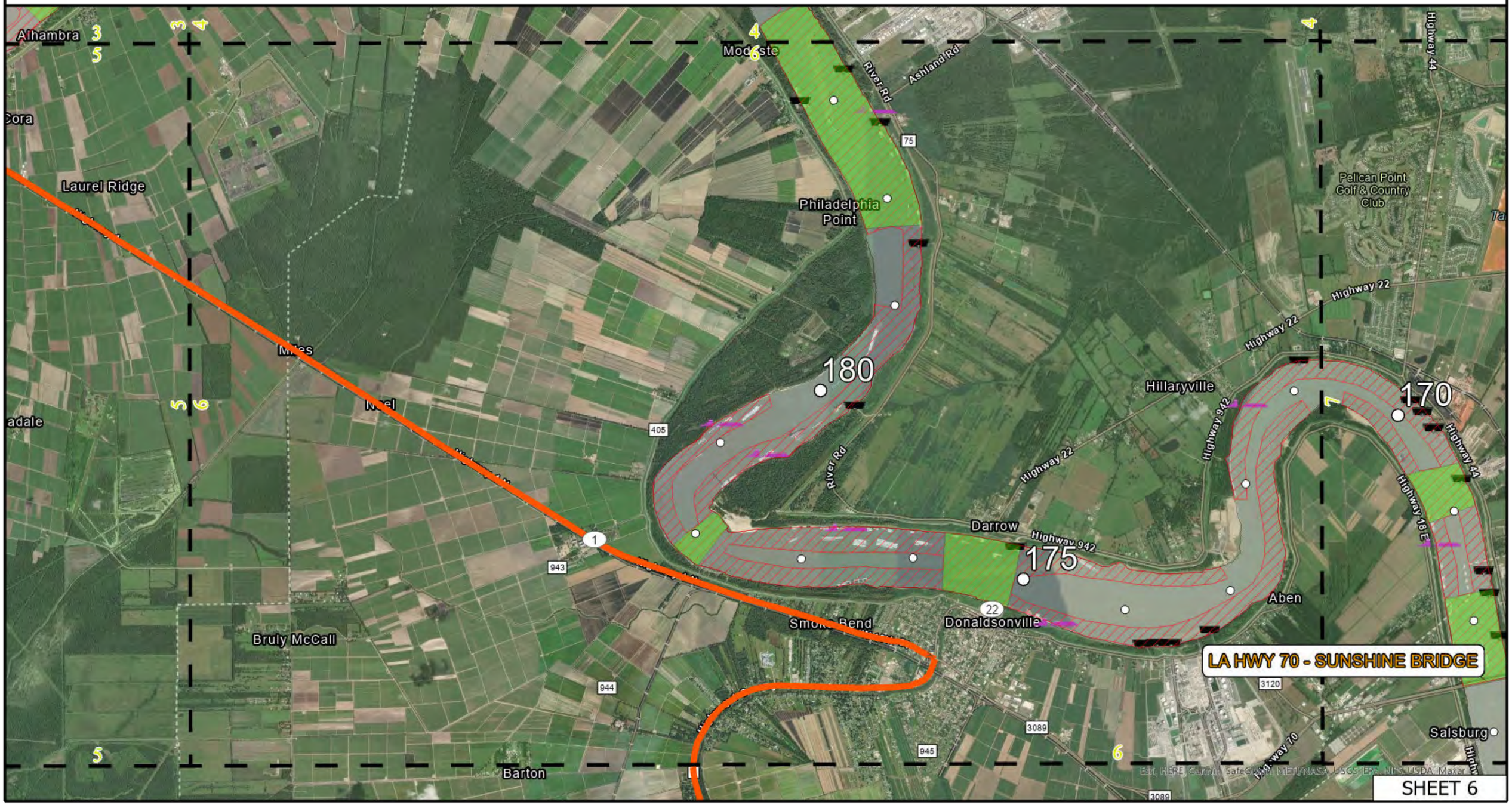
- Mooring Facility Symbol
- Fleeting Area Symbol



SHEET 6

MRB South GBR: LA 1 to LA 30 Connector
S.P. No. H.013284 - Navigation Study

N W E S

3,000 1,500 0 3,000 6,000 9,000 12,000
US Feet US Feet

MRB SOUTH
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT | CAPITAL AREA ROAD AND BRIDGE DISTRICT

Legend

- Page Matchline
- No Bridge Pier Zones
- No Bridge Zones (Anchorages)
- No Bridge Zones (Span Length Exceeded)
- Anchorage Area Symbol
- Mooring Facility Symbol
- Fleeting Area Symbol

SHEET 7

APPENDIX B

2015 USACE Navigation Charts

2015 Flood Control and Navigation Maps
Mississippi River
Cairo, Illinois to the Gulf of Mexico
Mile 953 A.H.P. to mile 22 B.H.P.

Prepared and produced under the direction of the
PRESIDENT, MISSISSIPPI RIVER COMMISSION, U. S. ARMY CORPS OF ENGINEERS

U. S. Army Corps of Engineers
Memphis District
167 North Main Street
Memphis, TN 38103-1894
901-544-4109
www.mvm.usace.army.mil

U. S. Army Corps of Engineers
Vicksburg District
4155 E. Clay Street
Vicksburg, MS 39183
601-631-5129
www.mvk.usace.army.mil

U.S. Army Corps of Engineers
New Orleans District
P. O. Box 60267
New Orleans, LA 70160-0267
504-862-2201
www.mvn.usace.army.mil

The 2015 Navigation Book has been designed to promote safe navigation for both deep-draft and shallow-draft vessels up and down the Lower Mississippi River, Gulf of Mexico to Cairo, IL. The U. S. Army Corps of Engineers encourages book users to submit corrections, additions, or comments for improving this chart to the Geospatial Coordinator, Mississippi Valley Division, 1400 Walnut St., Vicksburg, MS 39181.

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2015 Flood Control and Navigation Maps
Mississippi River
Cairo, Illinois to the Gulf of Mexico
Mile 953 A.H.P. to Mile 22 B.H.P.

63rd Edition

Louisiana, Mississippi, Arkansas, Missouri,
Tennessee, Kentucky, Illinois

Lower Mississippi River

Gulf of Mexico to Cairo, IL
Mississippi River, Southwest Pass, South Pass,
Baptist Collette, Tiger Pass,
Inner Harbor Navigation Canal, Industrial Canal
Algiers Canal, Harvey Canal, Baton Rouge Harbor,
Greenville, MS, Vicksburg, MS,
Memphis, TN, Cairo IL

HORIZONTAL DATUM

The horizontal reference datum of this chart is North American Datum of 1983 (NAD 83) which for charting purposes is considered equivalent to the World Geodetic System 1984 (WGS 84).

Users may plot positions obtained from satellite navigation systems such as the Global Positioning System (GPS) coordinates directly on these chart pages.

North American Datum 1983 graticule is indicated by lines, labeled with degree, minute, second, and hemisphere.

CHARTING DATUMS

Mean Lower Low Water (MLLW) used below Mississippi River, Head of Passes, LA. The Low Water Reference Plane (LWRP) is used for the Lower Mississippi River, Head of Passes upstream.

The LWRP for all charts has been adjusted to be referenced to the North American Vertical Datum of 1988 (NAVD 88).

NOTES

The drying height represented below river mile 173 was compiled from stereo aerial photography flown between May and June 2011.

This Navigation Chart Book has been corrected through the Local Notice to Mariners published weekly by the U. S. Coast Guard, as of the LNM-39-06.

River Mileages on the Mississippi River

The represented river mileage positions were computed as statute mile along the 1962 river thalweg. These river mile positions were set and remain in use today. Therefore these mile markers do not exactly correspond to the current thalweg distances nor to navigational distances as traveled by the mariner; instead, their map positions are to be considered as landmarks and points used for reference purposes.

Of note, prior to 1935, the Mississippi River mileage was measured from a zero at Cairo, Illinois. It is also mile 0.0 for the Upper Mississippi River. At that time the river mileage at New Orleans' Foot of Canal Street was approximately 975 miles. On today's maps, Cairo is 953.8 miles AHP, due to cutoffs made in the 1930s and ongoing river engineering efforts.

From 1935 to 1943, the river mileage was established as Mile 0.0 from the mouth of Southwest Pass. By 1944, the river mileage was determined to be 0.0 from the Mississippi River Head of Passes and it remains in effect today. This adjustment began use of the term "Above Head of Passes" or AHP for referencing current river miles.

WARNING

The represented survey information is accurate as of the date of publication or referenced date of source data. Hydrographic survey data is subject to change rapidly due to several factors including but not limited to dredging activity and natural shoaling and scouring processes. The U. S. Army Corps of Engineers accepts no responsibility for changes in the hydrographic conditions which develop after the date of publication.

CAUTIONS

Mariners are warned that logs and other floating debris are constant dangers to navigation.

Small craft operators are warned beware of severe water turbulence caused by large vessels traversing narrow channels and are recommended against night travel due to floating obstruction hazards.

Additional uncharted submarine pipelines and submarine cables may exist within the charted areas.

Not all submarine cables and pipelines are required to be buried, and those that were originally buried may have become exposed. Mariners should use extreme caution when operating vessels in depths of water comparable to their drafts in areas where pipelines and cables may exist, and when anchoring, dredging or trawling.

MISSISSIPPI RIVER LIGHTS

The numbers in parenthesis at the aids to navigation and facilities are distances in river miles above/below Head of Passes, example: Devil's Swamp (242.4)

MISSISSIPPI RIVER BUOYS

Buoys on the Mississippi River maintained by the U. S. Coast Guard are not shown in this Navigation Book with the exception of bridge approach buoys, Lighted Wreck Buoy "WR4", Mile 115.4, Lighted Wreck Buoy "WR1", Mile 125.0, Medora Crossing Buoy "2", Mile 211.5, Missouri Bend Buoys, "2", "4", "6", "8", "10", 12" Mile 222 and Red Eye Crossing Buoy."2", Mile 223.5.

Buoy locations shown represent approximate placement at a Low Water Reference Plane river stage.

Due to frequently changing river stages and river currents, which often necessitate the repositioning, discontinuance and establishment of floating aids to navigation, many low water buoys maintained by the U. S. Coast Guard are not shown in this Navigation Book. Consult Local Notice to Mariners for the latest river conditions.

Consult the U. S. Coast Guard Light List and Local Notice to mariners for additional information.

LOCK INFORMATION

See Code of Federal Regulations, Title 33 Navigation and Navigable Waters, Chapter II – Corps of Engineers, Department of the Army for locking information:
http://www.gpo.gov/fdsys/pkg/CFR-1999-title33-vol3/pdf/CFR-1999-title33-vol3-sec207-200.pdf

Daily updates of locking information, closures, anticipated queue times, number of tows waiting, and special instruction may be obtained at:
http://www2.mvn.usace.army.mil/od/lockupdates/inc_statusindex.asp

Lock Contacts and Information

Lock	Mile	VHF	Office Phone	After Hours	Length x Width
Algiers Lock	88.0	14	(504) 394-5714	(504) 394-7221	760' x 75'
Empire Lock	29.5	-	-	-	200' x 40'
Harvey Lock	98.3	14	(504) 366-4683	(504) 366-5187	425' x 75'
Inner Harbor Navigation Canal	92.6	14	(504) 945-2157	(504) 947-2606	640' x 75'
Ostrica Lock	25.7	-	-	-	250' x 40'
Old River Lock	304.0	14	(225) 492-3333	(225) 492-2301	1200' x 75'
Port Allen Lock	228.5	14	(225) 343-3752	(225) 344-8272	1202' x 75'
White River Lock	599	-	(501) 324-7340	(501) 324-7340	600' x 110'

NAVIGATION NOTES

The Prudent Mariner shall not rely solely on any single aid to navigation, particularly on floating aids. See the U.S. Coast Guard Light List for details.

Mariners should be cautioned that all aids to navigation depicted on charts comprise a system of fixed and floating aids with varying degrees of reliability.

The U. S. Coast Guard is responsible for placing and maintaining all aids to navigation. Buoys are set to mark project depths taking into consideration the prevailing river stages and obstructions, as well as the rise or fall of the predicted river conditions. Buoy positions as shown on the chart are "Position Approximate" (PA) locations.

Aids to Navigation may be carried off position by high water-accumulation of drift debris, ice or sunk by collision or other causes. When carried off position, destroyed or removed to prevent loss, buoys are replaced at the earliest opportunity by the U. S Coast Guard.

Buoys should always be left with as wide a berth as possible when passing consistent with the length and width of vessel or tow and the width of the river bend or crossing. A buoy should never be scraped, hit or run over by any vessel at any time. If this occurs the mariner is required to report it to the Coast Guard, 46 CFR 26.08-20.

MARINE INFORMATION

The Eighth Coast Guard District is continuously alert for circumstances, which affect safe and efficient passage of river traffic. The Aids to Navigation Office in New Orleans receives reports from mariners and government agencies and distributes information to mariners through various marine information channels.

The four primary means of passing marine information in the Eighth Coast Guard District:

1. Broadcast Notice to Mariners
2. Local Notice to Mariners
3. Channel Reports
4. Directly from Lockmaster

There are four basic marine information publications printed by either the Coast Guard or U. S. Army Corps of Engineers which should be on all vessels:

1. Corps of Engineers Navigational Charts
2. Navigation Rules, International-Inland
3. Light List, Volume V, Mississippi River System and Volume IV, Gulf of Mexico
4. Corps of Engineers Regulations (Bluebook) 33 CFR 207

HOW TO OBTAIN LOCAL NOTICE TO MARINERS

Local Notice to Mariners may be obtained by:

1. One-way e-mail service, via subscription through the U.S. Coast Guard Navigation Center website, Local Notice to Mariners link at: http://www.navcen.uscg.gov.

2. Or downloaded from the U.S. Coast Guard Navigation Center website, Local Notice to Mariners Link at: http://www.navcen.uscg.gov.

The U. S. Coast Guard, Eighth District offices may be contacted at:

Commander, (DPW)
Eighth Coast Guard District
Hale Boggs Federal Building
500 Poydras Street
New Orleans, LA 70130-3396
(504) 671-2107

Mariners may contact the U. S. Coast Guard Command Center, 24-hours a day at (504) 589-6225.

In case of emergency or accident, contact the appropriate Coast Guard sector office:

1. Sector Upper Mississippi River, (866) 360-3386
2. Sector Lower Mississippi River, (866) 777-2784
3. Sector Ohio Valley, (800) 253-7465
4. Sector New Orleans, (800) 874-2153

AIDS TO NAVIGATION

Aid to Navigation - The term Aid to Navigation means any device external to a vessel intended to assist a navigator to determine position or safe course, or to warn of dangers or obstructions to navigation.

Above Baton Rouge, LA (Mile 235.0) – Western Rivers System of Buoyage

The Western Rivers System – a variation of the standard U.S. Aids to Navigation System is employed on the Mississippi River and its tributaries above Baton Rouge, LA and on certain rivers which flow toward the Gulf of Mexico. For more information on aids to navigation access the U.S. Coast Guard Navigation Center website.

