US Army Corps
of Engineers ®
Galveston District

General Conformity Determination for Houston Ship Channel Expansion Channel Improvement Project

Harris, Chambers, and Galveston Counties, Texas

Prepared for:

U.S. Army Corps of Engineers, Galveston District

Provided by:

The Port of Houston Authority

Prepared by:

Starcrest Consulting Group, LLC and the Joint Venture of Turner Collie & Braden Inc. and Gahagan & Bryant Associates, Inc.

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Table of Contents

1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Galveston District and the Non-Federal Sponsor (NFS), Port Houston, are proposing to implement the Recommended Plan (RP) to address reducing transportation costs while providing for safe, reliable navigation on the Houston Ship Channel (HSC) system. The RP resulted from the HSC Expansion Channel Improvement Project (HSC ECIP), a 4-year federal navigation megastudy conducted to address navigation problems and opportunities. The RP is a Federally-proposed action to dredge portions of the HSC to wider and deeper dimensions to address limitations in the existing channel that result in navigation restrictions and delays with the current and future forecasted vessel traffic and commodity movement. In accordance with the General Conformity (GC) regulations promulgated under the Clean Air Act in 40 CFR Part 93 Subpart B, Determining Conformity of Federal Actions to State or Federal Implementation Plans (EPA 2010a), this Draft General Conformity Determination (GCD) has been prepared to analyze and document the GC-related air emissions that will result from the RP and document that these emissions conform to the latest U.S. Environmental Protection Agency (EPA) approved State Implementation Plan (SIP) applicable to the Houston/Galveston/Brazoria (HGB) ozone non-attainment area (NAA).

1.1 Project Background

The HSC consists of a 50-mile, 45-foot deep, 530-foot wide channel through Galveston Bay, and upstream of Galveston Bay narrowing down and becoming shallower through segments that are 400 feet and 300 feet wide and from 45 feet down to 36 feet deep. The HSC system includes the side channels, Bayport Ship Channel (BSC) and Barbours Cut Channel (BCC). Additionally, 250-foot wide barge lanes are currently maintained on the both sides of the HSC to separate the faster, deep-draft ship traffic from the slower, shallow-draft barge traffic. At each of these major components of the system, there are a variety of navigation features such as bend easings and turning basins to allow vessels to turn into channels and turn around. The last system-wide study of the HSC was completed in 1995, with the resulting project, the Houston and Galveston Navigation Channels (HGNC) Project being constructed primarily from 2000 to 2005. The study was completed almost 25 years ago, and initiated years prior to that at a time when major container terminals and vessel traffic had just started in the system (at Barbours Cut) and before the largest planned terminal (Bayport) was planned or built. The study was also complete before the continued and most recent exponential growth in crude and refined product shipping from Houston. Since then, industry trends in both containerized and bulk liquid or gas cargo have seen a shift to substantially larger vessels. This includes trends towards larger container vessels that have essentially doubled and tripled in capacity, growing from mean a new-build size of 3,000 Twenty-Foot Equivalent Units (TEU) to between a mean of 6,000 and 9,000 TEU, and largest sizes of upwards of 18,000 TEU. Locally, the HSC is beginning to experience vessel calls in the 10,000 TEU and higher class. Also, shifts in crude and refined product tanker size in the HSC is increasingly shifting from Panamax to larger Aframax and Suezmax vessel classes. These vessels come with a variety of transit restrictions related to vessel size and channel dimension due to vessel pilot rules designed to safely guide vessels. Additionally, the upper reaches of the HSC have -37.5 feet Mean Low Lower Water (MLLW) and -41.5 feet MLLW depths that are less than the maximum depth the main HSC provides, limiting vessel draft in these reaches. The HSC ECIP study addresses the delays, draft restrictions and other problems and opportunities related to navigation identified during the study, with an RP planned to address them.

1.2 Project Description, Purpose, and Need

The RP consists of dredging to widen the HSC through the Bay and through a limited segment above Morgans Point in the upper channel, deepen the draft-restricted upper channel, widen the BSC and BCC, and improve or construct new turning features throughout the system. The project also includes dredged material placement areas (PA) and beneficial use (BU) sites to manage material dredged for the project. During the feasibility study process, the various project alternatives formulated were evaluated and two were selected for advancement to detailed evaluation. One was the National Economic Development (NED) Plan, the plan that the USACE has identified as the plan that reasonably maximizes NED benefits consistent with protecting the Nation's environment. The other was the one that the NFS prefers, termed the Locally Preferred Plan (LPP). The LPP was selected as the plan recommended for implementation, and is therefore the RP. The NED Plan is a variant of the RP that omits widening of the HSC in the Bay from Redfish Reef northward to Morgans Point, and requires bend easing and further easing of the Bayport Flare at the confluence of the HSC with the BSC. Because the NED Plan is a smaller variant that omits two major widening segments, it requires fewer cubic yards of dredging, and fewer emissions, to construct. Therefore, the LPP represents the largest that emissions could be from the HSC ECIP project. Both plans are presented to the Assistant Secretary of the Army for Civil Works [ASA(CW)] for review and approval of the LPP as the RP. The LPP and NED Plan are illustrated in **Figure 1-1**. The following summarizes the channel improvement features of the LPP (which again, is the RP):

- Widen the HSC to 700 feet through Galveston Bay from Bolivar Roads near the Entrance Channel to the BCC, and provide bend easings at four bends along the channel. The NED Plan limits the widening to the lower section of the Bay from Bolivar Roads to Redfish Reef. The widening would include shifting the current shallow draft barge lanes outward of the widened channel.
- Widen the HSC from Boggy Bayou to Greens Bayou from it current 300 to 400-foot width to 530 feet.
- Widen the BSC and BCC to 455 ft wide, and construct a combination turning basin and bend easing at the BCC. The NED Plan requires further widening of the Bayport Flare.
- Deepen the HSC from Boggy Bayou to Hunting Bayou to -46.5 ft MLLW, and from Sims Bayou to the Main Turning Basin to -41.5 ft MLLW
- Expand and shift the Brady Island Turning Basin in the upper HSC to a larger diameter.
- Construct a shoaling attenuation feature, which is a groin or jetty-like structure to be modeled and designed during preconstruction engineering and design (PED) to address excessive shoaling occurring in the Bayport Flare.

