



May 29, 2019

**Mr. Paul Ramsey
Engineering Manager
Oiltanking North America
333 Clay Street, Ste. 2400
Houston, TX 77002**

Via email: paul.ramsey@oiltanking.com

**RE: Wetland Functional Assessment
Project Alpha
Texas City, Galveston County, Texas**

Mr. Ramsey,

Spirit Environmental, LLC ("Spirit") was contracted by Oiltanking North America ("Oiltanking") to complete an Interim-Hydrogeomorphic Model ("iHGM") Wetland Functional Assessment on the wetlands previously delineated by Spirit for Project Alpha ("project site") in Texas City, Galveston County, Texas. Spirit conducted a wetland delineation on the project site in March 2019, which has not been verified by the United States Army Corps of Engineers ("USACE"). The delineation report details that the approximately 6.82-acre project site consists of 0.27 acres of freshwater emergent ("PEM") wetlands, 1.61 acres of estuarine emergent ("EEM") wetlands subject to regulation under Section 404 of the Clean Water Act ("CWA"), 1.77 acres of EEM wetlands subject to regulation under Section 10 of the Rivers and Harbors Act ("RHA"), and 2.49 acres of Section 10 tidal waters.

In order to evaluate the functions and values currently exhibited by the wetlands proposed to be dredged and/or filled by Project Alpha, Spirit was contracted to complete the iHGM assessment. This analysis will serve to determine the amount of credits required to replace the ecosystem functions and values that are anticipated to be lost due to construction of the proposed project. The Galveston District of the USACE utilizes iHGM as the approved district-wide methodology for evaluating project impacts and compensatory mitigation.

The proposed project will avoid impacts to PEM wetlands; therefore, this analysis utilizes the tidal fringe iHGM for proposed impacts to EEM wetlands.

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This model was used for a rapid estimate of the ecological value of tidal fringe wetlands onsite. The iHGM model was run for all proposed impacts to on-site wetlands that are likely jurisdictional to the USACE under Section 404 of the CWA and Section 10 of the RHA.

TIDAL FRINGE iHGM

METHODS

The Tidal Fringe iHGM model consists of four (4) functional criteria: (1) Biota, (2) Botanical, (3) Physical, and (4) Chemical. Each functional criteria utilizes its own equation to determine the ecological function and value of the wetland. The Tidal Fringe iHGM model utilizes the following variables and formulas:

- V_{edge} – The amount of marsh-water (in meters or hectares),
- V_{hydro} – Site hydroperiod or degree of hydrological modifications,
- V_{nhc} – Number of nekton habitat types present within 150 feet of the edge of the WAA,
- $V_{typical}$ – Proportion of the site that is covered by vegetation typical of the regional subclass,
- V_{slope} – Distance to water greater than or equal to six (6) feet deep,
- V_{width} – Average marsh width,
- V_{rough} – Manning's roughness coefficient, and
- V_{soil} – Predominant soil texture.

Biota Formula

$$\left[\frac{(V_{edge} + 2 V_{hydro} + 0.5V_{nhc}/3.5) + (V_{typical})}{2} \right]$$

Botanical Formula

$$V_{typical}$$

Physical Formula

$$\left[\frac{(V_{slope} + V_{width} + V_{rough} + V_{soil} + V_{hydro})}{5} \right]$$

Chemical Formula

$$(V_{typical} \times V_{hydro})^{1/2}$$



For the purposes of this assessment, Spirit grouped the tidal fringe wetlands into two (2) WAAs. The WAAs included 0.758 acres of Section 10 EEM Impacted Wetlands and 0.820 acres of Section 404 EEM Impacted Wetlands. The attached map identifies the WAAs that were utilized for this evaluation.

RESULTS

Pre-construction scores for each variable were assigned based upon observations made by Spirit during the wetland delineation. Assigned scores for each variable are included in individual WAA spreadsheets in the attachments. All impacted wetlands are proposed to be either dredged or filled and assumed to have no post-construction values. Variable scores were input into each FCI formula to calculate the FCI for each of the four (4) functional criteria. Each FCI was multiplied by the number of acres in each respective WAA to calculate the FCU values. Table 2 summarizes the results of the calculation of the FCU values for EEM wetlands.

Table 2 – Summary of EEM FCU Loss

Function Type	FCU		
	Section 10 EEM WAA	Section 404 EEM WAA	Sum
Biota	-0.60	-0.62	-1.22
Botanical	-0.76	-0.83	-1.59
Physical	-0.39	-0.51	-0.90
Chemical	-0.59	-0.64	-1.23
Total FCU Loss	-2.34	-2.60	-4.94

SUMMARY AND RECOMMENDATIONS

To comply with USACE compensatory mitigation regulations, the value of each FCU type, described above, should be met or exceeded by the purchase of credits from a USACE-approved mitigation bank or the development of a Permittee-Responsible Mitigation (“PRM”) plan. According to the proposed project impacts, a minimum of 4.94 FCUs of EEM credits should be purchased from a USACE-approved wetland mitigation bank or offered by restoring/enhancing wetlands via a PRM Plan.

Based upon a review of the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (“RIBITS”), the project site is within the service area of one (1) USACE-approved mitigation bank which has credit availability for EEM wetlands, as of the date of this letter (i.e., Gulf Coastal Plains Mitigation Bank [“GCPM”]). Spirit recommends reviewing the credit reservation policy of this bank and proceeding to reserve credits to ensure credits are available for this project once the USACE regulatory permit is issued. Alternately, if a PRM Plan is developed, it must

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meet or exceed the FCU deficit created by the anticipated project impacts. Spirit can assist with this process if requested.

Thank you for the opportunity to assist you with this project. Should any questions arise concerning the results of this functional assessment, please feel free to contact me by phone at (281) 664-2875 or by email at jsmolik@spiritenv.com.

Sincerely,

A handwritten signature in black ink that reads "Jacqueline Smolik". The signature is written in a cursive, flowing style.

Jacqueline Smolik, WPIT
Project Manager
Spirit Environmental, LLC

Enclosures