

Review Assessment

of

Port Fourchon Belle Pass Channel Deepening  
Project

Section 203 Feasibility Study  
(January 2019, revised January 2020)



**April 2020**

## **Executive Summary**

The Greater Lafourche Port Commission (Port Commission) conducted a feasibility study to address navigation improvements for the Port Fourchon Belle Pass. The study was conducted under Section 203 of the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), as amended. The office of the Assistant Secretary of the Army for Civil Works (OASACW) has conducted a concurrent review of this submittal with the Headquarters, U.S. Army Corps of Engineers (Corps) with the purpose of determining federal interest and that the study demonstrates engineering, economic and environmental feasibility that all reports seeking construction authorization must demonstrate.

Based on the results of the review process, the Secretary has made the determination that the Port Commission's recommended plan is feasible from an engineering and construction viewpoint. In the event that the Port Commission's recommended plan is authorized for federal participation, the unresolved issues contained within the enclosed review assessment will need to be addressed prior to construction.

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## **I. Background**

The Greater Lafourche Port Commission (Port Commission) conducted a feasibility study to address navigation improvements for the Port Fourchon Belle Pass. The study was conducted under Section 203 of the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), as amended. The office of the Assistant Secretary of the Army for Civil Works (OASACW) conducted a concurrent review of the submittal with the Headquarters, U.S. Army Corps of Engineers (Corps, also referred to as USACE) with the purpose of determining federal interest and that the study demonstrates engineering, economic and environmental feasibility that all reports seeking construction authorization must demonstrate.

This Review Assessment provides the results of the Washington-level review. This review has been conducted to determine whether the study and the process under which the study was developed, each comply with Federal laws and regulations; a determination of whether the project is feasible; and identification of any conditions that the Secretary may require for construction of the project.

## **II. The Greater Lafourche Port Commission Section 203 Recommended Plan**

This section provides a summary of the Port Commission's recommended project, as contained within the Port Fourchon Belle Pass Channel Deepening Project, Section 203, Feasibility Study (January 2019, revised January 2020).

A. Location: Port Fourchon is located at the southern tip of Lafourche Parish, Louisiana, along the coast of the Gulf of Mexico. It is located on the southeast coast of Louisiana immediately inside the mouth of Bayou Lafourche.

B. Congressional Interest: Steve Scalise (LA-1)

C. Senators: Bill Cassidy and John Kennedy (Louisiana)

D. Problems: The Port Commission conducted this study to evaluate the economic feasibility of enlarging and extending the port's existing channels beyond their authorized depth of -24 MLLW. The current channel depth causes marine interests to use less efficient methods to service the offshore oil and gas facilities located in the Gulf of Mexico

E. Project Objectives: The fundamental study objective is to develop an optimal plan that can accommodate existing and future vessel traffic. The study specific objectives are to:

- Reduce the transportation cost of servicing the offshore drilling and related activities through Port Fourchon
- Improve efficient use of larger vessels
- Increase beneficial use of dredged material at suitable locations
- Facilitate future energy exploration and production fabrication
- Contribute to and expand the existing Coastal Louisiana Dredged Material Management Plan

- Reintroduce material from entrance channel to the littoral drift to preserve the flanking shoreline
- Use new work and maintenance material to create wetlands
- Contribute to the preservation of historically significant resources in the project area

F. The Greater Lafourche Port Commission's Recommended Plan:

The Port Commission's tentatively selected plan (TSP) was to deepen Port Fourchon to the following dimensions: 30x300 foot Bayou Lafourche; 50x475 foot Belle Pass; and 52x475 foot entrance channel.

The Port Commission's current Recommended Plan consists of deepening the Port Fourchon Belle Pass channel to -30 (North American Vertical Datum of 1988) feet compared to the currently authorized channel depth of -24 feet. The disposal plan provides for beneficial use of dredged material by placing material in locations to restore wetland habitats.

When economic conditions warrant, the Port will seek to re-evaluate additional deepening of the Port.

G. Price Level: October 2019

H. Interest Rate: 2.75%

I. Total Project First Cost: The first cost of the Port Commission's Recommended Plan is estimated at \$95,483,000 (Fiscal Year 2020 price levels), which equates to an estimated average annualized cost of \$15,136,000. The cost of operation, maintenance, repair, replacement and rehabilitation (OMRR&R) is estimated at \$11,436,000 annually.

J. Benefits: Deepening the Port Fourchon Belle Pass channel to -30 feet would achieve transportation cost savings from more efficient transportation. Benefits, in the form of transportation savings, are estimated at \$53,382,000, yielding net benefits of \$38,246,000 and a benefit to cost ratio of 3.53 to 1.

K. Cost Sharing: The project cost sharing will be determined in accordance with section 101 of the Water Resources Development Act of 1986, as amended.

### **III. Section 203 Review Assessment Summary**

In accordance with section 203 of WRDA 1986, as amended, the Secretary is required to provide a report to Congress that describes the following:

A. Feasibility determination (Whether the project is feasible (i.e. technically sound, economically justified and environmentally compliant)?

Based on the results of the review process, the Secretary has made the determination that the Port Commission's recommended plan is feasible from an engineering and construction viewpoint. In the event that the Port Commission's recommended plan is authorized for federal participation, the unresolved issues contained within the enclosed review assessment will need to be addressed prior to construction.

B. Recommendations concerning the plan or design of the proposed project.

The majority of the initial concerns with the plan and design of the project have been resolved. Concerns requiring further action, should the recommended plan be authorized, are related to cost, dredge material plan, and environmental compliance.

The cost estimate will need to be updated and reflect current Corps policies for cost risk with appropriate contingencies assigned to those risks, as well as an independent third party review and cost certification, in accordance with the Corps regulations and policy to reflect present day costs and certification policies. (See section C comments below)

The proposed plan anticipates beneficial use of dredged material that is not least cost placement. The additional beneficial use costs are related to over dredging and environmental monitoring, and need to be properly justified in order to be cost shared. Additionally, the report improperly assigns construction costs for additional dredged material placement facilities required for the project as federal operation and maintenance costs and needs to be revised. (See comments: B. Plan Formulation #1; E. Legal #3 and F. Real Estate #3)

C. Identify any conditions required for construction of the project.

National Environmental Policy Act (NEPA) requirements and other applicable environmental compliance activities must be completed before construction, including resolution of any issues identified as part of that process. (See comment D. Environmental #1) Additionally, a revised Real Estate Plan with all appropriate estates and a realistic timeline of activities (i.e. acquisition of necessary property interests and relocation of pipelines) must be prepared. (See comments E. Legal #6 and #7 and F. Real Estate #1 and #2)



## IV. Review History and Findings

Two Washington-level review cycles were conducted for the study. The initial review was conducted for the January 2019 Feasibility Study submittal and the second was for the Addendum, dated January 2020. The following section documents the issue resolution process from those reviews.

### **A. GENERAL COMMENTS**

1. Credit for Feasibility Study Costs: The non-Federal costs incurred by the sponsor for developing the feasibility study are not documented.

Basis for Concern: Per ER 1165-2-209, Section 5c – “Section 203 provides that if a project for which a feasibility study developed by non-Federal interests is authorized after the Secretary submits the report to the Congress, the Secretary shall credit toward the non-Federal share of the cost of construction of such project an amount equal to the portion of the cost of developing the study that otherwise would have been the responsibility of the United States if such study had been developed by the Secretary.” Per ER 1165-2-209, credit may not exceed \$1.5 million, which would have been the maximum Federal cost for a feasibility study, unless a greater credit amount is specifically authorized in law.

Significance of Concern: Medium. Comment relates to project cost sharing but does not affect the recommended plan.

Actions Needed to Resolve Concern: The report should document the amount of the feasibility study cost that the non-Federal interest believes should be credited towards their share of the project construction costs, and this amount should be reflected in the project cost sharing tables.

Port Response: The feasibility study is ongoing but exceeds \$3 million. If the study is approved, per ER 1165-2-209, a credit of \$1.5 million will be requested by the non-Federal interest as credit toward the non-Federal share of the cost of construction.

Because this is a post-feasibility detail, is there reason to address it in the feasibility report?

OASACW/HQUSACE Assessment: **Comment resolved**, no further action needed.

2. Cost Sharing for Categorical Exemption: The report has an incorrect statement regarding cost sharing for a plan selected under the categorical exemption for navigation projects.

Basis for Concern: Section 5.5.4 states that “Categorical exemptions for plans that are lesser projects than the NED plan are cost shared on the same basis as the NED”. This is an incorrect policy statement. It would imply that if the NED plan was 52 ft.,

for instance, then a 50 ft. project selected per the categorical exemption would be cost shared at 50/50 vs 75/25.

Significance of Concern: Low. Comment relates to report clarity.

Actions Needed to Resolve Concern: Delete the referenced statement from the report.

Port Response: The statement in Section 5.5.4 “Categorical exemptions for plans that are lesser projects than the NED plan are cost shared on the same basis as the NED.” was be removed.

OASACW/HQUSACE Assessment: **Comment resolved** with implementation of response.

3. Cost Sharing: The draft feasibility report incorrectly identifies the applicable cost-share for the general navigation features (GNF) of the project. The report describes the construction of the GNF features as cost-shared 65 percent Federal and 35 percent non-Federal (for example, see pp. v. section 8.2, section 8.7).

Basis for Concern: Section 101 of WRDA 1986, as amended and codified at 33 U.S.C. § 2211, provides that the non-Federal sponsor for a navigation project for a harbor shall pay during construction the following costs associated with general navigation features: (A) 10 percent of the cost of construction of the portion of the project which has a depth not in excess of 20 feet; plus (B) 25 percent of the cost of construction of the portion of the project which has a depth in excess of 20 feet but not in excess of 50 feet; plus (C) 50 percent of the cost of construction of the portion of the project which has a depth in excess of 50 feet. The non-Federal sponsor also must pay an additional 10 percent of the cost of the general navigation features of the project in cash post-construction over a period not to exceed 30 years, with interest, less any credit afforded by the Government for the value of lands, easements, rights-of-way, and relocations the non-Federal sponsor is required to provide for the project.

Significance of Concern: High. The non-Federal sponsor should understand its statutory cost-share responsibilities.

Actions Needed to Resolve Concern: The report should not describe the cost-share for the GNF features as 65 percent Federal and 35 percent non-Federal. The report should describe the cost-share of the GNF features based on the corresponding depth of the project consistent with section 101 of WRDA 1986, as amended and codified at 33 U.S.C. § 2211. The additional 10 percent payment of the total construction costs for the GNF features should be calculated and described as a separate, additional requirement to be provided by the non-Federal sponsor following completion of construction and the final accounting for the project.

Port Response: Concur. The report describes the construction of the GNF features as cost-shared 65 percent Federal and 35 percent non-Federal (for example, see pp. v. section 8.2, section 8.7). It should be stated “75% of General Navigation Features (GNF) during construction with an additional 10 percent of the cost of the GNF of the project in cash post-construction over a period not to exceed 30 years, with interest, less any credit afforded by the Government for the value of lands, easements, rights-of-way, and relocations the non-Federal sponsor is required to provide for the project”. The Tentatively Selected Plan (TSP) is a 30’ channel depth for the increment of Bayou Lafourche above Belle Pass and a 50’ channel depth below Belle Pass to the Gulf. References to cost-share for the GNF features as 65 percent Federal and 35 percent non-Federal will be removed and replaced with, “75% of General Navigation Features (GNF) during construction with an additional 10 percent of the cost of the GNF of the project in cash post-construction over a period not to exceed 30 years, with interest, less any credit afforded by the Government for the value of lands, easements, rights-of-way, and relocations the non-Federal sponsor is required to provide for the project”. Tables 8-1 and 8-2 in the report are computed consistent with the reviewer’s observation and the statutory cost-share responsibilities. The non-Federal sponsor (Port) understands its statutory responsibilities and the estimated cost sharing.

OASACW/HQUSACE Assessment: Response addresses concern, but comment is unresolved pending final depth of project in recommended plan (see Economic and Engineering and Construction comments).

Port Response: Concur. This issue is pending identification of the NED plan.

OASACW/HQUSACE Assessment: As recognized by the Port response, resolution of issue is pending identification of the NED plan.

GLPA comment. Concur. Along with this document GLPC is submitting an addendum as agreed to by the Assistant Secretary of the Army’s Civil Works office. The future without project conditions accounting for port development along Belle Pass have been eliminated from study analysis due to 1) pressing needs of the existing Port tenants and 2) the inherent timeframe associated with facility development along Belle Pass. Thus, the NED plan is the deepening without widening of the existing federal channels with a commensurate deepening of the associated access channels that will benefit from the deepening. The depth has optimized at 30 feet.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

4. Authorization: Text references to section 203 of WRDA 1986, as amended, should also acknowledge section 1126 of the Water Infrastructure Improvements of the Nation Act (Public Law 114-322) also known as the Water Resources Development Act (WRDA) of 2016, and section 1152 of WRDA 2018.

Basis of concern: Decision documents should reflect the most current and complete discussion of study authority.

Significance of concern: Low

Action needed to resolve concern: Update text throughout the report.

Port Response: Concur. The first reference to the section 203 authority in the FR and DEIS will be modified to add “1126 of the Water Infrastructure Improvements of the Nation Act (Public Law 114-322) also known as the Water Resources Development Act (WRDA) of 2016, and section 1152 of WRDA 2018. All others will simply note “as amended”.

OASACW/HQUSACE Assessment: **Comment resolved** with implementation of response.

## **B. PLAN FORMULATION**

1. Beneficial Use as Least Cost Disposal/Base Plan: The beneficial use placement does not appear to be the least cost disposal option, and therefore should not be identified as the base plan.

Basis for Concern: The report on Page A-38 of the economics appendix identifies Ocean Disposal as the least cost disposal option for the project, but then recommends beneficial use placement for the creation of wetlands instead because “a permit for ocean disposal has not been issued in 20 years”. Appendix D (ODMDS) also presents other options for disposal, but rules them out for various reasons. However, these rationales (such as permit difficulties, state requirements or local preferences) are not sufficient reasons for not selecting the least cost disposal option as the base plan. See Oct 21, 2015 DCW Memo – “Federal Standard Clarification Regarding Federal Dredging Mission and Interactions with Non-Federal Agencies”. Furthermore, even if near shore placement of material is more acceptable and/or least cost then offshore disposal, the proposed wetland creation includes additional costs that go beyond mere placement of material, including real estate acquisition, containment dikes, plantings, operations and maintenance costs, and environmental monitoring.

Significance of Concern: High. This comment at a minimum would affect the project cost sharing, but could also potentially change the project recommendation.

Actions Needed to Resolve Concern: The report first needs to determine what the actual least cost base plan is. Assuming that the beneficial use/wetland creation plan is still desired and the NFS is willing to cost share the additional amount beyond the base plan (65/35 for ecosystem restoration) this can be done during the PED phase (under the authority of Section 204 of WRDA 1992, as amended), or proposed for specific authorization under this feasibility study (in which case planning guidance related to Section 204 would still be followed). In the former case, the report would need to be rewritten to reflect the actual least cost base plan as part of the recommendation, and would then indicate that beneficial use options would be pursued prior to construction under the authority of Section 204. For the latter case, the

feasibility report should demonstrate justification for the beneficial use following guidance in ER 1105-2-100, Appendix E, Section V for ecosystem restoration projects, including demonstrating resource significance and conducting a cost effective/incremental cost analysis of alternatives. See the 8 Apr 2008 IG for Section 2037 of WRDA 2007, section 3c which states, – “plan formulation and policy considerations for beneficial use projects will be the same as other specifically authorized projects for the same purposes except that identification of alternatives and identification of the NER plan will necessarily be constrained by the fact that these projects are limited by the sediment available...” Also note that O&M for the beneficial use wetland sites under such a scenario would be a 100% non-Federal responsibility, and LERRDs associated with these sites would be credited towards the 35% non-Federal sponsor’s share for the ecosystem restoration project, vs being credited against the 10% of General Navigation Feature costs over time due from the non-Federal sponsor.

Port Response: As noted, there could be short term monetary advantages to selecting an Ocean Dredged Material Disposal Site (ODMDS) for material to be dredged from the entrance channel. However, due to federal and state legislation as documented in the State of Louisiana’s master plan, beneficial use in the form of marsh creation in the pre-designated areas meets these goals and results in the least expensive manner of achieving those goals. Lack of timely placement that would be achieved through this project, would result in environmental degradation and abet further area-wide land loss. The “cost of this degradation of “wetlands of the United States” is significant and irreversible without the application of this “windfall” vast sustainable volume of material. In addition, the placement of dredged material from the existing authorized federal channel and the designated dredging placement for the assumption of maintenance extending the federal project has set a precedent as the dredged material has always been used for beneficial use.

As per State of Louisiana Administrative Code (LAC 43:723.H), an application for a coastal use permit or for a federal project that requires a coastal use consistency determination, which involves more than 25,000 cubic yards of dredged material, shall include a Beneficial Use Disposal Plan. NOAA, in their "National Coastal Program Dredging Policies" published in April 2000 Technical Document, cites the importance of symbiotic relationship in Louisiana between navigation channel maintenance and marsh re-creation. To counterbalance that loss, statutory language dictates that material from dredging project involving more than 500,000 cubic yards of material shall be used for beneficial purposes of wetland protection, creation, enhancement, or combinations thereof (LA.Rev.Stat.Ann.Section 213.30H.(1)).

The State of Louisiana will be opposed to a new ODMDS, via the Coastal Zone Management Act and consistency determinations. The state wants the dredged material to be used as a resource and not disposed in the Gulf of Mexico.

EPA has jurisdiction over the ODMDS considerations, but EPA Region 6 is very overwhelmed at this point, and that status is not expected to change. Budgets have

been declining over the last many years and staff positions reduced. Jessica Franks, the only Ocean Disposal staff person, in Region 6 recently left the Agency. Replacement is improbable. Her supervisor, Karen McCormick, is unlikely to take on the long and difficult task of designating an ODMDS.

From a serious practical aspect, it should be noted that in the past when EPA was adequately staffed with sufficient monetary resources to designate an ODMDS, the rule of thumb for designation was that it would take two years and \$2 million. The funding may be about the same, but the time frame would likely stretch way out, given the lack of staff resources.

A recent former manager at EPA headquarters said without hesitation, “up to five years” for a new ODMDS for Port Fourchon.

No ODMDS is currently available and a new ODMDS or a disposal site is not likely to be established for Port Fourchon.

- EPA is unlikely to modify the existing Barataria Waterways ODMDS to allow disposal of Port Fourchon dredged material at that site.
- EPA is unlikely to establish a new ODMDS for Port Fourchon, because of limited staff resources, and given that it is merely a paper exercise to establish a base plan.
- A disposal site established by USACE is a possibility, but the need for funding and carrying out extensive baseline surveys, review of that information by EPA and USACE are considered barriers to a timely designation of a disposal site. This approach will be also viewed by EPA as superfluous, given it is a paper exercise, and not worth their time.

Per Planning Bulletin No. PB 2019-02, paragraph 3. Guidance: Reference 1 b allows for the use of non-Corps sources of data and information – the ODMDS white paper which is appended to the feasibility report. Therefore, the non-federal interest would prefer not to be subjected to an ineffective exercise that will be costly, time consuming and, thus, decrease the NED benefits due to a delay.

OASACW/HQUSACE Assessment: Response does not resolve concern. The report still needs to identify the base plan, which is the least cost disposal alternative. If offshore disposal (ODMDS) truly is impractical, then it can be screened out as an option. However, it appears there would still be lower cost disposal plans (unconfined disposal nearshore or in the littoral zone) than what is currently presented in the feasibility report, particularly since there are added costs for wetland creation that would go beyond mere placement of material.

To reiterate from the original comment, if the Port still wants to pursue authorization for cost-shared beneficial use, then the added cost for it, above the base plan, would need to be justified based on ecosystem restoration considerations per ER 1105-2-100, Appendix E, Section V. This means establishing resource significance,

formulating multiple (at least 2) beneficial use alternatives and conducting a cost-effective/incremental cost analysis as the basis for the plan that is ultimately recommended. Following this path, the report would then also need to be updated to reflect the changes in economics (costs for base plan only would be used for determining BCR for the navigation project, incremental cost for the beneficial use would be compared against habitat units gained from the beneficial use), cost sharing (65/35 for ecosystem restoration) and federal/non-federal responsibilities (for instance, O&M for the wetland containment dikes, if they are not part of the base plan, would be a non-Federal responsibility), and the inclusion of a monitoring/adaptive management plan. Finally, would recommend that the Port wait until the economic concerns that have been raised regarding project depth are resolved before addressing this comment, as the base plan and beneficial use options could change based on the volumes dredged if a shallower depth is ultimately recommended.

Port Response:

Draft cost comparison

<b>CONSTRUCTION ITEM/GENERAL NAVIGATION FEATURES (GNF)</b>	<b>TSP</b>	<b>ODMDS</b>
<b>DREDGING COST ONLY</b>	<b>PROJECT COST</b>	<b>PROJECT COST</b>
Mobilization, Demobilization and Preparatory Work (Dredging)		
Access Road & Clearing at Disposal Site	\$10,455,081	\$10,455,081
Hydraulic Dredging, Sorting, Screenings - Bayou Lafourche 0+00 to 130+00.	\$4,443,091	\$4,443,091
Advance Maintenance Dredging - Bayou Lafourche 0+00 to 130+00	\$2,405,335	\$2,405,335
Retention Dikes for Inland Disposal Area	\$2,254,926	\$2,254,926
Hydraulic Dredging, Sorting, Screenings - West Bell Pass Sta 130+00 to Sta 220+00.	\$35,094,446	\$35,094,446
Hydraulic Dredging, Sorting, Screenings - West Bell Pass Sta 220+00 to 330+00.	\$44,766,712	\$44,766,712
Hydraulic Dredging, Sorting, Screenings - West Bell Pass Sta 330+00 to 589+93.	\$50,074,433	\$29,578,561
Advance Maintenance Dredging - West Bell Pass Sta 130+00 to Sta 220+00	\$2,801,290	\$2,801,290
Advance Maintenance Dredging - West Bell Pass Sta 220+00 to 330+00.	\$3,759,515	\$3,759,515
Advance Maintenance Dredging - West Bell Pass Sta 330+00 to 589+93	\$14,229,066	\$8,404,994
Containment Dike for Dredge Material Area 130-270	\$1,790,632	\$628,013
<b>TOTAL GNF</b>	<b>\$172,074,527</b>	<b>\$144,591,964</b>

OASACW/HQUSACE Assessment: Response still does not address the various points brought up in the original comment and follow-up assessment. Does the Port intend to pursue/justify a cost-shared beneficial use plan?

GLPC comment. To date, the federal O&M dredging of the authorized 24-foot depth channels serving Port Fourchon has been dedicated 100% to beneficial use of dredged material by nourishing feeder berms in the littoral drift zone and creating marsh from interior channel maintenance. However, even though the application can be considered beneficial use of dredged material, this is the least cost disposal plan.

OASACW/HQUSACE Final Assessment: Comment is still unresolved. There are 2 remaining concerns:

1) Project costs still include \$605,571 for “Environmental and Wildlife Monitoring”, presumably, this is still associated with the wetland beneficial use sites. Least-cost placement does not and should not include these sorts of extra costs. If the Port wishes to include monitoring as a cost-shared feature, then the guidance stated in the original comment regarding the justification necessary for non- least cost placement should be followed. Alternatively, the Port could voluntarily undertake this monitoring on their own at 100% their cost (assuming appropriate site access, etc can be worked out with the Federal government), in which case it would not be considered a project cost (and thus should be removed from total project costs).

2) The total project cost appears to only account for an initial containment dike construction. However, Corps policy is to plan for sufficient confined disposal facilities to be available for at least 20 years (see ER 1105-2-100, Section 3-2b(8)). Also, the report indicates that the additional dikes will be built or raised incrementally as they are needed, and assigns all costs for additional dike construction as 100% Federal O&M costs. This is incorrect, as dredged material disposal areas are considered General Navigation Features (see ER 1105-2-100, Section 3-2a, as well as Section 101(a)(5) and (b)(2) of WRDA 1986, as amended (33 U.S.C. 2211(a)(5), (b)(2)) and thus the construction of such features (whether it is done during the initial construction or at a later time) should be cost-shared accordingly. Any needed maintenance or repair of the constructed dikes, however, would be a 100% Federal O&M responsibility for projects < 50 ft (assuming it is the NED plan). The report needs to determine the cost of construction for containment dikes necessary to hold at least 20 years worth of material, and include that as part of the total project cost. The project O&M costs should also be adjusted so that they only include the cost of maintenance and repair of the dikes, and not the construction of additional dikes or raises of existing dikes.

Additional analysis and cost refinement will be needed in PED to ensure the dredge material aspects of the project are policy compliant.

2. Planning Constraints: Several of the study constraints on pages 51 and 52 of the feasibility report do not appear to meet the definition of a constraint as discussed in section 2-3(a)(5) of ER 1105-2-100.

Basis of the Concern: As defined in ER 1105-2-100, constraints are factors that limit the planning process, such as resource constraints and legal and policy constraints.



While the listed factors may be important for the non-federal sponsor (NFS) to consider, not all may be considered constraints. Among the constraints listed in the report are NFS preferences which do not rise to the level of constraints. They include the following: to use dredged material for beneficial use; do not adversely affect landside infrastructure; Avoid conflict with...state regulation and State of Louisiana statutes, do not impact vital oil and gas pipelines. The later factor is somewhat confusing, given that 12 pipelines would be relocated for the project. While sponsor preferences and state laws may ultimately weigh in on the selected plan (as part of a locally preferred plan for instance), they should not limit the alternatives that are considered in the planning process, nor should they supersede Federal statutory requirements. In particular, it appears that some of these constraints are being inappropriately used to screen out dredged material placement options that would otherwise be considered "least cost" (see related comment on beneficial use as least cost disposal/base plan).

Significance of Concern: High, as the comment relates to the project recommendations.

Action Needed to Resolve Concern: The constraints listed in the "basis for concern" should be removed from the report, and should not be used as a basis for screening out measures or alternatives.

Port Response: Concur. These statements will be removed from pages 51 and 52 of the feasibility report.

OASACW/HQUSACE Assessment: **Comment resolved** by implementation of the response.

3. Minimum Alternative Depth of 30 ft: The report also does not explain why 30' is the minimum alternative depth that is examined.

Basis for Concern: Section 5.3 of the main report presents a minimum deepening alternative of 30', (6' deeper than the existing channel depth), but does not offer any explanation as to why smaller increments of deepening were not examined. Furthermore, 30' is the only depth alternative that is examined for the Bayou Lafourche segment of the project. Generally, depths are analyzed in 2-3' increments as a start (see Section 13.1 of IWR Report 10-R-4, NED Manual for Deep Draft Navigation) with smaller increments analyzed as needed.

Significance of Concern: High. Comment relates to the selection of the recommended plan.

Action Needed to Resolve Concern: The report should demonstrate that net benefits are not maximized at a shallower depth in the Bayou Lafourche segment.

Port Response: Port Fourchon services approximately 90% of the Gulf of Mexico's U.S. oil and gas rigs. Unlike ports that serve containerships, tankers and bulkers that

use multiple ports, the Port is home to a fleet of Offshore Service Vessels (OSV) built specifically and exclusively to operate within the authorized channel depth of the Port, in other words, between the Port and the rigs served and no other ports.