The RP would be constructed using hydraulic and mechanical dredges supported by various tender, boat, barges and scows. As discussed, the RP includes dredged material PAs and BU sites that would be constructed using the material or used to place the material. At the time of channel construction, material would be pumped by pipeline or transported by scow to upland or aquatic PA and BU sites to raise or build containment dikes, and fill the interior of sites. A variety of onshore equipment such as graders, excavators and dozers would be used to grade, shape and ditch the sites and dikes to build the features or dewater the material. Integral to the Dredged Material Placement Plan (DMMP) planned for the RP, are a variety of BU sites that will use the dredge material to construct ecological restoration features such as tidal marsh and bird islands that have been coordinated with Federal and State resource agencies. To manage the new work dredged material generated from constructing the RP, the following existing and new PAs and BU sites are proposed to be used to accept the material. These are illustrated in **Figure 1-2** through **Figure 1-6** described from the Gulf of Mexico to landward:

- Use of the existing Offshore Dredged Material Disposal Site (ODMDS) No. 1.
- Use new work material to construct the base of oyster reef mitigation pads in lower and mid Galveston Bay.
- Construct the following BU sites: two new 6 and 8-acre bird islands in the lower Bay and a new 3-bird island/tidal marsh in the middle part of the Bay. Construct a new marsh cell M12 and an unconstructed, previously authorized marsh cell M11 in the upper part of the Bay.
- Use material to repair and rehabilitate dikes at existing marsh cell M7/8/9.
- In the upper HSC, raise dikes and fill in the existing Filterbed and Glendale PAs, construct and fill a new, one-time upland PA E2 Clinton on PHA property, and beneficially use material to raise the grade of PHA property for future terminal development at BW8.

Once the RP and the above placement features are constructed, the channel would be maintained periodically through maintenance dredging over the next 50 years using the existing PAs and some of the sites created with the project material. The purpose of HSC ECIP study is to evaluate Federal interest in alternative plans (including the No-Action Plan) for reducing transportation costs while providing for safe, reliable navigation on the HSC system. Economic conditions have changed significantly since the last HSC study for both the container and bulk industry. An increase in throughput tonnage and a significant shift in average fleet size render current channel dimensions incapable of accommodating the forecasted commodity and fleet growth without significant and system-wide inefficiencies. The study evaluates and recommends measures that address current and expected inefficiencies. The needs for this project are to address problems and opportunities identified during the study including the following problems:

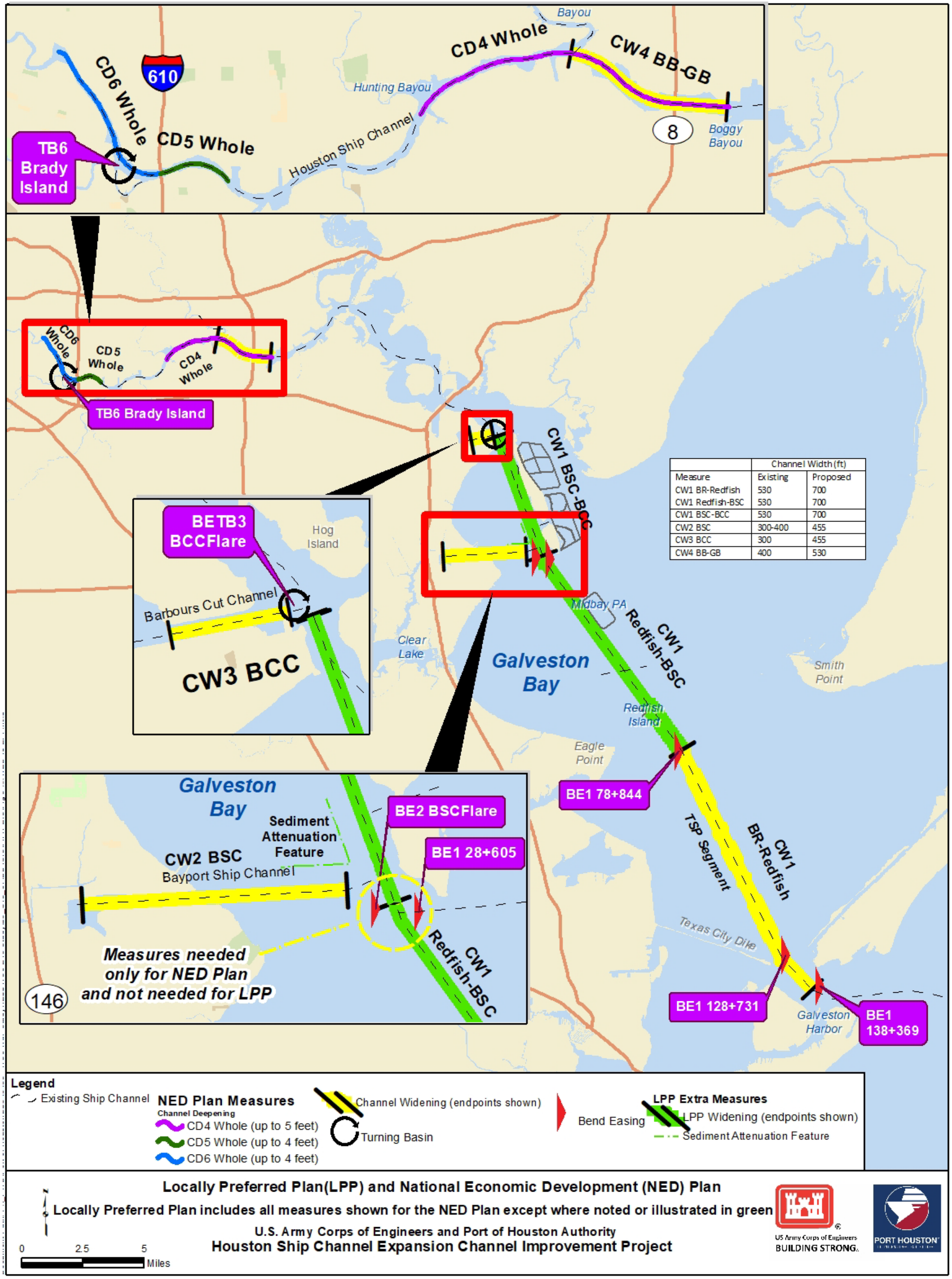
- Inefficient deep and shallow-draft vessel utilization of the HSC system resulting from existing channel depth, width, and configuration;
- Navigation safety concerns for deep and shallow-draft vessel traffic; and
- A lack of environmentally acceptable dredged material placement (PA/BU) with capacity to service the system

The following opportunities were identified:

- Reduce transportation cost of forecasted commodity volume at HSC;
- Eliminate or reduce navigation inefficiencies at HSC for existing and forecasted fleet (i.e., reduce delay times, interport movements, and transit times);
- Eliminate or reduce beam, length, and draft restrictions at HSC for forecasted fleet;

- Optimize channel configuration/design in a cost effective and environmentally acceptable manner that improves safety;
- Establish environmentally suitable PAs/BU sites for new work dredged material, as well as maintenance-dredged material;
- Reduce the environmental impacts from a new project, or protect or improve environmentally sensitive areas in the vicinity of the Federal project through BU of dredge materials; and
- Study the configuration of barge lanes and further optimize them.

The study evaluated a wide variety of widening, deepening, turning, and anchoring measures to address the problems and opportunities. Economic analysis was performed using vessel traffic and transit cost modeling. Engineering analysis was performed to establish proper channel design through ship simulation, hydrodynamic modeling, calculation of dredging and placement quantities, and estimation of construction costs. Environmental evaluation was performed including National Environmental Policy Act (NEPA) analysis and documentation, oyster reef and wetland surveys, and other impact analysis. The cost and benefit analysis identified the plans that produced the most net benefits while meeting the other objectives of the study that addressed the aforementioned problems and opportunities. The plans were evaluated following the planning procedures in USACE planning regulations for Civil Works projects. A Final Integrated Feasibility Report and Environmental Impact Statement (FIFR-EIS) has been developed as the decision document to coordinate the RP for approval and provide NEPA documentation. The RP is the project resulting from the study proposed for implementation to address those problems and opportunities.