Below Baton Rouge (Mile 235.0) – U. S. Standard Aids to Navigation System of Buoyage

The waters of the United States and its territories are marked to assist navigation by the U.S. Aids to Navigation System. This system encompasses buoys and beacons conforming to the International Association of Lighthouse Authorities (IALA) buoyage guidelines and other short range aids to navigation. All U. S. lateral marks are located in the IALA Region B and follow the traditional 3R rule; red, right, returning from sea. For more information on aids to navigation access the U.S. Coast Guard Navigation Center website.

Gulf Intracoastal Waterway

Aids to navigation marking the Intracoastal Waterway (Algiers Canal, Harvey Canal, IHNC, behind Port Allen Lock) exhibit unique yellow symbols to distinguish them from aids marking other waterways. When following the Intracoastal Waterway westward from Carrabelle, FL to Brownsville, TX, aids with yellow triangles should be kept on the starboard side of the vessel and aids with yellow squares should be kept on the port side of the vessel. A horizontal band provides no lateral information, but simply identifies aids to navigation as marking the Intracoastal Waterway.

DGPS FREQUENCIES

The U. S. Coast Guard Navigation Center (NAVCEN) operates the Coast Guard Maritime Differential Global Positioning System (DGPS) Service and the developing Nationwide DGPS Service, consisting of two control centers and over 60 remote broadcast sites. The Service broadcasts correction signals on marine radiobeacon frequencies to improve the accuracy of and integrity to GPS-derived positions. The Coast Guard DGPS Service provides 10-meter accuracy in all established coverage areas.

English Turn, LA
Site Name ENGLISH TURN, LA
Antenna Location 29-52.7N, 89-56.5W
Transmit Frequency (KHz) 293
Transmit Rate (bps) 200
Signal Strength 100uV/m at 170 NM

BoBo, MS
Site Name BOBO, MS
Antenna Location 34-6.91N, 90-41.47W
Transmit Frequency (KHz) 297
Transmit Rate (bps) 200
Signal Strength 100uv/m at 325km

St. Louis, MO
Site Name ST LOUIS, MO
Antenna Location 38-36.7N, 89-45.5W
Transmit Frequency (KHz) 322
Transmit Rate (bps) 200
Signal Strength 100uV/m at 115 SM

Additional information may be obtained from the U. S. Coast Guard Navigation Center website, http://www.navcen.uscg.gov.

CHART SYMBOLS

Above Baton Rouge, LA (mile 235.0) to Memphis, TN, Western Rivers System of Buoyage

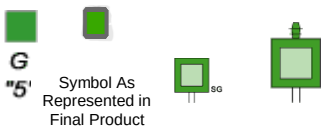
NR – Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners red, with white reflective border.

NG – Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners green, with white reflective border.

TR – Red Triangle

	Fl (2)	Flashing (2)
	Fl	Flashing
	Occ	Occulting
	Fl	Flashing
	Iso	Isophase

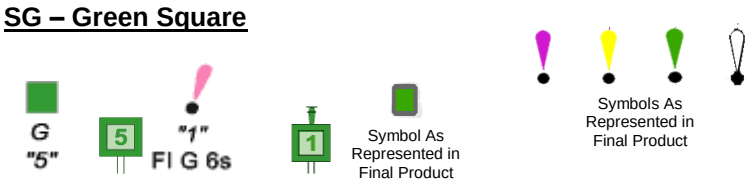
SG – Green Square



	Fl	Flashing
	Occ	Occulting
	Q F	Quick Flashing
	Iso	Isophase

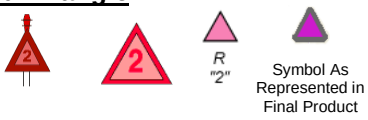
Below Baton Rouge, LA (mile 235.0) to Gulf of Mexico, U. S. Standard Aids to Navigation System of Buoyage

SG – Green Square



	Fl (2)	Flash (2)
	Fl	Flashing
	Occ	Occulting
	Q F	Quick Flashing
	ISO	Isophase

TR - Red Triangle



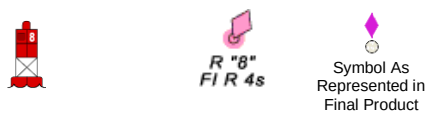
	Fl (2)	Flashing (2)
	Fl	Flashing
	Occ	Occulting
	Fl	Flashing
	Iso	Isophase

G C – Green Can Buoy

R N – Red Nun Buoy

G – Green Buoy

R – Red Buoy



KRW- Rectangular Red dayboard bearing a central white stripe

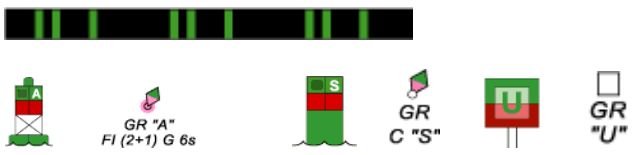
KWG - Rectangular White dayboard bearing a central green stripe

KWR - Rectangular White dayboard bearing a central red stripe

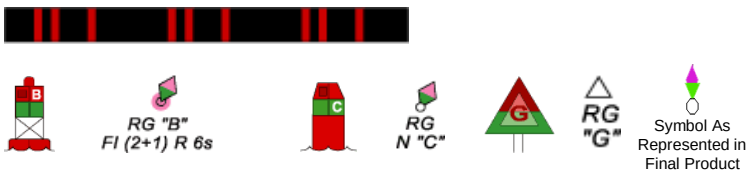
SY – Intracoastal Waterway Yellow Square

TY – Intracoastal Waterway Yellow Triangle

JG- Green and Red Junction Dayboard



JR – Red and Green Junction Dayboard



NB – Diamond-shaped dayboard divided into four diamond-shaped colored sectors with the sectors at the side corners white and the sectors at the top and bottom corners black, with white reflective border.

Anchorage Day Board

HYDROGRAPHIC FEATURES

Sailing Line - The Sailing Line shown is an approximate representation of the track a down bound vessel would follow during a low river stage equal to the Low Water Reference Plane water level.

Low Water Reference Plane – LWRP from Mile 320 to Mile 950 is the 2007 LWRP computer from 2007 average low water stage at discharge equaled or exceeded 97% of the time.

The Mississippi River 2007 LWRP mile 313.7 to 265.4 is based on a 97% discharge duration of 146,000 cfs at Tarbert Landing (1954-2005) and corresponding 10 year (1996-2005) mean stage of 14.8 ft.NAVD88 at Knox Landing, 13.5 ft.NAVD88 at Red River Landing, and 6.6 ft.NAVD88 at Bayou Sara.

The 2007 LWRP below river mile 265.4, from Baton Rouge to Venice is based on a 97% stage exceedence of daily lows for the period of record at each site.

Drying Height Area is defined as an area denoting the range between water edge and high water conditions. Drying height is denoted as dark brown in this publication. The feature applies only to that section of the river that is not controlled by a lock and dam, also known as open river.

Color for Water Areas
A dark blue tint is shown on pages in this Navigation Book to represent areas of less than Project Depth. The light blue areas represents depths of project depth or greater.

The navigation channel will be marked with buoys as per U.S. Coast Guard.

Channel data as depicted is as of date of survey.

DISTRICT	HYDROGRAPHIC SURVEY DATES
MEMPHIS	FEBRUARY 2010
VICKSBURG	MARCH – SEPTEMBER 2013
NEW ORLEANS	JANUARY - SEPTEMBER 2013

Mean Lower Low Water – (MLLW) The tidal datum that is the average of the lowest low water height of each tidal day observed over the National Tidal datum Epoch, 19-years metonic cycle.

Channel Condition Reports and Surveys
In general, this Navigation Book gives project depths for deep-draft ships, 45', up to Baton Rouge LA (Mile 232.4), 40' project depth between river miles 232.4 and 233.8, and project depth for shallow draft, 9', tows above Baton Rouge, LA. In all cases mariners are advised to consult with pilots, local, State or Federal authorities for the latest channel controlling depths. The controlling depths are shown on these charts and published in the appropriate Local Notice to Mariner. Current channel conditions for high shoal areas at passes and at Mississippi River Crossings are obtained from hydrographic surveys and posted to: http://www.mvn.usace.army.mil/Missions/Navigation/ChannelSurveys.aspx

Submarine Cables and Submerged Pipelines
Submarine cables and submerged pipelines cross many of the navigable waterways used by both large and small vessels. Normally warning signs are posted on the banks where submerged cables or a pipeline exists to warn mariners of their existence; in some areas warning signs are not always present.

CHART PAGE DESCRIPTIONS

Bridges and Cables
Vertical Clearances for Bridges are in feet above the appropriate reference gage zero reading. To obtain actual bridge clearance the mariner must subtract the appropriate gage river stage reading from the bridge clearance given.

Vertical Clearances for Overhead cables are in feet above the appropriate river gage mean high water readings; they may be as-built (verified by actual inspection after completion of structure), laser-range surveyed or authorized (design values specified in permit issued prior to construction. No differentiation is made in this Navigation Book between as-built, re-surveyed or authorized clearances.

Vertical Clearance for drawbridges and lift bridges are for the closed position and the open position as referenced to the appropriate river or tide gage as listed.

Vessels with masts, stacks, booms or antennas should allow sufficient clearance under power cables to avoid arcing.

Horizontal clearances for all bridges are in feet, as measured from the narrowest features.

Obstructions
Wrecks and other obstructions are mentioned only if of a relatively permanent nature and in or near normal traffic routes.

Depth is the vertical distance from the chart datum to the bottom and is expressed in feet. Depth contours are lines connecting points of equal depth.

Controlling Depth of a channel or crossing is the least depth within the limits of the channel; it restricts safe use of the channel to drafts of less than that depth.

Federal Project Depth is the designed dredging depth of a channel constructed by the U. S. Army Corps of Engineers; the project depth may or may not be the goal of maintenance dredging after completion of the channel and for this reason project depth must not be confused with controlling depth.

Region Covered	Begin Mile	End Mile	Project Depth
Cairo, IL to I-190 Bridge, La	960	233.8	9′
I-190 Bridge to Upper Baton Rouge Front Crossing	233.8	232.4	40'
Upper Baton Rouge Front Crossing to Head of Passes	232.4	0	45'
Head of Passes to Gulf of Mexico, (Southwest Pass)	0	22 BHP	45'

U. S. Buoyage Systems – Aids to Navigation
Aids to navigation depicted on charts comprise a system of fixed and floating aids with varying degrees of reliability. Therefore, prudent mariners will not rely solely on any single aid to navigation, particularly a floating aid. Consult the latest Light List or the Coast Guard Navigation Center website at: http://www.navcen.uscg.gov.

The U. S. Coast Guard Light List Volume V, Mississippi River System and Light List Volume IV, Gulf of Mexico, should be consulted for determination between Federally Maintained Aids to Navigation and Private Aids to Navigation.

The mariner is also cautioned that buoys may be missing or off station as the result of ice, running ice or other natural causes (high water), collisions, or other accidents.

Western Rivers System of Buoyage
The Western Rivers System is a variation of the standard U.S. Aids to Navigation System that is employed on the Mississippi River and its tributaries above Baton Rouge, LA and on certain rivers which flow toward the Gulf of Mexico. The Western Rivers System varies from standard U. S. system, as follows:

1. Aids to navigation are not numbered.
2. Numbers on aids to navigation do not have lateral significance, but rather indicate mileage from a fixed point (normally a river mouth or confluence).
3. Diamond shaped crossing dayboards, red and white or green and white as appropriate are used to indicate where the river channel crosses from one bank to another.
4. Lights on the green aids to navigation show a single-flash characteristic, which may be green or white.
5. Lights on the red aids to navigation show a group-flash characteristic, which may be red or white.
6. Isolated Danger marks are not used.

U. S. Standard Aids to Navigation System of Buoyage
The waters of the United States and its territories are marked to assist navigation by the U.S. Aids to Navigation System. This system encompasses buoys and beacons conforming to the International Association of Lighthouse Authorities (IALA) buoyage guidelines and other short range aids to navigation. All U. S. lateral marks are located in the IALA Region B (IALA B)and follow the traditional 3R rule; Red, Right Returning from sea. For more information on aids to navigation access the U.S. Coast Guard Navigation Center website at: http://www.navcen.uscg.gov

COMMUNICATIONS

Normal Lower Mississippi River VHF communication channels:

Channel Number	Usage
16	International Distress, Safety and Calling Channel. Ships required to carry radio, the USCG, and most coast stations maintain a listening watch on this channel.
22A	USCG Liaison and Maritime Safety Information Broadcasts. Broadcasts are announced on channel 16.
14	Most locks monitor and work this channel.
13	Devil's Swamp Light, Mile 242.4, AHP and above.
67	Devil's Swamp Light, Mile 242.4, AHP to the Gulf of Mexico.

Both channels 13 and 67 should be monitored by vessels transiting in this locality to ensure being altered to all traffic movements in the area.

Maritime Safety Information Broadcasts

The U.S. Coast Guard and other government agencies broadcast different kinds of maritime safety warnings, using a variety of different radio systems to ensure coverage of different ocean areas for which the United States has responsibility, and ensure all ships of every size and nationality can receive this safety information. All broadcasts except those over VHF and MF radiotelephone are made by computer.

Coastal Maritime Safety Broadcasts

VHF Marine Radio Broadcasts. Urgent marine navigational and weather information is broadcast over VHF channel 22A (157.1 MHZ) from over 200 sites covering the coastal areas of the U.S., including the Great Lakes, major inland waterways, Puerto Rico, Alaska, Hawaii and Guam. Broadcasts are first announced over the distress, safety and calling channel 16 before they are made. All ships in U.S. waters over 20m in length are required to monitor VHF channel 16, and must have radios capable of tuning to the VHF simplex channel 22A.

U. S. Coast Guard National Distress System

National Distress System VHF site consists of a receiver guarding VHF Channel 16, the maritime distress, safety and calling channel, and a transceiver capable of operating on one of six fixed maritime channels. Two of these channels are always Channel 16 and 22A.

Vessel Traffic Services

The purpose of a Vessel Traffic Service (VTS) is to provide active monitoring and navigational advice for vessels in particularly confined and busy waterways. All Vessels transiting the Lower Mississippi River, New Orleans Harbor area, Mile 103 AHP to Mile 88 AHP are required to contact New Orleans Vessel Traffic Service on VHF Channel 67 at the following locations:

Contact Governor Nicholls Light (VHF Ch 67):

- All Northbound Traffic at Chalmette Ferry Crossing, Mile 88.6 AHP.
- All Northbound Traffic at the Industrial Forebay, Mile 92.8 AHP.
- All traffic exiting the Inner Harbor Navigational Locks, before entering the Mississippi River.

Contact Gretna Light (VHF Ch. 67):

- All South Bound Traffic at Cargill Westwego Grain Elevator, Mile 103.0 AHP.
- All South Bound Traffic at Marlex Docks, The Navy Ships, Mile 99.1, AHP.

All other traffic departing docks within Mile 103 to Mile 88 area, contact the appropriate Traffic Light to request vessel movements.