The feasibility study included a survey of the Port's tenants to determine what size vessels they would use in order to determine what channel depth would be needed. The survey revealed that the tenants wanted a depth of 30 feet.

The deeper draft vessels would provide a larger carrying capacity, which would be fully utilized in both directions – to and from the rigs – to serve larger and more distance rig/platforms. These larger, more distant structures require precision in vessel stability for loading and unloading, which is better achieved by larger, more stable OSVs.

The channel depth was selected on the basis of the needs of the tenants and not on the basis of the accommodating the existing worldwide fleet such as utilized in typical USACE navigation studies.

Although many offshore petroleum rigs and platforms in the U.S. Gulf of Mexico are foreign made, supplying these rigs and platforms is subject to the Jones Act. Therefore, almost all the OSVs transiting thru Port Fourchon are American flagged and American built. Some of the OSV operators at Port Fourchon operate shipyards along the U.S. Gulf of Mexico to construct OSVs. As with all U.S. built vessels, these OSVs cost much more to construct than foreign built OSVs and are therefore used only for supplying rig and platforms in U.S. waters. Likewise, foreign flagged OSVs cannot be used to supply rigs in U.S. waters. The Gulf of Mexico has almost all of the offshore petroleum fields being explored in the U.S., primarily in the deep waters of the Central Region where Port Fourchon dominates as the supply base. For this reason, the channel depth at Port Fourchon has determined to design draft of almost all American flagged OSVs.

The study projections used a conservative vessel size transition for benefit analysis based on the past 40 years where the OSV operators at Port Fourchon have replaced their OSVs with larger OSVs when they are retired due to obsolescence.

Cost and benefits are expected to increase at a constant rate for any additional depth provided and the maximum net benefits would be achieved at the 30' depth. Additional analysis to demonstrate the optimization will add to the study cost and are considered unwarranted.

OASACW/HQUSACE Assessment: Response does not resolve concern. While end-user input and preferences can certainly be used to guide alternative formulation, it does not automatically determine what the NED plan is. The report still needs to include an economic analysis to show that net benefits do not reasonably maximize at a depth shallower than 30 ft,

Port Response: The -30' alternative takes full advantage of available facilities designed and built in the Inner Harbor of Port Fourchon. Interviews with current tenants, Offshore Suppliers and Vessel Operators supported the selection of a -30' depth. The facilities are developed to support a depth of -30' but require substantial retrofit to allow a depth deeper than -30'. Additional interviews would be required to establish if another depth would or could incentivize an investment in vessels to take advantage of an increment of depth less than the -30' proposed in the study. To partially address the comment, a hypothetical vessel and vessel operating cost were estimated to assess the viability of a -27' increment. It should be recognized this analysis is evaluated as a first added increment. The viability and NED plan as a last added increment will be much different than the indiscriminate evaluation presented below. The results of this analysis are provided in the following table (Includes all changes to each benefit category resulting from OASA-CW Comments):

**Economic Comparison by Channel Depth Alternative  
(\$1,000)  
2.875% Federal Rate, Expected Future Conditions (Excluding  
Sec. 6009 Benefits)**

Plan	Annual Benefits	Annual Costs	BCR	Net Excess Benefits
-27 foot	\$25,216	\$24,541	1.0	\$675
-30 foot	\$27,268	\$28,474	1.0	(\$1,206)
-35 foot	\$61,964	\$31,547	2.0	\$30,417
-40 foot	\$81,489	\$34,081	2.4	\$47,408
-45 foot	\$126,175	\$36,304	3.5	\$89,871
-50 foot	\$184,834	\$41,941	4.4	\$142,893

Incremental analysis including the Section 6009 Benefits:

**Economic Comparison by Channel Depth Alternative  
(\$1,000)  
2.875% Federal Rate, Expected Future Conditions, (Including  
Sec. 6009 Benefits)**

Plan	Annual Benefits	Annual Costs	BCR	Net Excess Benefits
-27 foot	\$25,216	\$24,541	1.0	\$675
-30 foot	\$46,383	\$28,474	1.6	\$17,909
-35 foot	\$89,691	\$31,547	2.8	\$58,144
-40 foot	\$174,189	\$34,081	5.1	\$140,108
-45 foot	\$241,516	\$36,304	6.7	\$205,212
-50 foot	\$322,261	\$41,941	7.7	\$280,320

OASACW/HQUSACE Assessment: Further explanation as to this analysis is needed. Why are there no Section 6009 benefits at a -27 ft depth? Note that

Section 6009 benefits should not be used as the basis for plan formulation, comparison of alternatives, or plan selection. See par 2 of the 13 Sep 2012 IG for Section 6009 – “While Section 6009 allows for additional NED benefits for navigation projects, it does not obviate the requirement to evaluate navigation projects in accordance with established Corps planning policies and practices”. Also, the primary concern in the comment was justification of selection of the -30 ft depth (vs something shallower) for the Bayou Lafourche reach, so showing the analysis as a “first added” increment for the entire harbor is not helpful in addressing that concern. It would be helpful to see the “last added increment” economic analysis at various shallower depths for the Bayou Lafourche segment only.

GLPC comment. Through elimination of the 50’ alternative for Belle Pass, the concern about first or last added element for Bayou Lafourche is no longer relevant. The addendum presents results of an analysis of channel depths ranging from 25 to 30 feet at one-foot increments which verifies that net benefits increase with each additional increment of depth through 30 feet. The analysis stopped at 30 feet because the bulkheads in place for Flotation Canal and Slips A, B & C would require a significant change to provide geotechnical stability for deeper channels.

OASACW/HQUSACE Final Assessment: **Comment is resolved.**

4. Incremental Analysis of Bayou Lafourche Segment: The report does not show incremental justification for the 30 ft. deepening of the “Bayou Lafourche” segment of the project.

Basis of Concern: The Bayou Lafourche segment of the project would appear to be a separable element as it does not seem to be required to realize benefits of the 50 ft. proposed deepening at the Belle Pass segment. Per ER 1105-2-100, Appendix E, Section E-3c(2) – “A separable element is any part of a project which has separately assigned benefits and costs, and which can be implemented as a separate action (at a later date or as a separate project). Separable elements usually must be incrementally justified”.

Significance of Concern: High. Comment relates to selection of the recommended plan.

Action Needed to Resolve Concern: The report should show separable cost/benefits for the Bayou Lafourche segment of the project to demonstrate that it is incrementally justified (i.e., benefits exceed costs for that segment), or provide an adequate explanation as to why it should not be considered a separable element.

Port Response: The analysis included a 30-foot-deep channel serving the entire Port which included the “upper” harbor served by Bayou Lafourche. This upper harbor is where the Offshore Service Vessels (OSV) operate. Their benefits cap at the 30-foot

depth but their benefits are presented for each incremental deepening of the downstream Belle Pass reach.

The incremental costs for the 30' foot Bayou Lafourche channel are \$15,679,000. Average Annual and the associated Expected Annual Benefits are \$353,779,000 resulting in a benefit to cost ratio of 22.6 to 1.

OASACW/HQUSACE Assessment: The report should still show the separable costs/benefits for the Bayou Lafourche segment of the project.

Port Response: Refer to Plan Formulation #3 above.

OASACW/HQUSACE Assessment: Resolution pending justification of -30ft for Bayou Lafourche, per Plan Formulation comment #3 above.

GLPC comment. As stated in response to Plan Formulation question 3 above, through elimination of the 50' alternative for Belle Pass, the concern about first or last added element for Bayou Lafourche is no longer relevant. The addendum presents results of an analysis of channel depths ranging from 25 to 30 feet at one-foot increments which verifies that net benefits increase with each additional increment of depth through 30 feet. The analysis stopped at 30 feet as the bulkheads in place for Flotation Canal and Slips A, B & C would require a significant change to provide geotechnical stability for deeper channels.

OASACW/HQUSACE Final Assessment: **Comment is resolved**

5. Rationale for Selection of Project Width: The EIS implies that the project width of 475 ft. was selected because it provides the maximum amount of dredged material for marsh creation. If that is the case, since the 475 ft. alternative does not maximize net benefits it should be identified as a Locally Preferred Plan (LPP) and cost shared accordingly.

Basis of Concern: The main feasibility report in Section 5.4 indicates that despite alternatives 6a (400 ft.) and 6b (450 ft.) showing higher net benefits,) alternative 6c (475 ft.) was selected as the recommended plan because 475 ft. was "necessary for channel design safety dimensions". However, the EIS offers a different explanation for why 475 ft. was selected. Per Section 2.7 of the EIS (Rationale for Plan Selection), Alternative 6c has "the greatest environmental net benefits to wetland habitats (saline and emergent marsh) and shoreline nourishment; and thus, is recommended as the TSP. The previous section (2.6) also indicates that one of the goals of the non-Federal sponsor is to "use all dredged material to the maximum extent possible to improve the existing ecological productivity of the surrounding ecosystems..." and that "Alternative 6c was determined to provide the maximum potential for marsh creation and shoreline nourishment through the beneficial use of dredge material". Taken together, the implication from these statements is that the plan was selected based on the non-Federal sponsor's preference to maximize the amount of material available for

beneficial use. Since this plan does not maximize net benefits, it would be a locally preferred plan and the non-Federal sponsor would be responsible for 100% of the cost of the project that is in excess of the plan that maximizes net benefits

Significance of Concern: High. Comment relates to justification for selected plan, and project cost sharing

Action Needed to Resolve Concern: The report should clarify the rationale for selection of the 475 ft. project width. See also the “actions needed” for the comment titled “Safety Reason for Over 400 ft. Wide Channel”. If 475 ft. was selected for reasons other than it being a minimum design requirement, then it is likely a LPP, and the report should identify it as such and the project cost share adjusted accordingly.

Port Response: Concur. The width was chosen strictly for safety and design criteria. The DEIS will be edited to remove any claim otherwise.

OASACW/HQUSACE Assessment: **Comment resolved** with implementation of the response.

6. Construction: The initial year of construction (2019) seems unrealistic. The project will not be able to be authorized in a Water Resources Development Act until 2020 or beyond. Allowing time for Preconstruction Engineering & Design activities, a more realistic timeframe to begin construction would seem to be 2022 or beyond. The Base Year should be adjusted accordingly.

Port Response: Concur. The stated year of initial construction is unrealistic and the study team agrees that the year 2022 would be more rational. Shifting the start date would have no impact on the cost if there is no adjustment to the length of construction. Therefore, expected annual cost will not change for a delay in initiating construction. Benefits could be slightly increased if the base year of the project moves closer to a period of expansion in the benefits curve. There could be minor changes in the expected annual benefits but the impact on feasibility would be negligible. Project benefits are significantly high compared to costs, the benefit to cost ratio (BCR) is over 17. It would be a rather expensive endeavor to rerun the numbers when the net benefits and thus, BCR, are so high and both would decrease insignificantly – less than numerical changes in either direction developed during PED.

OASACW/HQUSACE Assessment: **Response resolves the concern**, however if major changes are made to the document, the Team may wish to implement this adjustment also.

## **C. ECONOMICS**

1. Federally supportable plan – Single Owner Situation and NED: The benefits attributed to the rig operations constitutes a single owner situation. It is unreasonable for LNG vessels to benefit at more than 43ft channel depths, see comment on economic unreasonableness (LNG). Bulk cargo benefits are accrued completely at the 45ft

channel alternative, see table 39 of the economic annex. The benefits for channel improvements over 400 feet wide and 45ft deep are for a single beneficiary (rigs). Also, there appear to be only minimal additional benefits between the 45ft and 50ft depths, see comment about Corpus Christi, Ingleside activity. There is also no economic justification for the channel width to be greater than 400ft wide. The additional width also constitutes a single owner beneficiary situation.

Basis of Concern: ER 1105-2-100 (E-8) section 4(a) The Corps will not recommend Federal cost participation, establishment, or expansion of a Federal navigation project where the improvement would serve only property owned by a single firm, corporation or individual, or club or association with restrictive membership requirements. Also refer to ER 1165-2-123. The rig thruster removal activity at the dock is available at a 45 feet channel, via the Ingleside example activity. The benefits for this activity should be accounted for at both the 45ft and 50ft depths. The NED plan designation at 50ft was dependent on the thruster removal benefits only at 50ft. Page 23 of the economic addendum states “thrusters can be removed at the Ingleside, Texas deep hole with the Corpus Christi depth of 45 feet”. The Texas activity shows benefits start at 45ft depth. This means the NED plan is likely 400ft wide X 45ft deep.

Significance of Concern: High in terms of its effect on the federal participation and cost share

Action Needed to Resolve Concern: Cost out the 400ft X 45ft channel for federal cost share participation. The actions here to identify the authorized cost-share should be undertaken before approval.

Port Response: The single user issue does not appear to apply to this situation because the Port (non-federal interest) is a state entity and owns the terminals. ER 1105-2-100, page E-24 states, “the Corps may recommend Federal cost participation where the improvement would serve only property owned publicly by a single state county, municipality or other duly appointed public entity. The operations at the “rig” terminal employ various subcontractors and the rigs attended are owned by other companies. The LNG and bulk and general cargo terminal properties are owned by the non-federal interest.

As to the 50-foot depth, there are NED benefits from LNG carriers for a 50 ft. channel depth as explained in the LNG comment response. With both LNG benefits and shipyard benefits there are two beneficiaries for the 50-foot channel.

The Corpus Christi, Ingleside facility channel width and depth were based on a single owner facility obtaining a permit for channel augmentation. In direct talks with the facility, they were unwilling to provide any operational/client information. Thus there is not available record on their rig service in terms of size, frequency or ownership. So who they are marketing/serving is not public. Thus it can't be used as a limiting dimensional comparison. Their decision was financial and channel enlargement was 100% their cost.

OASACW/HQUSACE Assessment: The burden of proof on a single owner situation always applies. Port Fourchon is then under a lease agreement for the property. The area is owned by Wisner Dotation Trust (New Orleans). Port Fourchon's website states the lease is to "encourage private investment". The single owner policy is in place to ensure public ownership and competitive long term economic activity. A short-term lease with the facility operators would ensure competitive economic activity warranted for public investment. The facility lease needs to be in-place to ensure the facility operator are not acting as a private investment. Please provide a facility operator lease agreement. This will also ensure viability of the potential economic activity.

Also, see economic comment #4 and #5. Federally supportable plan or NED is still limited to a ~42ft depth (last depth with potential for multiple beneficiaries). There is no supportable evidence that the larger rig activity needs more than a 45ft depth. Both Brazos Island Harbor and Ingleside undergo this activity at the 45ft depth. Please provide the costs at the 42ft depth to demonstrate the federally supportable plan.

Port Response: The single owner issue does not appear to apply to this situation because the Port (non-federal interest) is a state entity and owns the LNG terminal location and leases the rest of the port from the Wisner Dotation Trust (New Orleans) and all these parcels are subleased to terminal operators on a competitive basis. ER 1105-2-100, page E-24 states, "the Corps may recommend Federal cost participation where the improvement would serve only property owned publicly by a single state county, municipality or other duly appointed public entity. The operators at the "rig" terminal employ various subcontractors. Independent companies own the rigs attended and are unaffiliated with operators or leaseholders. The LNG and bulk and general cargo terminal properties are owned by public interests.

The report demonstrates that there are NED benefits that accrue to channel depths greater than 42 feet. [The response to comment PL3 includes a supporting incremental analysis to identify the channel depth that maximizes NED net benefits.] Specifically, the LNG export facility will serve 220,000 cubic meter capacity vessels in the 50-foot channel. These vessels draw 46 feet and require 5-7 feet underkeel clearance. Additionally, there are 19 drillships and semisubmersibles in the world fleet with drafts between 39 and 42 feet. With a required 8-foot underkeel they would not be candidates for any other U.S. Gulf port.

OASACW/HQUSACE ASSESSMENT: Unresolved

- a) Single Owner situation - Provide documentation of the operator's lease agreement to demonstrate competitive leases in which ownership is not transferred to the facility operators. Typically we consider a lease less than 50 years does not transfer ownership.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.



- b) NED Plan identification – the current economic analysis is technically flawed and full of unrealistic assumptions. It has not identified the NED Plan. 1) The proposed LNG design vessel is above the 90<sup>th</sup> percentile of world fleet for LNG vessels. USACE analysis typically plans for the 70<sup>th</sup> - 80<sup>th</sup> percentile. The proposed DV [design vessel] is on a dedicated route in Qatar and is unavailable for contract in the gulf. IWR identified 5 of the 120K DWT LNG vessels in the world fleet. USACE ER 1105-2-100, suggests the selection of DV be a vessel expected to call with some frequency. Currently in the Gulf, large LNG vessels are in the 75k-85k DWT range with a max loaded draft of approximately 37ft. Ports in the gulf are currently planning for LNG vessel with slightly more than 90K DWT capacity.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

- c) Technical flaws in the load factor analysis - Based on IWR data the 122K DWT vessels do not have 220,000 cubic meter capacity. The analysis originally claimed this capacity to be 244,000 cubic meter capacity vessel. The actual capacity of the based on IWR data is 209,000 cubic meters. The loading and emersion factors provided should be based on molecular mass rather than using a conversion to go from volume to weight. The current volume to weight conversion is inaccurate. It needs to be updated to account for LNG being lighter than water. A LNG 122K DWT vessel volumetric calculation capacity maxes out at 99,703 metric tons. Based on immersion factors the maximum draft of this vessel is 38.67 feet. Please convert your calculations to metric tonnes since that is the unit of measure for the immersion factor. There is no supporting evidence provided in the spreadsheet for the use of 244,600 cubic feet of space. IWR research and IHS Sea-Web, has indicated the available cubic feet of capacity is 209,902 on a 122k DWT LNG vessel. The spreadsheet simply uses 90% of DWT to calculate metric ton capacity on the vessel classes. It is inaccurate to a portion of DWT capacity provided by ship designs as an indication of volumetric capacity.

OASACW/HQUSACE Agreed Action: select a DV below the 80<sup>th</sup> percentile and coordinate with IWR for this vessel's capacity calculations, loading practices and maximum loaded sailing draft to be consistent with actual experienced loading patterns. Then depict the benefit of the lower channel depth required for this vessel's max capacity.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

OASACW/HQUSACE Final Assessment: Concur that through the elimination of the 50' alternative for Belle Pass, this **concern is no longer relevant**.

2. Authorized Cost Limits and Section 902 application: The requested total project cost authorization and cost to calculate the Section 902 cost escalation limit should not include non-federal associated costs or Local service facilities.

Basis of Concern: Application of Section 902 WRDA 1986 "The maximum project cost limit imposed by Section 902 is a numerical value specified by law which must be computed in a legal manner (ER 1105-2-100 Appendix G)".

Significance of Concern: Low in terms of plan selection but High in terms of a recommendation to Congress.

Recommendation for Resolution: The authorized cost would be the first project costs (\$288,919,000) not the total economic investment (\$418,000,000), these correction should be done before project approval for authorization. Also do not include these associated costs in the IDC calculation. The corrections to IDC should be part of the economic validation scope of a post-authorization report.

Port Response: Concur: The \$418,000,000 includes associated cost that will not be part of cost sharing or the authorized cost but are necessary for the benefits to be realized. Chapter 8 deals with cost sharing and Figure 8-1 and 8-2 address the "Total General Navigation Features (GNF)". It is imperative that this cost be accurate as possible, since when authorized it will be the basis for any Section 902 analysis if one is ever necessary.

OASACW/HQUSACE Assessment: Please provide the revised cost share apportionment, see economic comment #8 on local service facilities shifted to the associated costs category.

Port Response: Total project cost for the GNF is \$288, 919,118, of which \$216,689,338 is the federal portion and \$72,229,779 is the non-federal cost.

CONSTRUCTION ITEM/GENERAL NAVIGATION FEATURES (GNF)	PROJECT COST	FEDERAL	NON-FED
Mobilization, Demobilization and Preparatory Work (Dredging)			
Access Road & Clearing at Disposal Site	\$10,455,081	\$7,841,311	\$2,613,770
Hydraulic Dredging, Sorting, Screenings - Bayou Lafourche 0+00 to 130+00.	\$4,443,091	\$3,332,318	\$1,110,773
Advance Maintenance Dredging - Bayou Lafourche 0+00 to 130+00	\$2,405,335	\$1,804,001	\$601,334
Retention Dikes for Inland Disposal Area	\$2,254,926	\$1,691,194	\$563,731
Hydraulic Dredging, Sorting, Screenings - West Bell Pass Sta 130+00 to Sta 220+00.	\$35,094,446	\$26,320,835	\$8,773,612
Hydraulic Dredging, Sorting, Screenings - West Bell Pass Sta 220+00 to 330+00.	\$44,766,712	\$33,575,034	\$11,191,678
Hydraulic Dredging, Sorting, Screenings - West Bell Pass Sta 330+00 to 589+93.	\$50,074,433	\$37,555,825	\$12,518,608
Advance Maintenance Dredging - West Bell Pass Sta 130+00 to Sta 220+00	\$2,801,290	\$2,100,968	\$700,323
Advance Maintenance Dredging - West Bell Pass Sta 220+00 to 330+00.	\$3,759,515	\$2,819,636	\$939,879
Advance Maintenance Dredging - West Bell Pass Sta 330+00 to 589+93	\$14,229,066	\$10,671,800	\$3,557,267
Containment Dike for Dredge Material Area 130-270	\$1,790,632	\$1,342,974	\$447,658
Environmental & Wildlife Monitoring	\$1,657,750	\$1,243,313	\$414,438
PLANNING, ENGINEERING, AND DESIGN	\$23,250,078	\$17,437,558	\$5,812,519
CONSTRUCTION MANAGEMENT	\$28,416,764	\$21,312,573	\$7,104,191
CONTINGENCY (Reserves at 80% Confidence)	\$63,520,000	\$47,640,000	\$15,880,000
<b>TOTAL GNF</b>	<b>\$288,919,118</b>	<b>\$216,689,338</b>	<b>\$72,229,779</b>

The remaining \$129,663,327 are all non-federal (100% local).

OASACW/HQUSACE Final Assessment: **Comment resolved.**

3. Incremental Justification for current channel dimensions: There doesn't seem to be a justification for the 45/50ft channel depth past the new turning basin. Currently the 50ft depth goes to station 130+00. There is no justification for the increment between the new TB and 130+00 below 30ft deep.

Basis for concern: ER 1105-2-100 Incremental justification

Significance of Concern: Low in terms of plan selection medium in terms of channel design and total authorized costs.

Recommendation for Resolution: Show justification for the current channel dimensions past the new turning basin or cost and design the channel with the 45/50ft depth stopping at the new turning basin. These corrections should be part of the final report, prior to authorization approval since they have implications on the costs share apportionment and total authorized costs.

Port Response: The approximately 1,200 foot long, 50 foot deep channel extension in Belle Pass immediately upstream of the turning basin would serve the bulk and general cargo facility. However, the general cargo benefits maximize at 40 feet and those derived for bulk cargo maximize at 45 feet although an incremental analysis would probably reduce that to 40 feet. Although the length of channel under discussion is almost negligible there would be a construction cost savings. The cost savings related to a reduction of depth from 50 feet to 45 feet would be on the order of \$850,000. O&M dredging saving would probably be negligible over such a short reach

The difference in the construction volume of material between the depths of -50 feet and -45 feet from Station 130+00 to 150+00 is summarized below.

Begin Station	End Station	Depth	Net Volume (CY)
130+00	150+00	-45	718,914
130+00	150+00	-50	857,319
		<b>Delta</b>	<b>138,405</b>

OASACW/HQUSACE Assessment: Show optimization for anything more than 40ft and please incorporate these changes in the authorized dimensions and cost share apportionment.

Port Response: The exact location of the turning basin and the transition from the 50 foot depth to the 30 depth and the commensurate width narrowing will be resolved in PED. The dimensions and costs as presented for this very short reach of the project

would exceed that associated with any smaller version of the project dimensions somewhere less than 5 percent.

OASACW/HQUSACE ASSESSMENT: Addressed with revisions to the authorization dimensions to show the potential 30ft channel begins on the north side of the turning basin, Station 130+00.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

OASACW/HQUSACE Final Assessment: Concur that through the elimination of the 50' alternative for Belle Pass, this **concern is no longer relevant**.

4. Economic reasonableness – Economic calculation & Model appropriateness: The benefit calculations are not reasonable for the level of economic activity described in the report. In particular the LNG benefits portrayed are unrealistic and there is no explanation of the analysis to support the current assessment. The LNG vessel identified at the 50ft depth is extremely rare and does not load to more than 45ft. The 122,300 DWT vessel has a design draft of 44.4 ft. and a volumetric capacity of 209,902 cubic meters. This volumetric capacity, when loaded with LNG at 500 kg/ m<sup>3</sup>, specifies that the vessel will be fully loaded (volumetrically) with 99,703 metric tons. (LNG is roughly in the range 410 to 500 kg/m<sup>3</sup>). Using the vessels dimensions and immersion rate, a fully loaded vessel would draft approximately 39 feet. With 4ft of underkeel the maximum channel depth required for this vessel is 43ft. Calculations are also not based on a model that has been approved or certified for use by USACE.

Basis of Concern: Per ER 1105-2-412, (Assuring Quality of Planning Models) Section 6 – “Use of certified or approved models for all planning activities is mandatory”. Also, per ER 1165-2-209, App B, par 2j(2), a Section 203 study “should specify whether the model used was approved or certified by the Corps of Engineers”.

Significance of Concern: High in terms of economic justification.

Action Needed to Resolve Concern:

- (a) Provide the economic spreadsheet model for an agency technical review.
- (b) Provide fleet forecasts and load factor analysis.
- (c) Please provide the LNG vessel fleet calls forecast for the WPC and WOPC.
- (d) Please provide the rational for the LNG 122k DWT vessel. It is rare and unavailable for use at Port Fourche. Also, the design vessel defense should address the destination ports ability to handle a 40ft or more drafting LNG vessel.
- (e) The feasibility report should state the economic model used for the study has not been approved or certified by USACE.

If the project is authorized without fully addressing these concerns, as a condition of implementation the model will need to be certified or approved for use by USACE and the economics of the project validated.

Port Response: As required by ER 1165-2-209, App B, par 2j(2), the study team acknowledges that economic benefits were derived by spreadsheet computations and not a certified model. These spreadsheets along with an explanation of their calculations are provided in a separate document for your review. They were reviewed by both an independent technical review and an independent external peer review so it should be noted to avoid confusion. Therefore the feasibility report was edited on page 2 of Annex 1 of the Economics Appendix to state the economic model used for the study has not been approved or certified by USACE but that it have been reviewed by both an independent technical review and an independent external peer review.

The economic spreadsheet provided includes the fleet forecast and load factor analysis for the WOPC and the WPC.

There are over 50 LNG carriers in the world fleet of 122,000 dwt which is a significant portion of the world fleet. These LNG carriers will be used for long distance transportation from Louisiana to the Philippines and will transit thru the Panama Canal. The largest LNG carriers have been transiting the Panama Canal since the completion of the new Panama Canal Locks in 2016.