	Channel Width (ft)	
Measure	Existing	Proposed
CW1 BR-Redfish	530	700
CW1 Redfish-BSC	530	700
CW1 BSC-BCC	530	700
CW2 BSC	300-400	455
CW3 BCC	300	455
CW4 BB-GB	400	530

Figure 1-1: The Proposed LPP and NED Plan

Figure 1-2: Proposed New Work Placement of the LPP and NED Plan

Figure 1-3: Lower Bay – Proposed New Work Placement of the LPP and NED Plan

Figure 1-4: Oyster Mitigation – Proposed New Work Placement of the LPP and NED Plan

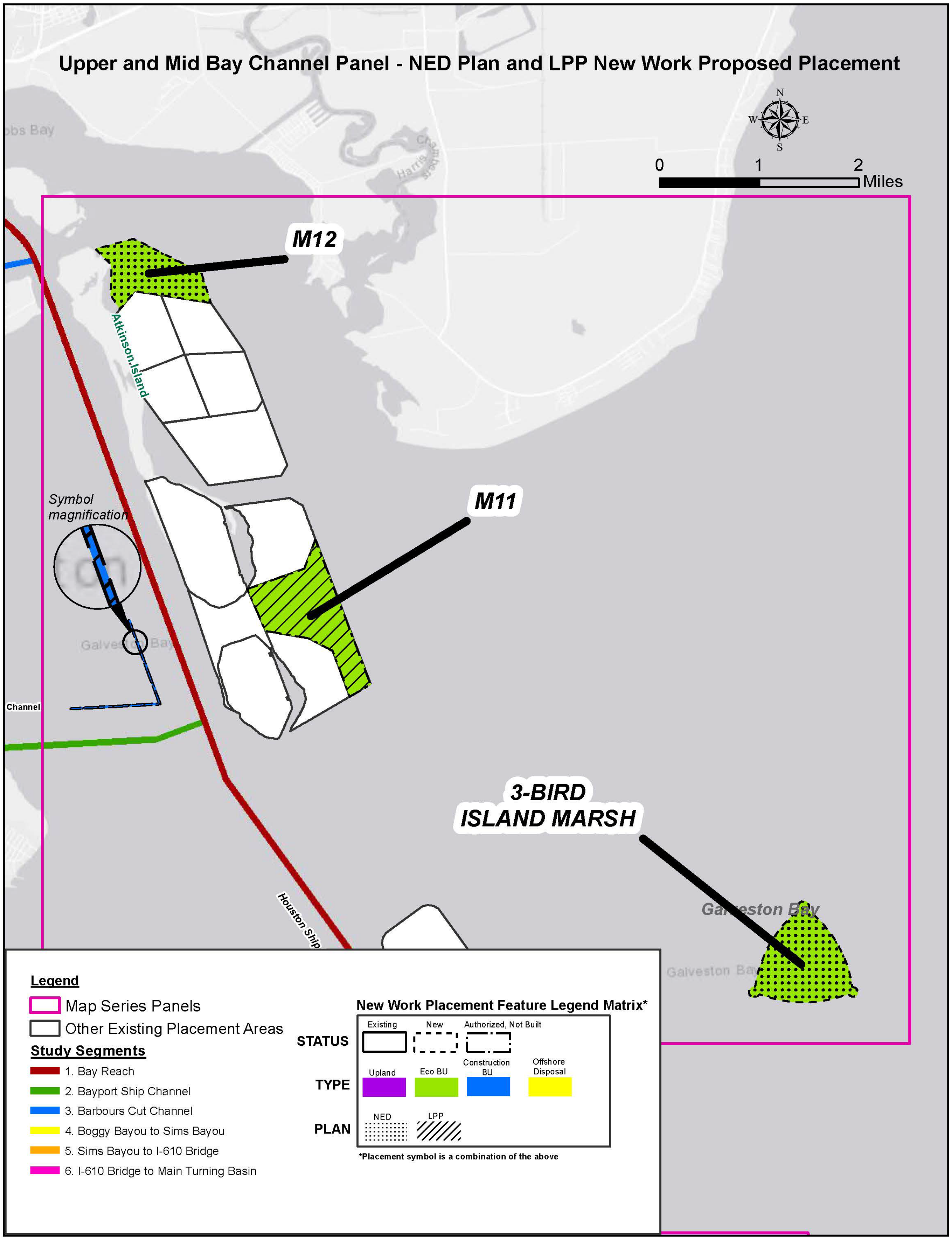


Figure 1-5: Upper and Mid Bay – Proposed New Work Placement of the LPP and NED Plan

Figure 1-6: Upper HSC – Proposed New Work Placement of the LPP and NED Plan

1.3 Regulatory Background

General Conformity is a Federal regulatory program designed to ensure that actions taken by Federal entities, such as projects proposed by the USACE, do not hinder states' efforts to meet the national ambient air quality standards (NAAQS). The definition of a Federal action as specified in 40 CFR 93.152 includes "…any activity engaged in by a department, agency, or instrumentality of the Federal government, or any activity that a department, agency or instrumentality of the Federal government supports in any way, provides financial assistance for, licenses, permits, or approves, other than activities related to transportation plans, programs, and projects developed, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601et seq.)"

With regard to a dredging project such as the Proposed Project, the Federal Action consists of a Federal project being funded and implemented by the USACE, which is subject to General Conformity review. Placement of dredged material is part of the proposed Federal Action, and is subject to General Conformity. Maintenance dredging is not subject to General Conformity review.

The EPA has established a series of steps to determine whether a given Federal Action is subject to General Conformity review as follows (EPA 2010b).

1. Whether the action will occur in a nonattainment or maintenance area (see **Table 1-1** below for the attainment status of the project area);
2. Whether one or more of the specific exemptions apply to the action;
3. Whether the federal agency has included the action on its list of "presumed to conform" actions;
4. Whether the total direct and indirect emissions are below or above the *de minimis* levels (see **Table 1-2** below for the *de minimis* levels); and/or
5. Where the facility has an emission budget approved by the state as part of the SIP, the federal agency determines if the emissions from the proposed action are within the budget.

Regarding the proposed Federal action to implement the RP,

1. The action will be occurring in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area, which is designated as serious nonattainment for the 2008 ozone standard and marginal nonattainment of the 2015 ozone standard;
2. None of the specific exemptions apply to the action, except to the extent that any of the dredging to be carried out is maintenance dredging, which is specifically exempt;
3. The USACE has not included dredging projects on a list of "presumed to conform" actions;
4. Total direct and indirect emissions, as currently estimated, will exceed the *de minimis* level of 100 tons of oxides of nitrogen (NO_x) in a marginal nonattainment area (NAA) and 50 tons of NO_x in a serious NAA. (see **Table 2-2**, **Table 2-3**, **Table 2-5**, and **Table 2-6**in Section 2 for estimated project related emissions); and

5. The USACE does not possess an emissions budget approved as part of the HGB area SIP.

Based on the discussion presented above and the emissions presented below in Section 2, a General Conformity determination is required for NO_x emissions from the RP. Since the action is required to demonstrate conformity, one or more of the following conditions must be met (EPA 2010b).