NOAA Weather Radio Frequencies

Channel	Frequency (MHz)
WX1	162.550
WX2	162.400
WX3	162.475
WX4	162.425
WX5	162.450
WX6	162.500
WX7	162.525

U. S. Marine VHF Channels

Channel Number	Ship Transmit MHz	Ship Receive MHz	Usage
01A	156.050	156.050	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area.
05A	156.250	156.250	Port Operations or VTS in the Houston, New Orleans and Seattle areas.
06	156.300	156.300	Internship Safety
07A	156.350	156.350	Commercial
08	156.400	156.400	Commercial (Internship only)
09	156.450	156.450	Boater Calling. Commercial and Non-Commercial.
10	156.500	156.500	Commercial
11	156.550	156.550	Commercial. VTS in selected areas.
12	156.600	156.600	Port Operations. VTS in selected areas.
13	156.650	156.650	Internship Navigation Safety (Bridge-to-bridge). Ships >20m length maintain a listening watch on this channel in US waters.
14	156.700	156.700	Port Operations. VTS in selected areas.
15	--	156.750	Environmental (Receive only). Used by Class C EPIRBs.
16	156.800	156.800	International Distress, Safety and Calling. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel.
17	156.850	156.850	State Control
18A	156.900	156.900	Commercial
19A	156.950	156.950	Commercial
20	157.000	161.600	Port Operations (duplex)
20A	157.000	157.000	Port Operations
21A	157.050	157.050	U.S. Coast Guard only
22A	157.100	157.100	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.
23A	157.150	157.150	U.S. Coast Guard only
24	157.200	161.800	Public Correspondence (Marine Operator)
25	157.250	161.850	Public Correspondence (Marine Operator)
26	157.300	161.900	Public Correspondence (Marine Operator)
27	157.350	161.950	Public Correspondence (Marine Operator)
28	157.400	162.000	Public Correspondence (Marine Operator)
63A	156.175	156.175	Port Operations and Commercial, VTS. Available only in New Orleans / Lower Mississippi area.
65A	156.275	156.275	Port Operations
66A	156.325	156.325	Port Operations
67	156.375	156.375	Commercial. Used for Bridge-to-bridge communications in lower Mississippi River. Internship only.
68	156.425	156.425	Non-Commercial
69	156.475	156.475	Non-Commercial
70	156.525	156.525	Digital Selective Calling (voice communications not allowed)
71	156.575	156.575	Non-Commercial
72	156.625	156.625	Non-Commercial (Internship only)
73	156.675	156.675	Port Operations
74	156.725	156.725	Port Operations
77	156.875	156.875	Port Operations (Internship only)
78A	156.925	156.925	Non-Commercial
79A	156.975	156.975	Commercial. Non-Commercial in Great Lakes only
80A	157.025	157.025	Commercial. Non-Commercial in Great Lakes only
81A	157.075	157.075	U.S. Government only - Environmental protection operations.
82A	157.125	157.125	U.S. Government only
83A	157.175	157.175	U.S. Coast Guard only
84	157.225	161.825	Public Correspondence (Marine Operator)
85	157.275	161.875	Public Correspondence (Marine Operator)
86	157.325	161.925	Public Correspondence (Marine Operator)
AIS 1	161.975	161.975	Automatic Identification System (AIS)
AIS 2	162.025	162.025	Automatic Identification System (AIS)
88A	157.425	157.425	Commercial, Internship only.

ADDITIONAL U. S. ARMY CORPS OF ENGINEERS NAVIGATIONAL PRODUCTS

Inland Electronic Navigational Charts (IENCs)

The U.S. Army Corps of Engineers produces Inland Electronic Navigational Charts (IENCs) for the Lower Mississippi River, Mile 236 upwards throughout the Inland Waterway System.

These IENCs are created for use in Electronic Chart Systems (ECS) to position a vessel upon the electronic navigational chart display. Use of ECS in conjunction with IENCs does not eliminate the USCG paper chart carriage requirement. Until such guidance and policy is established, IENCs provide a valuable adjunct to the 2015 Navigation Book.

IENCs offer significant benefits to vessels including accurate and real-time display of vessel position relative to waterway features, voyage planning and monitoring tools, Automatic Identification Systems (AIS) integration, and training tools for new personnel and integrated display of river charts, radar, and AIS.

All Mississippi River IENCs are maintained with updates of new or corrected Local Notice to Mariner information as it becomes available. IENCs are updated at least annually and monthly maintenance is currently underway.

The U. S. Army Corps of Engineers has and can develop large-scale specialized IENCs to respond to unique or short-term navigational requirements within the Inland Waterways System.

IENC chart products, services, and information are available for download at: http://www.agc.army.mil/Missions/Echarts

Other Electronic Navigational Charts

The National Oceanic & Atmospheric Administration's (NOAA) Office of Coast Survey produces Electronic Navigational Charts (ENC) for the Mississippi River, Mile 236 to the Gulf of Mexico and associated side channels. NOAA ENCs are available the Navigation Chart site at: http://www.nauticalcharts.noaa.gov/mcd/enc/index.htm

WATERBORNE COMMERCE STATISTICS CENTER

The U. S. Army Corps of Engineers, Waterborne Commerce Statistics Center under the authority of the Rivers & Harbors Act of 1922, collects, processes, distributes, and archives vessel trip and cargo data.

Under Federal law, vessel operating companies must report domestic waterborne commercial movements to the Corps.

Data summaries include origin to destination information of foreign and domestic waterborne cargo movements by region and state, and also waterborne tonnage for principal ports and state and territories. Internal waterway tonnage indicators are updated monthly on the NDC web site.

This acquired vessel movement data is primarily for Corps and other government agencies' use. However, summary statistics, which do not disclose movements of individual companies, are also released to private companies and to the general public

The Waterborne Commerce Statistics Center's summarizes this data in the publication, *Waterborne Commerce of the United States.* It is issued in five parts (one to cover each coast and a national summary). A database that aggregates information of foreign and domestic waterborne cargo movements is available on CD. The publication *Transportation Lines of the United States* contains listings of domestic vessel operators, details their equipment and references their service areas. Most data are available in both hard copy and electronic form. Specialized data processing requests are considered on a case-by-case basis. Products and services may be obtained by request to:

Waterborne Commerce Statistics Center (WCSC)
P.O. Box 61280
New Orleans, LA 70161-1280
(504) 862-1424 or (504) 862-1404

http://www.navigationdatacenter.us/wcsc/wcsc.htm

LEGEND

NAVIGATION FEATURES

Warning Sign — WARNING

Aid Label — Ashbrook Lt. (548.8)

Bridge Lights — Red Lt. | Green Lt.

Daybeacon — SG | TR

Lighted Bouy — Green Can Lighted | Red Nun Lighted | Junction Lighted

Bouy — Green Can | Red Nun | Junction | Mooring

Light — Green Lt. | Red Lt. | White Lt. | Yellow Lt.

TRANSPORTATION FEATURES

Interstate

Secondary Road

Tertiary Road

Railroad Road

Bridge Abutment Line (exggerated for clarity)

Ferry

Interstate Highway — 20

U. S. Highway — 61

State Highway — 101

HYDROGRAPHIC FEATURES

Mooring Buoy

River Mile — 437

River Gage

Flow Arrow

Dike / Jetty Centerline

Weir Centerline

Sailing Line

Recommended Route Area

River / Lake / Canal / Bayou

Sandbar (Drying Height)