The design drafts and the LNG capacity for the LNG carriers were obtained from IHS Sea-Web, which uses data provided to the IMO (International Maritime Organization). Sea-Web provides the LNG capacity measured in cubic meters. LNG capacity was converted from cubic meters to metric tons based upon .423 metric tons per cubic meter. AECOM assumed LNG will be shipped in the largest category LNG carriers available in the world fleet that can transport LNG thru the Panama Canal from Port Fourchon to Pagbilao, Philippines and has included the Panama Canal toll in the transportation cost. The larger LNG carriers that have been built during the past decade use a new tank design, which increases LNG capacity per dwt of the LNG carrier.

An LNG Hub is being developed by Energy World Company in the Philippines, which will be the primary destination for LNG exports from Port Fourchon. The LNG Hub will be in Pagbilao, Quezon Province where a major power plant is also being constructed. The Pagbilao power plant will be fueled with natural gas from the LNG Hub and coal from a neighboring coal dock. The harbor is currently 47.6 feet deep and is being currently being improved to facilitate the transportation of multiple commodities. Philippine power demand is forecasted to double within 20 years and this LNG Hub has been permitted and has been designated as a facility of national significance by the Philippine government.

OASACW/HQUSACE Assessment: Please provide the supporting information for the assertion that there are 50 122K DWT vessel currently in service. Also, provide those

currently in service in the Gulf of Mexico. The existing data shows that there are no vessels of this size currently in service as of 2017. Gulf ports have mentioned this vessel as potential for Gulf usage, however Port Fourchon would be competing with the other gulf ports for this vessel deployment. The selection of the design vessel should be based on a vessel that will reasonable call at the port with some frequency. A rare 122 DWT vessel split between other Gulf port will not likely call at port Fourchon with any frequency.

The loading and emersion factors provided should be based on molecular mass rather than using a conversion to go from volume to weight. Volume to weight conversion is inaccurate. A LNG 122K DWT vessel volumetric calculation capacity maxes out at 99,703 metric tons. Based on immersion factors the maximum draft of this vessel is 38.67 feet. Please convert your calculations to metric tonnes since that is the unit of measure for the immersion factor. There is no supporting evidence provided in the spreadsheet for the use of 244,600 cubic feet of space. IWR research and IHS Sea-Web, has indicated the available cubic feet of capacity is 209,902 on a 122k DWT LNG vessel. The spreadsheet simply uses 90% of DWT to calculate metric ton capacity on the vessel classes. It is inaccurate to a portion of DWT capacity provided by ship designs as an indication of volumetric capacity. Recommendation: revise the vessel capacity calculations to be consistent with actual experienced loading patterns and depict the benefit lower channel depth required at max capacity.

The largest LNG vessel in the service in the Gulf is a 112 DWT. It rarely shows up at Sabine-Neches and Freeport Harbor facilities. It has a sailing draft of 38ft. Both Freeport Harbor and Sabine Neches Waterway have suffice depth to allow the vessel to load deeper, however it is constrained by volumetric capacity of the vessel. Recommendation: revise the design vessel to a 90K DWT LNG vessel.

Please see economic comment #1. Please provide costs for a ~42ft channel to document the federally supportable channel depth.

Port Response: The LNG carriers used in the economic analysis are based upon the business plan of the LNG tenant, Energy World. For the future, with project condition Energy World will use larger LNG carriers to take cargos directly to the Philippines. These will be 220,000 cubic meter capacity vessels which are standard on the Market and have a working draft of about 46 feet. Galveston District has published that for the 40 foot deep Sabine LNG vessels are required to have 5-7 feet of underkeel clearance.

#### OASACW/HQUSACE ASSESSMENT: Unresolved

- a) LNG design vessel - Existing IWR and WCSC data shows that there are no vessels of this size currently in service to the US. The selection of the design vessel should be based on a vessel that will reasonable call at the port with some frequency. A rare 122 DWT vessel split between other Gulf port will not likely call at port Fourchon with any frequency. The largest LNG vessel in the service in the Gulf is a 112 DWT. It rarely shows up at Sabine-Neches and

Freeport Harbor facilities. It has a sailing draft of 38ft. Both Freeport Harbor and Sabine Neches Waterway have suffice depth to allow the vessel to load deeper, however it is constrained by volumetric capacity of the vessel. Recommendation: since this is a new facility I recommend revising the design vessel to a 90K DWT LNG vessel. It would likely demand a 40-42 (37ft sailing draft + 5ft underkeel), based on other gulf port experiences.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

- b) Technical flaws in the LNG load factor analysis - The loading and emersion factors provided should be based on molecular mass rather than using a conversion to go from volume to weight. Volume to weight conversion is inaccurate. A LNG 122K DWT vessel volumetric calculation capacity maxes out at 99,703 metric tons. Based on immersion factors the maximum draft of this vessel is 38.67 feet. Please convert your calculations to metric tonnes since that is the unit of measure for the immersion factor. There is no supporting evidence provided in the spreadsheet for the use of 244,600 cubic feet of space. IWR research and IHS Sea-Web, has indicated the available cubic feet of capacity is 209,902 on a 122k DWT LNG vessel. The spreadsheet simply uses 90% of DWT to calculate metric ton capacity on the vessel classes. It is inaccurate to a portion of DWT capacity provided by ship designs as an indication of volumetric capacity.

Action Needed to Resolve Concern:

- (a) Provide the economic spreadsheet model for an agency technical review.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

- (b) Provide fleet forecasts and load factor analysis.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

- (c) Please provide the LNG vessel fleet calls forecast for the WPC and WOPC.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

- (d) Select an LNG Design Vessel consistent with USACE economic policy

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

- (e) Revise the vessel capacity calculations to be consistent with actual experienced loading patterns and depict the benefits of a lesser channel depth required for actual max vessel capacity.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

OASACW/HQUSACE Final Assessment: Concur that through the elimination of the 50' alternative for Belle Pass, this **concern is no longer relevant**.

- 5. Multiport Analysis – Rigs and LNG are not in existing condition: The benefits for LNG and Rigs are subject to a Multiport Analysis. Several other gulf ports are in the process of developing infrastructure to export LNG. A number of ports in the Gulf are also developing services for larger Rigs. The scope of a multiport analysis is not limited to only existing traffic diversion from other port but rather any extent of future demand services. Long-term equilibrium state of supply chains should be examined across the gulf for the most efficient supply chain recommendation.

Basis of Concern: FERC license database lists multiple LNG submittals in the Gulf

Significance of Concern: High in terms of economic justification.

Action Needed to Resolve Concern: Conduct a multiport analysis for Rigs, service vessels and LNG in the Gulf.

If the project is authorized without fully addressing these concerns, as a condition of implementation the model will need to be certified or approved for use by USACE and the economics of the project validated.

Port Response: Energy World Inc. started the LNG export permitting process and is committed to locating at Port Fourchon. Energy World intends to begin operations at Port Fourchon with the current channel depth and its operations are not dependent upon deepening the channels. However, the deepening of the harbor will allow more efficient LNG carriers to be used. Energy World has a captive audience and is not competing with other U.S. ports exporting LNG.

Rig operators have stated that Port Fouchon would be the favored location for rig inspection and servicing work. Port Fourchon will have a geographic advantage for inspecting and servicing offshore rigs and platforms because it will be the closest shipyard to the deep-water petroleum fields. The other shipyards in the U.S. Gulf of Mexico are primarily topside fabricators and do not focus on rig inspection and repair.

As explained elsewhere, approximately 90% of the oil & gas exploration and production platforms are serviced from Port Fourchon. The benefit analysis does not include diversion of service vessel from other ports.



OASACW/HQUSACE Assessment: Rig and LNG vessel activity is a new which will require a multiport assessment to validate the economic viability. The LNG activity is not likely to materialize in the FWOPC of a 24' channel, see economic comment #11. The LNG vessels loading practice require a fully loaded pressurized natural gas compartments for safety operations. The provided "LNG" spreadsheet for review assumes a 20.5K DWT vessel with a design draft of 32.5 in the WOPC. LNG vessels are required to fill their holding tanks to a 90%+ loaded pressurized tank for safety reasons. The volumetric capacity and immersion factor would require this LNG vessel to load to 25ft+. It is unreasonable to assume this activity will existing the WOPC since the vessel will require ~30ft channel. This activity is an inducement in the WPC which will need a multiport assessment to validate.

The 203 report also mentions that it plans to attract the supply vessel activity away from Gulf port and Galveston. A multiport equilibrium assessment will need to be undertaken to ensure the economic viability of this large scale change in service vessel activity.

Port Response: Corps Planning Guidance (ER 1105-2-100) briefly addresses the criteria for determining the need for a multiport analysis in support of navigation studies. The Institute for Water Recourses expands on those considerations. Consistent with USACE guidance, the following addresses the application of multiport analysis to the Port Fourchon Deepening Study with respect to semi-submersible rigs and drillships, liquefied natural gas carriers, and general cargo vessels.

### **Semi-Submersible Rigs and Drillships**

Under future with-project conditions, Port Fourchon is expected to induce the transit of deeper and wider semi-submersible rigs and drillships to port facilities for periodic inspection, servicing, and retrofitting. Improved channel conditions in Port Fourchon would primarily compete with foreign ports in the Caribbean, but little, if any, with the few potentially competing ports in the U.S. Gulf of Mexico.

While Mobile, Alabama offers a ship repair facility accessed through a 44 x 250-foot channel, it has no history of servicing rigs within this size class.

In Texas, a rig facility is available at Brazos Island Harbor, but the channel width of 250 feet restricts entry to all but 14 per cent of the world's rig and drillship fleet. Tables 2-3 and 2-4 below, taken from the Brazos Island Harbor Channel Improvement Feasibility Study, show the world fleet distribution according to vessel width and the portion of that fleet that the port has historically attracted, of which there were none for rig widths of greater than 236 feet.

Also on the Texas gulf coast, the Kiewit facility at Ingleside and the Gulf Copper facility at Galveston are in potential competition with an improved channel at Port Fourchon. However, these ports are significantly more distant from future drilling locations in the deep waters of the Gulf of Mexico than is Port Fourchon.

The Kiewit facility has a channel 430 feet wide and 45 feet deep. At its own expense, Kiewit widened this channel by 30 feet, from the federally authorized width of 400 feet, for a length of 2.7 miles reflecting the need and importance of such dimensions for servicing these craft. While this investment demonstrates the competitive forces at work in the offshore oil and gas industry, the improvement nevertheless accommodates only 3 percent more of the world fleet. The Gulf Copper facility has similar dimensions.

There is no data source to document historical transit records by rigs to the facilities at Kiewit or Gulf Copper, and thus no future projections are available. However, the incentive to capture a larger share of the rig servicing market is demonstrated by the private investment made by Kiewit at the Ingleside port. The construction permit was issued in August 2011 and subsequent to the Gulf Copper facility becoming operational at its current channel dimensions. Finally, the Corps of Engineers, nor other federal agencies, maintain rig repair capabilities for the United States. The current and potential market for rig repair, and particularly the underling customer needs from the rig operators and their Exploration and Production customers, is based upon highly proprietary and competitive business models, and thus specific needs are impossible to obtain. However, based on Gulf of Mexico leases spanning more than thirty years, average lifecycle of rigs and equipment employed on the Gulf of Mexico, and discussions with industry participants, the need for repair, refurbishment or replacement is pending within the next few years.

Table 2-3 and 2-4 are from Brazos Island Harbor Channel Improvement Project Feasibility and clearly demonstrates the small population of rigs that the Brazos facility could serve.

<b>Table 2-3. World Offshore Rig Fleet as of January 2009 (Includes New Construction)</b>		
Rig Width (feet)	Number	Percentage of World Fleet
150-165	6	2.8%
189-197	3	1.4%
200-236	16	7.5%
246-249	4	1.9%
250-277	25	11.8%
280-298	24	11.3%
302-325	29	13.7%
327-349	29	13.7%
350-399	67	31.6%
400-410	7	3.3%
531	1	0.5%
820	1	0.5%
Greater than 820	0	0.0%
Total	212	100.0%

Source: Fairplay/Lloyds' Register of Ships, January 2009.

<b>Table 2-4. Comparison of World and Brownsville Offshore Rig Fleet</b>					
Rig Width (feet)	Percentage of Brownsville Fleet				Percentage of World Fleet
	2006	2007	2008	2009	
Less than or equal to 175	63%	50%	33%	67%	12%
200-236	37%	50%	67%	33%	8%
Greater than 236	0%	0%	0%	0%	80%
Total	100%	100%	100%	100%	100%

Table 3 shows the channel widths and depths at potentially competing rig ports in the U.S. Gulf.

<b>Table 3 Competing U.S. Gulf Ports By Channel Dimensions</b>			
	Depth (feet)	Width (feet)	
Brazos Island	42	250	
Galveston	45	1200	
Ingleside	45	430	

### **Liquefied Natural Gas Carriers**

Liquefied natural gas (LNG) carriers do not warrant a multiport analysis as the export from Port Fourchon is destined to overseas power plants owned by the lease holder of the Port Fourchon facility and thus do not involve any diversion from other ports.

### **General Cargo**

The NED benefits from general cargo shipments were entirely based upon cargo currently destined to Port Fourchon. At present, general cargo vessels transport equipment and supplies for the offshore petroleum industry from overseas to the Port of Houston or the Port of New Orleans. The cargo is then transferred to barge or truck for shipment to Port Fourchon. The NED benefits from allowing this cargo to be shipped directly to Port

Fourchon are entirely from transportation cost savings to captive tenants of Port Fourchon, which supply the offshore rigs.

OASACW/HQUSACE ASSESSMENT: Unresolved

Rig and LNG activities are unreasonable to assume in the WOPC. They are more positioned for a build it and they will come scenario, meaning they are dependent on Federal investment to be viable. Several items were agreed to be provided to better depict the likeliness of the local investment ahead of any required federal investment.

GLPC comment. Because GLPC has dropped the Belle Pass facility development as part of the FWOP economic condition, this request no longer applies. However, because this development has been underway for some time and continues, the following answers are provided.

Forecasts of future without-project conditions consider all other actions, plans and programs that would be implemented in the future to address the problems and opportunities in the study area in the absence of a Corps project, extending from the base year (the year when the proposed project is expected to be operational) to the end of the period of analysis. Both the Rig and LNG facilities are actively being developed with significant investment being made. The Port has a lease with the LNG developer beginning in January of 2020. The Port has also received letters of intent from tenants of the Fourchon Island Development for rig repair activities.

a) FERC application for LNG

GLPC comment. Fourchon LNG (Energy World) initiated the Pre-Filing Process through FERC in August of 2017 as documented in Docket Number PF17-9-000. In April of 2019 Fourchon LNG has filed the Environmental Resources Reports 2 (Water Resources), 3 (Fish, Wildlife, and Vegetation), 6 (Geological Resources), & 10 (Alternatives) required by the FERC process. Fourchon LNG is currently responding to comments provided by FERC in June of 2019 and continues to submit monthly FERC status reports.

- a. The following can be provided upon request:
  - i. Pre-Filing & Docket Number
  - ii. FERC comments on submitted environmental reports
  - iii. EIS/Environmental Submittals from Fourchon LNG to FERC
  - iv. Monthly FERC Reports
  - v. Estimated costs incurred by Fourchon LNG to date

b) Master plan for the LNG facility

GLPC comment. A master plan of the LNG facility was developed by Fourchon LNG can be seen along with the FERC submittals at the following website, <http://www.fourchonlng.net/about.php>.

c) Capacity contracts for the marketed LNG commodity

GLPC comment. The Purpose of the Fourchon LNG Project is to complete the Energy World group of companies supply chain by developing an Energy World-owned provider of American LNG. Fourchon LNG and its sister companies within the Energy World Group are vertically integrated. Energy World's business strategy involves taking control of as much as possible of the full supply and production chain linked to clean energy from natural gas.

The purpose of the Project is to extend the Energy World supply chain and to include an Energy World-owned provider of LNG for Energy World's Pagbilao LNG Hub Terminal and power plant, as well as other planned Energy World terminals in Asia. Because Energy World is currently using depleting gas fields in Asia for the Pagbilao import facility and its associated power station that facility is not an option and LNG would need to be supplied from various non-Energy World liquefaction terminals. Energy World is the consumer of the LNG as described in Fourchon LNG Resource Report 10 submitted to FERC.

d) Lease agreements for planned operators at the Rig facilities

GLPC comment. The Port has received letters of intent from tenants of the Fourchon Island Development for rig repair activities, which are available upon request. To date, the Port has invested significant time and money into the development of Fourchon Island and the Rig facilities. They have completed topographic survey and geotechnical engineering, as well submitting the required environmental permitting. Copies of the approved JD and Joint Application Permit to USACE are available on request. Costs of these pre-design efforts by the port represent a significant investment.

In addition to these completed pre-design efforts, the Port has executed contracts to begin the detailed Engineering and Design of Fourchon Island and the proposed slip.

- a. Letter of intent from Bollinger
- b. Port's Efforts to move forward with project
  - i. Environmental Permitting
    - 1. JD Approved – Provide Copies
    - 2. Joint Application Permit prepared
    - 3. Submittal expected 11-8-19
  - ii. Engineering
    - 1. Pre-Engineering Design completed items
      - a. Geotech
      - b. Survey
      - c. Conceptual Development Plan/Master Plan

e) Multiport analysis for the LNG and Rig activity

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

The LNG activity is not likely to materialize in the FWOPC of a 24' channel, see economic comment #11. The assumption that multiport is not required since the LNG facility has committed to Port Fourchon is an inaccurate assumption. The current condition at Port Fourchon does not warrant and is inaccurate to assume a captive economic activity company scenario assumption, which might preclude the need for a multiport analysis. World Energy does not have a FERC license and has not shown evidence of commitments to World Energy's storage capacity by end users. Since these items have not been provided a multiport analysis is required to show overall demand for LNG is sufficient to warrant an investment at Port Fourchon and that the investment is most efficient to be made at Port Fourchon.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

Based on industry feedback LNG vessels loading practice require a fully loaded pressurized natural gas compartments for safety operations. The provided "LNG" spreadsheet for review assumes a 20.5K DWT vessel with a design draft of 32.5 in the WOPC (channel is currently 24ft). LNG vessels are required to fill their holding tanks to a 90%+ loaded pressurized tank for safety reasons. The volumetric capacity and immersion factor would require this LNG vessel to load to 25ft+. It is unreasonable to assume this activity will exist in the WOPC since the vessel will require ~30ft channel. After a review of the world fleet only 11 of the 506 LNG vessels in service have the MXSLLDs ranging from 23.00 to nearly 27.00 feet with cubic ratings extending from about 14,000 to nearly 31,000 cbms. Review of age indicates only about half of these vessels are relative recent construction expected as a basis for application in a vessel service forecast indicating limited likelihood of future replacement or replacement sufficient to significantly increase the number in class respective to the nature of service in question versus services for which these hulls are already employed. This indicates a very unlikely scenario that World Energy will locate at Port Fourchon without federal investment. Due to the notably restricted depths for without versus proposed with-project conditions subject evaluations arguably present reasonable justification for undertaking multiport evaluations compared to application of assumptions for use of comparatively small vessels as a sustainable regime of transport versus the potential of transport via other ports which already support larger and more efficient hulls (and which may have viable alternatives for distribution of LNG from source to such ports). The proposed activity is an inducement in the WPC which will need a multiport assessment to validate. Absent of the federal investment at Port Fourchon Energy World will likely explore opportunities at other Gulf ports. This is evident in their expectation to use an inefficient/small vessel on the existing 24' channel. The

vessel would require a partial load with is not industry practice for LNG loading and this type of vessel is not readily available for contract.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

The current LNG design vessel is inconsistent with policy and is extremely unreasonable to assume for Port Fourchon. The LNG vessel mentioned is rare, misrepresented capabilities and not available in the Gulf. Very few 120,000 DWT exist in the world fleet, their volumetric capacity is 204,000 cubic meter and has a max drafts of 39ft, the vessel is on a dedicated route in Qatar. The other ports in the Gulf undergoing the LNG export activity shows a max draft LNG vessel around 37 ft with no physical channel constraints to using a larger LNG vessel. These vessel's range from 75,000 to 90,000 DWT. IWR has evaluated the availability of the current fleet and order books. It was agreed to use a vessel similar to other facilities in the Gulf; Freeport or Sabine Pass. It was also agreed to use volumetric capacity loading analysis in the economics. This analysis will reveal the actual channel requirements ranges around similar to others port experiences in the Gulf. The same design vessel analysis was agreed for the Rig operations.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

The current rig operations are infrequent and small contracts. The current Rig design vessel is above the 90th percentile in the world fleet and would be an extremely infrequent call to Port Fourchon; our policy guides our analysis to design for vessels that would call with relative frequency. Planning above the 90<sup>th</sup> percentile only provide service to a few additional rigs. These Rigs are on a 5-10 cycle for repair and inspection, which equates to no more than three of the larger rigs a year will be looking for this service. Two other harbors in the GOM can serve the larger Rig demand for repair and inspection of the larger rigs. Even if the analysis assumes all three rigs call to Port Fourchon; three calls a year does not constitute relative frequency required in USACE policy. Existing Gulf facilities have capacity to serve these large vessel, and an additional Rig operation targeting the large semi-submersibles is likely to make other federal investments obsolete. It was agreed to provide background information on the port's Rig expected facility development and lease agreements. A multiport analysis is need to ensure appropriate federal investments don't pick winners and losers. It was also agree to select a design vessel within the 70th percentile of the world fleet which would likely lead to a maximum channel requirement of 42ft.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

Rig and LNG vessel activity is a new which will require a multiport assessment to validate the economic viability. The LNG activity is not likely to materialize in the

FWOPC of a 24' channel, see economic comment #11. The LNG vessels loading practice require a fully loaded pressurized natural gas compartments for safety operations. The provided "LNG" spreadsheet for review assumes a 20.5K DWT vessel with a design draft of 32.5 in the WOPC. LNG vessels are required to fill their holding tanks to a 90%+ loaded pressurized tank for safety reasons. The volumetric capacity and immersion factor would require this LNG vessel to load to 25ft+. It is unreasonable to assume this activity will existing the WOPC since the vessel will require ~30ft channel. This activity is an inducement in the WPC which will need a multiport assessment to validate.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

6. Safety - Safety reason for over 400 foot wide channel justification: The additional safety design consideration should be worked into engineering construction and design metrics and not as a planning objective. As a planning objective the desired level of safety can be managed by non-structural measures or vessel transiting restrictions.

Basis for concern: EM 1110-2-1613; ER 1105-2-100 Non-structural measures

Significance of Concern: High in terms of efficiently meeting the planning objectives.

Actions Needed to Resolve Concern: Provide a rational for the additional widening feature above standard engineering and design. Extraction from similar channel designs or conducting ship simulations are a few examples of engineering design standards. Apply non-structural formulation techniques for additional safety considerations. See similar comments on justification of additional channel width.

Port Response: Widening of the channel is not above the standard engineering and design standards. Design criteria established for the design of the channel dimensions and results are discussed in detail in Engineering Appendix Section 11 "Detailed Design". Channel dimensions were determined per USACE EM 1110-2-1613 "Hydraulic Design of Deep Draft Navigation Channels". Chapter 8 of EM 1110-2-163 outlines channel width criteria as a function of design vessel beam and standard allowable multipliers and recommends values of 2.0 to 6.0 times the design vessel beam for one-way ship traffic. See Table 11-2 from the Engineering Appendix below.



Table 11-2 below from EM 1110-2-1613 provides recommended multipliers based on channel types and current speeds.

Table 11-2: One Way Ship Traffic Channel Width Design Criteria

Channel Cross Section	Design Ship Beam Multipliers for Maximum Current, Knots		
	0.0 to 0.5	0.5 to 1.5	1.5 to 3.0
Constant Cross Section, Best Aids to Navigation			
Shallow	3.0	4.0	5.0
Canal	2.5	3.0	3.5
Trench	2.75	3.25	4.0

In addition to Table 11-2 above, EM 1110-2-1613 states that the channel width multiplier range from 2.0 to 7.0 for the design vessels.

The calculated beam to width multipliers range 3.0 to 4.9 for all design vessels forecasted for the 475ft section of the channel, with the exception of the Semisubmersible Drilling Rig, which had a calculated multiplier of 1.4. See Table 11.4 of the Engineering Appendix below for complete summary of design vessel beam to width multipliers calculations.

Table 11-4: Channel Width Design Summary 475 ft.

Design Vessel	Vessel name	Beam (ft.)	Per EM 1110-2-1613 Table 8-1		Calculated Design Multiplier Based on Selected Design Channel Width <sup>2</sup>	
			Multiplier	Channel Width (ft.)	Multiplier	Channel Width (ft.)
Semisubmersible Drilling Rig	Ocean Monarch	333	4.0	1332.0	1.4	475.0
Drill Ship (2) <sup>1</sup>	Discoverer Enterprise	125	4.0	500.0	3.8	475.0
	Deepwater Frontier	138	4.0	552.0	3.4	475.0
General Cargo Vessel		97	4.0	388.0	4.9	475.0
LNGC Vessel-Phase I <sup>3</sup>		98	4.0	393.7	4.8	475.0
LNGC Vessel Phase II-1 <sup>3</sup>		115	4.0	459.3	4.1	475.0
LNGC Vessel - Phase II-2 <sup>3</sup>		161	4.0	644.0	3.0	475.0

1. Of the larger drill ships, two distinct vessel types are listed.
2. Page 8-4 of EM 1110-2-1613, 31 May 06 for one-way ship traffic, values vary from 2.0 to 6.0 or even 7.0 times the design ship beam.
3. Energy World LNG Facility design vessel information provided by the Port

OASACW/HQUSACE Assessment: Concur, Safety is accounted for in engineering regulations not in addition subjective planning objectives. Please ensure the report reflects the engineering standard for safety.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

7. Future without Project Conditions – OSV Fleet Transition: Annex to Appendix A – Economics Table 7 (pg.8) shows 687 calls in 2015 by the smaller OSV1s but table 8 shows 1,011 calls in the 2017. While table 7 shows 112 calls of the larger more efficient OSV2 in 2015 and table 8 shows the same 112 calls for 2017. This assumes growth in the smaller domestic flagged more expensive OSV1 class and no growth in the larger foreign flagged more efficient OSV2 class without any evidence to support the conclusion. The larger OSV2 are more efficient and can currently fit in the channel, it seems this class would have a more significant role in the without project condition. The with-project condition for this activity then assumes a new class of OSV(3)s will be designed specifically for the improved channel. There are other ports undergoing the same service activity which has not resulted in the fleeting industry to design a larger class vessel and it is unreasonable to assume the improvements at Port Fourchon would change the entire industry. It appears that some benefits are associated with OSV3s shifting from neighboring port to use Port Fourchon. See economic comment #5. The benefits are then predominately based on using an unrealistically small without project vessel and proportion then fully transitioning to an unrealistically large service with-project vessel at unrealistic proportions. Furthermore the supply vessel tonnage doubles prior to the base year without any evidence to support the increased drilling activity in the next five years.

Significance of Concern: High in terms of economic justification.

Action Needed to Resolve Concern:

- (a) Provide the economic spreadsheet model for an agency technical review.
- (b) Provide basis for the fleet transition
- (c) Provide the multiport analysis for the larger service vessel utilization.