1. Demonstrating that the total direct and indirect emissions are specifically identified and accounted for in the applicable SIP;
2. Obtaining a written statement from the state documenting that the total direct and indirect emissions from the action, along with all other emissions in the area, will not exceed the SIP emission budget;
3. Obtaining a written commitment from the state to revise the SIP to include the emissions from the action;
4. Obtaining a statement from the metropolitan planning organization (MPO) for the area documenting that any on-road motor vehicle emissions are included in the current regional emission analysis for the area's transportation plan or transportation improvement program;
5. Fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant or precursor in the same nonattainment or maintenance area.

A sixth potential demonstration method, conducting air quality modeling that demonstrates that the emissions will not cause or contribute to new violations of the standards, or increase the frequency or severity of any existing violations of the standards, is not available for the RP, because modeling is not acceptable for ozone nonattainment areas due to the complexity of ozone formation from precursor pollutants and the limitations of current air quality models. Of the options detailed above, the USACE elected to utilize the second option, obtaining concurrence from the Texas Commission on Environmental Quality (TCEQ) that the total direct and indirect NO_x emissions from the action will not exceed the applicable SIP emissions budget, because of the low level of emissions compared with the SIP budget, and the temporary nature of the emissions.

Table 1-1: Attainment Status of Houston-Galveston-Brazoria Area

Pollutant	Primary NAAQS	Averaging Period	Designation	Counties	Attainment Deadline
Ozone (O_3)*	0.070 ppm (2015 standard)	8-hour	Marginal Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Montgomery	August 3, 2021
	0.075 ppm (2008 standard)	8-hour	Serious Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller	July 20, 2021
Lead (Pb)	0.15 µg/m^3 (2008 standard)	Rolling 3-Month Average	Unclassifiable/ Attainment		
Carbon Monoxide (CO)	9 ppm	8-hour	Unclassifiable/ Attainment		
	35 ppm	1-hour	Unclassifiable/ Attainment		
Nitrogen Dioxide (NO_2)	0.053 ppm	Annual	Unclassifiable/ Attainment		
	100 ppb	1-hour	Unclassifiable/ Attainment		
Particulate Matter (PM_{10})	150 µg/m^3	24-hour	Unclassifiable/ Attainment		
Particulate Matter ($PM_{2.5}$)	12.0 µg/m^3(2012 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	15.0 µg/m^3(1997 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	35 µg/m^3	24-hour	Unclassifiable/ Attainment		
Sulfur Dioxide (SO_2)	0.03 ppm**	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	0.14 ppm**	24-hour	Unclassifiable/ Attainment		
	75 ppb	1-hour	Attainment/ Unclassifiable		

Table 1-2: Significant Action Thresholds in Nonattainment Areas

Ambient Pollutant	Nonattainment Status	Tons/yr
Ozone (VOCs or NO_x):		
	Serious NAA's	**50**
	Severe NAA's	25
	Extreme NAA's	10
	Other ozone NAA's outside an ozone transport region	100
	Other ozone NAA's inside an ozone transport region	
	VOC	50
	NO_x	100
Carbon monoxide:	All NAA's	100
SO_2 or NO_2	All NAA's	100
PM–10:		
	Moderate NAA's	100
	Serious NAA's	70
PM–2.5:		
	Direct emissions	100
	SO_2	100
	NO_x (unless determined not to be a significant precursor)	100
	VOC or ammonia (if determined to be significant precursors)	100
Pb:	All NAA's	25

Source of table: 40 CFR §93.153 Applicability. (Amended to include PM2.5)

The HGB nonattainment status is now classified as serious as a result of the 2008 Eight-Hour Ozone Standard Designations. This designation brings the tons-per-year down to 50 for all Ozone emissions. This change which took effect September 23, 2019 has been reflected in this report. The attainment date for serious nonattainment areas is July 20, 2021 with a 2020 attainment year.

2 PROJECT CONSTRUCTION EMISSIONS

Project construction emissions of NO_x and VOCs have been estimated because of the Project area's status as an ozone nonattainment area. The emission estimates are based on equipment and activity estimates provided by the project engineers and emission factors and other information from published sources, including the PHA's most recent air emissions inventory, *2013 Goods Movement Air Emissions Inventory* (Eastern Research Group, 2017). Use of the Goods Movement Emissions Inventory (GMEI) as a source of emission factors and other emissions-related information ensures that the emission estimates presented in this conformity determination are consistent with the PHA's port-wide inventory of air emissions.

Schedule and equipment information for the LPP has been provided by the Joint Venture of Turner Collie and Braden, Inc. and Gahagan and Bryant Associates, Inc. based on project design parameters for the plan. Information includes:

- Equipment type (dredge, barge, tug, dozer, etc.)
- Engine type (main, auxiliary, etc.)
- Engine horsepower and load factor (% of full load)
- Hours of operation for each vessel or piece of equipment

The following sections describe the different categories of emitting equipment that would be used to construct the LPP.

2.1 Dredging Equipment and Supporting Vessel Emissions

Emission sources on the dredge itself consist of diesel-fueled engines that provide power for the various operations required for dredging. The dredge is expected to be a cutter suction dredge equipped with a main engine to provide power to the cutterhead, an engine to power the ladder pump used to transport the dredged material from the substrate to the surface, an engine to move and position the ladder that guides and positions the cutterhead, and an auxiliary engine to produce electricity for power needs on the dredge. The dredging operation will also require various support vessels such as positioning tugs, crew boats, and survey boats.

The project engineers provided estimated characteristics of the diesel engines on board the dredge such as total horsepower, operating hours, and average operating loads. They also provided typical characteristics of the support vessels, including total installed horsepower and operating hours. Emission factors for all of these diesel engines were obtained from the "harbor craft" section of the GMEI, which lists emission factors for marine engines of various sizes and emission tier levels.

2.2 Dredged Material Placement Site Work

Once the dredged material has been placed in the placement area it will be moved and compacted by non-road equipment such as dozers and loaders. The project engineers provided typical horsepower, operating hours, and load factors for this type of equipment. Emission factors were based on the emission certification levels of Tier 1 non-road equipment. Dredged material placement and handling will account for a relatively small percentage (approximately 8%) of overall project construction NO_x emissions and approximately 18% of VOC emissions.

2.3 Employee Vehicle Commuting

Employee vehicle commuting will make up a very small part of overall project construction emissions, and will represent a negligible percentage of SIP emissions. As an example, the latest EPA approved SIP documentation includes on-road emissions based on 169,918,016 miles per weekday (TCEQ 2016).[1] A 100-person work force making an average 50-mile round trip commute would drive 5,000 miles per day, or 0.003% of the on-road basis of the current SIP.