Mooring Facility Area

Hulk Area

Dredging Area

Revetment Area

Restricted Anchorage Area

Fleeting Area

Anchorage Area

Lock Chamber Area

Dam Area

TOPOGRAPHIC FEATURES

Facility Number — 10

Boat Ramp

Gaming Boat — GB

Airfield

Levee Station — 4500+00

County / Parish Boundary

State Boundary

Pipeline Submarine

Cable Submarine

Powerline Overhead

Wildlife Management Area

Island /Wetland Area

Levee Area

Municipal Area

Land Cover

District Boundary Area

2015

Legend

Last Revised Date: 5/5/2016

2015 **SCALE = 1:40,000**

1 0.5 0 1 2 Miles

1 0.5 0 1 2 Kilometers

CHART NO. 74

Last Revised Date: 5/6/2016

River Mile 232.7 to 222.5

2015 **SCALE = 1:40,000**

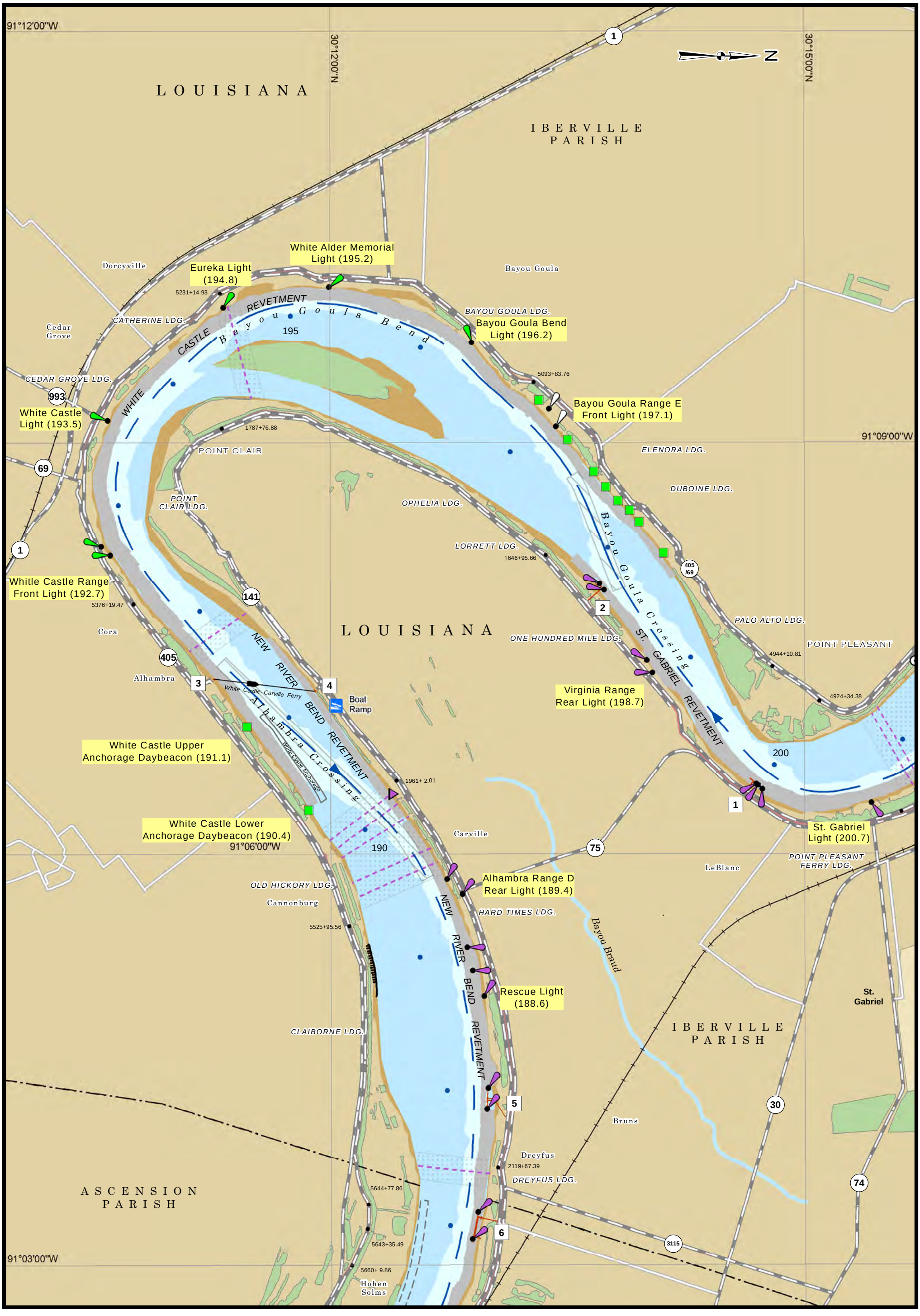
1 0.5 0 1 2 Miles

1 0.5 0 1 2 Kilometers

CHART NO. 75

Last Revised Date: 5/6/2016

River Mile 222.9 to 201.1



2015 **SCALE = 1:40,000**

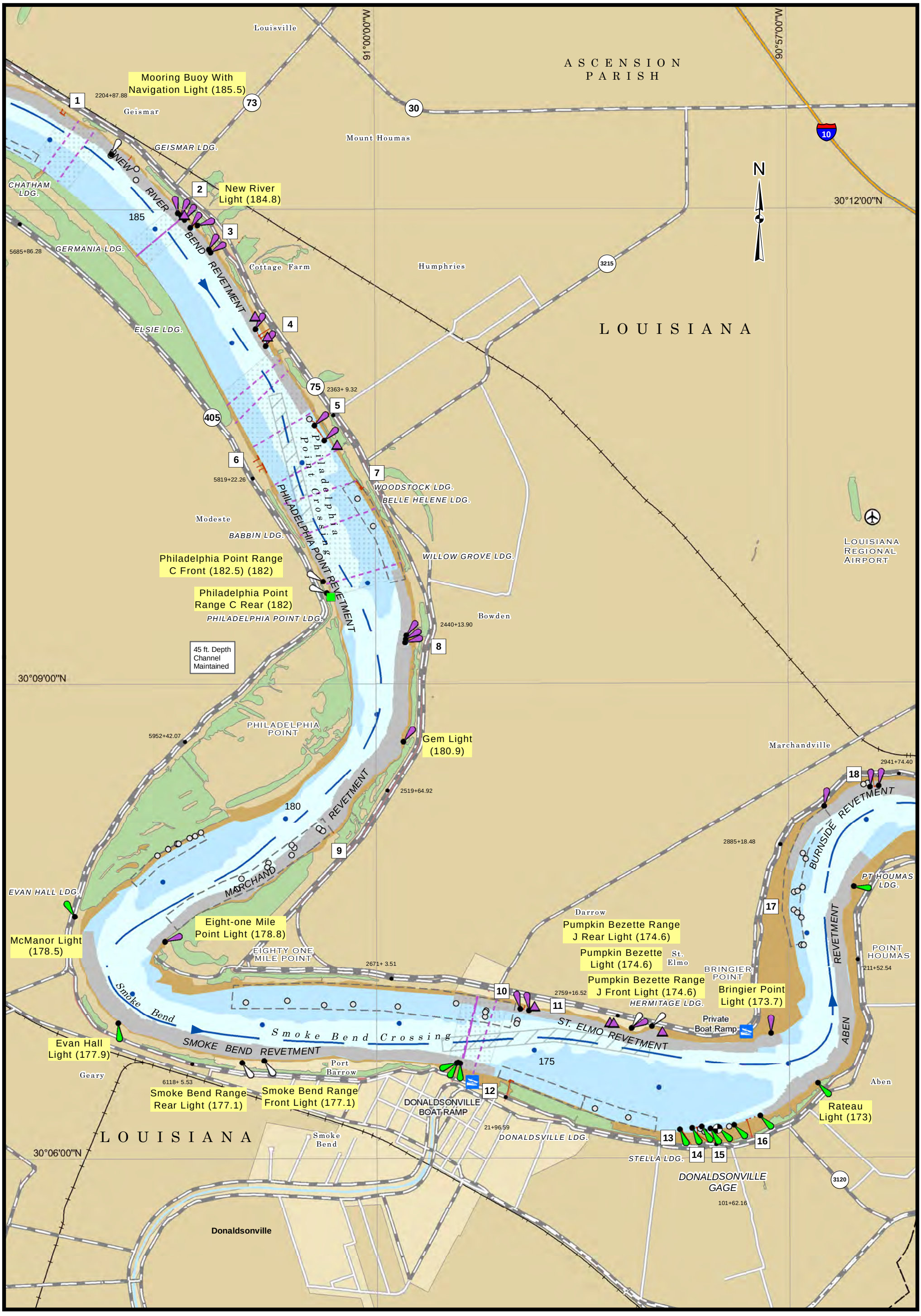
1 0.5 0 1 2 Miles

1 0.5 0 1 2 Kilometers

CHART NO. 76

Last Revised Date: 5/6/2016

River Mile 201.1 to 186.4



2015 **SCALE = 1:40,000**

1 0.5 0 1 2 Miles

1 0.5 0 1 2 Kilometers

CHART NO. 77

Last Revised Date: 5/6/2016

River Mile 186.4 to 170.6

Riverton Light (171.2)
Impala Warehousing Light 170 (170.6)
Ormet Primary Alumina Corp., Burnside Terminal, Barge Dock And Fleets. (170.3)
Impala Warehousing Lighted Mooring Buoy A (169.6)
Impala Warehousing Lighted Mooring Buoy B (169.6)
Wade Hampton Light (172)
Americas Styrenics Dock Lights (166.8)
Sunshine Upper Anchorage Daybeacon (167)
Sunshine Lower Anchorage Daybeacon (165)
St. Alice Light (164.8)
Brilliant Point Light (163.5)
Nita Light (162.2)
Lower Limit Port of Baton Rouge Mile 168.3
BURNSIDE REVETMENT
ST. ELMO REVETMENT
ABEN REVETMENT
ST. ALICE REVETMENT
ROMEVILLE REVETMENT
Sunshine Anchorage
Burnside
Marchandville
Darrow
Donaldsonville
HERMITAGE LDG.
St. Elmo
BRINGIER POINT
Private Boat Ramp
PT HOUMAS LDG.
POINT HOUMAS
BURNSIDE LANDING
Aben
STELLA LDG.
Lemannville
Salsburg
SALSBURG LDG.
UNION LDG.
Union
ARCADIA LDG.
White Hall
Lauderdale
Central
Helvetia
WILTON LDG.
HELVETIA LDG.
Welcome
ST. CLARA LDG.
BRILLIANT POINT
LILY LDG.
Hymel
Romeville
ST. CECILI LDG.
ASCENSION PARISH
ST. JAMES PARISH
LOUISIANA
2885+18.48
2759+16.52
2941+74.40
211+52.54
311+89.77
101+62.16
3059+73.72
401+61.06
506+68.37
3177+79.31
3282+90.10
617+52.49
3378+59.99
727+70.51
3442+91.74
30°09'00"N
30°06'00"N
30°03'00"N
90°54'00"W
90°57'00"W
90°51'00"W
N

2015 SCALE = 1:40,000

1 0.5 0 1 2 Miles

1 0.5 0 1 2 Kilometers

CHART NO. 78

Last Revised Date: 5/6/2016

River Mile 174.2 to 160.4

APPENDIX C

2013 USACE Bathymetric Maps

2013 Hydrographic Survey Maps

Mississippi River

Black Hawk, Louisiana to the Gulf of Mexico
Mile 324 A.H.P. to Mile 23 B.H.P.

US Army Corps of Engineers®
Mississippi Valley Division

Background

The Mississippi River has the third largest river basin in the world. It is the fabled river of Native Americans, the explorers Marquette and Joliet, the words and works of Mark Twain, and the scourge of steamboat pilots. Man's modern relationship with the Mississippi River began by using the river as the focal point for transportation, commerce, and trade. Favorable locations along the river, such as landings and river confluences, grew into settlements.

These settlements grew into towns, which grew into cities including Memphis, Vicksburg, Natchez, Baton Rouge, and New Orleans. Transportation progressed from canoes in the 1700's, to ferries and steamboats into the 1930's, and finally to a major transportation artery connecting the United States “Western Rivers.” Today, dredging of the Mississippi River’s Southwest Pass provides deep draft, ocean going vessels access to travel as far as 240 miles inland to the Port of Baton Rouge, LA.

The Mississippi River Commission (MRC) was established by an Act of Congress on June 28, 1879. Congress charged the MRC with the mission to develop plans to improve the condition of the Mississippi River, foster and give safety to navigation, promote commerce, and prevent destructive floods.

The MRC was charged with prosecuting the comprehensive river management program known as the Mississippi River and Tributaries (MR&T) project, which was authorized through the Flood Control Act of 1928. The MR&T project is the largest flood control project in the world, providing protection to the 36,000 square-mile lower Mississippi valley. The navigation features of the MR&T project seek to facilitate navigation and promote commerce on the nation’s most vital commercial artery. The MR&T project has developed a river channel with the dimensions and alignments that carry floodwater flows efficiently and are also suitable for navigation. Waterborne commerce on the Mississippi River increased from 30 million tons in 1940 to nearly 435 million tons today.

In 2011, the Ports of South Louisiana, New Orleans, Baton Rouge, and Plaquemines were ranked by tonnage, as the first, fifth, tenth, and fourteenth largest United States ports. When combined this port complex, outranks the fourth largest port in the world in tonnage, that of Rotterdam, Netherlands.

This Publication

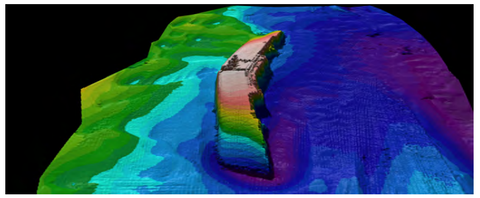
This publication of the 2013 Mississippi River Hydrographic Survey Book represents its 6th Edition in this format with prior surveys being published in 1949, 1961, 1973, 1985, and 1991. Prior comprehensive surveys were published by the Mississippi River Commission in 1883, 1913, and 1935.

This publication is produced at roughly ten year intervals or after a large flood event. Its supporting collected survey data will be used for the channel improvement, river engineering, and river management missions at the USACE New Orleans District.

Survey Data Collection

The earliest comprehensive surveys took years to complete and were performed by dropping a heavy lead weight on a marked line (leadline survey) to collect each shot at approximate positions between markers placed on the bankline that defined a range line across the river. The first 1883 effort took 30 years to complete. The 2013 publications survey was collected under several contracts in phases, in February 2011, December 2012, and Mar 2013. A small portion in the vicinity of River Mile 320 was run in December 2009. This survey exploited modern technologies, using DPGS positioning and Multibeam sounding equipment. This survey collected well into the millions of soundings.

The density of multibeam surveys provides extraordinary levels of detail and allows representations of underwater obstructions and wrecks below the muddy Mississippi. For example, USACE has produced detailed renderings of the Union Faith wreckage located near River Mile 95.



Union Faith Wreckage Color Rendering

The Union Faith was a general cargo freighter of medium size: 7,301 GT (gross tons), 503.25 feet in length overall, and a breadth of 64.11 feet. The vessel currently rests on the bottom of the Mississippi River, approximately 100 yards downriver from the Greater New Orleans Bridge, due to an explosive collision with a barge in 1969.

However, representation of this dense multibeam sounding survey has limitations when developing contours. Multibeam soundings create a significant noise level at the map sheet’s 1:20,000 scale. Therefore, a thinning process was used to provide a more cartographically pleasing interpretation of the original multibeam survey. The data was processed into DTMs from which depth values were extracted along the river range lines. Then these pseudo “single beam” cross-sections were contoured into depth curves. This data thinning results produce a representation of reality compatible with those in past hydrographic survey books.

Other data formats are available, if larger scale or other representations or analyses are required.

Other Data Formats

Publication Date	Available Data Formats
2014	Maps: MicroStation DGN files Survey: Text files for range line survey and multibeam
2004	Maps: MicroStation DGN files Survey: Text files for range line survey and soundings
1991	Maps: MicroStation DGN files Survey: Text files for range line survey and soundings
1985	Maps: PDF files Survey: Data not available

Refer to USACE New Orleans WWW site for data available to download:
http://www.mvn.usace.army.mil/Missions/Engineering/GeospatialSection.aspx

Low Water Reference Plane

Low Water Reference Plane (LWRP) is a hydraulic-based reference plane established from long-term observations of the river's stage, discharge rates, and flow duration periods developed about the 97% flow duration line and/or the 97% stage exceedence of daily lows for the period of record at a specific site. Per EM 1110-2-1003, Engineering and Design - Hydrographic Surveying, construction and improvements along the middle and lower Mississippi River are performed relative to the LWRP at a particular point.

Methodology of LWRP Depth Contouring

The Terra Scan software product running on top of Bentley MicroStation was utilized to both process the XYZ data of the 2’X2’ gridded points of the Mississippi River multi-beam survey. The data along the river ranges was extracted using a 10’ wide path. From this dense data, points were extrapolated every 100 feet along the range to develop a new XYZ dataset. The datasets were broken into reaches of similar LWRP values and the LWRP value subtracted from the Z values. The resultant XYZ datasets were triangulated within the Terra Scan software and contours displayed. The contours were modified to correct areas in which the software could not display the contours smoothly.

Topographic Features

The topographic features within this publication were reused from the topographic feature layers found within the 2004 publication, with the exception of adding the John James Audubon bridge at River Mile 262 and updating of Mississippi River revetments. The 2004 book’s stereocompilation was produced from aerial imagery collected in February 2002. Therefore, the topographic features should be considered for reference only. More current digital imagery and digital topographic data sets are readily available for other uses.

Datums & Elevations

Source of Hydrographic Survey Data:
The Mississippi River multi-beam survey was performed under Contract Number DACW912P8-09-C-0059. This survey covered River Miles 324 to 0. Survey was performed between December 2012 and to May 2013. The South and Southwest Pass surveys were performed in January 2013 and April 2013 respectively by the Corps of Engineers New Orleans Districts Operations Division maintenance surveys. The Pass A Loutre surveys were performed via separate contract, W912P8-10-D-0050 in September 2013.

Note: Pass A Loutre is not a federally maintained waterway.

The multi-beam surveys listed above provided coverage of the river bottom from as near to each bank as possible. The overbank survey data extending from the end of the multi-beam surveys were carried over from the 2003-2004 Hydrographic Survey Book.

All surveys were performed relative to NAD83, Louisiana South Zone 1702 horizontal datum and NAVD88, 2004.65 vertical datum.

Care must be taken when comparing LWRP contours from past products to the current product.

Care must be taken when comparing elevations from past products to the current product.

Submerged Pipelines and other Depicted Utilities

Please note that this product should not be considered an authoritative source for placement and existence of submerged pipelines. Refer to the National Pipeline Mapping System (www.npms.phmsa.dot.gov), USACE permit and regulatory information, other data sources specifically tracking pipeline infrastructure, and ultimately reference the physical pipeline crossing signage found along the river.

Authorization & Funding

The 1879 Mississippi River Commission Act (46th Congress, Sess. I. Ch. 43. 1879) empowered the MRC to make surveys and investigations necessary to prepare plans to improve the river channel, protect the banks, improve navigation, prevent destructive floods, and promote commerce.

Funding sources the current surveys came from Mississippi River O&M projects, the Channel Improvement Program, and the USACE Inland Electronic Navigational program. Funding to produce the publication was provided by Mississippi River O&M project.

Not Suitable for Navigation

This publication is not a navigational product. It is not considered suitable for navigation nor acceptable to meet USCG Chart Carriage requirements.

About the Cover

The 2013 Hydrographic Survey Book cover is a composite of the New Orleans “crescent” area of the Mississippi River. The left-most image is from Chart 76 of the 1913 Chart of the Mississippi River from the Mouth of the Ohio River to the Gulf of Mexico. The center image is from Sheet 50 of the 1973-1975 Mississippi River Hydrographic Survey Book. The right-most image is aerial photography from 2012.

MISSISSIPPI RIVER

HYDROGRAPHIC SURVEY 2013

NARRATIVE SHEET

CURRENT AND HISTORICAL RENDITION INFORMATION

U.S. ARMY ENGINEERS DISTRICT, NEW ORLEANS

FILE NO. H-5-55630

INDEX MAP

MISSISSIPPI RIVER

HYDROGRAPHIC SURVEY

2013

BLACK HAWK, LA. TO HEAD OF PASSES, LA.
ALSO SOUTH AND SOUTHWEST PASSES
AND PASS A LOUTRE

PREPARED UNDER THE DIRECTION OF THE
PRESIDENT, MISSISSIPPI RIVER COMMISSION
BY THE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
NEW ORLEANS, LOUISIANA

IN 86 SHEETS

SCALE OF MILES
5 0 5 10 15

SCALE OF KILOMETERS
5 0 5 10 15 20 25

NOTES: (Black Hawk, La. To Head of Passes, La.)
Lambert Conformal Conic Projection, North American Datum of 1983.
All elevations are expressed in feet and refer to North American Vertical Datum of 1988.
Contours below Low Water Reference Plane are expressed in feet at 5 and 10 ft. intervals.
Contours above Low Water Reference Plane are expressed in feet at 5 ft. intervals.
Planimetry from aerial photographs flown February 2002.
Distances on Mississippi River above Head of Passes are shown at 1 mile intervals,
1962 survey.

NOTES: (South and Southwest Passes and Pass a Loutre.)
Lambert Conformal Conic Projection, North American Datum of 1983.
All elevations are expressed in feet and refer to North American Vertical Datum of 1988.
Contours below -20 ft. contour are expressed in feet at 10 ft. intervals.
Planimetry from aerial photographs flown February 2002.
Distances on South and Southwest Passes below Head of Passes are shown at 1 mile intervals,
1962 survey.
Distances on Pass a Loutre, from junction of Mississippi River and Pass a Loutre, are
shown at 1 mile intervals, 1962 survey.