If the project is authorized without fully addressing these concerns, as a condition of implementation the model will need to be certified or approved for use by USACE and the economics of the project validated.

Port Response: See response to comment 4 above. The text below offers additional but outside source documentation as allowed and encouraged by paragraph 2 of the Planning Bulletin, PB 2019-02.

Port Fourchon is, by far, the dominant port in the offshore oil support industry, despite its current depth restrictions. An estimated 95% of Gulf of Mexico offshore oil and gas is supported through Port Fourchon. This is due to a combination of factors, including its central geographic location close to most oil fields and the concentration of existing tenants, allowing for “one stop shopping” for all offshore support requirements.

In *Offshore Service Industry and Logistics Modeling in the Gulf of Mexico* (2015), Mark Kaiser of the Center for Energy Studies at Louisiana State University states:

“Port Fourchon is the largest and most diverse shorebase in the region, with over two dozen E&P firms maintaining offshore logistics offices (e.g., Anadarko, Chevron, BP, W&T Offshore) and the entire spectrum of support services, including diving and subsea (e.g., Cal Dive), fluids and chemical suppliers (e.g., Nalco, Newpark), equipment supply, and rental.” (Page 90)

“Fourchon is the largest and most critical shorebase for the offshore industry in the GOM. ... All deepwater operators have facilities at Fourchon, as well as all of the majors and a large number of independents. All of the integrated service providers have terminals at Fourchon.” (Page 94)

Even with other competing ports having greater depths, vessels are specifically designed for Port Fourchon’s dimensions due to its preeminence in the business, as noted by multiple industry interviews.

Supply vessel traffic projections prior to the base year are from *Offshore Service Industry and Logistics Modeling in the Gulf of Mexico* (2015).

The foreign flagged more efficient OSV2 vessels cannot participate in many of the oil and gas support activities due to Jones Act restrictions. This limits the total number of OSV2 vessels calling at the Port. The Foreign OSV2 vessel category is expected to remain a constant 10% of total trips by Large OSVs.

Even once the channel has been improved, the analysis does not assume an immediate switch to larger vessels. The larger vessels are assumed to be constructed following the existing pattern of approximately 1 to 2 new vessels per year.

Some Construction vessels, which are currently too large to use Port Fourchon, are expected to switch from other ports to Port Fourchon following implementation of the improvement project. However, this accounts for a maximum of only 17 additional vessel calls per year at Port Fourchon.

Spreadsheets were reviewed during the internal QMS process as well as during the IEPR. Spreadsheets can also be provided for ATR.

OASACW/HQUSACE Assessment: The position of Port Fourchon as the premier supply service location for offshore wells is not in question. The question is meant to draw out the reasonableness in going from the most inefficient vessel in the world fleet to the most efficient vessel in the world fleet due to the project improvement. This is the most optimistic assumption for OSV fleet transition available. More efficient OSV2 are not limited in activity for new wells located in deeper water. The deep water wells are the driver of the optimistic growth in the Port Fourchon 203 report.

To test the economic viability of the improvement, I recommend using the most efficient vessel available in the WOPC (OSV2) then transitioning slowly to a few OSV3 and a few construction vessels in the WPC. Also, if the economic analysis intends to state that the channel improvements will induce industry to build vessels to fit the channel then the economics needs to account for the associated capital cost of new vessels being put into commission.

Recommend providing a no growth scenario under a realistic vessel forecast mentioned about to ensure economic viability.

Port Response: Because IWR does not keep data on OSVs, data was developed for carrying capacity and operating costs. As for projections of the fleet, the overall OSV vessel traffic is not forecast to increase at Port Fourchon. Only deep water exploration is expected to increase, using the largest OSVs available. The fleet of the largest OSVs are expected to change gradually. These OSVs are forecast to be replaced based upon age and the end of their service life, and therefore their cost should not be included as an associated cost.

OSV traffic is expected to grow at a rate of 0.2 percent annually. Under with-project conditions, as older OSVs are retired, replacement OSVs will be constructed at greater dimensions to specifically be able to take advantage of greater carrying capacity afforded by the deeper channel. The maximum number of annual trips is defined for these large replacement vessels at 115, which does not exceed 5 percent of all such vessel trips.

OASACW/HQUSACE ASSESSMENT: Please provide the revised analysis mentioned in this response.

GLPC comment. The revised analysis, as requested, is provided in the addendum.

OASACW/HQUSACE Final Assessment: **Comment resolved.** It is suggested that ATR and model certification cover this in the next phase.

8. Local Service Facilities. There is little to no discussion of the local service facilities and the associated costs that would be required to realize the benefits claimed for the various channel improvements.

Basis of Concern: Due to the drastic change in depths, it is unclear as to the amount of infrastructure that would be required to accommodate the larger vessels expected with implementation of a project.

Significance of Concern: These local service facilities, including berthing areas may represent a significant project cost that should be included in the economic analysis.

Action Needed to Resolve Concern: Provide clarification as to what local service facilities will be required as well as their associated costs.

Port Response: The Associated Features are local service features required to be provided by the non-Federal sponsor to realize the benefits of the navigation improvements. The associated features are identified in Section 17 Associated Features & Costs section of the Engineering Appendix. And include the following:

1. Slips A, B, C and Flotation Canal (Existing bulkheads are currently designed to - 30 ft and will require no improvements by GLPC).
2. Fourchon Island Slip Bulkhead
3. Fourchon Island Deep Loading Hole and Advanced Maintenance

These features are required by users of the navigation channel to take advantage of the project and realize the intended benefits. Conceptual designs were developed for replacement or new bulkheads, and dredging requirements, including dimensions and dredged material quantities, were also estimated.

The study also evaluated the costs of associated features required to realize the benefits of channel deepening, based on the current configuration of associated features and work required to adapt these facilities for use of the deeper channel. The non-Federal sponsor would be responsible for all costs for required slip, bulkhead, and other associated feature modifications in conjunction with the Project. See below for a summary of the Associated Feature costs.

Associated Feature	Description	Estimated Construction Cost
Slips A, B, C & Flotation Canal	Dredging from currently authorized elevation of -24 ft. MLLW to -30 ft. MLLW (including dredging for advanced maintenance)	\$8,200,665 <sup>1</sup>
Fourchon Island Slip Bulkhead	Bank stabilization due to deepening of the slip to elevation of -50 ft. MLLW	\$37,212,500 <sup>2</sup>
Fourchon Island Deep Loading Hole	Dredging from elevation -50 ft. MLLW to -85 ft. MLLW (including dredging for advanced maintenance)	\$1,445,728 <sup>3</sup>

Notes:

1 – Based on Unit Cost of \$6.08/CY.

2 – Based on Unit Cost of \$125/SFT of Bulkhead.

3- Based on Unit Cost of \$6.24/CY.

OASACW/HQUSACE Assessment: A new Rig facility and a new LNG facility are to be located in Port Fourchon. The LNG train, pipeline and landside infrastructure servicing

the LNG terminal should be accounted as an associated costs in the economic analysis. The Rig fabricator landside infrastructure, berth and drydock is also an associated cost. Fourchon Island Deep Loading Hole associated costs calculation should go from +1 to -50 MLLW. New berthing area provided for the queuing or docking of vessels is a local service facility. The berthing area at the proposed rig fabricator facility is a local service facility. Please include these additional costs in the table provided above and omit these costs from the cost share apportionment of GNF.

See economic comment #5 on multiport. These two activities are unlikely to develop at Port Fourchon in the WOPC. The activities are induced by the channel improvements and the landside infrastructure are a function of the total economic costs to realize the benefits of the project.

Port Response: The LNG facility will use 16,500 cubic meter capacity LNG carriers in the FWOP. Rig repair already exists at Port Fourchon and the Port has a commitment for expanded facilities even in the 24 foot deep channel.

OASACW/HQUSACE ASSESSMENT: Please provide agreed to information. See economic comment #5 on multiport. These two activities [LNG & rig] are unlikely to develop at Port Fourchon in the WOPC. The activities are induced by the channel improvements and the landside infrastructure are a function of the total economic costs to realize the benefits of the project. Include the startup costs of the Rig and LNG facilities in the economic analysis.

GLPC comment. Because the 50' portion of the project (Belle Pass) has been eliminated from consideration at present, the issue is a moot point.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

9. Fleet Projections. It is unclear as to the basis for assuming that vessel calls by large OSVs will increase significantly in the future.

Basis of Concern: While the percentage has increased recently, it still represents only 1.8% of the calls. Considering that it would seem likely this the rate of increase may level off in the future, it is unclear as to whether an increase to 5% is truly reasonable.

Significance of Concern: The assumption that calls by large OSVs will increase significantly results in a significant increase to project benefits.

Action Needed to Resolve Concern: Provide further discussion as to why it is likely that vessel calls by large OSVs will increase to such an extent that they will make up 5% of the calls.

Port Response: AECOM estimated the vessel calls by larger OSVs in the WPC based upon the obsolescence or lifespan of the existing OSVs serving deep water rigs far offshore. The overall trend for offshore petroleum exploration for decades has been

exploration in deeper water further offshore which is most efficiently supplied with larger OSVs. Based upon the economies of scale for larger OSVs, the larger amount of supplies needed for deep water exploration and the longer distance offshore for deep water exploration, the number of OSV trips by larger OSVs from Port Fourchon is expected to increase. The percentage of overall OSV calls by larger OSVs is not relevant to estimating NED benefits but is nevertheless expected to continue increasing as smaller OSVs serving near shore offshore rigs are taken out of service and more large OSVs serving offshore fields more than 100 miles offshore are constructed and placed in service.

The percentage of trips by large OSVs is capped at a maximum of 5%. Of the vessels built and on order to be built in the US (which is required to be part of the Jones Act fleet) from 2016 to 2020 (37 vessels), approximately 45% (17 vessels) fit into the “large OSV” category. This supports the assumption that calls by large OSVs will continue to increase.

The overall growth in total traffic at Port Fourchon is not forecasted to grow at all in the Medium case, and only by 1% per year even in the High forecast. Additionally, total traffic is forecast to decrease by 1% in all cases after Year 20. Overall, the Port believes that the forecast is conservative.

OASACW/HQUSACE Assessment: The trend mentioned above should be applied to the WOPC. Currently the economic analysis assumes a transition to the larger OSVs only under the WPC, but the evidence provided above claims an existing condition and historical transition to larger OSVs. Recommend that the foreign flagged OSV2 and Construction vessel continue to make up a significant portion of the WOPC and grow proportionally. A transition of the OSVs to the larger class is needed in the WOPC to ensure economic viability. See economic comment #7.

Port Response: Construction vessels were removed from the economic analysis. The foreign OSVs are kept in both the WOPC and the WPC but at low numbers because of Jones Act restrictions.

OASACW/HQUSACE ASSESSMENT: Please provide the revised analysis mentioned in this response.

GLPC comment. The revised OSV analysis, as requested, is provided in the addendum. In addition the benefits of channel deepening accrued by construction vessels has been included.

OASACW/HQUSACE Final Assessment: **Comment resolved.** It is suggested that ATR and model certification cover this in the next phase.

10. Project Benefits. It is unclear as to how the project benefits were actually calculated.

Basis of Concern: The analysis appears to utilize some type of spreadsheet model as opposed to HarborSym as is typical for USACE analyses. As it stands, it is unclear as to the inputs used as well as how the calculations were actually performed. This makes it difficult to evaluate whether the benefits claimed in the report are reasonable.

Significance of Concern: High. Without understanding the inputs to the spreadsheet, it is impossible to evaluate the reasonableness of the project benefits.

Action Needed to Resolve Concern: Provide an explanation as to the spreadsheet inputs/calculations.

Port Response: HarborSym has a maximum vessel count of 10,000. Port Fourchon has historically received anywhere from 100 to 450 vessel calls per day. Even at the low end of this range, the annual number of vessel calls far exceeds HarborSym's capacity.

The spreadsheet models were reviewed extensively during an internal QMS process as well as during the IEPR. The spreadsheets are being provided for review.

It should be noted that the spreadsheet analysis employed by AECOM is an extension of what was used on the recently approved assumption of maintenance of the Bayou Lafourche portion of the federal project.

OASACW/HQUSACE Assessment: Please provide the spreadsheet model for an ATR review.

Upon review of the spreadsheets:

The vessel operating costs found in Brazos Island Harbor feasibility report was based on rig movement and prep cost of removing the rig thrusters prior to channel entry. It is inappropriate to use it in the voyage transportation costs savings calculations. Rigs are loaded onto heavy lift ships for their voyages. The rig thrusters are only used as stabilization and slight maneuvering. Recommend providing an example transportation cost savings calculation for the rig transportation costs savings.

Also, please develop model documentation explaining the inputs, assumptions, calculations and outcome.

Port Response: Project benefits were computed using a separate spreadsheet model for each of the following benefit categories: rigs, offshore supply vessels, liquefied natural gas carriers, general cargo vessels, and bulk carriers. Documentation for these spreadsheet models are provided as file attachments to this response.

OASACW/HQUSACE ASSESSMENT: Please provide the revised analysis mentioned in this response for ATR.



GLPC comment. Because the 50' portion of the project (Belle Pass) has been eliminated from consideration at present, rig, LNG and bulk cargo analyses are no longer considered in this feasibility study. However, Documentation of the spreadsheet models used to calculate benefits for the OSVs and general cargo vessel categories are provided in the addendum as part of this "package".

OASACW/HQUSACE Final Assessment: **Comment resolved.** It is suggested that ATR and model certification cover this in the next phase

11. Vessel Fleet. It is unclear as to how the LNG vessel fleet changes under the various alternatives.

Basis of Concern: The analysis appears to assume that the vessel fleet will transition to the largest vessels capable of utilizing the port at the given depths. However, it seems unlikely that a full transition would occur as smaller vessels would likely continue to be used.

Significance of Concern: High. Assuming fleet transition to the largest vessels possible is likely to significantly overstate project benefits.

Action Needed to Resolve Concern: Provide clarification as to the assumptions regarding changes to the vessel fleet under the various alternatives. If necessary, revise the analysis such that the future vessel fleet is truly reasonable.

Port Response: The LNG carrier vessel fleet forecast is based upon serving Pagbilao in the Philippines and a deep-water port in the Caribbean or Central America. Colon, Panama has a new LNG import facility near the entrance to the Panama Canal with a harbor depth of 60 ft. Serving this operational facility would provide Energy World flexibility in routing LNG carriers and supplying its LNG Hub.

An LNG Hub is being developed by Energy World Company in the Philippines, which will be the primary destination for LNG exports from Port Fourchon. The LNG Hub will be in Pagbilao, Quezon Province where a major power plant is also being constructed. The Pagbilao power plant will be fueled with natural gas from the LNG Hub and coal from a neighboring coal dock. The harbor is currently 14.5 meters deep and is being currently being improved to facilitate the transportation of multiple commodities. Philippine power demand is forecasted to double within 20 years and this LNG Hub has been permitted and has been designated as a facility of national significance by the Philippine government.

OASACW/HQUSACE Assessment: The demand projections for long term LNG contracts is not in question. The request is to describe the LNG vessels and loading patterns expected in the FWOPC and then provide and describe the LNG vessel expectation under the different depth alternatives. The provided "LNG" spreadsheet for review assumes a 20.5K DWT vessel with a design draft of 32.5 in the WOPC. LNG vessels are required to fill their holding tanks to a 90%+ loaded pressurized tank

for safety reasons. The volumetric capacity and immersion factor would require this LNG vessel to load to 25ft+. It is unreasonable to assume this activity will exist in the WOPC (24ft channel) since the vessel will require ~30ft channel. This activity is an inducement in the WPC, see comment #5 on multiport analysis.

Also, please develop a reasonable vessel fleet forecast with a full distribution of potential vessels rather than a full transition to the largest vessel.

Port Response: The forecasted loading practices of LNG carriers has been revised based upon the Energy World business plan as provided in August 2019.

The tenant will use the standard 16,500 cubic meter tanker that they have jointly developed with GTT. draft 15.7'. These will go to their facility in Jamaica for consumption and for consolidation in 80,000 cubic meter vessels to the Philippines.

For the future, Phase 2 the LNG tenant will use larger LNG carriers to take cargos directly to the Philippines. These will be 220,000 cubic meter capacity vessels and have a working draft of about 46 feet. Galveston District has published that for the 40 foot deep Sabine LNG vessels are required to have 5-7 feet of underkeel clearance.

OASACW/HQUSACE ASSESSMENT: Please provide the revised analysis mentioned in this response as well as the commitments to Energy World's capacity, master plans and FERC licensing.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

12. Depth Justification. It is unclear as to the drafts associated with the drilling rig fleet currently present in the Gulf of Mexico that currently calls on other ports but is expected to call on Port of Fourchon under the with project conditions.

Basis of Concern: While the analysis indicates the increased number of calls for each of the various depth alternatives, without an understanding of the existing fleet not calling on Fourchon, it is difficult to understand the need for greater depths at the harbor. It would be useful to have a table showing the drilling rig calls at other ports (ex: Galveston) including drafts under the Without Project Conditions and then a display as to how those would change under the with project conditions. Also, while operators may have indicated a preference for Fourchon, it is unclear as to whether the portside infrastructure could accommodate all of the vessels desiring to use the port. Additionally, is it possible that some operators may choose to continue to call on one of the other GOM ports despite being slightly further than Fourchon?

Significance of Concern: High. Without and understanding of the existing/future without project conditions, it is not possible to assess the likelihood of realizing the projected project benefits.

Action Needed to Resolve Concern: Provide a table showing the drilling rig calls at other ports (ex: Galveston) including drafts under the Without Project Conditions and then a display as to how those would change under the with project conditions. Provide further discussion as to the possibility that operators may continue to call on ports other than Fourchon as well as Fourchons ability to provide the portside infrastructure necessary for all of the vessels being claimed under the future with project conditions.

Port Response: The draft needed for rigs was based upon the number of semi-submersible rigs and drill ships forecasted to be deployed to the Gulf of Mexico. The semi-submersible rigs require the most channel depth and are expected to be serviced at Port Fourchon. The number of rig visits to the Port Fourchon shipyard was based upon the historical number of mobile rigs in the U.S. Gulf of Mexico and forecasts of offshore petroleum exploration.

There are only two facilities in the U.S. that have facilities to serve large platforms – Brazos 50' (once deepened) and Ingleside (45'). The Galveston, Mobile and other facilities are designed for smaller platforms.

OASACW/HQUSACE Assessment: The large rig operation benefits at Brazos Island Harbor where not contingent on the 50' depth. Similar to Ingleside and Port Fourchon the benefits for the large rig operations at Brazos Island Harbor are available at the 45' depth. There is not currently a multiport analysis which evaluated the economic viability of the rig operations and demand for services at Port Fourchon.

See economic comment #5 on multiport. The current economic analysis presumes more rigs will be serviced at Port Fourchon under the different depth scenarios. This indicates an inducement effect which will need to be assessed under a multiport analysis. Continue to recommend the action from the original comment to provide real industry based behavior at other Gulf ports, and ensure the economic viability for this activity at port Fourchon.

Port Response: The incremental analysis of channel depth alternatives for Belle Pass is driven by the fleet characteristics for semi-submersible rigs and drillships.

A table is provided below showing the current distribution of the fleet of semi-submersible rigs and drillships operating in the U.S. Gulf of Mexico. The table consists of the names of specific vessels along with their characteristics with respect to width, length, operating draft, transit draft, and the required channel depth necessary for transit incorporating an 8-foot underkeel clearance requirement.

There are 30 vessels in total, which represents slightly fewer than 22 percent of the global fleet. Under without-project conditions, these vessels would call on either of three gulf ports: Brazos Island Harbor in Brownsville, TX, which offers an authorized channel depth of 42 feet although constrained by a 250' channel width, the Ingleside facility in Corpus Christi, TX that affords a channel depth of 45 feet, and the Copper Gulf facility at Galveston which has a 45 foot deep channel. The Brazos channel cannot accommodate any of the semi-submersible rigs due to draft and underkeel clearance requirements. Additionally, although 6 of these 12 rigs have a width of 240 feet, the minimum safety clearance required, particularly that needed by tug assist vessels, precludes transit at this port. The remaining six 6 semi-submersible rigs are wider than 250 feet. Moreover, channel at Brazos is insufficient to permit transit of 5 of the 18 drillships due to draft restrictions. Ingleside, due to channel depth restrictions, can accommodate 23 of the 30 vessels. Moreover, private interests that operate from the Corpus Christi harbor recently obtained a permit to widen the La Quinta channel to 430 feet, from the Federally authorized width of 400 feet. The significance of this action lies in the fact that both the cost to construct a wider channel and the additional annual operations and maintenance cost required for a widened channel are to be financed entirely by these non-Federal interests. This indicates that these private interests expect significant additional benefits to accrue drawing from existing gulf operations so as to justify an investment that is entirely funded by the private sector.

Under a with-project condition where Port Fourchon is deepened to 50 feet, it will be able to accommodate all drillships. For semi-submersible rigs, it would be able to accommodate only 5 of the 12 semi-submersible rigs in gulf fleet, given a fixed 8-foot underkeel clearance requirement. However, each rig has a unique underkeel clearance requirement and a fixed value may not be applicable to all rigs. Under a "high" scenario, as part of the economic analysis, underkeel clearance is reduced to 6 feet, which is an indicator of this variability. If such were the case, then operators for vessels with a draft requirement of 51 feet (including 6 feet of underkeel clearance) could time a port transit with a maximum increase of depth at high tide over mean low gulf of one foot in this region. This could then potentially allow transit in the channel to all but one of the semi-submersible rigs.

Given its closer proximity to target deepwater drilling locations in the Gulf of Mexico, it is expected that Port Fourchon would capture a significant percentage of the vessels transiting the gulf to a capable port for periodic inspection, repair, refurbishment, and upgrades.

**Fleet Distribution  
Semi-Submersible Rigs and Drillships  
U.S. Gulf of Mexico**

	Vessel Name	Length	Width	Operating Draft	Transit Draft	Required Channel Depth Including UKC*
<b>Semi-Submersible Rigs</b>	ENSCO 8500	255	240	55	45	53
	ENSCO 8501	255	240	55	45	53
	ENSCO 8502	255	240	55	45	53
	ENSCO 8503	255	240	55	45	53
	ENSCO 8505	255	240	55	45	53
	ENSCO 8506	248	240	57	45	53
	Noble Danny Adkins	409	277	85	39	47
	Noble Jim Day	409	278	86	48	56
	Noble Paul Romano	348	328	79	36	44
	Noble Amos Runner	348	376	79	35	43
	West Capricorn	324	258	66	28	36
	West Sirius	380	298	66	28	36
<b>Drillships</b>	Ocean Black Hawk	757	118	36	36	44
	Ocean Black Hornet	754	118	36	29	37
	Ocean Black Lion	757	118	36	32	40
	Ocean Black Rhino	754	118	36	29	37
	Noble Bob Douglas	752	118	36	36	44
	Noble Bully 1	615	128	33	33	41
	Noble Don Taylor	752	118	36	36	44
	Noble Sam Croft	752	118	36	36	44
	Noble Globetrotter I	620	105	39	39	47
	Paragon DPDS1	449	105	26	26	34
	Rowan Renaissance	752	118	36	31	39
	Rowan Resolute	752	118	36	31	39
	Rowan Reliance	752	118	36	31	39
	Rowan Relentless	752	118	36	31	39
	West Aquila	238	42	39	28	36
	West Auriga	748	138	39	28	36
	West Neptune	748	138	39	28	36
	West Vela	748	138	39	28	36

\* UKC is the acronym for "Underkeel Clearance"

While no database currently exists that records the history of trips and drafts from U. S. ports for these types of vessels, the most relevant data that could be reported was provided by BOEM, and consists of the annual number of exploration development plans submitted to them from offshore operators. A high correlation between plan submittal and operational exploration activity can be reasonably expected, but for annual reporting, a time lag should also be recognized.

A summary for is provided below of the annual number development plans submitted by operators for deepwater location depths of greater than 500 feet from 2009 to 2018.

2018 - 443  
2017 - 356  
2016 - 385  
2015 - 530  
2014 - 510  
2013 - 412  
2012 - 395  
2011 - 396  
2010 - 325  
2009 - 172

These data show the historical level of location-specific rig deployment for exploration and delineation activities in the U. S. Gulf of Mexico for which the aforementioned rig fleet is used.

OASACW/HQUSACE ASSESSMENT: Please provide the rig operator commitments and lease agreements. From the information provided from above, a reasonable design vessel for rigs and drill ships appears to be the Noble Amos Runner. It is at approximately the 82<sup>nd</sup> percentile of the rig and drill ship fleet population. The dimensions are 376ft wide with a sailing draft of 35ft which allows for the high end (8ft ukc) assumption. Once designed for the Noble Amos Runner it is likely that given a more reasonable assumption of 6ft ukc the Port of Fourchon could accommodate close to the 90<sup>th</sup> percentile of rigs and drill ships. The rest of the Noble fleet can likely be accommodated once considerations for tide and lesser ukc are applied to the assumption.

Based on the information provide please revise the analysis to a reasonable design vessel for rigs and drill ships; Noble Amos Runner.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

13. Transportation Savings. The analysis assumes a savings of 316 miles for rigs compared to other GOM locations. However, simply taking an average of the other 8 ports may overestimate these savings as Curacao is significantly further than the other U.S. based ports, skewing the average significantly.

Basis of Concern: If only the six U.S. based ports are considered, the savings drop to 110 miles. Additionally, it is unclear as to the appropriateness of using an average as it is unclear as to the distribution of calls among these other ports.

Significance of Concern: Medium. As it stands, it appears that benefits may be overstated.

Action Needed to Resolve Concern: Provide further justification for using an average distance for the 8 ports. Otherwise, revise the analysis such that it better reflects the actual distribution of calls.

Port Response: The distribution of calls of offshore petroleum rigs to shipyards is not available. The shipyards usually publicize major projects but do not disclose all calls of offshore rigs for inspection and repair and they do not disclose the contract values of projects. The shipyards on the U.S. Gulf of Mexico generally concentrate on vessel construction rather than vessel inspection, repair and refurbishment.

Curacao is the largest shipyard dedicated to servicing and repairs in the Caribbean/Gulf of Mexico Region. It has the largest drydocks and services many types of vessels. During 2018 the capabilities at the Damien shipyard in Curacao were significantly improved with new drydocks. The Grand Bahama Shipyard in Freeport, Bahamas is also a large shipyard that services offshore rigs and services and has been expanding its infrastructure and capabilities. These distant shipyards justify the travel distance used in the Port Fourchon analysis.

OASACW/HQUSACE Assessment: The current average used is the most optimistic assumption available due to the limited information. A weighted average is the most appropriate miles calculation. After review of the economic spreadsheet it is apparent the miles and VOCs used for rigs are overstating benefits dramatically. The vessel operating costs found in Brazos Island Harbor feasibility report was based on rig movement and prep cost of removing the rig thrusters prior to channel entry. It is inappropriate to use it in the voyage transportation costs savings calculations. Rigs are loaded onto heavy lift ships for their voyages. The rig thrusters are only used as stabilization and slight maneuvering. Recommend providing an example transportation cost savings calculation for the rig transportation costs savings using a heavy lift VOC and an U.S. only miles calculation.