2.4 Emissions Calculations and Results

Emission estimates for each engine have been based on horsepower hours (hp hrs), calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative (i.e., to be relatively high so as to calculate reasonably worst-case emission levels). Emission factors for marine engines (propulsion and auxiliary engines on dredges, tugs, work boats, etc.) are from Port Houston's most recent (2013) air emissions inventory and reflect average emissions from these engines in 2013. Emission factors for nonroad engines are based on the Tier 1 emission standards stratified by horsepower. The Tier 1 standards have been applicable since the late 1990s (year depending on horsepower) and so reflect the oldest equipment likely to be in use when the project elements take place and likely overestimate the age of equipment that will actually be used, consequently overestimating prospective emissions.

The emission factors used in calculating these emissions are presented in **Table 2-1**. As noted above, the emission factors are based on Tier 1 standards, which likely overestimate the emissions that would actually occur because of the introduction of Tier 2 and Tier 3 engines into the equipment that may be used on the project. While NO_x and VOC emissions have been calculated for demonstration of General Conformity related emissions, other criteria pollutants have been included for completeness. The anticipated schedule of work was used to allocate emissions to each of the project years. **Table 2-2** presents a summary of emissions by year for the LPP.

[1] *HGB 2008 Eight-Hour Ozone RFP SIP Revision* Adopted by TCEQ 15 December 2016 and approved by EPA on 13 February 2019. See: https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/Adoption/16017SIP_HGBRFP_Ado.pdf Accessed 11 July 2019

Table 2-1: Emission Factors Used for Nonroad and Marine Engines

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 1 nonroad						
(11 ≤ hp < 25)	7.1	0.60	0.58	0.004	1.0	4.9
(25 ≤ hp < 50)	7.1	0.60	0.58	0.004	1.0	4.1
(50 ≤ hp < 100)	6.9	0.60	0.58	0.004	1.0	8.5
100 ≤ hp < 175	6.9	0.60	0.58	0.004	1.0	8.5
175 ≤ hp < 300	6.9	0.40	0.39	0.004	1.0	8.5
300 ≤ hp < 600	6.9	0.40	0.39	0.004	1.0	8.5
600 ≤ hp < 750	6.9	0.40	0.39	0.004	1.0	8.5
>750	6.9	0.40	0.39	0.004	1.0	8.5
Marine Cat 1 & Cat 3						
Dredging	9.3	0.23	0.22	0.004	0.1	1.80
Miscellaneous	9.1	0.23	0.22	0.004	0.1	1.78
Tug	8.7	0.23	0.22	0.004	0.1	1.74

Table 2-2: Estimated Tier 1 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	850	32	31	0.47	49	470
Year 2	**2024**	1,330	54	52	0.77	93	870
Year 3	**2025**	565	22	21	0.32	35	337
Year 4	**2026**	535	22	21	0.30	36	340
Year 5	**2027**	243	11	10	0.14	19	177
Year 6	**2028**	129	6	5	0.08	10	94
Total		**3,652**	**146**	**141**	**2.08**	**243**	**2,288**

The results indicate that NOx emissions will be above the lowest *de minimis* threshold of 50 TPY in all 6 years for the LPP. Therefore, a formal determination of conformity would be required.

Tier 2 emissions standards for the various categories of marine engines became effective in different years dependent on the size category of the engine, with Category 2 becoming effective as late as 2007, and Category 3 in 2011. Dredge main engines displacement and horsepower typically fall into either Category 2 or 3. With more than a decade since initial effective dates, Tier 2 dredges are becoming a more common part of the national large dredge fleet. Also, Tier 2 standards for nonroad equipment, although a minor part of emissions in this project, were effective in the 2003 to 2006 range. Therefore, to provide a range of emission estimation that might be more reflective of equipment ultimately used, emissions have also been estimated for the use of Tier 2 engines rather than the Tier 1-based estimates presented above. While it is not possible to predict the actual equipment that will be brought to the project by contractors who have yet to be selected, it is more likely that equipment will be Tier 2 or newer based on when the standards were implemented. Tier 3 dredges are newer and fewer in number than Tier 2 in the domestic fleet with only a few spread amongst approximately 3 companies (some are under construction). Tier 3 push or tow boats, although expected to be a smaller percentage of the available fleet, are present in the regional fleet. To analyze the benefit to further reducing construction emissions, Tier 3-associated emissions were also estimated.

The 2013 Goods Movement Air Emissions Inventory does not include Tier 2 or 3 emission factors. Therefore, the marine factors were selected from another recent emissions inventory released by a Texas port, the 2013 Air Emissions Inventory for Port Corpus Christi, July 2015 (Port of Corpus Christi Authority 2013). Nonroad Tier 2 emission factors were based on the Tier 2 emission standards since more precise modeling would require detailed model year and other engine information that is not available. The Tier 2 emission factors used in calculating these emissions are presented in **Table 2-3** below. **Table 2-4** presents the results for the LPP using Tier 2 emission factors. The Tier 3 emission factors used in calculating these emissions are presented in **Table 2-5** below. **Table 2-6** presents the results for the LPP using Tier 3 emission factors.

Table 2-3: Tier 2 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 2 nonroad						
$(11 \leq hp < 25)$	5.6	0.60	0.58	0.005	1.0	4.9
$(25 \leq hp < 50)$	5.6	0.45	0.44	0.005	1.0	4.1
$(50 \leq hp < 100)$	5.6	0.30	0.29	0.005	1.0	3.7
>750	4.9	0.22	0.21	0.005	1.0	3.7
$100 \leq hp < 175$	4.9	0.15	0.15	0.005	1.0	2.6
$175 \leq hp < 300$	4.8	0.15	0.15	0.005	1.0	2.6
$300 \leq hp < 600$	4.8	0.15	0.15	0.005	1.0	2.6
$600 \leq hp < 750$	4.8	0.15	0.15	0.005	1.0	2.6
Cat 1 and Cat 2 Tier 2						
Dredge main	6.9	0.37	0.36	0.004	0.1	1.8
Dredge aux	5.2	0.15	0.14	0.004	0.1	1.8
Tug main	6.1	0.37	0.36	0.004	0.1	1.8
Tug aux	5.2	0.15	0.14	0.004	0.1	1.8
Miscellaneous	5.2	0.15	0.14	0.004	0.1	1.8

Table 2-4: Estimated Tier 2 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	583	28	27	0.47	49	228
Year 2	**2024**	915	41	40	0.77	93	378
Year 3	**2025**	393	18	17	0.32	35	155
Year 4	**2026**	372	16	16	0.30	36	151
Year 5	**2027**	167	7	7	0.14	19	72

Year 6	**2028**	88	4	4	0.08	10	39
Total		**2,517**	**113**	**111**	**2.08**	**243**	**1,023**

Table 2-5: Tier 3 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**VOC**	**CO**
Tier 3 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.22	0.21	0.005	1.0	3.7
175 ≤ hp < 300	4.9	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
>750	4.8	0.15	0.15	0.005	1.0	2.6
Marine						
Cat 1 and Cat 2 Tier 2						
Main - large dredge	6.2	0.20	0.19	0.004	0.1	3.7
Main - small dredge	5.0	0.08	0.08	0.004	0.1	3.7
Dredge auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Main - large tug	5.0	0.08	0.08	0.004	0.1	3.7
Main - small tug	4.0	0.08	0.08	0.004	0.1	3.7
Tug auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Miscellaneous	4.0	0.08	0.08	0.004	0.1	3.7