LEGEND

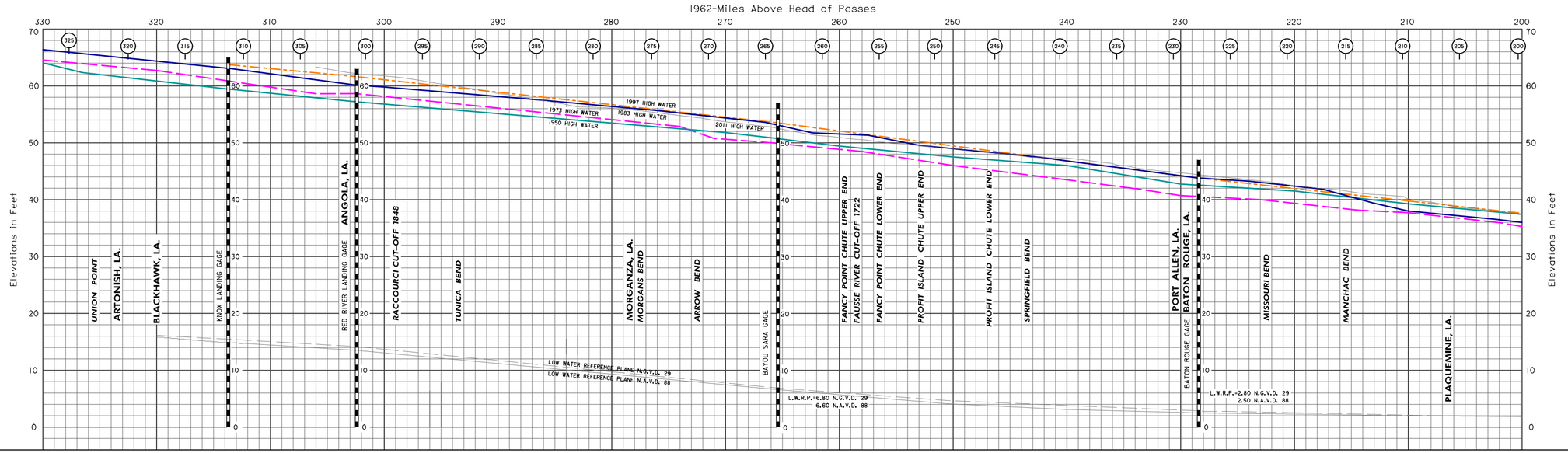
- 1269+40.3 / 1272+67.0 — Levee baseline, toe, and station numbers
- Top of levee (no baseline) and toe
- Wavewash Protection
- Foreshore Protection
- Revetment
- Bulkhead
- Paved road, four or six lanes wide
- Paved road, two lanes wide
- Loose surface road, graded and drained
- Improved dirt road
- Unimproved dirt road
- Street
- 179 — River mile above head of Passes (1962)
- Low Water Reference Plane
- L.W.R.P. 3 | 4 — Low Water Reference Plane Elevation (to nearest foot N.G.V.D.)
- R-180.7 — Range Designation (1942 mileage)
- Direction of flow
- River Gage
- ☆ MARCHAND LT. — Navigation light and name
- Submarine pipe or cable crossing

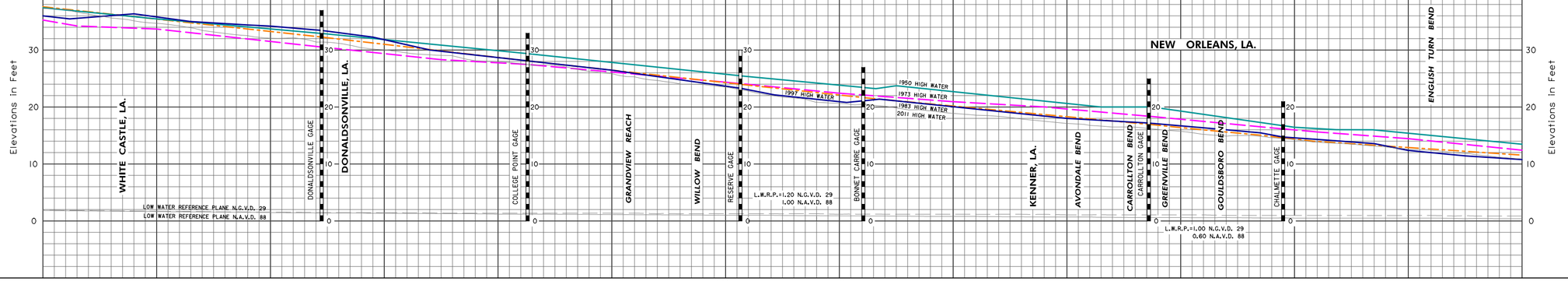
VICKSBURG ENGINEER DISTRICT
WILKINSON COUNTY
WEST FELICIANA PARISH
MISSISSIPPI
LOUISIANA
NEW ORLEANS ENGINEER DISTRICT

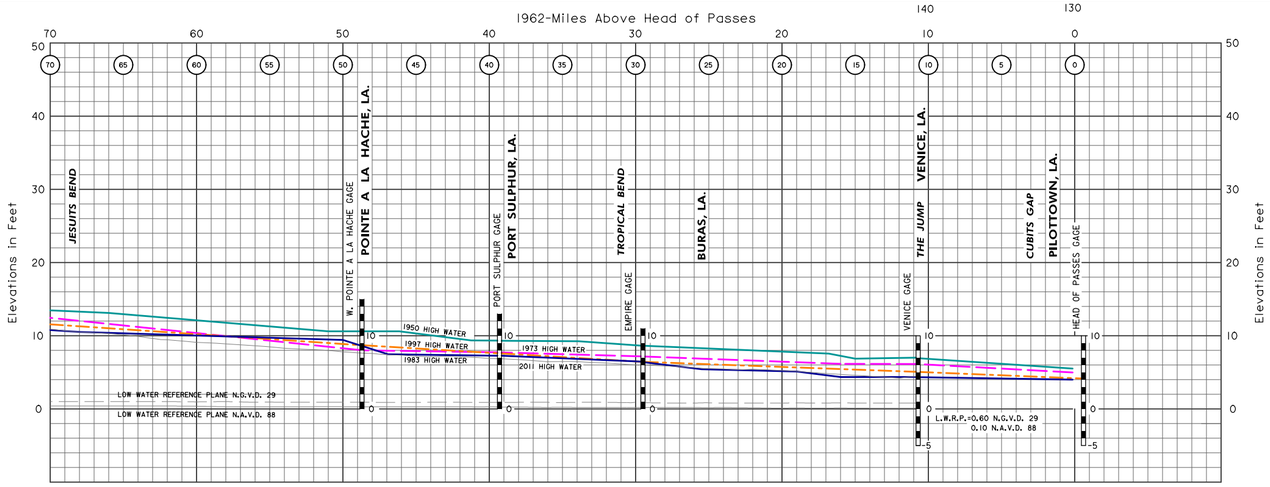
Black Hawk · Torras · Morganza · St. Francisville · Plaquemine · White Castle · Donaldsonville · Gramercy · Laplace · Pilottown · Venice · Myrtle Grove · Pointe A La Hache · Port Sulphur · Empire · Buras · Burrwood · Port Eads · Belle Chasse · Poydras · Algiers · KENNER · NEW ORLEANS · BATON ROUGE · PORT ALLEN

GULF OF MEXICO · BRETON SOUND · LAKE MAUREPAS · LAKE PONTCHARTRAIN · LAKE BORGNE

91°45′ 91°30′ 91°15′ 91°00′ 90°45′ 90°30′ 90°15′ 90°00′ 89°45′ 89°30′
31°00′ 30°45′ 30°30′ 30°15′ 30°00′ 29°45′ 29°30′ 29°15′ 29°00′







LWRP VALUE TABLE

LOCATION	1962 RIVER MILEAGE	2007 LWRP NGVD 29	2007 LWRP NAVD 88 2004.65
KNOX LANDING GAGE	313.7	15.40	14.80
RED RIVER LANDING GAGE	302.4	14.10	13.50
BAYOU SARA GAGE	265.4	6.80	6.60
LMS STA 2870+00	250.4	4.60	4.10
BATON ROUGE GAGE	228.4	2.80	2.50
RESERVE GAGE	138.7	1.20	1.00
CARROLLTON GAGE	102.8	1.00	0.60
VENICE GAGE	10.7	0.60	0.1

NOTES

The 2007 LWRP mile 313.7 to 265.4 is based on a 97% discharge duration of 146,000 cfs at Tarbert Landing (1954-2005) and corresponding 10 year mean stage of 14.8 ft. NAVD88 at Knox Landing, 13.5 ft NAVD88 at Red River Landing, and 6.6 ft NAVD88 at Bayou Sara.

The 2007 LWRP below mile 265.4, from Baton Rouge to Venice is based on a 97% stage exceedance of daily lows for the period of record at each site.

LEGEND

(280) 1942 Mileage above Head of Passes

280 1962 Mileage above Head of Passes

1950 High Water

1973 High Water

1983 High Water

1997 High Water

2011 High Water

2007 LWRP, NGVD 29

2007 LWRP, NAVD 88 2004.65

MISSISSIPPI RIVER
HYDROGRAPHIC SURVEY 2013
LOW WATER REFERENCE PLANE
AND
1950, 1973, 1983, 1997 AND 2011 HIGH WATER
BLACK HAWK, LA TO HEAD OF PASSES, LA

IN 1 SHEET

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS, CORPS OF ENGINEERS

FILE NO. H-05-47753

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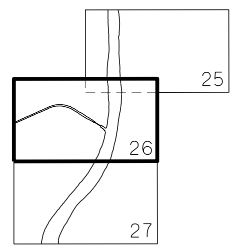
Horizontal Datum ..... North American Datum 1983 (NAD 83)
Ellipsoid .... GRS 80
L.W.R.P. - Low Water Reference Plane.

SCALE 1:20,000

FEET 1000 0 1000 2000
METERS 100 0 100 500 1000
MILES 0 1/8 1/4 3/8 1/2 5/8 3/4 7/8 1



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MISSISSIPPI RIVER
HYDROGRAPHIC SURVEY 2013
BLACK HAWK, LA TO HEAD OF PASSES, LA
ALSO SOUTHWEST, SOUTH, AND PASS A LOUTRE.
IN 86 SHEETS
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

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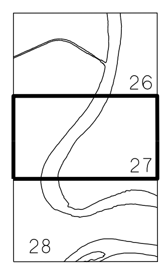
MILES: 0 1/8 1/4 3/8 1/2 5/8 3/4 7/8 1



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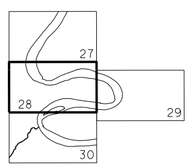

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CORPS OF ENGINEERS

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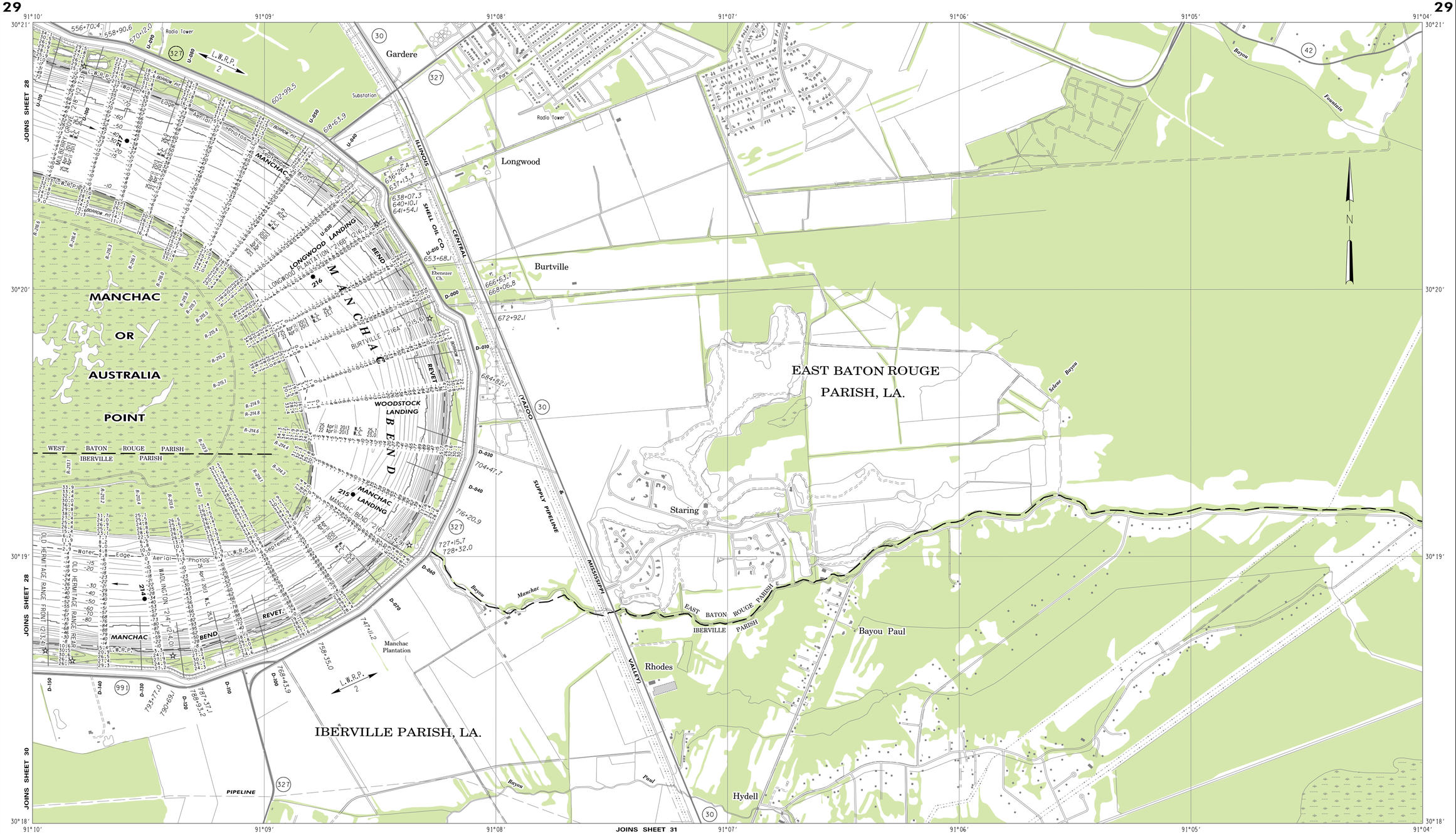
29



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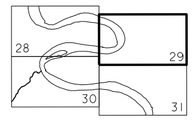

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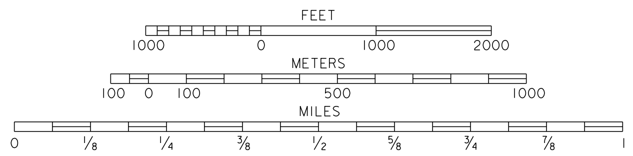

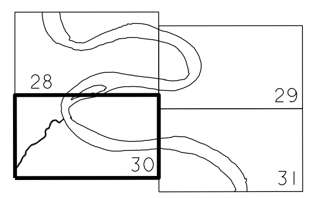

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IN 86 SHEETS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS.
CORPS OF ENGINEERS

FILE NO. H-5-47753

31

91°10′ 91°09′ 91°08′ 91°07′ JOINS SHEET 29 91°06′ 91°05′ 91°04′

30°18′ 30°17′ 30°16′ 30°15′

IBERVILLE PARISH, LA.

IBERVILLE PARISH, LA.

JOINS SHEET 30

JOINS SHEET 32

Water Tower Zion Rock Cem. & Church

Bayou Paul

L.W.R.P.

Sunshine Oil Field

Sunshine

Sunshine School

Iberville

ILLINOIS CENTRAL

SHELL PIPELINE CO. SUPPLY PIPELINE

Cemetery Mt. Carmel Ch.

Substation

Radio Tower

GRANADA CROSSING

GRANADA LDG.

LBC PETROUNITED SUNSHINE (203.8)

GRANADA RANGE REAR

GRANADA RANGE FRONT (203.6)

SUNSHINE LDG.

GABRIEL REVET.

SALUTE LDG.

GOLDEN RIDGE LDG.

GULF STATES UTILITIES CO. WILLOW GLEN POWER PLANT (201.6)

PIPELINES

ST. GABRIEL "202" (200.7)

LOUISIANA PRISON FARM CAMP "M"

Oakley

MISSISSIPPI (VALLEY)

St. Gabriel Water Twrs.