Port Response: For drillships and rigs deployed in expected future deepwater locations in the Gulf of Mexico, the average distance to Port Fourchon is estimated to be 170 nautical miles. In the initial analysis the average distance from these deployment locations to alternative ports was estimated to be 487 nautical miles. The result was that the difference in transit distance, 316 nautical miles, was the basis for transportation cost savings. However, the port of Curacao is not considered a viable competitor to Port Fourchon for in-port inspection, repair, and retrofitting. Since the distance to Curacao was included in the prior analysis, the average reduction in transit distance was significantly skewed and thus inaccurate. As a result, the average reduction in transit distance was recalculated to exclude Curacao as an alternative port and the reduction in nautical miles was reduced from 316 to 167. The details of this calculation are shown below. Consequently, the Rig Transit and Section 6009 workbooks have been revised to reflect the change in average distance saved and corresponding benefit reductions.

Average Distance To Rig Deployment

Locations

From Alternative Service

Ports

(In Nautical Miles)

Port Name	Including Curacao	Excluding Curacao
Brownsville (Keppel- Amfels)	313	313
Corpus Christi (Keiwit)	313	313
Galveston	248	248
Sabine	233	233
Pascagoula	276	276
Mobile	302	302
Grand Bahama	677	677
Curacao	1,527	N/A
Average	486	337
Distance to Port Fourchon	170	170
Difference	316	167

Another significant aspect of transportation cost savings attributable to the 50-foot channel alternative at Port Fourchon is focused on the manner in which rig thrusters are separated from the rig platform as it approaches the port. Under future with-project conditions, both drillships and semi-submersible (floating) rigs are expected to transit to the Port Fourchon entrance under their own power from Gulf of Mexico locations. From the entrance channel, floating rigs will be towed



into the shipyard before thrusters are removed, thereby significantly reducing the cost of inspection. The ability to remove thrusters in a protected harbor, rather than in open water outside the entrance channel, will provide a cost savings of \$7 million per rig. After thrusters are removed, the floating rigs are usually serviced in a dry dock to maintain and repair components damaged in the harsh offshore environment. The thrusters are reinstalled in port before the floating rig is redeployed. Because the thrusters can be removed at the Ingleside, Texas deep hole with the Corpus Christi Harbor channel depth of 45 feet, the thruster removal benefits compared to open sea removal are only counted for the 50-foot depth alternative.

OASACW/HQUSACE ASSESSMENT: Please provide the revised transportation costs savings analysis with revised distances.

The activity of thruster removal is a moot scenario for Port Fourchon. Other USACE ports have demonstrated this activity at their port, albeit in an inefficient manner of offshore thruster removal. Port Fourchon has not demonstrated any rig activity. USACE policy guides an economic analysis of federal investment decision which are designed to make a transportation activity more economically efficient. It directly precludes the assumptions that with federal investment it will induce an unlikely private business activity, as is the case at Port Fourchon. Documentation of existing activity of thruster removal at Port Fourchon is needed as well as semi-submersible rig activity for dry dock inspection and repair. Without demonstrating existing activity at Port Fourchon the economic analysis needs to consider the entire LNG and Rig capital investment as local service facilities (LSF) investment and include them in the total economic cost. The analysis would also need to analyze the entire GOM demand for repair and inspection services to show the needed capacity at Port Fourchon and demonstrate the economic viability/efficiencies gained to the nation to make the shift away from the current port undergoing this activity. The required information and analysis can all be scoped through a multiport analysis.

GLPC comment. Through elimination of the 50' alternative for Belle Pass, this concern is no longer relevant.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

14. 6009 Benefits. It is unclear as to the actual calculation that was done when calculating 6009 benefits.

Basis of Concern: It appears that the analysis uses a daily cost multiplied by the amount of time the rigs are expected to be serviced, but it is unclear as to how the age of the rigs (and corresponding amount of service time) was determined. Is this based on actual data or some assumption?

Significance of Concern: Medium. Section 6009 benefits represent a significant benefit category. As a result, it should be clear as to how they were determined.

Action Needed to Resolve Concern: Provide clarification as to how 6009 benefits were actually calculated.

Port Response: A daily cost was used to determine 6009 benefits. The length of time rigs will be in the shipyard for service is based upon the forecasted age of rigs operating in the Gulf of Mexico and therefore the amount of servicing required, whether for inspection, repairs or refurbishment. These figures are shown in the workbook model.

OASACW/HQUSACE Assessment: 6009 benefits should be based on the lost contract value to the nation. If Ingleside, and Brazos Island Harbor lack capacity to attract the rig contracts within the U.S. then Port Fourchon additional capacity would be the application of additional U.S. contract value.

Port Response: The service revenue per day for rig fabrication services is based on statistics from the BOEM Publication "Offshore Rig Construction Market in the Gulf of Mexico". The average daily cost for a rig in the shipyard undergoing inspection and repair. This figure of \$200,000 per day is based upon shipyard compensation per employee, shipyard revenue per employee and the number of shipyard employees required during servicing. The labor cost per day is \$160,000 and material used at the shipyard is assumed to cost \$40,000. Based upon average compensation at shipyards and a labor multiplier of 2.8 of compensation, each shipyard employee is estimated to provide \$800 per day in revenue to the shipyard. This equates to 200 shipyard employees working on a rig each day the rig is in the shipyard. Rig operators stated that approximately 200-shipyard employees work on rigs while they are in dry-dock in shipyards.

The length of time for servicing rigs was based upon the age of the rigs in the three offshore fields that provide a potential market for Port Fourchon, the U.S. GOM, the Mexican GOM, and the Atlantic Basin. All rigs are assumed to receive inspections, repairs and refurbishments based upon their age, with five-year-old rigs receiving 30-day inspections and repairs in the shipyard, 10-year-old rigs receiving 60 days of inspections and repairs, and 15-year-old rigs receiving 120 days of inspections and repairs.

OASACW/HQUSACE ASSESSMENT: Addressed. Please consider providing the regulatory requirements for dry-dock inspections in the report. Also, please omit the 6009 information from all formulation tables. The plan formulation is to be based on tradition USACE economics. The 6009 addition is only provided for budgeting considerations, per IG on 6009.

GLPC comment. Nonconcur. As stated in paragraph 3.b. of the referenced 9-13-12 guidance:

“incremental value of the energy exploration and the production fabrication contracts to be executed in the future that exceed any work planned in the without project condition and that can only be accommodated with the proposed channel improvement will be permitted in this NED benefit calculation, regardless if work was displaced from foreign or domestic yards.”.

While GLPC concludes that the guidance does allow for the inclusion, the Section 6009 benefits would be hard to quantify for the existing facility on Slip C and thus Section 6009 benefits not have been included in the most recent economic analysis presented in the addendum.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

#### **D. ENVIRONMENTAL**

1. NEPA and Environmental Compliance Activities: Consultation will need to be completed to comply with several environmental requirements including Section 7 of the Endangered Species Act, Fish and Wildlife Coordination Act, Essential Fish Habitat amendments to the Magnuson Stevens Fisheries Conservation and Management Act, Section 401 water quality certification, Coastal Zone Management Act, Section 106 of the National Historic Preservation Act, and other Federal environmental laws. Environmental compliance needs to cover all impacts associated with the recommended plan to be legally and policy compliant.

Basis of concern: Legal and policy compliance with environmental laws and regulations. Environmental compliance requirements will need to be satisfied prior to USACE endorsement of the final report.

Significance of concern: High as it affects environmental acceptability of the plan.

Action needed to resolve concern. Without completion of environmental compliance activities at this phase of study, the Secretary will likely make this a condition for project implementation.

Port Response: Action is pending further direction from HQUSACE.

OASACW/HQUSACE Assessment: It is understood that the non-Federal interest will request environmental compliance assistance from New Orleans District, at their cost, per the Implementation Guidance for section 1152 of WRDA 2018. Comment will remain unresolved until completed.

Port Response: We are coordinating with MVN (New Orleans District).

OASACW/HQUSACE Final Assessment: The revised report states that there are no significant environmental impacts, however environmental compliance activities have

not been completed, and the NEPA effort is an EIS. (Concur that a project with this scale of construction (almost 1800 acres of beneficial use with 8 miles of containment dikes) over several years warrants an EIS). A policy compliant report is pending due to the fact that many of the environmental statutes still require the lead Federal agency to consult and coordinate.

NEPA, and other applicable environmental compliance activities must be completed before construction, including resolution of any issues identified as part of that process.

2. Cumulative Effects: The draft environmental impact statement (EIS) does not sufficiently evaluate cumulative effects on all of the environmental resources affected by the recommended Federal action.

Basis for the concern: CEQ NEPA implementing regulations require consideration of cumulative impacts in an EIS. 40 C.F.R. §§ 1508.7, 1508.25. Chapter 4 of the EIS, Environmental Consequences, does not discuss cumulative effects for most categories of resources, with the exception of section 4.5.5 and section 4.8.

Significance of the concern: High - The proposed project has several associated actions that have the potential to result in substantial environmental effects, and should be discussed in the cumulative effects analysis. Examples include the new LNG plant and the new Fourchon Island slip included in the future without project condition; the initial construction of Fourchon Slip and adjacent landside facilities are estimated to impact approximately 900 acres of Fourchon Island. Please note that this comment is directed to the initial construction of Fourchon Island slip and landside facilities; the EIS includes consideration of the dredged material that would be generated by the deepening of the proposed -24 foot Fourchon Island slip to -50 foot condition.

Action Needed to Resolve Concern: A cumulative effects analysis should be completed for all environmental resource categories discussed in the EIS.

Port Response: The following response has been inserted into the DEIS:

Cumulative impacts are defined in 40 CFR 1508.7, 1508.25 as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts for the project TSP were assessed in accordance with the above referenced CFR.

### **Considerations of Impact Evaluations for Various Individual Projects**

Past, present, and reasonably foreseeable projects/activities within the study area were compared to the project TSP, to determine whether the TSP, when combined

with the impacts of other actions, could have cumulatively significant impacts on the environment.

## **Past or Present Actions**

1. ***Final DEIS on the Proposed Port Fourchon Development Plan (Phase Four), Lafourche Parish, LA (March 1979).*** Phase Four of the Port's proposed development included the following activities: dredging a channel and T-Slip and relocation/maintenance of entrance channel at Belle Pass (20 feet by 300 feet), stone jetty improvements at Belle Pass (Bayou Lafourche), dredging and stabilizing flotation canal, and drainage improvements.

The following environmental observations were projected in this report: temporary increases in turbidity, loss of benthic organisms due to dredging/onshore construction, disruption to food supply for aquatic species, disruption to breeding and feeding activities for aquatic and waterfowl species, terrestrial habitat disruption due to previous (prior to this project) dredge spoil disposal. The following impacts to wetlands were projected: 55 acres of land loss for the construction of T-slip on the left descending back of Pass Fourchon (about 1.7 miles north the mouth of the about at the Gulf), conversion of 450 acres of marsh habitat to dryland, 3-foot elevation rise from dredged material, reduction of terrestrial wildlife habitat, and beach and shoreline erosion increase from increase in passing vessel wave wash.

The conversion of marsh to dryland (450 acres) was predicted to result in recreational revenue losses from fishing/duck hunting. Fisheries habitat loss resulting from hydrological changes was predicted to increase salinity in Bayou Lafourche and adjacent marsh/estuarine habitats reducing estuary productivity. These impacts were expected to potentially be mitigated for by restricting water exchange through tidal streams connecting Bayou Lafourche and Timbalier Bay.

Project construction was determined to affect 6 archeological sites, with only 2 listed as eligible for nomination to National Register of Historic Places. The 2 sites were said to be protected from dredged material disposal during construction. Increased bank erosion and maintenance dredging will have long-terms effects on sites.

***Feasibility Report and DEIS, Port Fourchon, LA (August 1994).*** This Port project included the following activities: enlargement of Belle Pass and Bayou Lafourche from the Gulf at Mile 0 to Mile 3.4 to a -24-foot depth and 300-foot width, enlargement of the entrance channel from the Gulf shoreline to the associated Gulf -26-foot contour with a 300-foot width, modification of the channel bend at Pass Fourchon to a 575-foot width, and dredging by hydraulic cutter head dredge.

The following environmental observations were projected in this report: increases in turbidity and the potential for temporary increase in some water pollutants within

the water column from dredging and rapid recovery from turbidity in marine-estuarine environment, long-term benefits realized for dredge disposal creating continuous saline marsh habitat and shoreline nourishment

The project was determined to create 445 acres of marsh over the 50-year project life. Further, it was expected there would be little to no influence on salinity levels upstream of Golden Meadow, no significant adverse impacts to water supply or designated uses, 2 archaeological sites in project vicinity would not be affected by project construction, no risks of encountering HTRW sites during construction or maintenance, minor adverse impacts to non-motile aquatic species in dredging and disposal areas by turbidity increase and entrapment, and the project would not jeopardize threatened or endangered species or their critical habitat.

2. ***Draft Environmental Assessment, Fourchon Beach Shoreline Protection GLPC, Lafourche Parish, LA (November 2012).*** The project included the following activities: construction of rip-rap revetment (as a Section 406 Hazard Mitigation project) along north shore of Flotation Canal to stabilize canal bank from erosion during storm events and prevent filling of Flotation Canal shipping channel, with approximately 3.0 acres of marsh impacted.

The following environmental observations were projected in this report: short-term increase in sedimentation of surface waters directly adjacent to the project site; impacts to local water quality would be minor, localized and short-term in duration; particulate emissions from generation of fugitive dust during construction increased temporarily in immediate project area, localized and short-term duration. USFWS determined the project may affect, but would not likely adversely affect fish and wildlife resources. NMFS determined the project may impact EFH, so construction required fish dips to be installed in the revetment to allow passage of fish between marsh area and Flotation Canal. With installments, impacts to wildlife and vegetative resources were expected to be minor and localized.

The existing project for Port Fourchon is part of the Bayou Lafourche and the Lafourche Jump Waterway authorization created by the resolution of the Committee on Public Works, U.S. House of Representatives dated May 5, 1966. Existing water projects in the immediate area include both shallow draft navigation; shoreline protection; and wetland protection and restoration.

3. ***Bayou Lafourche and Bayou Lafourche Jump Waterway, Louisiana (Auxiliary Channel).*** The most directly related water project is the federally authorized navigable channel extending Bayou Lafourche northward to the Gulf Intracoastal Waterway. This is an authorized 12- by 125-foot navigation channel in Bayou Lafourche from Port Fourchon north to Leeville, Louisiana; a continuation northward with a 9- by 100-foot channel in Bayou Lafourche from Leeville to the lower limits of Golden Meadow; and a 12- by 125-foot channel, from Leeville east to Grand Isle via the Southwestern Louisiana Canal and Bayou Rigaud.

Surrounding Port Fourchon are various Louisiana Coastal Masterplan shoreline protection and saline marsh creation projects. These were created through the Coastal Wetlands Planning, Protection, and Restoration Act - legislation designed to identify, prepare, and fund construction of coastal wetlands restoration projects. In various stages of planning and implementation, the following projects flank the Belle Pass entrance channel and/or surround Port Fourchon:

4. ***West Belle Pass Headland Restoration (TE-0023)***. This project was sponsored by CEMVN and CPRA under CWPPRA (Public Law 101-646, Title III). Project construction was completed in July of 1998. TE-23 is listed on the 2nd CWPPRA Priority Project List. The West Belle Pass Headland Restoration project is a shoreline protection and saline marsh creation project located on the southwestern portion of the Caminada-Moreau Headland at the interface of the Belle Pass navigation channel and the Gulf of Mexico. Additionally, the project is situated directly across the federally maintained Bayou Lafourche navigation channel from Port Fourchon. The western portion of the headland is separated from the vastly larger eastern part via the Belle Pass Rock Jetties and forms its southern border with the Gulf of Mexico and its northern border with Timbalier Bay. The project area consists of 1,341 acres of saline marsh, scrub-shrub, beach/bar/flat, and open water habitats.
5. ***West Belle Pass Barrier Headland Restoration (TE-0052)***. This project is federally sponsored by the NMFS and locally sponsored by CPRA under CWPPRA Public Law 101-646, Title III. TE-52 is listed on the 16th CWPPRA Priority Project List. The project Environmental Assessment (TE-52) documented that there was no SAV present in the TE-52 project area in May of 2006 (NOAA, 2010). The project area is composed of 411 acres dominated by shallow open water, saltmarsh, and barrier islands with beach and dune habitats. The purpose of the project was to create habitat along the West Belle Pass barrier island.
6. ***West Fourchon Marsh Creation and Nourishment (TE-0134)***. The project created 302 acres of saline intertidal marsh and nourished 312 acres of emergent marsh using material dredged from the Gulf, southwest of the project area. Vegetative planting were completed at a 50% density.

***Caminada Headland Beach and Dune Restoration (BA-0045)***. The Final Biological Assessment for BA-45 was published in 2011, and evaluated the potential impacts of proposed restoration of the Caminada Headland upon federally listed and proposed threatened and endangered species, designated and proposed critical habitat, and determines whether these species or habitats are likely to be adversely affected by implementing this project. This shoreline is immediately east of the navigation channel jetties.

This reach of beach is one of the most rapidly eroding shorelines in the United States (McBride et al. 1992; Connor 2004) and the report notes that the observed long-term (100 years) average shoreline erosion rate at the Caminada Headland, approximately 45 feet per year, would likely continue for the near future without intervention. Increased stress on fish and wildlife was projected as various fish and wildlife nursery, feeding, nesting and roosting habitats continue to be lost and degraded.

The purpose of the Caminada Headland Restoration Project is to restore the geomorphic function and unique critical and essential fish and wildlife habitats of the Caminada Headland's barrier system and reverse the current trend of degradation on the Caminada Headland. Restoration efforts would target ecologically distinct, critical, high-priority areas that would increase sustainability with essential form and function of the natural barrier ecosystem.

Part of the restoration material was proposed to come from O&M dredging from Port Fourchon navigation channels. Section 7006(c)(1) of WRDA 2007 authorized the Secretary to carry out the Caminada Headland component of the recommended plan for Barataria Basin Barrier Shoreline (BBBS).

7. ***Caminada Headland Beach and Dune Restoration Increment 2 (BA-0143).*** The project is currently in engineering and design phase, and involves restoration through beach and dune fill placement (utilizing an offshore sand resource) approximately 31,000 feet of shoreline to create 330 acres of beach and dune habitat at the western end of the Caminada Headland between the east jetty at Belle Pass (sta. 0+00) eastward to the approximate location of Bayou Moreau (sta. 315+00).
8. ***Caminada Headlands Back Barrier Marsh Creation (BA-0171).*** The project is currently in engineering and design phase, and is proposed to create and nourish 385 acres of back barrier intertidal marsh behind 3.5 miles of Caminada Headland in Lafourche Parish using material dredged from the Gulf of Mexico.
9. ***Caminada Headlands Back Barrier Marsh Creation Increment 2 (BA-0193).*** The project is currently in engineering and design phase, and is proposed to create 542 acres of marsh using 1.6 million CY from Gulf of Mexico.

The non-federal sponsor works diligently to protect and restore the coastal landscape and habitats that surround the Port; and works closely with federal, state, and local partners to implement, enhance, and champion numerous coastal and environmental restoration projects in the area, including the Port's Maritime Forest Ridge Restoration, Marsh Creation, and Fourchon Beach Repair projects.



All Port expansion and development efforts strive to avoid environmental impacts and implement mitigation efforts when potential impacts are unavoidable.

**10. Port Fourchon Maritime Forest Ridge Restoration Project.** The Maritime Forest Ridge project represented the first attempt at restoring elevated Chenier forested ridge habitat from open water. With the help of many coastal and environmental partners coupled with generous donations from industry partners, the Port Commission's ridge has provided vital lessons in plant propagation for restoring these unique habitats, construction techniques, and planting and soil chemistry methodologies. The ridge is currently over 6,000 feet in length and has served as a test bed and observation point for environmental studies and restoration research for over a decade now. When the ridge is fully constructed, it will stretch for approximately 12,000 linear feet, and about sixty acres of marsh and sixty acres of ridge will be re-created. Ultimately, the project could include walking trails and a coastal/marine ecosystem education center.

**11. Port Fourchon Northern Expansion.** The Port's multi-phased Northern Expansion projects and resulting Marsh Creation Plans serve as an example of how these mitigation efforts can benefit the surrounding landscape when the Port's development activities produce unavoidable environmental impacts.

Phase I of the Northern Expansion commenced in 1999 and consisted primarily of construction of Slips A and B. In addition to the development of Slips A and B, Phase I also resulted in the creation of 785 acres of new marsh situated north of the Port's Flotation Canal ("Phase I Mitigation"), approximately 75 acres more than that to which the Port was committed in the Phase I permit.

Phase II of the Northern Expansion included the development of Slip C and an extension of the Port's Maritime Forest Ridge. This project was estimated to impact roughly 69 acres of wetlands. This mitigation plan ("Phase II Mitigation") proposed creation and preservation two separate mitigation sites, establishing roughly 362 acres of marsh and enhancement and preservation of an additional 15.53 acres of marsh to offset the wetland impacts associated with Phase II. The Port proposed to conduct 342 acres of marsh creation (enhancing an additional 0.93 acres) in open water north of its Maritime Forest Ridge and 20 acres of marsh creation (enhancing an additional 14.60 acres) directly southeast of and adjacent to Phase I Mitigation Area B. At the request of the reviewing agencies, the Port introduced a comprehensive series of "fish dips" into its planned embankment of Flotation Canal along with an integrated system of tidal creeks throughout the center of the Phase I mitigation ensuring adequate water exchange between the Flotation Canal for Phase I Mitigation and Phase II Mitigation.

Phase III of the Northern Expansion included the dredging and development of Slip D. This project was estimated to impact roughly 13.2 acres of wetlands. This

Marsh Creation plan proposed creating roughly 64.55 acres of marsh to offset these potential wetland impacts associated with the Phase III Project. The Port proposed to construct the Phase III Marsh Creation in open water north of its ongoing Phase II Mitigation generally situated north of the Maritime Forest Ridge.

**12. Draft Environmental Assessment, Fourchon Beach Shoreline Protection GLPC, Lafourche Parish, LA (November 2012).** The project included the following activities: construction of rip-rap revetment (as a Section 406 Hazard Mitigation project) along north shore of Flotation Canal to stabilize canal bank from erosion during storm events and prevent filling of Flotation Canal shipping channel, with approximately 3.0 acres of marsh impacted.

The following environmental observations were projected in this report: short-term increase in sedimentation of surface waters directly adjacent to the project site; impacts to local water quality would be minor, localized and short-term in duration; particulate emissions from generation of fugitive dust during construction increased temporarily in immediate project area, localized and short-term duration. USFWS determined the project may affect, but would not likely adversely affect fish and wildlife resources. NMFS determined the project may impact EFH, so construction required fish dips to be installed in the revetment to allow passage of fish between marsh area and Flotation Canal. With installments, impacts to wildlife and vegetative resources were expected to be minor and localized.

### **Reasonably Foreseeable Future Actions**

- 1. Port Fourchon Belle Pass Channel Deepening Project.** The TSP for the Port Fourchon Belle Pass Channel Deepening Project is a reasonably foreseeable future action for the project area. Refer to Chapter 2 (sections 2.8 and 2.9) of this report for a detailed description of the TSP and impacts.
- 2. Fourchon Island Development.** The first project phase of Fourchon Island Development at the Fourchon will begin with the construction of the FWOP feature Fourchon Island Slip. The 1,755-foot by 1,985-foot Fourchon Island Slip (or terminal) is to be located on the east bank of the Belle Pass channel between sta. 140+00 and 150+00, and dredged to the authorized 24-foot depth of the federal channels Bayou Lafourche and Belle Pass. The construction of this slip is designed to have an 850-foot offset of facility development from the aforementioned slip dimensions. The non-federal sponsor is preparing to evaluate the potential environmental impacts that may result from the project components such as the landside facilities and the Fourchon Island Slip itself. Compensatory mitigation would be required for all wetland impacts.

3. ***Liquefied Natural Gas (LNG) Facility.*** The Port is in the permitting process along with a tenant to develop a liquefied natural gas (LNG) export terminal and the developer has permit applications under review. The LNG facility is to be located on the west bank of Belle Pass (sta. 140+00 to 150+00) opposite of Fourchon Island Slip. The LNG tenant is preparing to evaluate the potential environmental impacts that may result from this project. Compensatory mitigation would be required for all wetland impacts.

## **Resource Impact Evaluation**

In assessing cumulative impacts, only those resources expected to be directly or indirectly impacted by the TSP, as well as by other actions within the geographic scope and time frame were chosen for cumulative impact analysis. Based on these criteria, the following resources were identified as relevant resources for the cumulative impacts analysis:

- Bays and Deep Water Habitats;
- EFH;
- Threatened and Endangered Species;
- Air Quality;
- Water Quality;
- Commercial Fisheries and Recreational Fisheries

## **Bays and Deepwater Habitats**

The primary effects to bays and deep water habitats in the project area would be to benthos. Organisms present on water bottoms are affected by dredging and placement of dredged materials. Past or present projects described above in the study area have resulted in benthic community impacts that are similar to those that would be caused by the TSP. Previously dredged areas were deepened or maintained, resulting in minor and temporary direct impacts to benthic organisms that had recolonized those areas after prior dredging. TSP impacts would not result in the addition of permanent new benthic impacts and would not significantly increase the area of water bottom that is affected by dredging.

Dredged material placement at marsh creation areas and nearshore Feeder Berm buries and temporarily smothers benthic organisms within those areas. The nearshore Feeder Berm/nearshore nourishment, which is dispersive, would likely be subjected to reuse frequently. Placement of dredged material in the nearshore zone would impact benthos in a limited area, and the material would be rapidly dispersed from the area due to wave action and longshore currents. The TSP would not be expected to contribute to long-term benthic organism impacts. No cumulative benthic impacts are expected related to the TSP and other projects.

## Essential Fish Habitat

EFH would not be significantly affected by construction of the TSP. The TSP would temporarily reduce the quality of submerged soft bottom habitats in the vicinity of the dredging and some individual fishes of managed species may be temporarily displaced. Past or present projects and potential projects in the study area have resulted and would result in minor EFH impacts to the study area that are similar to those that would be caused by the TSP. Inasmuch as all of these impacts are minor and temporary, the TSP would not permanently add to cumulative EFH impacts. The TSP would not exacerbate temporary EFH effects because the foreseeable projects would not overlap with the TSP in time or space.

The implementation of the TSP and reasonably foreseeable future projects (Fourchon Island Slip, the LNG terminal, and their attendant landside maritime facilities) should consider and monitor areas of potential anoxic conditions (low dissolved oxygen) or potential changes in hydrology and/or saltwater intrusion that may come from deepening channels and/or the deep turning basin. This project should include monitoring of nutrients, dissolved oxygen, and other parameters prior to implementation and for a period of at least ten years after implementation. Overall, the TSP would provide fisheries more productive habitats, such as intertidal marsh, marsh edge, and shallow water, thus increasing nursery function, provide greater protection from predation, increase food supply, and increasing the overall growth and survival of fisheries.