Table 2-6: Estimated Tier 3 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**VOC**	**CO**
Year 1	**2023**	429	11	11	0.42	47	307
Year 2	**2024**	747	21	21	0.73	92	511
Year 3	**2025**	331	10	10	0.31	35	226
Year 4	**2026**	320	10	9	0.30	36	218
Year 5	**2027**	139	4	4	0.14	19	98
Year 6	**2028**	74	2	2	0.08	10	53
Total		**2,039**	**58**	**58**	**1.99**	**241**	**1,413**

The Tier 2 NO_x results indicate a reduction of approximately 30 percent for the LPP, a substantial reduction. The Tier 3 NO_x results indicate a further reduction of 18 percent from Tier 2 in the highest emission year. Though these results are substantially reduced, they still exceed the *de minimis* threshold of 50 TPY in 4 of the 5 years. Therefore, a formal determination of conformity would still be required for either plan.

Most of the emissions are from the marine category, of which dredge engines dominate. Due to the increased demand for larger-scale dredging resulting from supplemental Federal funding, and the progression of several deepening and widening projects for major channels to funding and construction, demand for new dredging capacity has resulted in a $1.5 billion dredging fleet expansion (Navingo Maritime and Offshore Media Group 2019). Several of the major dredging firms have new large cutterhead dredges planned for delivery in the next 2 years to meet industry capacity needs, including Manson, Weeks, Callan and Great Lakes Dredging and Dock (Navingo Maritime and Offshore Media Group 2019, Gerhardt 2018). Therefore, there will be an increase in dredges that meet emissions standards higher than Tier 2, and it is possible that equipment used for the proposed project could be higher tier equipment, which would further reduce the actual emissions. However, the limited population and availability of higher tier equipment may limit cost-feasible bidding for project implementation.

3 LONG-TERM EMISSIONS IMPACTS OF THE PROPOSED PROJECT

As discussed in Section 1.2, the LPP addresses multiple navigation problems and opportunities related to transportation delays, inefficiencies, and the related costs. Addressing these directly decreases the time and fuel spent transporting the commodities shipped through the HSC system, and by extension, the associated emissions from Ocean Going Vessels (OGV). The reduction of transportation costs by the measures formulated for both plans is achieved in two primary ways. One way is by reducing transportation delays in the form of slower or delayed navigation, and waiting at docks and anchorages due to navigation restrictions. Another way is to reduce inefficient delivery of cargo imposed by draft restrictions by deepening the channel to alleviate light loading of vessels. In support of the NEPA documentation of project effects, analysis was conducted to estimate the projected air pollutant emissions reductions from OGVs resulting from implementation of the LPP. The analysis and results are summarized in this section, and are described in detail in Section 3.1.8.2 of Appendix G, Environmental Supporting Document of the FIFR-EIS, and Attachment 1 to Appendix G, Houston Ship Channel Expansion Channel Improvement Project Projected Emissions Reductions.

As part of the economic analysis required for the feasibility study, detailed estimates of projected future commodities, vessel fleets, vessel movement, and associated transportation costs are conducted by navigation economists to analyze whether proposed plans are economically justified. Harborsym, the USACE's certified economic analysis computer simulation model developed by the Institute for Water Resources (IWR), is used to aid the analysis. According to the model's user manual, Harborsym is based on the creation of discrete event Monte Carlo simulations that mimic movement of vessels through a harbor (USACE IWR 2012). The model uses these event simulations along with user-defined statistical inputs to generate trips and calculate vessel transit time, loading and unloading time at docks, and docking and undocking time. A model of the harbor network that physically and statistically represents the navigation conditions of the harbor and its channels is developed as part of the analysis, and incorporates the vessel pilot rules that govern how different classes of vessels can move (one-way, two-way, loaded etc.) given the size, channel dimensions, and other navigation conditions. The model provides a detailed estimate of vessel calls (i.e. trips) and transit times by major vessel categories (i.e. tankers, containers, bulkers by different size classes) and can be used to quantify the extra or reduced time involved in transporting cargo by comparing with-project scenarios to without project conditions. An economic model for the HSC system, using Port of Houston-specific vessel fleets, current and future commodities throughput, and vessel pilot rules from the Houston Pilots Association, was developed for this study's economic analysis.

In order to maximize confidence in and utility of the emissions reduction analysis, the Harborsym output was used to support the operational air analysis. Due to the way specific channel improvements work to reduce transportation time, the reduced hours associated with certain groups of measures (e.g. channel widening, deepening) and study segments can be generally categorized as waiting (hours spent waiting at berth or anchorage) or steaming (under way using propulsion). These assumptions were used to employ the appropriate emissions factors and activity. The annual in-port reduction in these hours by vessel category and by study segment were used to estimate emissions reduced by the action alternatives. Besides in-port reductions, which would occur landward of the entrance buoy to the HSC, the proposed action alternatives would also reduce vessel transit hours and emissions seaward of the buoy in the shipping lanes of the Gulf of Mexico through the elimination of vessel trips. These reductions would take place mostly outside of the HGB NAA, but would still represent substantial emissions reductions in the North American Emissions Control Area (ECA), which encompasses the US Gulf of Mexico. In-port reductions would take place within the HGB NAA. The annual in-port reduction in hours for the Years 2029 and 2044 were used to provide a range of reduction reflecting the increasing reduction occurring as traffic increases in the future due to increased commodity demand.

To provide average vessel engine specifications for the different categories, main engine and auxiliary engine size data was obtained from world fleet vessel data from Information Handling Services (IHS) Fairplay Seaweb, a world vessel registry service. Emissions estimates were developed in accordance with EPA-standard methodologies used for port air emission inventories specified in the *Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories* (ICFI, 2009), including emissions factors for the criteria pollutants, and load factors for propulsion and auxiliary engines. Vessel speed necessary to define various estimate factors were obtained from the economic analysis information used to define vessel transit. One important condition reflected in the operational emissions reduction calculations was the difference in age and engine emissions standards of the OGVs between the larger, newer classes of vessels expected to call at the Port of Houston (POH) and the smaller, older class of vessels replaced. The main vessel category involved are Post-Panamax first (PPX1), second (PPX2) and third generation (PPX3) container vessels (aka New Panamax). The LPP would lift key restrictions that would enable PPX3 vessels that have a capacity in the 10,000 to 12,000 TEU range to call. This would enable a shift of the fleet calling at POH from being dominated by PPX1 (4,000-6,000 TEU) and PPX2 (6,000-10,000 TEU) to one dominated by PPX 2 and PPX3. The average build year of the PPX3 class (taken as PPX of 120 deadweight tons [DWT] or larger) according to the SeaWeb world fleet data is 2012 with most vessels in the 2013-2014 build year, and relatively few ships, comprising a small percentage of the world container vessel fleet. The PPX3 vessel class is relatively new with most of the future fleet of this class expected to have been built in the last few years or in future years to come. SeaWeb fleet data for those with PPX2 dimensions indicated an average build year of 2012, and an average build year of 2003 for PPX1.