Water Tower

Shell Oil Co. Loading Line

Cemetery

Church

Substation

Allemania Plantation

Soulouque

POINT PLEASANT

Mt. Olive Ch.

Cem.

St. Raphael Cem.

Bayou la Butte

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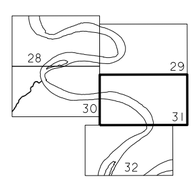
SCALE 1:20,000

FEET
1000 0 1000 2000

METERS
100 0 100 500 1000

MILES
0 1/8 1/4 3/8 1/2 5/8 3/4 7/8 1



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IN 86 SHEETS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

31

FILE NO. H-5-47753

JOINS SHEET 31

OVERLAPS SHEET 34

JOINS SHEET 33

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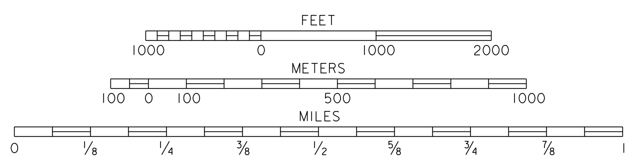

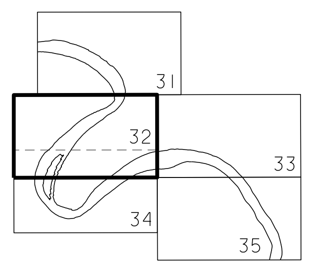

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ALSO SOUTHWEST, SOUTH, AND PASS A LOUTRE.
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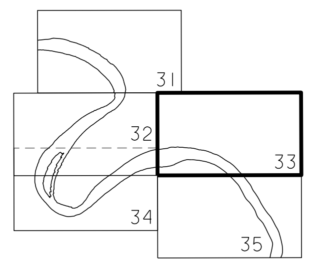

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FILE NO. H-5-47753

OVERLAPS SHEET 32

JOINS SHEET 33

JOINS SHEET 35

IBERVILLE PARISH, LA.

IBERVILLE PARISH, LA.

Bayou Goula

St. Paul Church

Bayou Goula Sch.

Church

Tally-Ho Plantation

Tally-Ho Sugar Mill

BAYOU GOULA BEND

BAYOU GOULA LDG.

ELENORA LDG.

BAYOU GOULA

GOULA

Goula

TOWHEAD

WHITE ALDER MEMORIAL (195.2)

EUREKA (194.8)

ENTERGY

Bayou

CATHERINE LDG.

POINT CLAIR

POINT CLAIR LDG.

WHITE CASTLE

WHITE CASTLE REVET.

WHITE CASTLE LDG.

CEDAR GROVE LDG.

BELLE GROVE LDG.

FERRY

NEW RIVER REVET

BEND

Water

Gillis G. Long Hansen Disease Center

Radio Tower

Water Tower

Cem.

Sch.

Ch.

Dorcyville

Cedar Grove

Soniat

Trailer Park

White Castle

Texas

Alhambra

Cora

Carville

Carville School

St. Bethel Ch. & Cem.

Bayou Braud

Brazil Ch. & Cem.

Cannonburg

Asbery A.M.E. Ch. & Cem.

HARD TIMES LDG.

OLD HICKORY LDG.

ALHAMBRA RANGE REAR

ALHAMBRA RANGE FRONT

SHELL PIPELINE CO. - 6 PIPELINES

SOUTHERN NATURAL GAS CO. 4-12" GAS PIPELINE

12-4" POLARIS CORP. GAS PIPELINES

TEXAS

PACIFIC

ENTERGY

L.W.R.P.

N

SCALE 1:20,000

FEET 1000 0 1000 2000

METERS 100 0 100 500 1000

MILES 0 1/8 1/4 3/8 1/2 5/8 3/4 7/8 1

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32 33 34 35

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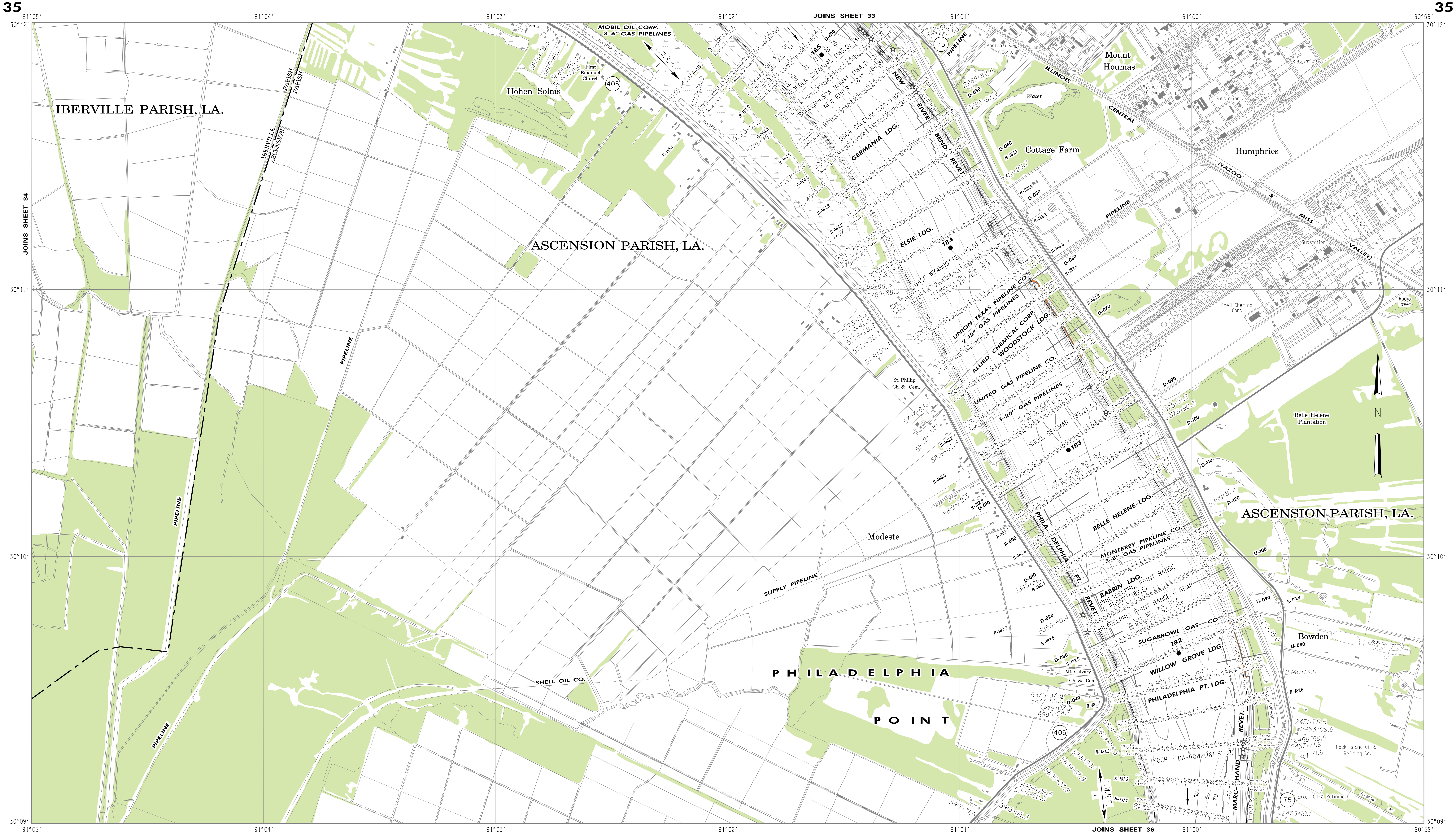
JOINS SHEET 33
JOINS SHEET 34
JOINS SHEET 36
IBERVILLE PARISH, LA.
ASCENSION PARISH, LA.
ASCENSION PARISH, LA.
PARISH
IBERVILLE
ASCENSION
Hohen Solms
First Emanuel Church
MOBIL OIL CORP.
3-6" GAS PIPELINES
Mount Houmas
Cottage Farm
Humphries
ILLINOIS CENTRAL
(YAZOO & MISS. VALLEY)
Shell Chemical Corp.
Belle Helene Plantation
Modeste
St. Phillip Ch. & Cem.
Mt. Calvary Ch. & Cem.
Bowden
Rock Island Oil & Refining Co.
Exxon Oil & Refining Co.
P H I L A D E L P H I A
P O I N T
NEW RIVER BEND REVET.
GERMANIA LDG.
ELSIE LDG.
BASF WYANDOTTE (183.9)
UNION TEXAS PIPELINE CO.
2-12" GAS PIPELINES
ALLIED CHEMICAL CORP.
WOODSTOCK LDG.
UNITED GAS PIPELINE CO.
3-20" GAS PIPELINES
SHELL GEISMAR (183.2)
BELLE HELENE LDG.
MONTEREY PIPELINE CO.
3-8" GAS PIPELINES
BABBIN LDG.
PHILADELPHIA POINT RANGE
PHILADELPHIA PT. REVET.
SUGARBOWL GAS CO.
WILLOW GROVE LDG.
PHILADELPHIA PT. LDG.
KOCH - DARROW (181.5)
MARC-HAND REVET.
SUPPLY PIPELINE
SHELL OIL CO.
PIPELINE
L.W.R.P.
185
184
183
182
405
75
N
91°05′
91°04′
91°03′
91°02′
91°01′
91°00′
90°59′
30°12′
30°11′
30°10′
30°09′

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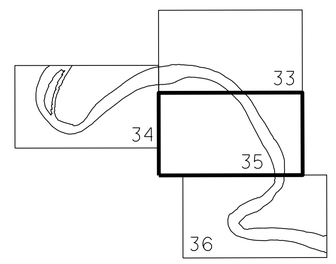

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MISSISSIPPI RIVER

HYDROGRAPHIC SURVEY 2013

BLACK HAWK, LA TO HEAD OF PASSES, LA
ALSO SOUTHWEST, SOUTH, AND PASS A LOUTRE.
IN 86 SHEETS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

FILE NO. H-5-47753

JOINS SHEET 35

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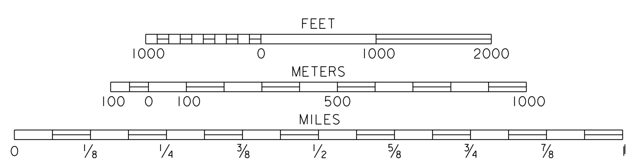

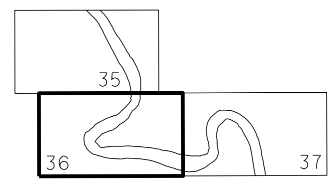

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Planimetry from aerial photographs flown February 2002.
● Distances on Mississippi River above Head of Passes are shown at 1 mile intervals.
1962 survey.
Projection ..... Lambert Conformal Conic
Horizontal Datum ..... North American Datum 1983 (NAD 83)
Ellipsoid ..... GRS 80
L.W.R.P. - Low Water Reference Plane.

SCALE 1:20,000

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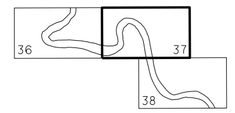
METERS
100 0 100 500 1000
MILES
0 1/8 1/4 3/8 1/2 5/8 3/4 7/8 1



INDEX TO ADJOINING SHEETS

MISSISSIPPI RIVER

HYDROGRAPHIC SURVEY 2013

BLACK HAWK, LA TO HEAD OF PASSES, LA
ALSO SOUTHWEST, SOUTH, AND PASS A LOUTRE.

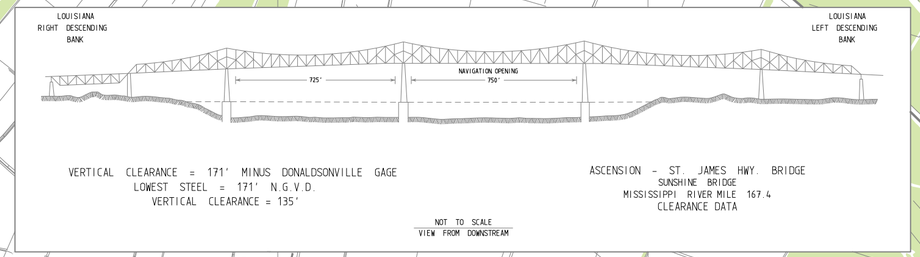
IN 86 SHEETS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

FILE NO. H-5-47753

JOINS SHEET 37

JOINS SHEET 39



ST. JAMES PARISH, LA.

ST. JAMES PARISH, LA.

All elevations are expressed in feet and refer to North American Vertical Datum of 1988.
Contours below Low Water Reference Plane are expressed in feet at 5 and 10 ft. intervals.
Contours above Low Water Reference Plane are expressed in feet at 5 ft. intervals.
Planimetry from aerial photographs flown February 2002.
● Distances on Mississippi River above Head of Passes are shown at 1 mile intervals, 1962 survey.
Projection ..... Lambert Conformal Conic
Horizontal Datum ..... North American Datum 1983 (NAD 83)
Ellipsoid ..... GRS 80
L.W.R.P. - Low Water Reference Plane.

SCALE 1:10,000

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METERS
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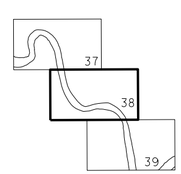

INDEX TO ADJOINING SHEETS

MISSISSIPPI RIVER

HYDROGRAPHIC SURVEY 2013

BLACK HAWK, LA TO HEAD OF PASSES, LA
ALSO SOUTHWEST, SOUTH, AND PASS A LOUTRE.

IN 86 SHEETS

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS,
CORPS OF ENGINEERS

FILE NO. H-5-47753

APPENDIX D

Mississippi River Bridges

Appendix D – Mississippi River Bridges

This appendix includes schematic bridge cross sectional elevations for those bridges located from just North of Baton Rouge to New Orleans. See *Table D-1* below for further details. The intent is to show the main navigation span distances serving tows and ships that would operate within the study area.