The TSP is expected to have only temporary and localized effects on the water column and benthic habitats of the identified categories of EFH (estuarine emergent wetlands, mangrove wetlands, mud, sand, shell, and rock substrates, and estuarine water column), including the associated effects on the biota (if present) during project dredging and placement activities. Flora and fauna should quickly re-colonize the areas following these events. Over the life of the project, there would be an increase of 2,361 net acres of marsh habitat which would provide 1,055 average annual habitat units of emergent marsh. A mitigation and monitoring plan for the proposed project would be implemented, and would thereby prevent adverse cumulative environmental effects (see Appendix C of the DEIS). Therefore, project impacts are not anticipated to result in negative cumulative effects on the aquatic system. Tables G-8 and G-9 provide a summary of project effects.

HQ comment/question: Have we done an EFH assessment for this? Is it in the previous DEIS submitted?

GLPC comment. The GMFMC, in cooperation with NMFS, delineated and provided the EFH designations for federally managed species identified in Gulf FMPs. The EFH of managed species in the project area were considered and analyzed. The EFH Assessment includes direct, indirect, and cumulative impacts discussions. The EFH existing conditions are discussed on DEIS Page 3-23 onwards. The EFH discussions on all alternatives and the preferred alternative are discussed in the Environmental Consequences chapter and details EFH Impacts on direct, indirect, and cumulative

impacts from Page 4.27 (Section 4.5.5). The cumulative impacts sections to the managed species is detailed in Page 4-36 through 4-38.

## **Invasive Species**

The possibility exists for invasive species, which often outcompete native species, to colonize new marsh creation areas and hinder the further colonization of desired native species. During the construction of these marsh sites, monitoring will be systematically conducted on flora and fauna to ensure that invasive species do not gain a foothold over desired species in the new areas. Control and removal methods vary depending on the species of concern. Overall, the alternatives are not expected to directly increase the number of invasive species or have any impacts on invasive species currently documented within the study area.

Invasive species may be indirectly introduced or impacted by the action presented under this alternative, especially through the increase of vessel traffic or recruitment of new clients to the Port. The expansion of the navigation channels around the Port is expected to increase the overall traffic throughout the Port and could potentially attract business. New exotic flora and fauna may be introduced to the study area via these vessels visiting Port Fourchon, either as stowaways or in ballast water.

## **Threatened and Endangered Species**

The past projects Final DEIS (1979), Feasibility Report and DEIS (1994), FEMA's Draft Environmental Assessment (2012) listed above in preceding sections made the following conclusions on T&E species, respectively: encroachment on the following brown pelican, bald eagle and peregrine falcon (these species have since been delisted, and are now listed as 'species of concern'); no impacts to T&E species or their critical habitat, and no presence of T&E species/there would likely be no effect on the West Indian manatee and the Gulf sturgeon. At this time, no documents are available regarding the details of the reasonably foreseeable future projects or potential impacts to the surrounding environment that are anticipated to occur due these projects. In addition, those projects would require their own independent ESA consultations.

DEIS Appendix B includes the ESA Project Review and Guidance document approved by USFWS. This referenced document discusses the impacts of the proposed alternatives on the T&E Species. This document also consists of guidance by USFWS on the best management practices (BMPs) in order to avoid and minimize the impacts on various species. These species include red knot, West Indian manatee, piping plover, sea turtle, and migratory birds (bald eagle and colonial water birds).

Overall, there would be positive net benefits to wetland resources, including piping plover critical habitat, in the project area, with the creation of emergent wetland and

barrier headland and island habitats as a result of the TSP. The proposed TSP would result in approximately 1,055 AAHUs and 2,361 net acres of saline marsh habitat over the 50-year project life under the moderate sea level rise rate (see Appendix C for WVA assumptions). Additionally, this project will have unrealized benefits from continued nourishment of barrier shorelines through maintenance dredging over the project life.

Considering the above conclusions on T&E species and the long history of environmental due diligence of the non-federal sponsor, cumulative effects to T&E species are not expected.

## **Air Quality**

The GHG emissions that would result from the TSP would be negligible relative to the total national emissions inventory, and would not have a significant effect on global warming. Furthermore, increased air contaminant emissions are not expected with TSP channel improvements. The construction dredging associated with the proposed channel expansion detailed under this alternative would temporarily increase the amount of emissions in the environment near the project area. Air emissions would be expected to increase for maintenance activities proposed under this alternative compared to the no-action alternative, due to the increase in length and width of the navigation channel. Combustion products from fuel burned during dredging and placement operations would be the primary source of air containment emissions released during the project. This equipment includes:

- Dredging and Support Equipment
- Non-Road Construction Equipment
- On-Road and Employee Vehicles
- Maintenance Dredging and Support Vessels

The Port Fourchon Project area is in attainment for the principle pollutants listed by NAAQS on the Annual Certified Emissions Data Report that was last updated in September of 2017. The LDEQ air quality monitoring station named Fourchon Term (AI number: 3051) provides a record of emissions inventory for the state. Lafourche Parish, including the Port Fourchon Project area, is in attainment for the principle pollutants listed by NAAQS on the Annual Certified Emissions Data Report (LDEQc, 2017).

The proposed construction and maintenance cycles are phased and staggered, therefore, the past, current and future projects are not expected to compound air quality concerns and the cumulative impacts are not anticipated.

HQ Assessment/question: Is there technical work/backup for this in the draft documents?

GLPC comment. The study team does not have “technical work/backup” to address air quality impact assessments. This decision was made since the air quality impacts (direct, indirect, and cumulative) can be assessed by extrapolation from current activities and their air quality observations.

DEIS page 3-16 describes existing conditions of the Air Quality. The project area that is within Lafourche Parish is in attainment for the principal pollutants listed by National Ambient Air Quality Standards (NAAQS) on the Annual Certified Emissions Data Report that was last updated in September of 2017. The LDEQ air quality monitoring station

## **Noise Impacts**

The impacts are expected to temporarily increase during the initial new construction dredging and during the placement of dredge material. An analysis of the noise levels produced by the equipment typically used during these process is not expected to cause severe or irreversible damage to humans or wildlife within the study area. The construction and maintenance activities of the proposed projects are phased therefore, the equipment noise will not be compounded and will remain as the current level of noise in the area. Avoidance of the project area by terrestrial and aquatic wildlife is expected to be the most significant impact to the project area. Wildlife would be expected to return to the areas upon completion of these project elements.

HQ Assessment/question: This is usually shown using decibel levels and distance to nearest receptors. Was this analysis done to support this statement?

GLPC comment. The study team does not have “technical work/backup” to address noise impact assessments. This decision was made since the noise impacts (direct, indirect, and cumulative) can be assessed by extrapolation from current activities and their noise level observations. Ambient noise levels are not available for the Port Fourchon area. Noise resulting from no-action and action alternatives is not expected to be a significant since the project area is not located within any municipality and there are no residential or civic buildings located at Port Fourchon.

The effects of dredging noise on aquatic communities present within the designated EFH categories resultant of Project implementation would vary among fish species/life stages present in the Project channels and the marsh creation and shoreline nourishment beneficial-use placement areas. Noise pollution is another term used to describe anthropogenic causes of undesired changes to underwater soundscapes with the potential to affect the hearing or bioacoustics of fishes.

Ambient noise sources near the Port include both natural and artificial sources. Natural sounds include wind, waves, fish, tidal currents, and mammals. Through the years, recreational and other commercial boat traffic has increased adding to the ambient noise caused by industrial activities. Artificial sounds include commercial and

recreational ships and boats, dredging, pile driving, etc. Tidal currents produce hydrodynamic sounds of lower frequencies (<100 Hz), which are not significant along the Gulf. Ship and boat traffic generate sounds in frequencies ranging from 10 to 1000 Hz. Wind speed also produces sounds above 500 Hz. Biological sounds associated with a host of mammals, fishes, and invertebrates can generate broadband noise in the frequency of 1 to 10 kHz with intensities as high as 60 to 90 dBA.

Human activity produced ambient noise at Port Fourchon results from current operations and maintenance (O&M) activities of the Bayou Lafourche and Belle Pass federal channels and the Port access channels, as well as commercial vessel traffic and dock side facilities. Noise sources for vessels include, cranes and various propulsion motors. Dockside noise sources include cranes, trucks, cars, and loading and unloading equipment.

The Environmental Consequences section details the noise impacts. Under the proposed project alternative, impacts are expected to temporarily increase during the initial new construction dredging and during the placement of dredge material. An analysis of the noise levels produced by the equipment typically used during these process is not expected to cause severe or irreversible damage to humans or wildlife within the study area. Avoidance of the project area by terrestrial and aquatic wildlife is expected to be the most significant impact to the project area. Wildlife would be expected to return to the areas upon completion of these project elements. Currently, there is annual/bi-annual O&M dredging and the Port has almost continual dredging in developing Slip D. Current activities and future construction activities along with O&M will be very similar. In addition, these activities will occur in non-residential area.

## **Water Quality**

The historical and most recent testing data for the study area indicates an absence of contamination. Dredging and placement at open-water may increase suspended solids, bound nutrients, and deplete oxygen. However, this impact is temporary, localized, and except for turbidity, insignificant. If temporary degradation occurs, the area should rapidly return to ambient conditions upon completion of dredging. The impacts of the other dredging projects included in this analysis would be similar. With implementation of BMPs and other permitting requirements, no cumulative surface water quality impacts are expected related to the TSP and other projects.

The other water quality parameters such as water temperature, salinity, dissolved oxygen, and nutrients are also not expected to be impacted by the present and the future actions (see DEIS Appendix I and Appendix F of the Feasibility Report). The impacts variations are low and short ranged. Cumulatively, these parameters will not be impacted as shown by the variations estimated by the modeling efforts.

However, a discussion on dissolved oxygen and nutrients impacts deserves more attention. In coastal Louisiana, low dissolved oxygen also occurs in the bottom water on the continental shelf (about 6 km south of Port Fourchon) from May to September because of stratification and nutrient-enriched primary production. Dissolved oxygen



in coastal waters is influenced by physical and biogeochemical processes and nutrient loading. The physical processes include the stratification of the water column based on temperature and salinity differences (determined by development of a thermocline and pycnocline) that restricts mixing and replenishment of dissolved oxygen in the bottom water.

The biogeochemical processes influencing low dissolved oxygen ( $\leq 2\text{mg/l}$ ) include nutrient enrichment (point and non-point sources) that drives phytoplankton primary production responses in the surface waters that produce organic matter that sinks to the bottom and fuels decomposition. This microbial decomposition process consumes oxygen in the bottom water and sediments and with the stratification of the water column can lead to low dissolved oxygen in the bottom waters. High turbidity and low nutrient levels can also limit phytoplankton primary production. These physical and biogeochemical drivers need to be met for the development of bottom-water low oxygen conditions.

Dissolved oxygen (DO) concerns relating to channel deepening can be divided into three issues: (1) as the channel depth increases, the ability of oxygen to reach the river bottom decreases, causing lower average levels of dissolved oxygen at the bottom, and (2) as the channel prism enlarges, additional saltwater is moved to the upper portions of the harbor and in to the estuary, decreasing the ability of those waters to accept oxygen from the air, and (3) as the channel prism enlarges, the average velocity decreases, reducing the mixing of oxygen throughout the water column. If dissolved oxygen concentrations decrease to unacceptable levels, it could have deleterious effects on fish and other aquatic organisms. Lower dissolved oxygen levels also reduce the ability of the estuary to handle the point and non-point source loads of pollutants entering the estuary.

Another critical factor influencing dissolved oxygen levels in the estuary is the interaction of physical and biological processes. A decrease in dissolved oxygen levels typically occurs during summer months. This is the combined effect of the reduced diffusion of oxygen into warm waters and the higher rate of uptake of oxygen from biologic organisms.

As a result of implementing the TSP, it is predicted that DO and salinity concentrations in the aquatic system would remain the same, as would the non-stratified water column conditions and high flushing rates. These anticipated future with project implementation modeled parameters provide that the greater project area is likely not susceptible to dredging-induced eutrophication (in the form of hypoxia) (Rabalais et al., 2002). It is also unlikely that DO concentrations would fall below 0.2 mg/L (or ppm) and cause benthic habitats to become oxygen-deficient, thereby inducing hypoxic stress in benthos causing emigration or mortality (Rabalais et al., 2002). Further, dredging operations have been conducted in the Port main navigation channel by the Corps since 2001, and no historic dredge events have been recorded as causing anoxic fish kills or harmful algal blooms. The modeling results indicate that increasing maintenance dredge depth within navigation channel would likely have no significant

impact on the dissolved oxygen concentrations in the Port waterways. Predicted values of dissolved oxygen showed significant seasonal fluctuations but were approximately spatially-uniform throughout the Port waterways due to energetic secondary currents.

Given the constraints of no vertical water column profiles to calibrate to and no analogue of deep loading holes, the first order estimates provided by the model suggest that the surface water salinity may be reduced from 8 mg/l in the spring to 5 mg/l in the summer in areas of Bayou Lafourche. If the hydrodynamics in the channel and channel dead ends are similar to the modeled hydrodynamics of Bayou Lafourche, then model output suggests that the water column is well-mixed and the lowest DO may be around 5 mg/l during summer conditions. The current analysis establishes that dissolved oxygen variation is within accepted levels.

Bottom-water dissolved oxygen is likely to be reduced under stratified conditions in deep dredged channels (-50 to -85 ft.) including the deep loading hole (a construction component of only Alternatives 6a through 6c-TSP) in Port Fourchon. Therefore, DO cumulative impacts on the aquatic system are not anticipated.

### **Commercial and Recreational Fisheries**

Fish would likely leave dredging areas and placement areas for more-favorable, less-turbid locations; however, once construction and placement are complete, water and foraging conditions would improve, and fish would return to the area. No long-term cumulative impacts are expected from the TSP combined with area projects.

### **Conclusions**

Cumulative impacts due to past, existing, and reasonably foreseeable future projects, along with the proposed TSP, are not expected to have significant adverse effects in the study area. Many of the projects occurring in the vicinity, including the TSP impacts, are part of the continuing port and shipping industry development. Impacts associated with the TSP would be temporary and minor, requiring no compensatory mitigation. With compliance to environmental regulations, use of BMPs during construction, and compliance with agencies requirements to minimize impacts, these projects are not expected to have long-term detrimental effects on environmental resources in the area.

OASACW/HQUSACE Assessment: **Comment has been resolved** with implementation of the response. As noted in the comment above, Federal environmental compliance requirements still must be completed by the Federal government. The recommended plan must be identified before environmental compliance requirements can be completed.

3. **Monitoring and Adaptive Management:** The monitoring and adaptive management plan as discussed on EIS Appendix C and section 4.13 of the EIS provides a framework for such a plan, but does not meet the requirements of the implementation guidance for section 2039 of WRDA 2007.

Basis for the concern: The monitoring and adaptive management plan does not include important factors required in the implementation guidance, such as performance standards, likely adaptive management actions and costs.

Significance of the concern: Medium

Action needed to resolve concern: Develop the monitoring and adaptive management plan to address all the requirements of section 2039 of WRDA 2007.

Port Response: DEIS Appendix C has been revised to incorporate the following as such:

The following proposed Port Fourchon Belle Pass Channel Deepening Project Monitoring Plan with Adaptive Management Strategies was developed in accordance with Section 2039 of the Water Resources Development Act of 2007. Dependent upon project authorization, monitoring of the proposed project is necessary to determine if the predicted WVA AAHU outputs are being achieved and to provide feedback for future projects. The predicted WVA AAHU outputs should be finalized to incorporate site-specific characteristics during the project engineering design and permitting phases.

#### Monitoring Goals

1. Optimize beneficial use of project dredged material placed in marsh creation and shoreline nourishment areas.
2. Validate the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.
3. Determine the acres of open-water filled for marsh creation.
4. Determine the acres of emergent marsh created.
5. Determine the elevation of acres created.
6. Determine changes in water quality parameters within the project channels.
7. Determine and/or update information necessary to the project adaptive management plan.

#### Features to be Monitored

1. Project Channels
2. Marsh Creation Placement Areas
3. Shoreline Nourishment Placement Areas
4. Emergent Marsh Control Sites

#### Control Sites

Monitoring on both project and control sites would provide a means to establish performance standards that can be used for the comparison of site emergent marsh habitat functionality, and therefore should be employed as a means of assessing project effectiveness in terms of fulfilling the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.

#### Monitoring Strategies

Monitoring data should be collected using standardized data collection techniques and should be analyzed to determine whether the beneficial use approaches such as marsh creation and shoreline nourishment are achieving the anticipated benefits. Operations, maintenance, and monitoring (OM&M) reports should be developed to document the condition of project features; present and interpret monitoring data, and make recommendations for adaptive management of the project. Monitoring includes vegetation surveys, land-water analysis, topographic surveys, bathymetry surveys, water quality data collection, and habitat classification. The Coastwide Reference Monitoring System-Wetlands (CRMS-Wetlands) stations in the vicinity would provide data on local hydrographic conditions and vegetative community.

The following monitoring strategies would provide the information necessary to evaluate the specific goals listed above:

1. Vegetation                      To determine if the project activities are creating functional marsh habitat, vegetation surveys should be conducted at selected monitoring stations (2 m x 2 m) in the project area. Vegetation data would be used to assess the colonization and transition of vegetation on the created marsh platform and berm and to compare this vegetation to local, natural emergent marsh. Surveys of vegetation should follow CRMS methodology and should include an assessment of total cover, species present, percent cover of each species, average height of each vegetation layer, and the depth of water on the marsh surface. The salinity, specific conductivity and temperature of the soil bore water at 10 cm and 30 cm depth should also be collected in coordination with the vegetation surveys at each marsh plot (Folse et al. 2014; as cited in Curole, Hartman, and Lee, 2017). Vegetation surveys should be scheduled for years 2020, 2030, 2040, 2050, 2060, and 2070.
2. Land-Water Analyses              To determine the acres of open-water filled for marsh creation, land-water analysis of aerial photography should be used in conjunction with topographic surveys of the project area to evaluate the project's success of creating functional marsh habitat. Land-water analysis of aerial photography should be used in conjunction with topographic surveys to evaluate the functionality of the

created marsh platform through the project's 50-year monitoring life. Land to water ratios in the project area should be determined using CRMS 2020, 2030, 2040, 2050, 2060, and 2070 aerial photography (Z/I Imaging digital mapping camera) with 1-meter resolution.

- |                           |  |
|---------------------------|--|
| 3. Topographic Surveys    | To help determine if the project activities are creating functional marsh habitat and nourishing the littoral zone of the shoreline nourishment placements areas, data from topographic surveys should be compared over time to measure if the dredged material is settling at the predicted rate and if the marsh platform and shoreline restoration berm are retaining elevations that promote healthy native marsh habitat. Topographic surveys would be conducted in years 2020, 2030, 2040, 2050, 2060, and 2070. |
| 4. Bathymetry             | To determine the elevation of marsh acres created and the littoral zone of the shoreline nourishment placements areas, bathymetric surveys should be undertaken for project specific data collection. In addition, project specific bathymetric surveys of the shoreline nourishment placement areas should be performed along cross sectional survey transects in the littoral zone as per (Steyer et al., 1995).   |
| 5. Water Quality          | To determine changes in the water quality parameters of the project features, during dredged material placement activities measure specific conductance, temperature, dissolved oxygen, and pH in the deepened channel, turning basin and control sites for comparisons between each site.   |
| 6. Habitat Classification | To document vegetated and non-vegetated marsh creation placement areas, infrared aerial photography (CIR) should be obtained. The photography should be photointerpreted, scanned, mosaicked, georectified, and analyzed.  |

#### Anticipated Statistical Tests

1. Descriptive and summary statistics for vegetation should be used to determine spatial and temporal differences in species composition and cover for habitat classification.

#### *Goals:*

- Determine the acres of emergent marsh created.
- Validate the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.

Descriptive and summary statistics for land-water analyses should be used to determine differences in mean elevations, habitat class, and area in acres of open-water filled and emergent marsh created for comparison with habitat classification standards.

*Goals:*

- Determine the acres of open-water filled for marsh creation.
- Validate the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.

2. Descriptive and summary statistics for topography should be used to determine differences in mean elevations, habitat class, and area in acres.

*Goals:*

- Determine the acres of open-water filled for marsh creation.
- Determine the acres of emergent marsh created.
- Validate the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.

3. Descriptive and summary statistics for bathymetry should be used to determine differences in mean elevations.

*Goals:*

- Optimize beneficial use of project dredged material placed in marsh creation and shoreline nourishment areas.
- Determine the acres of open-water filled for marsh creation.
- Determine the acres of emergent marsh created.
- Validate the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.
- Determine and/or update information necessary to the project adaptive management plan.

4. Descriptive and summary statistics using the water quality data collected at the monitoring sites should be used to determine indicators for potential anoxic conditions (low dissolved oxygen) or potential changes in hydrology and/or saltwater intrusion that may come from deepening channels and/or the deep turning basin.

*Goals:*

- Determine changes in water quality parameters within the project channels.
- Validate the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.
- Determine and/or update information necessary to the project adaptive management plan.

5. Descriptive and summary statistics using the habitat classification efforts should be used to determine the acres of emergent marsh created.

*Goals:*

- Determine the acres of emergent marsh created.
- Validate the USFWS and non-federal agreement on the amount of beneficial acreage to be constructed by the proposed project.
- Determine and/or update information necessary to the project adaptive management plan.

Project Cost

Environmental & Wildlife Monitoring

Project Cost  
\$2,092,660

(Note: Activities include monitoring for manatee, sea turtle, migratory bird, nesting birds, and other identified protected species, as well as a senior scientist to be on site of all activities.)

**To conclude DEIS Chapter 4 section 4.13, it has been revised to cross-reference DEIS Appendix C as such:** “The details of the project monitoring plan are provided in DEIS Appendix C.”

OASACW/HQUSACE Assessment: **Comment is resolved** pending outcome of environmental compliance activities.

**E. LEGAL**

1. Sponsor Requirements in the Recommendations: The sponsor requirements indicated in section 10.2 of the draft feasibility report are not accurate. Section 10.2.a.1. states the non-Federal sponsor will provide 50 percent of design costs for the project. Section 10.2.a.2. describes the additional 10 percent of total construction costs for GNF features required by 33 U.S.C. § 2211(a)(2) as funds the non-Federal sponsor is required to provide during construction “to make its total contribution of construction of the GNFs.”

Basis of Concern: Section 105(c) of WRDA 1986, codified at 33 U.S.C. § 2215(c), states that the costs of design of a water resources project “shall be shared in the same percentage as the purposes of such project.” Per 33 U.S.C. § 2211(a)(1), the non-Federal sponsor is required to pay 25 percent of construction costs associated with GNF features assigned to a channel depth in excess of 20 feet but not in excess of 50 feet. The additional 10 percent payment required by 33 U.S.C. § 2211(a)(2), reduced by creditable real property interests and relocations, is determined during and required to be paid after the final accounting conducted upon completion of construction.

Significance of Concern: Medium.

Recommendation: Section 10.2.a.1. of the recommendations section of the report should be revised to state the correct cost-share percentages for preconstruction engineering and design. Section 10.2.a.2. of the recommendations section of the

report should be revised to state “25 percent” instead of “10 percent” of construction costs associated with GNF features assigned to a channel depth in excess of 20 feet but not in excess of 50 feet. Section 10.c. of the recommendations section of the report correctly summarizes the additional 10 percent payment requirement.

Port Response: Concur, Section 10.2.a.1. of the report will be revise to state “25 percent” instead of “10 percent” of construction costs associated with GNF features assigned to a channel depth in excess of 20 feet but not in excess of 50 feet. The 10% is a typo and Figures 8-1 and 8-2 in the report are computed consistent with the reviewer’s observation and the statutory cost-share responsibilities.

OASACW/HQUSACE Assessment: Both Sections 10.2.a.1. and 10.2.a.2. should be revised to state “25 percent” instead of “50 percent” and “10 percent”, respectively, based on current project depths in draft report; however, comment is unresolved pending final depth of project in recommended plan (see Economic and Engineering and Construction comments). The non-Federal interest’s cost-share percentage of the general navigation features is dependent upon the depth of the project. See 33 U.S.C. § 2211.

Port Response: Concur.

OASACW/HQUSACE Assessment: Both Sections 10.2.a.1. and 10.2.a.2. should be revised to state “25 percent” instead of “50 percent” and “10 percent”, respectively, based on current project depths in draft report; however, comment is unresolved pending final depth of project in recommended plan (see Economic and Engineering and Construction comments). The non-Federal interest’s cost-share percentage of the general navigation features is dependent upon the depth of the project. See 33 U.S.C. § 2211.

GLPC comment. Both Sections 10.2.a.1. and 10.2.a.2. have been revised to state “25 percent” instead of “50 percent” and “10 percent”, respectively.

OASACW/HQUSACE Final Assessment: Section 105(c) of WRDA 1986, codified at 33 U.S.C. § 2215(c), states that the costs of design of a water resources project “shall be shared in the same percentage as the purposes of such project.” Section 10.2.a.1. still states that the non-Federal interest will provide 50 percent of design costs assigned to navigation. Per the depth of the recommended plan for construction, the non-Federal interest will be required to pay 25 percent of the cost of the construction of the project. See 33 U.S.C. 2211(a)(1)(B). Thus, the non-Federal interest will be required to provide 25 percent of design costs. Section 10.2.a.1. must be revised to state “25 percent” instead of “50 percent.”

A future Design Agreement will make this cost share correction.



2. **Plan Description in Recommendation:** The recommendations in Chapter 10 of the draft feasibility report are not legally sufficient. The recommendation is missing a “clear reference to the plan being recommended for implementation, including appropriate mitigation” and a “phrase stating that the plan is being recommended ‘with such modifications thereof as in the discretion of the Commander, HQUSACE, may be advisable.’” ER 1105-2-100, para. G-9.i.(4). The TSP is not clearly defined in the recommendations section of the report and does not appear to be consistently described throughout the report.

**Basis of Concern:** When a project is authorized by Congress, the recommendations contained in the feasibility report becomes the legislative basis for proceeding with the project as a Federal undertaking that will not change unless modified by Congress through applicable general legislation or by specific legislative action for the particular authorization in question. ER 1105-2-100, para. G-9.i.(1). Accordingly, the wording of recommendations, incorporated by reference in the authorizing act, has the force of law for the project and requires special attention.

**Significance of Concern:** High

**Action Needed to Resolve Concern:** The description of the undertaking provided in the section 106 review consultation initiation letters in Attachment 3 of Appendix A to the Draft Environmental Impact Statement appears to be the clearest and fullest description of the TSP in the report package. The recommended plan should be clearly, precisely, and consistently described in Chapter 10 and throughout the report similar to manner in which the TSP is described in these letters.