Two key changes in marine emissions standards took place in 2010 that would result in reduced emissions for newer Category 3 engines. First, EPA passed regulations requiring new U.S. flagged or manufactured OGVs with Category 3 engines to meet Tier 2 standards by 2011 which would reduce NO_x from then-current standards by 15 to 25 percent. Thereafter, new engines would have to meet Tier 3 standards by 2016 which would reduce NO_x 80 percent from pre-2011 standards. Also, since 2015, all fuel produced and sold in a NAA for Category 3 engines must have fuel with sulfur content reduced to 1,000 ppm. Second, the United Nations International Maritime Organization (IMO) required all OGVs calling or traveling through the North American ECA to meet fuel and emissions standards similar to the EPA standards discussed above. Starting in 2012, fuel sulfur content was to be reduced to 10,000 ppm, and then to 1,000 ppm in 2015, and in 2016, new engines must use NO_x or other ozone precursor exhaust after-treatment systems, to achieve reduced emissions equivalent to the EPA Tier 3 standard. Future year IMO ECA adjustments in the 2009 EPA port inventory guidance were applied to the emissions factors commensurate with the future 2029 project year. Although smaller PPX1 vessels may be built in the future, the fleet age average of 2003 indicates this will be a small, niche market, as the general trend towards the larger classes will predominate, and PPX1 age in the future would likely remain older, with engines meeting lower tier standards. Therefore, the difference in emissions standards between the older

PPX1 and the shift to newer PPX2 and PPX3 vessels, was accounted for by adjusting the PPX3 vessels to reflect Tier 3 emissions standards.

Table 3-1 shows a summary of the projected in-port emissions reductions from OGVs in tons per year (tpy) for the LPP. Emissions are estimated based on vessel hourly reductions projected for the years 2029 and 2044, and pollutants of concern for this analysis include criteria pollutants nitrogen dioxide (NO_x), particulate matter 10 micrometers or less in diameter (PM_{10}), PM 2.5 micrometers or less in diameter ($PM_{2.5}$), hydrocarbon (HC) which is analogous to VOC, carbon monoxide (CO), sulfur oxides (SO_x) and greenhouse gas pollutant carbon dioxide (CO_2). Note that since these values represent reductions in emissions, higher values indicate greater reductions. For each year analyzed, calculations demonstrate a significant reduction in emissions associated with the LPP for all pollutants.

Table 3-1: Summary of In-Port Operational Emissions Reductions by the LPP

Emissions Reductions (tpy)							
Year	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**HC**	**CO**	**SO_x**	**CO_2**
2029	147.2	15.61	14.24	3.35	7.74	17.98	29,274
2044	334.4	31.61	28.84	6.90	16.03	36.53	59,474

The results show that the LPP, which provides full widening through the bay, and reduces the most transit delays, reduces in-port NOx emissions by greater than the *de minimis* threshold (50 TPY) throughout the project operational timespan. The annual LPP NO_x emissions reductions were interpolated between 2029 and 2044, and cumulative reductions calculated, then compared to the total conformity emissions for the LPP as shown in **Table 3-2**. From 2044 and forward, the underlying economic analysis assumes a steady state of commodity growth and transport, which results in the constant annual reduction from that point forward. The cumulative reduction surpasses the Tier 1 construction total of 3,652 tons presented in **Table 2-3** in 2043, which means construction emissions would be offset by operational reductions in fourteen years after the project would be operational. The cumulative reduction surpasses the Tier 2 construction total of 2,517 tons presented in **Table 2-6** in 2044, eleven years after the project would be operational. The cumulative reduction surpasses the Tier 3 construction total of 2,145 tons presented in **Table 8** in 2037, ten years after the project would be operational. Once the shift to the larger, newer vessel fleet plateaus in 2040, it would take 10 years to reach a cumulative NOx reduction that surpasses the Tier 1 emissions, 7 years to surpass the Tier 2 emissions, and 6 years to surpass the Tier 3 emissions. The results of the analysis demonstrate the positive impacts to the long-term operational emissions that can be anticipated. The removal of inefficient vessel traffic patterns and loading, and the increase in efficiency brought on by the economies of scale allowed by the increased channel size contribute to the forecasted emissions decrease.

Table 3-2: Cumulative In-Port Operational NO_x Reduction of the LPP

Year	**NO_x Reduction (TPY)**	**Cumulative NO_x Reduction (tons)**
2029	147	

Year	NO_x Reduction (TPY)	Cumulative NO_x Reduction (tons)
2030	164	311
2031	181	493
2032	198	691
2033	215	906
2034	232	1,138
2035	249	1,388
2036	266	1,654
2037	283	1,937
2038	300	2,237
2039	317	2,555
2040	334	2,889
2041	334	3,224
2042	334	3,558
2043	334	3,892
2044	334	4,227
2045	334	4,561
2046	334	4,895
2047	334	5,230
2048	334	5,564
2049	334	5,899
2050	334	6,233
2051	334	6,567
2052	334	6,902
2053	334	7,236
2054	334	7,571
2055	334	7,905
2056	334	8,239
2057	334	8,574
2058	334	8,908
2059	334	9,242
2060	334	9,577
2061	334	9,911
2062	334	10,246
2063	334	10,580
2064	334	10,914
2065	334	11,249
2066	334	11,583
2067	334	11,917
2068	334	12,252

Year	NO_x Reduction (TPY)	Cumulative NO_x Reduction (tons)
2069	334	12,586
2070	334	12,921
2071	334	13,255
2072	334	13,589
2073	334	13,924
2074	334	14,258
2075	334	14,592
2076	334	14,927
2077	334	15,261
2078	334	15,596

4 GENERAL CONFORMITY EVALUATION AND PRELIMINARY DETERMINATION

As noted in Section 1 (Introduction) and illustrated in **Table 2-2**, **Table 2-3**, **Table 2-5**, and **Table 2-6**, only emissions of NO_x exceed the applicable General Conformity threshold. Therefore, this section addresses NO_x emissions with respect to General Conformity requirements. To demonstrate whether the RP (LPP) construction NO_x emissions can be accommodated in the HGB SIP emissions budgets, the most recent EPA-approved ozone SIP demonstration documents were reviewed for emissions inventory information. In consideration of the definition and conformity determination requirements for the most recent revisions to the SIP in 40 CFR §93.152 and §93.158(a)(5)(i)(A) respectively, the latest approved revision to the SIP is the *HGB 2008 Eight-Hour Ozone RFP SIP Revision*, approved by EPA on February 13, 2019 (TCEQ 2016).

This SIP RFP demonstration was reviewed to determine the various activity categories of emissions in which the RP's construction activities will fall. While the SIP evaluates NO_x emissions from all sources, including biogenic (non-human-caused) emission sources, this evaluation focuses on the categories most relevant to the RP construction emissions, specifically the Commercial Marine and Construction and Mining categories. Employee commuting emissions would be a negligible amount of project emissions, as explained in Section 2.3, and given the size of the mobile source budget, would be an even more negligible percentage of this budget.