Table D-1: Lower Mississippi River Bridge Information

Bridge	Reference Gage	Waterway	Mile	Channel Span		Alternate Span	
				Horizontal Clearance	Max. Vertical Clearance	Horizontal Clearance	Max. Vertical Clearance
Crescent City Connection - Lower	Carrollton	LMR	95.7	750’	171’	NA	NA
Crescent City Connection – Upper	Carrollton	LMR	95.8	750’	171’	NA	NA
Huey P. Long	Carrollton	LMR	106.1	750’	153’	500’	145’
Hale Boggs – Luling	Reserve	LMR	121.6	1,200’	158’	460’	142’
Gramercy	Reserve	LMR	145.9	750’	164’	NA	NA
LA 70 Sunshine Bridge	Donaldsonville	LMR	167.4	750’	171’	725’	147’
Baton Rouge I-10 Horace Wilkinson	Port Allen	LMR	229.3	500’	174’		
Baton Rouge Hwy 190/Railroad	Port Allen	LMR	233.9	748’ (East)	111’	623’Center 443’West	111’
John James Audubon	Red River Landing	LMR	261.8	1,463’	135’	NA	NA

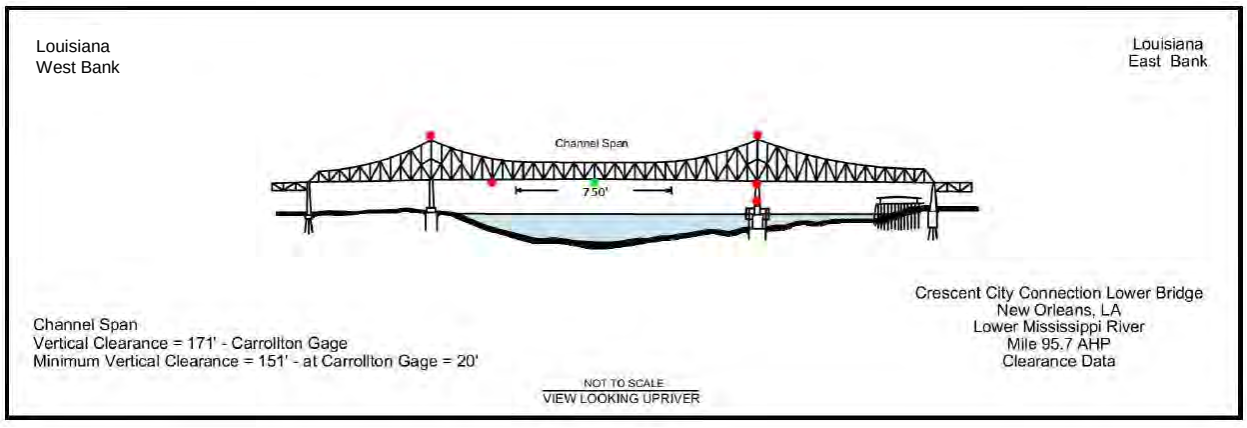

Figure D-1: Crescent City Connection Lower Bridge

Figure D-1 above shows schematic cross-section of the Lower Crescent City Connection Bridge located in New Orleans, LA. This cantilever bridge carries the eastbound lanes of U.S. Hwy 90 over the Mississippi River. It was opened in 1958.

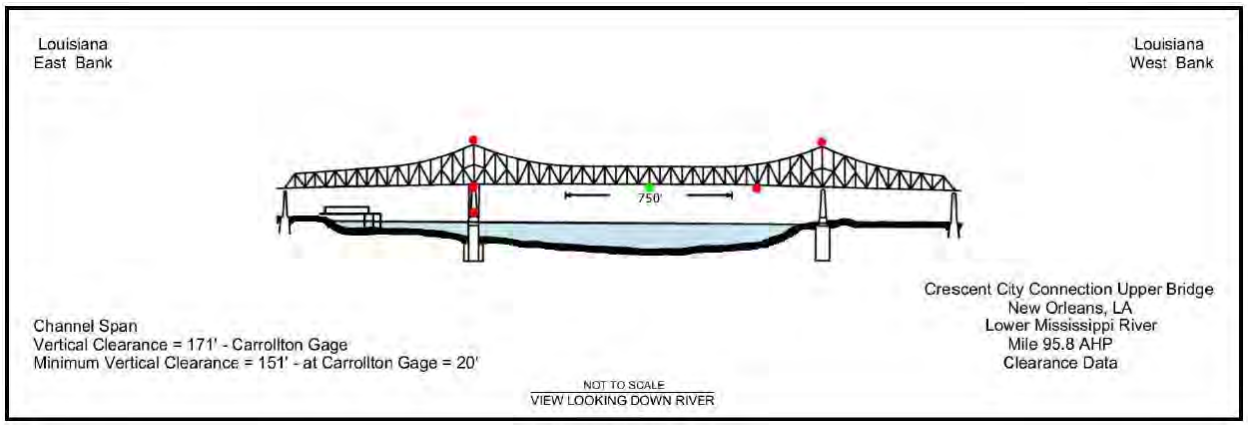

Figure D-2: Crescent City Connection Upper Bridge

Figure D-2 above shows schematic cross-section of the Upper Crescent City Connection Bridge located in New Orleans, LA. This cantilever bridge carries the westbound lanes of U.S. Hwy 90 over the Mississippi River. It was opened in 1988.

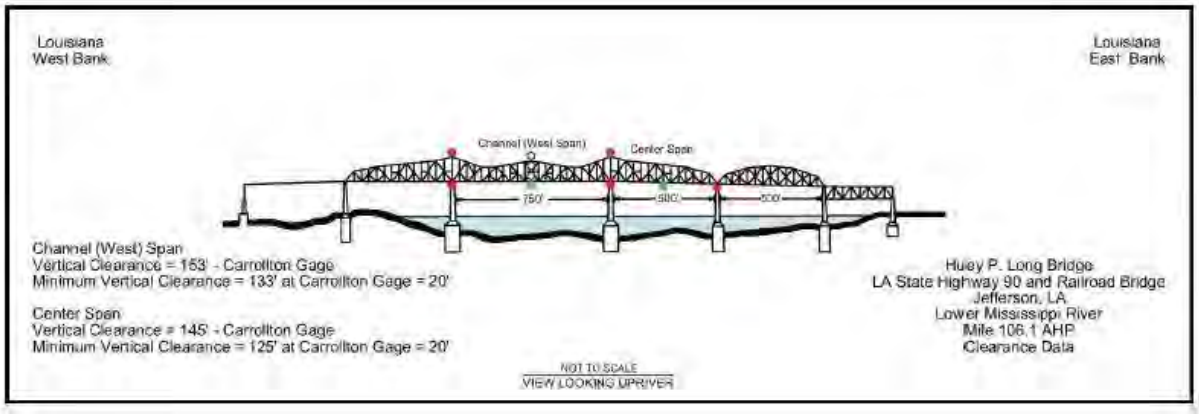

Figure D-3: Huey P. Long Bridge, U.S. Hwy. 90 and Railroad Bridge

Figure D-3 above shows schematic cross-section of the Huey P. Long Bridge. Located in Jefferson Parish, Louisiana. The Huey P. Long is a cantilevered steel through-truss bridge that was opened in 1935.

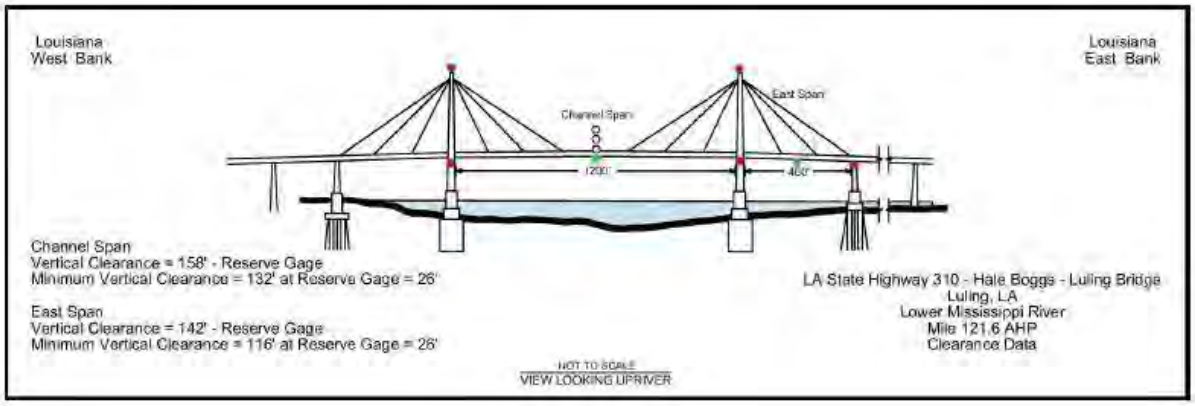

Figure D-4: Hale Boggs Luling Bridge, LA Hwy. 310

Figure D-4 above shows schematic cross-section of the Hale Boggs Memorial Bridge (also known as the Luling–Destrehan Bridge), which is a cable-stayed bridge over the Mississippi River in St. Charles Parish, Louisiana. Its navigation channel width of 1,200 feet is the greatest of any bridge south of Baton Rouge. It was opened in 1893.

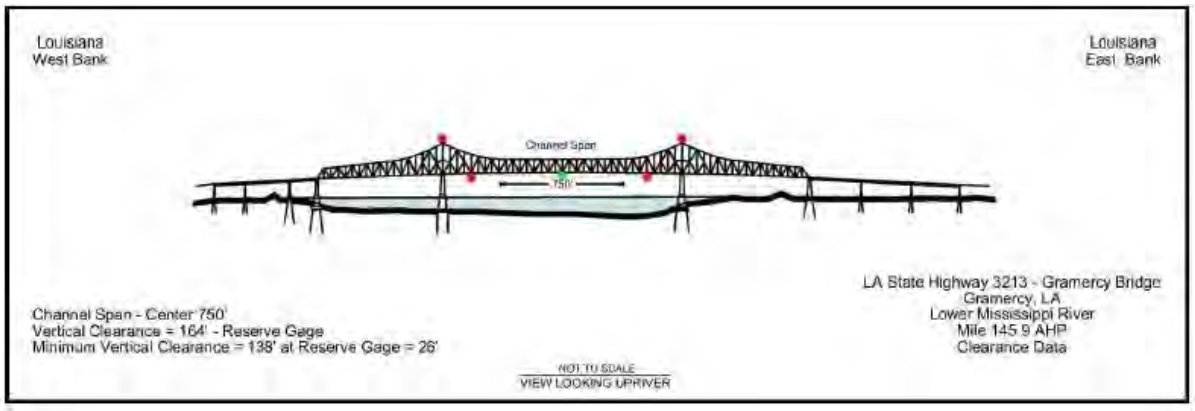

Figure D-5: Gramercy Bridge, LA. 3213

Figure D-5 above shows schematic cross-section of the Gramercy Bridge, which is a cantilever bridge over the Mississippi River. It is the second newest Mississippi River Bridge in Louisiana. It was opened in 1995 and has a navigation channel width of 750 feet.

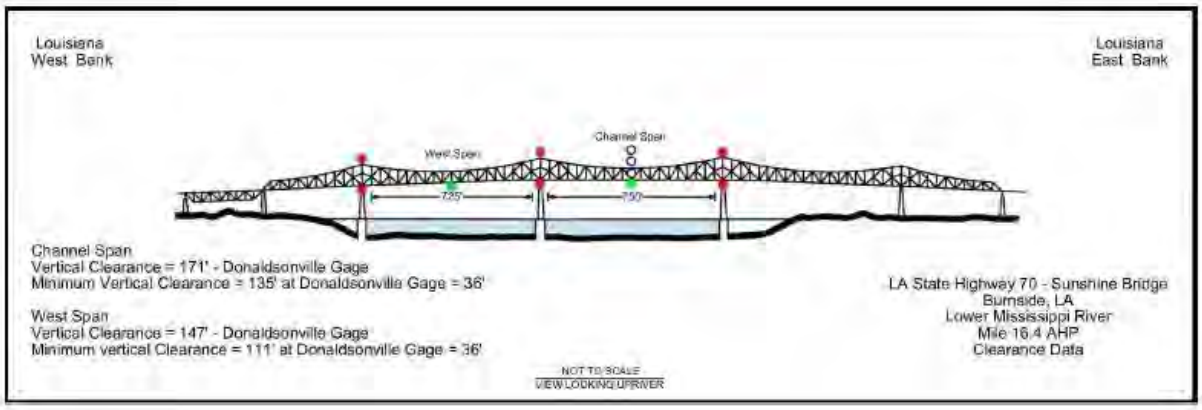

Figure D-6: Sunshine Bridge, LA 70

Figure D-6 above shows schematic cross-section of the Sunshine Bridge, located in Burnside, LA. Opened in August 1964, the Sunshine Bridge was built as a continuous steel truss - through deck.

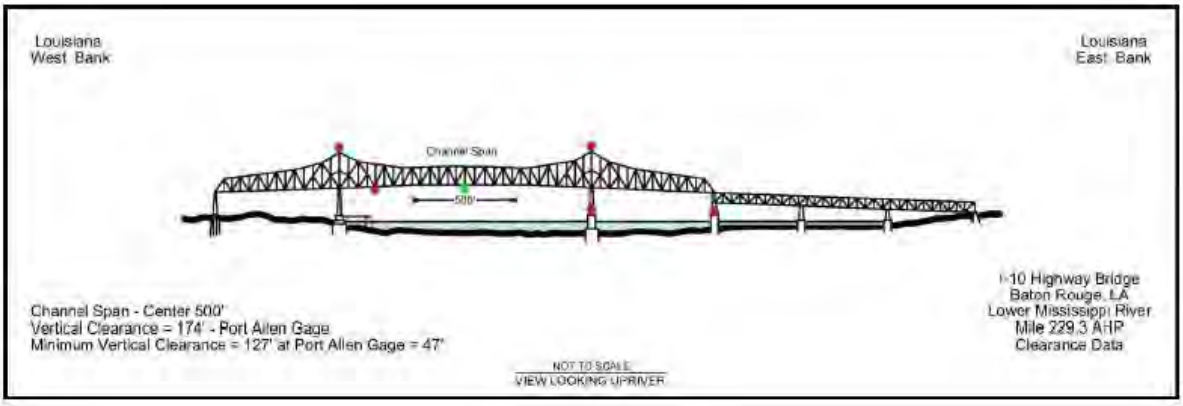

Figure D-7: Horace Wilkinson Bridge, I-10 Bridge

Figure D-7 above shows schematic cross-section of the Horace Wilkinson Bridge, also known as the I-10 Bridge, located in Baton Rouge, LA. Opened in 1968, the Horace Wilkinson was built as a cantilever bridge and has a clear navigation width of 500 feet.

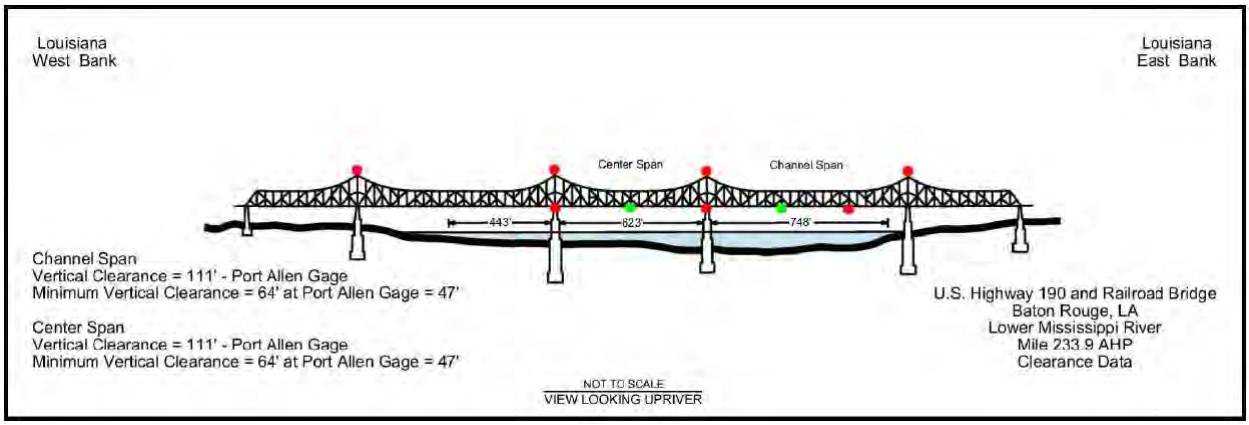

Figure D-8: U.S. Highway 190 and Railroad Bridge

Figure D-8 shows schematic cross-section of the U.S. Highway 190 Bridge located between Port Allen and Baton Rouge. This truss cantilever bridge over the Mississippi River carries the U.S. Hwy 190 and one railroad line between East and West Baton Rouge Parishes. The bridge was opened in 1940.