**Port Response:** Concur. Section 10.1 of FR Chapter 10 text will be expanded to state: The locations of these improvements are shown in Figure 1. The initial construction of three features shown on Figure 1 are not part of the feasibility study and will be built by others, likely prior to the initiation of work described in the feasibility study. The features are: the Fourchon Island Slip/Deep Loading Hole, the Turning Basin, and the Liquid Natural Gas (LNG) Facility. The recommended improvements would deepen the downstream Belle Pass Federal channel (sta. 130+00 to 589+93) to -50 feet, widen this reach of the channel from the existing 300-foot width to 475 feet, and extend the entrance channel approximately 5.2 miles into the Gulf. In the DEIS this is termed the Tentatively Selected Plan (TSP). The following total dredging depth requirements of the Belle Pass Federal channel include advanced maintenance and a 2-foot safety factor: -53 feet deep from sta. 130+00 to 220+00, -56.5 feet deep from sta. 220+00 to 330+00, and -54.5 feet deep from sta. 330+00 to 589+00. Modifications to the upstream interior channels (sta. 0+00 to sta. 130+00) – Bayou Lafourche; Flotation Canal; and Slips A, B, and C (and berthing areas) – would deepen the channels to -30 feet and retain the existing 300-foot width in this interior section. The total dredging depth requirement of the Bayou Lafourche Federal channel would be -33 feet deep, which includes 3 feet of advanced maintenance. Fourchon Island Slip and the turning basin would be deepened to -50 feet. The deep loading hole in this Slip would be dredged to a depth of -85 feet. The existing pair of Federal jetties would not be altered

and would be maintained as needed. The TSP would require the relocation of 12 pipelines, all of which would be performed by contractors prior to the initiation of channel dredging contracts. Project construction would occur over an estimated period of 4 years. Maintenance dredging would begin after the fourth year of construction, and would be conducted for a period of 50 years thereafter. Channel reaches would be dredged on cycles necessary to maintain the authorized depths and widths. New work and maintenance dredged material would be fully utilized as beneficial use sediments, with dredged material placed in nearshore areas as shoreline nourishment in active feeder berms and in the proposed marsh creation areas, as has been the practice of the USACE for each maintenance cycle of the federally maintained project.

Engineering plates are provided in Engineering Appendix, Annex 5 – TSP Design Engineering.

OASACW/HQUSACE Assessment: An exact copy and paste of the description of the undertaking provided in the section 106 review consultation initiation letters in Attachment 3 of Appendix A to the Draft Environmental Impact Statement into the recommendations section (Chapter 10) of the report with cross-references to figures that will not be duplicated into the report does not make logical sense. This description was provided only as an example in the “Action Needed to Resolve Concern” to ensure the final recommended plan is clearly, precisely, and consistently described in Chapter 10 and throughout the report. Regardless, comment is unresolved pending final recommended plan.

Port Response: Concur.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

3. Dredge Material Management Plan: Appendix J to the EIS, the Dredged Material Management Plan (DMMP), does not identify the least cost/base plan for the disposal of dredged material associated with construction of the project. The DMMP also does not consider or evaluate alternatives plans for the disposal of the dredged material.

Basis of Concern: Paragraphs E-15.a.(3) and b. in Appendix E of ER 1105-2-100 describe the principles for establishing a base plan to dispose of dredged material associated with navigation projects in the least costly manner. Table E-14 in Appendix E of ER 1105-2-100 sets forth the minimum information required in a DMMP to provide a sound and documented basis for decision makers to judge the DMMP.

Significance of Concern: High. Where environmentally beneficial use of dredged material is the least cost, environmentally acceptable method of disposal, it is cost-shared as a navigation cost. Beneficial uses that involve incremental costs above the base plan for the use of dredged material to improve, restore and protect environmental resources, pursuant to section 204 of WRDA 1992 or section 207 of WRDA 1996, are either a non-Federal responsibility or a shared Federal and non-

Federal responsibility. The recommended plan for the use of dredged material may change based upon the identification of the base plan and applicable cost-share.

Action Needed to Resolve Concern: The DMMP must identify the least cost/base plan for the disposal of dredged material associated with construction of the project, evaluate alternative plans, and correctly assess the applicable cost-share for the recommended plan for the use of dredged material.

Port Response: The Study Team approached the DMMP not as a screening plan formulation document but as an Operations document to demonstrate that not only is there a 20-year disposal capacity but a 50-year and beyond capacity and how where dredging and disposal would take place.

The issue of least cost has to consider practicality in terms of other State and Federal legislation and achievability in terms of embarking on identifying an ODMDS knowing the beaurocratic environment that we live in. Dredged material is a resource and should not be wasted, thus the white paper on ODMDS that was included in the feasibility report. This issue was addressed in Plan Formulation comment 1. Much of that response is repeated below:

An assessment was performed to document the management of all planned Federal and nonfederal dredge material, including new work and maintenance for the placement of dredged material in the vicinity of Port Fourchon. Based on calculated volumes of new work material and maintenance material, the assessment examined potential deposition areas for placement areas. The inland areas made use of the nearest available placement areas and locations were chosen for inland disposal solely based on location and proximity to the channel as evident in Figure 13-1 of the Engineering Appendix.

While discussed in other comments above, it is worth repeating that to waste this material in the open Gulf may be the least navigation-related cost, it raises the federal and state designated marsh creation areas around the Port disproportionately such that the marsh creation can never be realized. The symbiotic opportunity should not be ignored.

However, for a cost comparison, the following is offered. An assessment was performed to document the management of all planned Federal and nonfederal dredge material, including new work and maintenance for the placement of dredged material in the vicinity of Port Fourchon. Based on calculated volumes of new work material and maintenance material, the assessment examined potential deposition areas for placement areas. The inland areas made use of the nearest available placement areas and locations were chosen for inland disposal solely based on location and proximity to the channel as evident in Figure 13-1 of the Engineering Appendix.



Figure 13-1: TSP Dredge Material Placement

Two options were evaluated for the offshore placement areas including Ocean Dredged Material Disposal Sites (ODMDS) and shoreline placement in the littoral zone. Below is a comparison of disposal cost for the two offshore disposal options, minus the ODMDS permitting cost. The ODMDS was determined to not be a viable option due to permitting cost and schedule restrictions.

For a comparison of disposal cost for the two offshore disposal options see Plan Formulation Comment 1.

OASACW/HQUSACE Assessment: This comment is unresolved. Feasibility reports recommending congressional authorization of new navigation projects or modifications of existing projects must include a dredged material management plan (DMMP) that addresses, at minimum, the subject matter outlined in Table E-14 of ER 1105-2-100, which includes alternative disposal measures to address identified problems and opportunities, beneficial uses alternatives, reasons for selecting and combining measures to form alternative plans, and an explanation of whether the selected management plan is consistent with the base plan for the purpose of determining the manner in which costs of the selected plan will be shared. The Federal interest in continued operation and maintenance of an existing Federal project for its navigation purpose is defined by the least cost plan for dredged material management that is consistent with sound engineering practice and meets all applicable Federal environmental standards. Costs for beneficial uses consistent with, and part of, the base plan are O&M costs and will be cost-shared in the same manner as other general navigation feature O&M costs. See 33 U.S.C. § 2211(b). Otherwise, where beneficial uses involve an incremental cost over the base plan, these incremental costs are either a non-Federal responsibility or are a shared Federal

and non-Federal responsibility depending on the type of beneficial use. For the beneficial use of dredged material to improve, restore and protect environmental resources, pursuant to Section 204 of the WRDA 1992 or Section 207 of the WRDA 1996, the non-Federal sponsor must provide 35 percent of the cost associated with construction of the project for the protection, restoration, and creation of aquatic and ecologically related habitats, including provision of all lands, easements, rights-of-way, and necessary relocations; and pay 100 percent of the operation, maintenance, replacement, and rehabilitation costs associated with the project. Accordingly, the report for this proposed project must include a DMMP that identifies the selected alternative in compliance with the law and policy summarized above.

Port Response: This issue is still pending and is addressed in Plan Formulation Comment #1 above.

OASACW/HQUSACE Assessment: As is stated in the HQUSACE Assessment for Plan Formulation Comment #1, this response still does not address the various points brought up in the original comment and follow-up assessment. Does the Port intend to pursue/justify a cost-shared beneficial use of dredged material plan?

GLPC comment. The tentatively selected plan incorporates the least cost disposal. Entrance channel material will be used in the continuation of the current federal O&M practice of nourishing submerged feeder berms along the littoral drift zone on both sides of the entrance channel. Material dredged from Belle Pass and Bayou Lafourche will continue to be used in nourishing submerging saline wetlands and creating new ones. By following current practice, this is the least cost plan and coincidentally provides beneficial use of dredged material.

OASACW/HQUSACE Final Assessment: See the HQUSACE Assessment of the GLPC comment in response to the OASACW/HQUSACE Assessment of the Port Response to Plan Formulation Comment #1, with which this commenter concurs. In accordance with Section 101(a)(5) and (b)(2) of WRDA 1986, as amended (33 U.S.C. 2211(a)(5), (b)(2)), the costs of constructing any land-based and aquatic dredged material disposal facilities that are necessary for the disposal of dredged material required for the construction, operation, or maintenance of a navigation project will be cost-shared with the non-Federal interest as general navigation features, not operation and maintenance costs.

Additional analysis and cost refinement will be needed in PED to ensure the dredge material aspects of the project are policy compliant.

4. NED Plan Concerns: The draft feasibility report recommends Plan 6c as the tentatively selected plan (TSP), but Plan 6a appears to be the alternative plan that maximizes national economic development (NED) benefits. The report states the widening alternative of 475 ft. in Plan 6c (compared to 400 ft. and 450 ft. for alternatives 6a and 6b) was “necessary for channel design safety dimensions” without explanation as to why these alternatives were not then screened out during plan formulation based on

the acceptability criteria. The draft economic appendix (Appendix A) to the draft feasibility report adds to the confusion stating that the TSP, Plan 6c, is both the NED plan and the Locally Preferred Plan (LPP).

Basis of Concern: Per the Water Resource Council's "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" (P&G), dated 10 March 1983, a plan recommending Federal action is to be the alternative plan with the greatest net economic benefit consistent with protecting the Nation's environment (the NED plan). Per paragraph 2-3.f.(4) of ER 1105-2-100, an LPP is a plan requested by the non-Federal sponsor that deviates from the NED plan, and the non-Federal sponsor generally is required to pay the difference in cost between the NED plan and LPP. Additionally by policy and ER 405-1-12, Chapter 12, dredged material is to be disposed on fee lands except in limited exceptions which do not apply here.

Significance of Concern: High. Costs may be overstated and a more economical alternative that is environmentally acceptable may be available.

Action Needed to Resolve Concern: The feasibility report and relevant appendices must be updated to identify whether the recommended plan is the NED plan or an LPP and explain the justification for the selected plan.

Port Response: Concur. There is no good explanation for the screening on width for Belle Pass and the Entrance Channel. It came about when the engineering team raised the issue of The USACE's safety channel width criteria. And on that basis the channel 475 foot channel width is the NED plan. There is no locally preferred plan. The report has been purged of references to the LPP.

OASACW/HQUSACE Assessment: Per OASACW/HQUSACE Assessment of other comments above, it remains unresolved whether the NED plan has been correctly identified.

Port Response: Concur. Resolution will be achieved once the NED is identified.

OASACW/HQUSACE Final Assessment: Page 15 of the Addendum to the Economics Appendix (A) (page A-43 of the revised appendix) describes the recommended plan as the NED plan, TSP, and the LPP. Per paragraph 2-3.f.(4) of ER 1105-2-100, an LPP is a plan requested by the non-Federal sponsor that deviates from the NED plan, and the non-Federal sponsor generally is required to pay the difference in cost between the NED plan and LPP. If the recommended plan in the report is the NED plan, this reference to an LPP should be removed in this appendix.

This correction should be made in future decision documents for the project.

5. Real Estate Plan: The real estate acquisition capabilities of the non-Federal sponsor are unclear.

Basis of the Concern: In Exhibit E, the Assessment of Non-Federal Sponsor's Real Estate Acquisition Capability, in Appendix C, the draft Real Estate Plan, to the draft feasibility report, the finance director of the non-Federal sponsor states that the sponsor's projected in-house staffing level is sufficient considering its other workload and the project schedule to meet its responsibilities for the project. This assessment also states the sponsor has "quick-take" authority for the project. The local sponsor assessment section of the Real Estate Plan, in contrast, states that, although the non-Federal sponsor has the ability to contract for services, "their in-house staff is limited, and they lack 'quick-take' authority.

Significance of the Concern: Low

Recommendation: The report and corresponding real estate plan should identify the non-Federal sponsor's real estate acquisition capabilities.

Port Response: GLPC does have quick take authority under La.R.S. 19:141, et seq. The non-federal interest is sufficiently staffed to meet its responsibilities under the project and can revise the "Local Sponsor Assessment" section (second paragraph, first sentence) of the REP to correctly reflect these issues.

OASACW/HQUSACE Assessment: **Comment resolved** with implementation of the response.

6. Utility Relocation: The report identifies twelve pipelines that must be relocated for the project. The report states that all relocations are the responsibility of the pipeline owners and operators to be carried out through horizontal directional drilling by contractors for the pipeline owners prior to the initiation of channel dredging contracts. The report implies that the Government will exercise its navigation servitude to relocate any of these pipelines in waters subject to the navigation servitude.

Basis of the Concern: Section 101(a)(4) of WRDA 1986, 33 U.S.C. § 2211(a)(4), requires non-Federal sponsors to perform or assure the performance of all relocations of utilities necessary to carry out Federal navigation improvements. The law apportions payment responsibility between the owner of the utility and the non-Federal sponsor only in the case of utility relocations necessitated by projects with an authorized depth of greater than 45 feet ("deep-draft utility relocations"). For such deep-draft utility relocations, the non-Federal sponsor must bear at least 50 percent of the cost of relocation. Thus, except as to deep-draft utility relocations, whether the non-Federal sponsor owes compensation to the utility owner is determined by principles of just compensation under state law and the terms of any non-Federal permits, licenses, or rights-of-way instruments for the utility. Under section 101(a)(2) of WRDA 1986, the costs borne by the non-Federal sponsor for utility relocations are credited toward the non-Federal sponsor's additional payment of 10 percent of the

cost of general navigation features. The amount of credit to be afforded for the total cost of each relocation shall not exceed the amount the Corps determines to be necessary to provide a functionally equivalent facility. The exercise of the navigation servitude to compel relocations of utilities is within the Government's discretion. The Corps will only exercise the navigation servitude to compel relocations for a project under limited circumstances set forth in the Director of Civil Works (CECW-P) Policy Guidance Letter No. 44 (27 September 2017), which will not affect the non-Federal sponsor's responsibility for payment of relocation costs under section 101(a)(4) and administrative costs associated with the exercise of the navigation servitude.

Significance of Concern: Medium.

Recommendation for Resolution: The report should recognize the non-Federal sponsor's obligation to perform or assure the performance of all relocations of utilities necessary to carry out Federal navigation improvements in accordance with 33 U.S.C. § 2211 and Director of Civil Works (CECW-P) Policy Guidance Letter No. 44 (27 September 2017).

Port Response: Concur. The Real Estate Appendix was edited in the Relocation section to state the non-Federal sponsor's obligation is to perform or assure the performance of all relocations of utilities necessary to carry out Federal navigation improvements in accordance with 33 U.S.C. § 2211 and Director of Civil Works (CECW-P) Policy Guidance Letter No. 44 (27 September 2017).

OASACW/HQUSACE Assessment: In addition to the Real Estate Appendix, all related discussion to utilities relocations in the report must recognize the non-Federal sponsor's obligation to perform or assure the performance of all relocations of utilities necessary to carry out Federal navigation improvements in accordance with 33 U.S.C. § 2211 and Director of Civil Works (CECW-P) Policy Guidance Letter No. 44 (27 September 2017). These obligations should be described in the report beyond mere cross-citation to this law and policy.

Port Response: Concur. Any discussion within the report of utility relocations will be revised to recognize the non-Federal sponsor's obligations to perform or assure performance of all relocations necessary to carry out Federal navigation improvements in accordance with 33 U.S.C. § 2211 and Director of Civil Works (CECW-P) Policy Guidance Letter No. 44 (27 September 2017). These revisions will go into greater detail regarding the process the non-Federal sponsor will employ in discussion of the project with owners of affected utilities, negotiation and funding of necessary relocations and timelines associated therewith.

OASACW/HQUSACE Final Assessment: Footnote 3 to Table 5-3 on page 60 and the response to public comment 25 on page 107 of the report still state that, "All relocations are the responsibility of the pipeline owners." As stated in this comment, Section 101(a)(4) of WRDA 1986, 33 U.S.C. § 2211(a)(4), requires non-Federal sponsors to perform or assure the performance of all relocations of utilities necessary



to carry out Federal navigation improvements. Federal law apportions payment responsibility between the owner of the utility and the non-Federal sponsor only in the case of utility relocations necessitated by projects with an authorized depth of greater than 45 feet (“deep-draft utility relocations”). Otherwise, whether the non-Federal sponsor owes compensation to the utility owner is determined by principles of just compensation under state law and the terms of any non-Federal permits, licenses, or rights-of-way instruments for the utility. Per the depth of the recommended plan, the report should reflect the non-Federal interest’s obligation to perform or assure the performance of all utility relocations.

Future decision documents for the project should make this correction.

7. Non-Standard Estates: The temporary work area and pipeline easement and draft ecosystem restoration easement in the draft Real Estate Plan (Appendix C) are non-standard estates that have not been approved by HQ Real Estate.

Basis for Concern: Per Real Estate Policy Guidance Letter No. 31 (11 January 2019), a non-standard estate can no longer be approved solely by its inclusion in a feasibility report. Non-standard estates must be coordinated with the Division and HQ Real Estate as early as possible in the planning process to ensure the justification is sound, the non-standard estate complies with law and project authority, and the non-standard estate will serve the project purposes. A request for a non-standard estate also must include an acquisition strategy and a risk assessment and show how the project purposes are met by the recommended estate.

Significance of Concern: High. The provision of the minimum interests in real property necessary for the project is required for project execution and is a statutory obligation of the sponsor.

Recommendation for Resolution: Any proposed non-standard estates must be coordinated with the Division and HQ Real Estate for review and a final determination as soon as possible.

Port Response: Based upon consultations with MVN-RE the non-federal interest will need to submit applications for approval to deviate from the Standard Estates in order to utilize the Ecosystem Restoration Easement and the Temporary Work Area and Pipeline Easement. MVN-RE says this approval process is separate and apart from the 203 application and approval for the Non Standard Estates (NSE) cannot be obtained through the 203 process. MVN-RE has provided several examples of requests to deviate that will be use in drafting our own.

OASACW/HQUSACE Assessment: Comment resolution pending coordination of non-standard estates in accordance with Real Estate Policy Guidance Letter No. 31. Further, real estate interests necessary for the project may change depending on final plan recommended for authorization, per other comments raised.

Port Response: Following further coordination with MVN-RE, the non-Federal sponsor has elected to utilize the Utility and/or Pipeline Easement Standard Estate as opposed to the Temporary Work Area Non-Standard Easement. With respect to the Ecosystem Restoration Easement, the non-Federal sponsor has been in close coordination with MVN-RE and will be soon submitting documentation to initiate the formal process of requesting a deviation from the requirement for fee acquisition and utilization of the Ecosystem Restoration Easement.

OASACW/HQUSACE Assessment: Comment resolved pending coordination of proposed non-standard estate in accordance with Real Estate Policy Guidance Letter No. 31. As noted in last assessment, minimum real estate interests determined to be necessary for the project are dependent on the final recommended plan.

GLPC comment. Following further coordination with MVN-RE, the non-Federal sponsor has elected to utilize the Utility and/or Pipeline Easement Standard Estate as opposed to the Temporary Work Area Non-Standard Easement. With respect to the Ecosystem Restoration Easement, the non-Federal sponsor has been in close coordination with MVN-RE and has submitted documentation to initiate the formal process of requesting a deviation from the requirement for fee acquisition and utilization of the Ecosystem Restoration Easement.

OASACW/HQUSACE Final Assessment: The Real Estate Plan included in Appendix C of the report, as revised, still includes a request for approval of an ecosystem restoration easement as a non-standard estate (see Exhibit C). Per Real Estate Policy Guidance Letter No. 31 (11 January 2019), a non-standard estate can no longer be approved solely by its inclusion in a feasibility report, as previously noted. The proposed non-standard estate is not within the scope of the District's approval authority; the request must be elevated to HQ Real Estate as early as possible for review and final determination. The request for a non-standard estate must include an acquisition strategy, a risk assessment, and demonstration of how the project purposes are met by the recommended estate.

A condition for implementation will be a revised Real Estate Plan with all appropriate estates and timeline of activities properly accounted for.

## **F. REAL ESTATE**

1. Estates: The Real Estate Plan (REP) included as part of the feasibility study does not seem to take into account Planning Policy Guidance Letter 44 which generally requires non-Federal sponsors (NFS) perform deep draft utility facility relocations and not rely on the federal navigation servitude. The REP appears to presume that the great majority of the pipelines will be relocated by the facility owner at their own expense and without expense to the NFS and that such removals will be affected by use of the federal navigation servitude. In addition, the REP equates the federal navigation servitude with public lands (see pages 3 and 10 of the Appendix C). The federal navigation servitude is a power, not a property right, and by policy the Corps of Engineers will generally not assert the servitude for a non-Federal sponsor on deep

draft projects, as Congress has clearly indicated that utility/facility owners for such projects shall not bear more than half the expense of such relocations. In addition, the REP recommends two estates, neither of which is standard, and seems to presume that inclusion of those estates in the final REP will result in approval of the estates. This is no longer the case--Real Estate Policy Guidance Letter 31, 11 January 2019. One of the two estates listed purports to be a standard estate--a temporary work area easement for 54 years with added rights to operate, maintain, repair and replace a pipeline. The deviations from the standard estate are not minor and the estate is in fact a non-approved non-standard estate. The estate may also not adequately protect the federal project for the life of the project and may not bar landowner activities that could jeopardize project benefits. Moreover, that particular estate lists the grantee as the United States of America, when in fact the grantee should be listed as the United States of America and/or the NFS. Consistent with this anomaly, on Page 8 of Appendix C, the Local Sponsor Assessment says that the NFS is doing the land acquisitions and relocations, but the schedule on the same page has New Orleans District doing those activities. The two proposed estates may well leave the landowners with so little value after their acquisition that the acquisitions would be tantamount to acquiring the fee and leave the landowners with uneconomic remnants, which by law, policy and regulation the NFS would have to offer to acquire (see particularly the Landowner Attitudes section of the REP which clearly indicates the remaining interests in the land may not be economic remnants). Note also that the Sponsor Capability Assessment says the NFS has quick take authority, but the REP says it does not. The NFS must have the ability to timely acquire the necessary rights for the project even if it itself does not have quick take authority. If the NFS does not have such authority and cannot get a co-sponsor who does have such rights, then it would be possible to request that the Federal Government perform condemnations on behalf of the non-Federal sponsor, but such a request would have to be made in accordance with ER 405-1-12, Chapter 12, and there can be no assurance that such a request would be approved--the time to make any such request is when it is determined that the NFS neither has nor can partner with a NFS who has quick take authority.

Basis for the Concern: Public Law 91-646. Planning Policy Guidance Letter 44 and Real Estate Policy Guidance Letter 31. The concern is that as written the REP and the planning documents do not appear to identify or properly cost the necessary rights and estates for the project that the NFS must acquire.

Significance of the Concern: High. The current REP does not adequately or fully document what rights and lands must be acquired by the NFS and what the anticipated costs will be.

Recommendation: Take into account RE PGL 31 and Planning Guidance Letter 44 and do not rely on the federal navigation servitude to require pipeline removals on this deep draft project. Given this basis, redraft the REP and the cost estimates to reflect the necessary interests for the project. If non-standard estates are required, they must be separately requested by the established processes for doing so, and cannot be

approved below the HQ USACE level. The Director of Real Estate has approval authority for nonstandard estates. Finally, any proposed estates of less than fee must leave the landowner with sufficient rights and privileges that the residue is an economic unit and not an uneconomic remnant.

Port Response: The non-federal interest needs further consultation with USACE.

OASACW/HQUSACE Assessment: In progress, not yet resolved. Further coordination with the port took place in an in person meeting 14 May 2019. As no response was provided to the original comment, the original comment stands. However, given that the NED plan and the final depths of the recommended plan are currently in flux, note particularly that the non-Federal sponsor's payment responsibilities for the utility relocations will vary as provided in 33 U.S.C. 2211(a)(4) and explained in PGL 44. It is imperative that each pipeline to be relocated (or removed or modified) be separately identified and that the depth of the recommended channel in that area be specified. For "deep-draft utility relocations" required for authorized depths of greater than 45 feet, the non-Federal sponsor must bear at least 50 percent of the cost of relocation. For depths less than 45 feet, whether the non-Federal sponsor owes compensation to the utility owner is determined by principles of just compensation under state law and the terms of any non-Federal permits, licenses, or rights-of-way instruments for the utility, which may alter otherwise applicable statutory or common law payment responsibilities. As provided in paragraph 7 of PGL 44, exercise of the Federal navigation servitude is within the discretion of the Government and may only be exercised to compel relocations of utilities when responsibility for relocation costs, as between the non-Federal sponsor and the utility owner, is clear under state law and the terms of any applicable non-Federal permits, and when the non-Federal sponsor lacks the legal capability to require owners to relocate. Exercise of the Federal navigation servitude is further subject to the additional conditions and requirements set forth in paragraph 7 of PGL 44. See also Legal Comments 3, 6 and 7 and Plan Formulation Comment 1.

Port Response: See Response to Legal Comment No. 7 above. Under La.R.S. 19:141, et seq., the non-Federal sponsor has the authority to acquire fee title and/or servitudes/easements prior to judgment (ie. "Quick Take Authority"). Any statement inconsistent with this provision throughout the REP or report will be revised accordingly. The non-Federal sponsor is well aware that the Federal Navigation Servitude cannot be utilized to compel utility relocations except in limited circumstances and, at this time, does not anticipate that any of those circumstances exist for this project. Between Quick Take Authority and the non-Federal sponsor's exemplary working relationship with the oil and gas community and the owners of property needed for the project, the non-Federal sponsor is confident all property interests and relocations necessary will be amicably achieved within the parameters set by law, regulation and USACE guidance.

Given the non-Federal sponsor's decision to utilize the Utility and/or Pipeline Easement Standard Easement in lieu of the Temporary Work Easement initially

proposed, the issues raised with respect to the utilization of the Temporary Work Easement are moot.

Essentially all of the property covered by both the Utility and/or Pipeline Easement and Ecosystem Restoration Easement consists of coastal open water areas in the immediate vicinity of the Gulf of Mexico. The value of such lands is predominantly associated with the mineral exploration rights which will remain unaffected by this project. Contrary to the concern that the easements “may well leave the landowners with so little value after their acquisition,” the marsh creation associated with the project will arguably enhance the value of the property.

The non-Federal sponsor has been successfully completing large scale marsh creation projects for nearly two decades and negotiating with many of these property and utility owners for much longer. We are confident that we have appropriately identified the property rights necessary for the project and the value and means to acquire same.

OASACW/HQUSACE Final Assessment: In progress, not yet resolved. Regarding the nonstandard estate for the beneficial use of dredged material a non-standard estate can no longer be approved solely by its inclusion in a feasibility report (per Real Estate Policy Guidance Letter No. 31 (11 January 2019)), as previously noted in policy and legal compliance review team comments. The proposed non-standard estate is not within the scope of the District's approval authority; the request must be elevated to HQ Real Estate as early as possible for review and final determination. The request for a non-standard estate must include an acquisition strategy, a risk assessment, and demonstration of how the project purposes are met by the recommended estate. There are no notes to this requirement in the REP.