The NO_x emissions budget for commercial marine vessels (CMV), which constitute most of the project emissions at more than 90%, was obtained from Appendix 1, Reasonable Further Progress Demonstration Spreadsheet, to the *HGB 2008 Eight-Hour Ozone RFP SIP Revision* [RFP SIP] (TCEQ 2016). **Table 4-1** below provides the uncontrolled and controlled CMV emissions inventory for the HGB NAA excerpted from Appendix 1 of the RFP SIP. The RFP SIP demonstration contained non-road mobile source category emissions, which encompasses various sub-categories of construction, mining, agricultural, and landscaping, but did not further break down emissions into the sub-categories. The RFP SIP demonstration separated oil and gas drilling rigs from this estimate into a separate estimate, and provided non-road mobile source emissions for 2017, but did not contain information for future year projections. The emissions estimated for uncontrolled (i.e. before required emissions standards and controls are applied) emissions, source reductions due to controls, and the resulting controlled emissions, are presented in **Table 4-2**.

Table 4-1: Statewide and HGB Area CMV Emissions, tpy

Analysis Year	NOX (tpd)		VOC (tpd)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
2011	68.95	61.61	1.59	1.59
2017	38.16	28.77	1.21	1.15

Table 4-2: HGB RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC (tons per day)

Emissions	NO_X	VOC
Uncontrolled emissions	210.26	123.21
RFP non-road source reduction	123.29	89.63
RFP controlled (post-control) emissions	86.97	33.58

The LPP marine vessel Tier 1 emissions are compared with the HGB CMV projections in **Table 4-3** below. Project emissions represent no more than 11.9% of CMV emissions in any one year and make up approximately 5% of CMV emissions on average over the project work period. The project non-road equipment consists of the landside dozers, loaders and other equipment used to conduct PA site work described in Section 2.2. As discussed in that section, these emissions are a relatively minor part of the project emissions. The LPP non-road category Tier 1 emissions are compared to the HGB non-road mobile source controlled emissions in **Table 4-4** below. Note, for presentation, these are shown as tons per day instead of tons per year. As shown, the project non-road source emissions represent no more than 0.26% of emissions and make up 0.1% to 0.2% of non-road emissions on average over the work period.

Table 4-3: CMV Tier 1 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	782	10,501	7.4%
2024	1,248	10,501	11.9%
2025	525	10,501	5.0%
2026	487	10,501	4.6%
2027	201	10,501	1.9%
2028	112	10,501	1.1%
All years	**3,355**	**63,006**	**5.3%**

Table 4-4: Non-Road Tier 1 Emissions (tons per day)

	LPP Landside Non-Road Emissions		SIP Controlled Non-Road Emissions for 2017		Project % of 2017 Non-Road emissions	
Year	NOx	VOC	NOx	VOC	NOx	VOC
2023	0.19	0.03	86.97	33.58	0.21%	0.08%
2024	0.22	0.03	86.97	33.58	0.26%	0.10%
2025	0.11	0.02	86.97	33.58	0.13%	0.05%
2026	0.13	0.02	86.97	33.58	0.15%	0.06%
2027	0.12	0.02	86.97	33.58	0.13%	0.05%
2028	0.05	0.01	86.97	33.58	0.05%	0.02%
All years	**0.81**	**0.12**	**521.82**	**201.48**	**0.2%**	**0.1%**

To provide comparison with the range of estimated emissions in Section 2, CMV emissions have also been compared between the LPP project based on the use of Tier 2 engines instead of the Tier 1 and the SIP emissions, in tons per year, is presented in **Table 4-4** below. Project emissions are reduced to no more than 8% of CMV emissions in any one year and make up 3.7% of CMV emissions on average over the project work period. Similarly, for non-road emissions, the Tier 2 LPP emissions are compared to SIP emissions, in tons per day in **Table 4-6**. Project NO_x emissions are slightly reduced percentage-wise to 0.1% of SIP non-road emissions.

Table 4-5: CMV Tier 2 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	535	10,501	5.1%
2024	856	10,501	8.2%
2025	364	10,501	3.5%
2026	337	10,501	3.2%
2027	137	10,501	1.3%
2028	76	10,501	0.7%
All years	**2,306**	**63,006**	**3.7%**

Table 4-6: Non-Road Tier 2 Emissions (tons per day)

	LPP Landside Non-Road Emissions(tons per day)		SIP Controlled Non-Road Emissions for 2017 (tons per day)		Project % of 2017 Non-Road emissions	
Year	NOx	VOC	NOx	VOC	NOx	VOC
2023	0.13	0.03	86.97	33.58	0.15%	0.08%
2024	0.16	0.03	86.97	33.58	0.18%	0.10%
2025	0.08	0.02	86.97	33.58	0.09%	0.05%
2026	0.09	0.02	86.97	33.58	0.11%	0.06%
2027	0.08	0.02	86.97	33.58	0.09%	0.05%
2028	0.03	0.01	86.97	33.58	0.04%	0.02%
All years	**0.57**	**0.12**	**521.82**	**201.48**	**0.1%**	**0.1%**

The Tier 3 emissions from **Table 4-7** were also compared to the CMV SIP budget. As shown, the maximum annual emissions are no more than 7.5% of the CMV budget, and average 3.2% of the CMV budget. Comparatively, the Tier 3 emissions comprise 0.7% less of the CMV SIP budget than the Tier 1 emissions.

Table 4-7 CMV Tier 3 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	458	10,501	4.6%

2024	752	10,501	7.5%
2025	320	10,501	3.2%
2026	298	10,501	3.0%
2027	120	10,501	1.3%
2028	66	10,501	0.7%
All years	**2,015**	**63,006**	**3.2%**

The USACE believes that on average, the LPP emissions constitute a small percentage of the applicable SIP budgets, and the reduction in ship channel operational emissions resulting from the project's navigation improvements would produce greater long-term emissions reduction, then the emissions from this project can clearly be accommodated in the HGB SIP emission budget. The USACE has preliminarily determined that the project construction emissions can conform to the applicable HGB SIP. Therefore, USACE seeks TCEQ's concurrence with this assertion.

5 DRAFT GCD COMMENTS AND RESPONSES

The USACE will submit this Draft GCD, and issue a public notice announcing the availability of the Draft GCD for the RP for a 30-day comment period. The public notice and Draft GCD will be posted on the USACE website. Availability of the public notice and Draft GCD will be communicated to TCEQ, EPA Region 6, and the Houston-Galveston Area Council (H-GAC), which is the MPO for the HGB NAA. The Notice of Availability will be published in the Houston Chronicle and posted on the USACE website.

5.1 TCEQ, EPA, and MPO Comments

Comments and recommendations received from the TCEQ, EPA Regiona 6 and MPO, and responses to them, will be summarized in this section, once received.

5.2 Individual and Organized Groups Comments

Comments received from the public and organizations, and responses to them, will be summarized in this section, once received.

6 FINAL GENERAL CONFORMITY DETERMINATION

PENDING COMPLETION

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