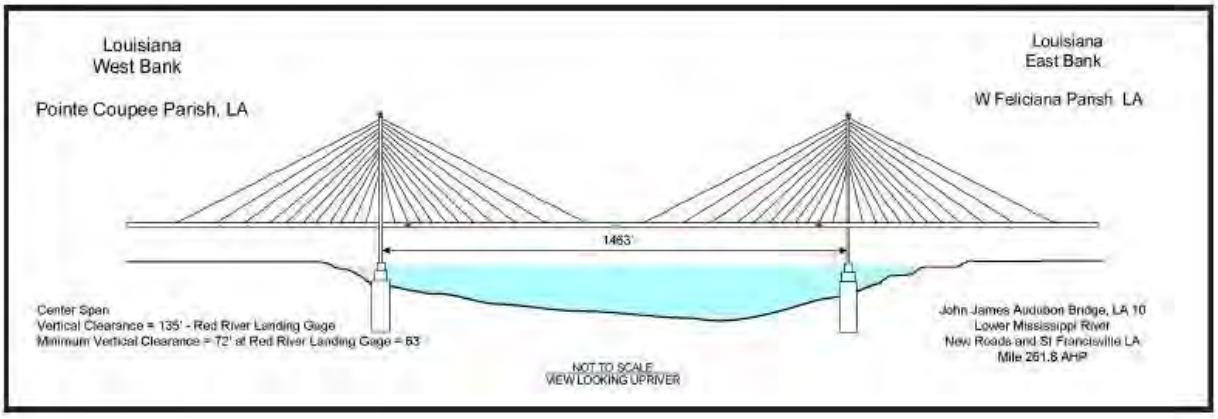

Figure D-9: John James Audubon Bridge, LA 10

Figure D-9 above shows schematic cross-section of the Audubon Bridge which was opened in 2011. It is located just above the study area and north of Baton Rouge which is the terminus of the Mississippi River Ship Channel, meaning that deep-draft ships do not pass under this bridge. However, the largest tows operating on the Mississippi River do.

APPENDIX E

Anchorage Locations

Appendix E - Anchorage Locations

The table below lists the names and locations of federally authorized anchorages located within the study area.

Lower Mississippi River Deep Draft Anchorage			
Deep Draft Anchorage	Mileage		Bank
	Lower	Upper	
Lower Baton Rouge	228.5	229	Center
Baton Rouge General	225.8	227.3	West
White Castle Anchorage	190.4	191.1	West

APPENDIX F

Revetment Locations

Appendix F - Revetment Locations

Table F-1 below shows the locations of revetments within the study area. While a bridge pier could be located within a revetment location, special conditions are required by the U.S. Army Corps of Engineers.

Table F-1: Revetments U. S. Army Corps of Engineers, New Orleans District

Feature Name	Up River Mile	Down River Mile	Revetment River Mile	Length Mile
Port Allen	232.3	228.9	230.5-R	3.3
Arlington	228	224.8	226.5-L	3.1
Missouri Bend	224.2	219	222.0-R	5.8
Manchac	218.7	212.2	215.5-L	7.4
Plaquemine Bend	211.7	203.9	209.0-R	8.5
St. Gabriel	203.5	197.8	201.0-L	6.3
White Castle	198.5	190.4	193.0-R	8.7
New River Bend	191.5	183.3	185.0-L	8.7
Philadelphia Point	182.9	181.8	182.5-R	1
Marchand	182	178.5	180.5-L	3.7
Smoke Bend	178.4	175.2	177.5-R	3.4
St. Elmo	175.7	172.9	174.5-L	2.3
Aben	173.3	171.2	172.5-R	2.2
Burnside	171.6	166.2	169.5-L	5.6

APPENDIX G

Terminal Facility Locations

Appendix G – Terminal Facility Locations

This appendix tabularizes the names and locations of terminal facilities found within the study area.

Table G- 1 – Terminal Facilities as per USACE Navigation Chart 74A 2015

Display Number	Facility Name	River Mile	Bank
1	Humble Oil Zone #6C	232.2	Left
2	Intercontinental Terminals Co., Anchorage Chemical Terminal Wharf	232.2	Right
3	Seariver Maritime Wharf	231.8	Left
4	Placid Refining, Tanker Wharf.	231.8	Right
5	Placid Refining, Barge Wharf.	231.7	Right
6	Martin Marietta, Baton Rouge Yard Landing	231.0	Left
7	Luhr Brothers, Baton Rouge Landing	230.8	Left
8	Casino Rouge Wharf	230.6	Left
9	Baton Rouge Harbor Service Wharf	230.5	Left
10	West Baton Rouge Tourist Commission, Court Street Landing	230.2	Right
11	Baton Rouge City Excursion Wharf	229.7	Left
12	Argosy Casino Wharf Co	229.5	Left
13	Greater Baton Rouge Port Commission, Dock No. 2 Wharf.	229.4	Right
14	Greater Baton Rouge Port Commission, Dock Connection Wharf.	229.2	Right
15	Baton Rouge City Wharf	229.1	Left
16	Greater Baton Rouge Port Commission, Dock No. 1 Wharf.	229.0	Right
17	Cargill, Greater Baton Rouge Port Commission Grain Wharf	228.8	Right
18	Economy Boat Store Wharf	228.5	Left
19	Elmwood Marine And Mckinney Fleet & Barge Service, Wharf And Bato	228.1	Left
20	Cargo Carriers, Port Allen Wharf And Fleet	228.0	Right
21	John W. Stone Oil Distributors, Baton Rouge Wharf	225.5	Left

Table G- 2 – Terminal Facilities as per USACE Navigation Chart 75A 2015

Display Number	Facility Name	River Mile	Bank
1	Dow Chemical U.S.A., Plaquemine Dock No. 2, Hydrocarbon Wharf	221.8	Right
2	Dow Chemical U.S.A., Plaquemine Dock N0. 1, Chemical Wharf	210.0	Right
3	Plaquemine Towing Corp., Cleaning Wharf.	208.5	Left
4	Plaquemine Towing Corp., Repair Wharf And Banta Mile 208 Fleet.	208.3	Left
5	State Of Louisiana, Plaquemine Ferry Landing.	207.9	Right
6	State Of Louisiana, Plaquemine Point Ferry Landing.	207.3	Left
7	Georgia Gulf Chemicals & Vinyls, Plaquemine Barge Wharf.	205.6	Right
8	Georgia Gulf Chemicals & Vinyls, Plaquemine Ship Wharf.	205.5	Right
9	Ashland Chemical Co., Plaquemine Plant Wharf	204.8	Right
10	Lbc Petro United Terminal, Sunshine Terminal Wharf	203.9	Left
11	Entergy Gulf States Utilities Co., Willow Glen Power Plant Wharf	201.6	Left

Table G- 3 – Terminal Facilities as per USACE Navigation Chart 76A 2015

Display Number	Facility Name	River Mile	Bank
1	Pioneer Americas, St. Gabriel Wharf	199.9	Left
2	Kinder Morgan, St. Gabriel Terminal	198.2	Left
3	State Of Louisiana, White Castle-Carville Ferry Landing.	191.6	Right
4	State Of Louisiana, Carville-White Castle Ferry Landing.	191.0	Left
5	Atofina Petrochemicals, Cos-Mar Plant Wharf	187.9	Left
6	General Electric Co., Geismar Wharf	187.1	Left

Table G- 4 – Terminal Facilities as per USACE Navigation Chart 77A 2015

Display Number	Facility Name	River Mile	Bank
1	Elpaso Field Services (Riverside Plant Wharf)	186.0	Left
2	Borden Chemical, Geismar Industrial Complex Wharf	185.0	Left
3	Osca Calcium Chloride Plant Wharf	184.7	Left
4	International-Matex Tank Terminals (Imtt)	183.9	Left
5	Shell Chemical, L.P., Geismar Plant Wharf	183.2	Left
6	T. T. Barge Cleaning, Mile 183, Inc.	183.2	Right
7	Carline'S Geismar Fleet, Landing Wharf And Fleet	182.6	Left
8	Koch Gathering Systems, Darrow Oil Field Wharf	181.5	Left
9	L&L Fleeting, Mile 179 And Mile 180 Dry Bulk Transfer Moorings	180.2	Left
10	L & L Cleaning And Repair, Wharf And Mooring.	175.2	Left
11	L & L Cleaning & Repair Wharf Mile 175 Dry Bulk Transfer Mooring	175.1	Left
12	Donaldsonville Fleet & Barge Service, Wharf And Main Fleet	175.1	Right
13	Cf Industries, Donaldsonville Urea Barge Dock.	173.8	Right
14	Cf Industries, Donaldsonville Barge Wharf.	173.7	Right
15	Cf Industries, Donaldsonville Ship Wharf.	173.6	Right
16	Triad Nitrogen, Donaldsonville Wharf	173.4	Right
17	Getco Mile 171 And Mile 172 Dry Bulk Transfer Moorings	171.9	Left
18	River Cement Sales Co., Burnside Terminal Wharf	170.9	Left

Table G- 5 – Terminal Facilities as per USACE Navigation Chart 78A 2015

Display Number	Facility Name	River Mile	Bank
1	Ormet Primary Alumina Corp., Burnside Terminal Barge Dock And Fleets	170.1	Left
2	Ormet Primary Alumina Corp., Burnside Terminal Ship Wharf	169.9	Left
3	E.I. Du Pont De Nemours & Co., Burnside Plant Wharf	169.2	Left
4	Motiva Enterprises, Convent Refinery Dock No. 2.	168.4	Left
5	Motiva Enterprises, Union Refinery Dock No. 1.	168.2	Left
6	Lafarge North America, Union Terminal Wharf	167.8	Left
7	Valero Asphalt Products	167.7	Right
8	Mosaic	167.0	Right
9	Mosaic, Faustina Plant Barge Wharf.	166.8	Right
10	Americas Styrenics, St. James Plant Wharf	166.5	Right
11	Pure Resources, Lapice Oil Transfer Facility Wharf	166.1	Right
12	Bisso Towboat Co., Burnside Mooring	165.6	Left
13	Zen-Noh Grain Corp. Wharf.	163.7	Left
14	Nucor Steel	163.0	Left
15	Occidental Chemical Corp., Convent Plant Wharf	161.4	Left
16	Raven Energy	160.9	Left
17	Ergon-St. James, Crude Oil Terminal Wharf	160.8	Right

APPENDIX H

Utility Crossing Locations

Appendix H – Utility Crossing Locations

This appendix tabularizes the names and locations of utilities found within the study area.

Table H- 1 – Utility Crossings as per USACE Navigation Chart 74A 2015

River Mile	Vertical Clearance	Name	Channel
232.8	N/A	Salvay Processing Co. (4)	Mississippi River
232.8	N/A	Formosa Plastics Corp. (2)	Mississippi River
232.6	N/A	ARCO	Mississippi River
232.5	N/A	Exxonmobil Pipeline Co. (18)	Mississippi River
232.5	N/A	Exxon Mobil (2)	Mississippi River
231.8	N/A	Exxon Mobil	Mississippi River
230.7	N/A	Bell South Telephone Co. (2)	Mississippi River
230.5	N/A	Bell South Telephone Co.	Mississippi River
230.2	N/A	Bell South Telephone Co.	Mississippi River
229.4	N/A	Bell South Telephone Co.	Mississippi River
229.2	N/A	Bell South Telephone Co. (2)	Mississippi River
227.4	N/A	Shell Pipeline Co.	Mississippi River
226.1	N/A	Exxon Mobil (2)	Mississippi River
225.7	N/A	ARCO (3)	Mississippi River
224.2	150.0'	Red Eye Crossing	Mississippi River

Table H- 2 – Utility Crossings as per USACE Navigation Chart 75A 2015

River Mile	Vertical Clearance	Name	Channel
209.5	N/A	Air Products And Chemical Inc.	Mississippi River
209.5	N/A	Bridgeline Gas Distribution	Mississippi River
209.4	N/A	Bridgeline Gas Distribution	Mississippi River
201.5	166.0'	Point Pleasant	Mississippi River
200.9	N/A	Varibus Corp.	Mississippi River
200.9	N/A	Sabine Gas Transmission Corp. (3)	Mississippi River

Table H- 3 – Utility Crossings as per USACE Navigation Chart 76A 2015

River Mile	Vertical Clearance	Name	Channel
201.5	166.0'	Point Pleasant	Mississippi River
200.9	N/A	Varibus Corp.	Mississippi River
200.9	N/A	Sabine Gas Transmission Corp. (3)	Mississippi River
200.8	N/A	Bridgeline Gas Distribution	Mississippi River
200.8	N/A	Air Products And Chemical Inc. (2)	Mississippi River
200.8	N/A	Faustina Pipeline Co. (2)	Mississippi River
200.8	N/A	LA Resources Pipeline Co.	Mississippi River
194.5	N/A	Entergy Corp.	Mississippi River
191.8	N/A	The Polaris Corp. (2)	Mississippi River
190.2	N/A	Southern Natural Gas (4)	Mississippi River
190.1	N/A	Southern Natural Gas	Mississippi River
190.0	N/A	Southern Natural Gas	Mississippi River
189.9	N/A	Enterprise Products Operating	Mississippi River
189.8	N/A	Shell Pipeline Co. (6)	Mississippi River
187.6	N/A	Shell Pipeline Co.	Mississippi River

Table H- 4 – Utility Crossings as per USACE Navigation Chart 77A 2015

River Mile	Vertical Clearance	Name	Channel
185.8	N/A	Exxonmobil Pipeline Co. (6)	Mississippi River
184.9	N/A	East Ascension Telephone Co.	Mississippi River
184.9	N/A	East Ascension Telephone Co.	Mississippi River
183.7	N/A	ARCO	Mississippi River
183.6	N/A	Elpaso Petroleum Pipeline	Mississippi River
183.4	N/A	United Gas Pipeline Co. (3)	Mississippi River
183.4	N/A	Gulf South Pipeline Co.	Mississippi River
182.9	N/A	Shell Oil Co.	Mississippi River
182.7	N/A	Texas Brine Company Llc	Mississippi River
182.4	N/A	Monterey Pipeline Co. (3)	Mississippi River
182.1	N/A	Sugar Bowl Gas Co.	Mississippi River
175.5	N/A	South Central Bell Telephone	Mississippi River
175.5	N/A	South Central Bell Tel. Co.	Mississippi River
175.4	N/A	South Central Bell Telephone	Mississippi River

Table H- 5 – Utility Crossings as per USACE Navigation Chart 78A 2015

River Mile	Vertical Clearance	Name	Channel
170.5	N/A	Louisiana Power & Light Co.	Mississippi River
170.4	N/A	Louisiana Power & Light Co.	Mississippi River
169.3	N/A	Monterey Pipeline Co.	Mississippi River
167.8	N/A	Shell Oil Co.	Mississippi River
167.6	N/A	Texaco Pipeline Co. (2)	Mississippi River