A condition for implementation will be a revised Real Estate Plan with all appropriate estates and timeline of activities properly accounted for.

2. Schedule: The REP schedule has condemnations, if needed, scheduled for the same time period as negotiations with landowners. Condemnation can only occur after actual, practical and realistic negotiations. This means this is a sequential activity, it cannot take place simultaneously with negotiation on any particular tract. The time necessary to process a condemnation is also of necessity affected by what court system will be used for the condemnations as well. In addition, the schedule as a whole seems very optimistic and certainly does not take into account the time needed to relocate pipelines.

Basis of the Concern: Public Law 91-646, the Uniform Relocation Assistance act requires that good faith negotiations occur for acquisition of lands associated with federal projects.

Significance of the Concern: High. The schedule as a whole seems very optimistic, but particularly the overlap of negotiations and condemnations is unrealistic and not attainable.

Recommendation: Reexamine the schedule with a view toward realistic attainment of the projected activities.

Port Response: Once mapping and appraisals are complete, allowing 8 months to negotiate acquisition is very conservative. Aside from the 2 landowners holding the least amount of acreage, the non-federal interest has a long history of real estate dealings with the major landowners. Within a month or two of negotiations, we'll know whether we're reaching an amicable acquisition. The process for filing quick-take proceedings, if necessary, and the vesting of property in accordance therewith, can be complete in 30-60 days. Table 3 of the REP will be edited to reflect that the 8 months for negotiations should be reduced to 5 months and the 6 months for condemnations to 3 months and have them occur sequentially.

OASACW/HQUSACE Assessment: Not yet resolved. The schedule still does not take into account the time necessary to effect pipeline removals, but only the time necessary in order to acquire the necessary real estate rights.

Port Response: The pipeline relocations are taken into account. They are scheduled to start in 2021 and take 451 days ending on May 30, 2022. Project dredging mobilization will start during pipeline relocations but not commence until completion of the pipeline relocations as shown in the engineering appendix annex 4-1.

OASACW/HQUSACE Final Assessment: While Table 3 of the Real Estate Plan shows condemnations, if necessary, taking 6 months, there is a note saying it runs concurrently with negotiations and closings. As noted previously, condemnations is a sequential activity, it cannot take place simultaneously with negotiation on any particular tract.

A condition for implementation will be a revised Real Estate Plan with all appropriate estates and timeline of activities properly accounted for.

3. Disposal Material: The REP and the feasibility report package appear to assume that beneficial use of dredged material is the least cost environmentally acceptable alternative. Basis of the Concern: By policy and ER 405-1-12, Chapter 12, dredged material is to be disposed on fee lands except in limited exceptions which do not apply here. Beneficial use of dredged material, if the least cost environmentally acceptable alternative is appropriate. There is no validation that that is in fact the case here.

Significance of the Concern: High. Costs may be overstated and a more economical alternative that is environmentally acceptable may be available.

Recommendation to Resolve the Concern: Run an economic analysis to compare the costs of disposal alternatives. Select the least cost environmentally acceptable alternative and edit the REP to reflect this.3.

Port Response: See Response to Legal, Question 3. Dredge Material Management Plan

OASACW/HQUSACE Assessment: Not yet resolved. See Plan Formulation 1 and Legal 3 comments, responses and assessments.

Port Response: Please see responses to Plan Formulation 1 and Legal 3.

OASACW/HQUSACE Assessment: Comment not resolved. Echoing assessments from Plan Formulation 1 and Legal 3, as stated in the HQUSACE Assessment for Plan Formulation Comment #1, this response still does not address the various points brought up in the original comment and follow-up assessment. Does the Port intend to pursue/justify a cost-shared benefit use of dredged material plan?

GLPC comment. The tentatively selected plan incorporates the least cost disposal. Entrance channel material will be used in the continuation of the current federal O&M practice of nourishing submerged feeder berms along the littoral drift zone on both sides of the entrance channel. Material dredged from Belle Pass and Bayou Lafourche will continue to be used in nourishing submerging saline wetland and creating new ones. This constitutes the NED plan.

OASACW/HQUSACE Final Assessment: **Comment resolved** with implementation of response.

## **G. ENGINEERING AND CONSTRUCTION**

1. Channel Depth Distance from Port: From a review of an NOAA navigation chart of the area, it appears the proposed deepened 50-foot channel ends in 30-foot deep waters. It appears the existing 41 mile channel would need to be extended approximately 5 additional miles to reach 50-foot plus depths. It is unclear if this extension is part of the project and project costs.

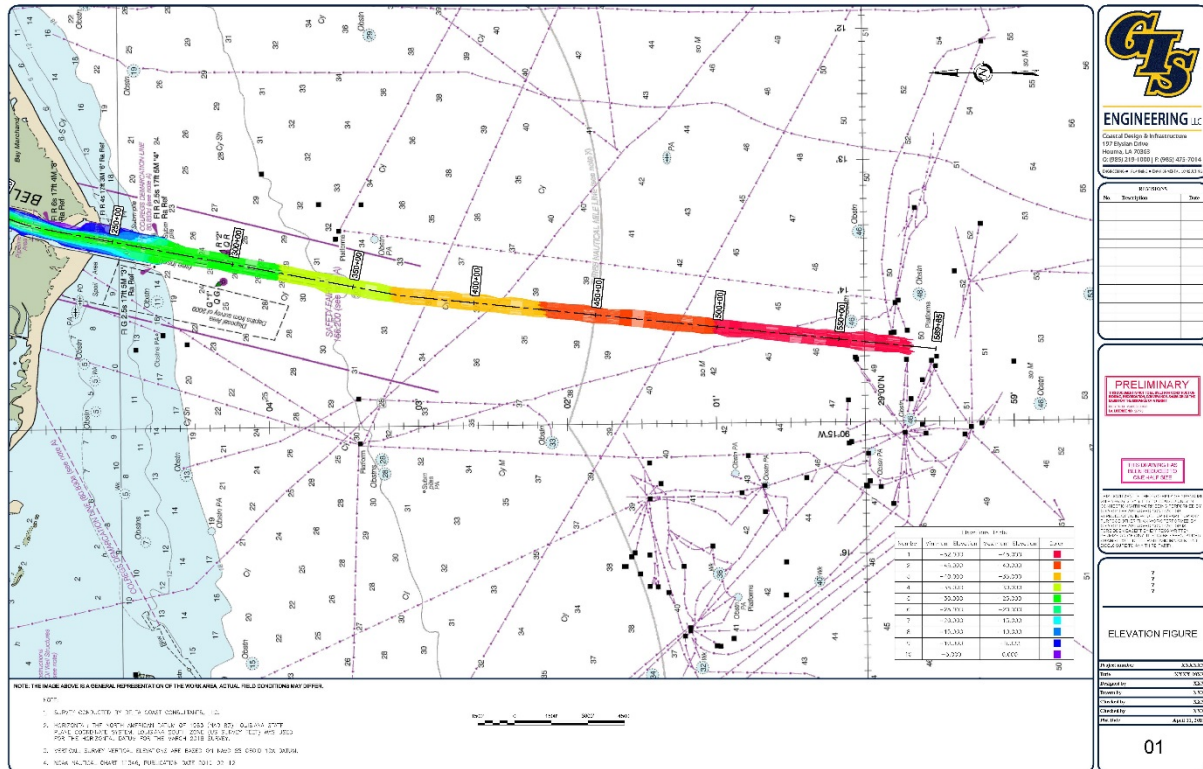
Basis of concern: Project costs may not be adequately reflected

Significance of concern. High as it relates to project justification

Recommendation to resolve concern: Provide hydro surveys and or navigation chart surveys which denotes where the 50 foot depth in the Gulf is located and how additional depth will be achieved.

Port Response: See attached Figure which shows the project alignment overlain on the most recent NOAA Navigation Chart published 2-12-2019 and also contains the bathymetric survey performed on May 2018 which clearly shows the project extends

to the -50 foot depth/contour. Also see Cross Sections in Annex 5 of the Engineering Appendix prepared using the bathymetric survey performed on May 2018 for existing channel elevation, surface information and channel section data used for dredge material computations.



OASACW/HQUSACE Assessment: Please ensure the submitted material is incorporated in the final report in the applicable location. **Comment resolved.**

2. Channel Quantities: The estimated dredge material quantities appear to be over stated. The report doesn't adequately discuss the quantities by depth for the various alternatives nor the proposed over-dredge depth. Allowable Over-Depth should be documented to verify quantities are correctly calculated.

Basis of concern: Verification of Cost analysis for estimated quantities. EM 110-2-1613 is the design manual for deep draft navigation.

Significance of concern. Medium

Recommendation to resolve concern. Provide proposed over dredging depths and estimated quantities per incremental level for dredge material to verify calculations of cost estimate.

Port Response: As stated in Section 10.5 of the Engineering Appendix, paid allowable over depth dredging is a construction design method for dredging that occurs outside



the required authorized dimensions and advance maintenance to compensate for conditions and inaccuracies in the dredging process. Allowable overdepth can vary from 1 ft. to 2 ft. and is permitted to allow for inaccuracies of the dredging process and is widely accepted but is not a requirement.

For the purposes of this evaluation there will be no allowance for over depth dredging on the basis of “still water” dredging with high precision within the upper Port channel. No allowance for over depth will be evaluated at the lower Port channel due to assumed sheltered waterway and soft sediment with accurate dredging equipment. Dredging contracts will contain stipulations that no over depth will be paid and overdepth dredging will be considered an incidental non-paid quantity.

OASACW/HQUSACE Assessment: Due to the Port’s desire for beneficial use of the dredge material, over depth of the channel will have an impact on created marshes and other uses of the material, which could have real estate and project footprint requirements. While the USACE agrees that the cost of over depth dredging will not be an issue, the beneficial uses being proposed of the material will be an issue. Please estimate an over dredging material amount to be used for the beneficial uses sections of the project so that this can be accounted for in the final project costs for real estate and ecological components of the project.

Port Response: The dredged material quantities have been calculated and provided in the feasibility report. Other than the quantities allocated for creating underwater surf zone feeder berms, the remaining quantities are allocated for marsh creation regardless of whether it is classified as over depth &/or advance maintenance.

OASACW/HQUSACE Final Assessment: Beneficial Use of this material and the quantities of material associated with this material is still an issue. Cost sharing for over depth dredging for beneficial use is also a concern. Quantities need to be broken down for the 6 foot of deepening, per section. Over dredge of material for beneficial uses also need to be separated so decision makers can determine what can cost shared, dependent upon if it is determined that beneficial use of the material will be allowed for this project.

Additional analysis and cost refinement will be needed in PED to ensure the dredge material aspects of the project are policy compliant.

3. Channel Clearances: The report doesn’t adequately discuss vessel fleet forecast. By identifying vessel type for the project and typical vessel loading, calculations for channel depth and under-keel clearances which agree with minimum stakeholder need and US Coast Guard standards can be completed.

Basis of concern: Verification of Cost analysis for estimated quantities. EM 110-2-1613 is the design manual for deep draft navigation.

Significance of concern. Medium

Action needed to resolve concern. The document should address vessel information to adequately justify project depths, quantities, and cost estimates.

Port Response: The evaluation of the Extension Channel dimensions required identifying the operating characteristics of the vessels using the Channel. Design vessels were chosen, as outlined in the Economics Analysis, based on the ships historically calling on and projected to call on Port Fourchon, as described in Section 11 of the Engineering Appendix. Vessels used for the basis of design are shown below in Table 11-1 from the Engineering Appendix.

Table 11-1: Selected Design Vessels

TYPE	VESSEL NAME	OWNER
OSV/PSV Design Vessel	Normand Installer	Solstad Offshore
Semisubmersible Drilling Rig	Ocean Monarch	Diamond Drilling
Drill Ship (2) <sup>1</sup>	Discoverer Enterprise	TransOcean
	Deepwater Frontier	TransOcean
LNGC Vessel-Phase I <sup>2</sup>		Energy World
LNGC Vessel Phase II-1 <sup>2</sup>		Energy World
LNGC Vessel - Phase II-2 <sup>2</sup>		Energy World

1. Two distinct vessel types are listed.

2. Energy World LNG Facility design vessel information provided by the GLPC.

The USACE Engineering Manual 1110-2-1613 “Hydraulic Design of Deep Draft Navigation Channels,” was used to determine required channel dimensions based on the design vessels in Table 11-1 and is detailed in Section 11 in the Engineering Appendix. Design vessel widths are shown in Table 11-4 of the Engineering Appendix. Design vessel required drafts are listed in Table 11-8 of the Engineering Appendix and shown below.

Table 11-8: Selected Design Vessel Req'd Drafts

TYPE	VESSEL NAME	OWNER	TRANSIT DRAFT (ft.)	REQ'D CHANNEL DEPTH FOR UNDERKEEL CLEARANCE (ft.)
OSV/PSV Design Vessel	Normand Installer	Solstad Offshore	-27	-30
Semisubmersible Drilling Rig	Ocean Monarch	Diamond Drilling	-41	-50
Drill Ship (2) <sup>1</sup>	Discoverer Enterprise	TransOcean	-42	-50
	Deepwater Frontier	TransOcean	-42	-50
LNGC Vessel-Phase I <sup>2</sup>		Energy World	-24 to -27	-30
LNGC Vessel Phase II-1 <sup>2</sup>		Energy World	-35	-44
LNGC Vessel - Phase II-2 <sup>2</sup>		Energy World	-44	-50

1. Of the larger drill ships, two distinct vessel types are listed.
2. Energy World LNG Facility design vessel information provided by the Port

Required channel depths were determined using EM 1110-2-1613. See Figure 11-3 from the Engineering Appendix which shows the channel depth allowances based on transit draft and required underkeel clearance.

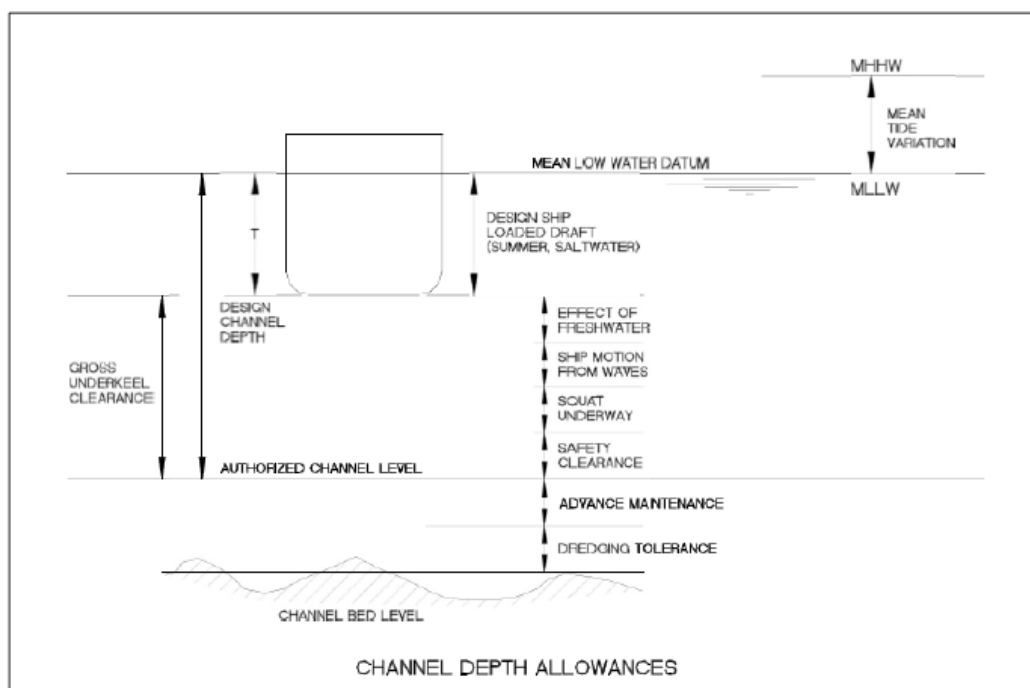


Figure 11-3: Channel Depth Allowances (EM 1110-2-1613's Fig. 6-17)

Gross underkeel clearance is the minimum clearance available between the deepest point on the vessel and the required authorized channel level and ranges from 3 ft. to

9 ft. which includes effects of freshwater, motion from waves, squat underway, and safety clearance. Required authorized depths for each reach were determined from the required transit depths and gross underkeel clearances required for each design vessel and is summarized in Table 11-8 of the Engineering Appendix.

The table below expands Table 11-8 and contains the vessel dimensions and required underkeel clearances required for the existing and projected vessel traffic based on EM 1110-2-1613 and vessel operator requirements at Port Fourchon. These vessel drafts and underkeel requirements were used as the basis for determining the required channel depths as summarized in the table below.

TYPE	VESSEL NAME	OWNER	LOA (ft)	BREADTH (ft)	TRANSIT DRAFT (ft)	UNDERKEEL CLEARANCE (ft) <sup>4</sup>	REQ'D DEPTH (ft)	TRIPS PER WEEK
PORT FLEET								
OSV/PSV Design Vessel	Normand Installer	Solstad Offshore	406	92	-27	3	-30	Daily
Semisubmersible Drilling Rig	Ocean Monarch	Diamond Drilling	340	333	-41	9	-50	3-4 trips per year
Drill Ship (2) <sup>1</sup>	Discoverer Enterprise	TransOcean	835	125	-42	8	-50	3-4 trips per year
	Deepwater Frontier	TransOcean	726	138	-42	8	-50	3-4 trips per year
ENERGY WORLD FLEET								
LNGC Vessel-Phase I <sup>3</sup>		Energy World	656	98	-24 to -27	3	-30	2
LNGC Vessel Phase II-1 <sup>3</sup>		Energy World	820	115	-35	9	-44	2
LNGC Vessel - Phase II-2 <sup>3</sup>		Energy World	984	164	-44	6	-50	1

#### Notes

1. Of the larger drill ships, two distinct vessel types are listed.
2. Page 8-4 of EM 1110-2-1613, 31 May 06 For one-way ship traffic, values vary from 2.0 to 6.0 or even 7.0 times the design ship beam
3. Energy World LNG Facility design vessel information provided by the Port
4. Req'd Underkeel: OSV - 3FT, Semisubmersible Drilling Rigs and Drill Ships 6-9 ft

For Bayou Lafourche (Sta. 0+00 to 130+00) and the existing Inner Port (Slips A, B, C, Flotation Canal), OSV/PSV are the design vessels used as the basis of design and the require an authorized channel depth of -30ft MLLW to meet the minimum underkeel clearance requirements.

For Belle Pass (Sta. 130+00 to 220+00), the turning basin/slip and the Entrance Channel (Sta. 220+00 to 589+93) , the remaining fleet required a draft of -41 to -44 feet with 6 ft. to 9ft. of underkeel clearance, therefore requiring an authorized channel depths of -50 ft. MLLW.

OASACW/HQUSACE Assessment: USACE does not concur with response. The typical analysis for deep draft ports reference a class or type of ship that would be frequently using the port in the future. The reference material above shows actual ships that denote a 41 to 42 foot draft. Of those ships, the Deepwater Frontier was noted as “retired” by the owner, the Ocean Monarch, was noted as working out of the Australia area, with only the Discoverer Enterprise assigned to the Gulf region. This does not meet the justification for going to a 50 foot depth on the channel. Further analysis of the Diamond Drilling and TransOcean fleets working in the Gulf region indicate numerous vessels that have a 27 to 32 foot transit draft. There are a few vessels from those fleets that have a 39 to 42 foot draft, but due the very limited number of those types of vessels, they are not likely to provide enough justification to go to the 50 foot channel being requested by the applicant. Unless further justification is provided by the applicant to justify a future class/fleet vessel depth of a significant number of vessels working in the Gulf region to USACE (must show a definitive trend of the Gulf fleet that will be going to several deep draft vessels of the 39-42 draft capacity), USACE will not recommend the 50 foot channel depth plan to the ASA office. USACE encourages the applicant to work with the navigation center in Mobile Alabama, and Mr. Todd Nettles (251-694-3841) to provide the appropriate vessel classification documentation/justification for the project that meets USACE policy and guidance.

Port Response: Table for design vessels revised to reflect classes and types of ships and not specific ships, see below. Specific ships previously mentioned were used as representatives for the classes and type and not intended to imply that those actual vessels were the design basis. Although the Deepwater Frontier was noted as “retired” by the owner, there are other vessels included in the world fleet requiring the 39 to 42 foot draft and future vessels that are projected to call on Port Fourchon. In addition, Energy World will use 220KM3 vessels which will require drafts of 46’.

Design Vessel	Volumetric Capacity Range (cu m)	Volumetric Capacity Average (cu m)	Dwt Range	Dwt Average	Loa (Ft)	Beam (Ft)	Transit Draft (Ft)	Underkeel Clearance (Ft) <sup>3,4</sup>	Req'd Depth (Ft)
<b>Port Fleet</b>									
Offshore Vessels (OSV) & Platform Supply Vessels (PSV)	-	-	-	9,511	406	92	27	3	30
Semisubmersible Drilling Rig	-	-	-	-	340	333	41	9	50
Drill Ship <sup>1</sup>	-	-	-	69,500	835	125	42	8	50
Drill Ship <sup>1</sup>	-	-	-	73,675	726	138	42	8	50
<b>LNG Fleet</b>									
LNG Tanker <sup>2</sup>	125,000 - 170,000	139,651	65,000 - 100,000	76,641	942	148	38	7	45
LNG Tanker <sup>2</sup>	170,000 - 260,000	204,660	95,000 - 155,000	119,961	1027	163	43	7	50

#### Notes

1. Of the larger drill ships, two distinct vessel types are listed.

2. Vessel Information based on Worldwide LNG fleet as of March 2018.

3. Req'd Underkeel: OSV - 3FT, Semisubmersible Drilling Rigs and Drill Ships 6-9 ft.

4. As documented by the USACE in the Sabine-Neches Waterway in Texas in the USACE Fact Sheet as of February 21, 2012, LNG vessels require 5-7 feet of underkeel clearance.

Further, USACE will only recommend a 5 foot under keel clearance depth for the deep draft deepening project (2 foot for Coast Guard, 2 foot for safety and 1 foot for fresh water for a total of 5 foot of under keel clearance depth). Given the majority of the existing vessel fleet is operating around the 27 to 32 draft depth, the applicant must provide a cost/design analysis at a 37 foot channel depth in the revised report, as there seems to be enough justification to go to that depth. That justification (fleet vessels of the 27 to 32 draft vessel types) will need to be submitted in the revised report.

Port Response: The USACE documented in the USACE Fact Sheet for the in the Sabine-Neches Waterway in Texas in February 21,2012 that LNG vessels require 5-7 feet of underkeel clearance. See quotation from the USACE Fact sheet below:

“The Sabine Neches Waterway supports a large percentage of the Nation's petrochemical industry and has two Liquefied Natural Gas (LNG) facilities which require underkeel clearances ranging from 5-7 feet. Unlike other vessels, these LNG vessels cannot be lightered therefore if required underkeel clearances are not maintained; the vessels cannot enter the waterway.”

We do not agree with the USACE's recommendation of only using the minimum recommended in the document.

In addition, in interviews with rig operators, the rig operators report that they require a minimum of 8 feet underkeel.

Additionally, as an editorial comment to the ASA office on this project, USACE will note the location of the Port on the Gulf in regards to tropical storm activity, and the vulnerability of the infrastructure and channel/navigational port impacts to those tropical storms. By further concentrating the oil/gas vessel fleets and the associated service industry to this location, when the port does get impacted from significant tropical storms, the national economic impact to oil/gas/natural gas prices will be further impacted as far as scale and duration.

Port Response: Port Fourchon currently services over 90% of the Gulf of Mexico's deepwater oil production. Impacts will be no different than what the Port currently faces yearly.

OASACW/HQUSACE Assessment: The submitted material doesn't support a proposed channel depth of 50 feet per USACE policy and regulations. A design vessel report with supporting documentation that follows USACE policy and regulations is still needed. At this time, the USACE recommends to the ASACW that the applicant submit a design vessel report that follows all USACE policy and regulations to support the proposed channel depth in order for the project to receive further consideration for conditional approval.

GLPC comment. New generation offshore vessels require three or more feet of underkeel clearance (UKC). This amount of UKC is necessary because these vessels have sophisticated under keel suction systems for engine cooling water. Additionally, operators do not want to scrape bottom because OSVs have expensive thrusters and dynamic positioning (DP) systems that allow them to remain stable in strong seas, which can be damaged by even soft bottom sediments.

OASACW/HQUSACE Final Assessment: Based upon the revised and proposed dredging depth of -30 feet (additional 6 feet), the **above documentation will suffice.**

4. Datum: The report generally states depths are “below the water-line.” The elevation datum used, such as NVD ‘88, Mean Lower Low Water, should be stated.

Basis of concern: Using standardized datum is critical in identifying over depth requirements and verification of quantities

Significance of concern. Medium

Action needed to resolve concern. Report should be updated to reflect datum information.

Port Response: CONCUR, Report contains datum information. Please provide location of inconsistent datum statement and report will be revised to provide consistency.

OASACW/HQUSACE Assessment: For instance, in Section A-2 of the report, elevations and depths are indicated with no indication of datum. Please ensure that report and appendices are properly documented with the appropriate datum to which the information was received in, and if necessary, adjustments made to that data so that the reader understands that the data was received in this datum, and appropriate adjustments were made (if required) to get the analysis completed in one referenced datum elevation. Comment resolved pending back check of final report.

Port Response: Concur. Edits will be made.

OASACW/HQUSACE Final Assessment: **Comment resolved.**

## **H. COMMENTS ON ADDENDUM**

### **1. Categorical Exclusion**

Concern: Categorical exclusion section in chapter 10 section 10.3 was removed in the addendum. The current recommendation is a plan without considering plans to go deeper (30ft+). The rationale for not looking at other plans appears reasonable however this rationale would likely be the substantive material for a categorical exclusion from considering other depths.

Basis of Concern: Categorical exclusion establishes the potential for other depths to be evaluated in the future.

Recommendation: Provide a section describing the categorical exclusion. Future decision documents should address this concern.

### **2. Authorization and Cost Share**

Concern: U.S. Coast Guard (USCG) costs of \$173,095 are included in the total project costs for authorization.



Basis of the Concern: The \$173,095 USCG cost for relocation of navigation aides are considered an associated costs. Our authorization and appropriation does not cover the USCG expense of \$173,095.

Significance: Low for no impact on plan selection

Recommendation: The USCG costs should be removed from the total number being requested for authorization in Table ES-1 and similar tables throughout the report. These costs should be itemized in the supporting recommendation paragraphs as associated costs that USCG will need to incur. Recommend making this change for the authorization document. Future decision documents should scrub the cost estimate to address this concern.

### 3. Agency Technical Review and Model Certification

Concern: It is unclear whether the economic analysis was reviewed, whether Harborsym was used and unclear whether the fleet forecast for OSVs is reasonable.

Basis of the Concern: Economic calculations and assumptions are the basis for the determination on whether the plan is “feasible” per guidance.

Significance: medium

Recommendation: Perform ATR and model certification on the primary components of the economic analysis. Recommend this action for follow-up in a post authorization phase.