

ALTERNATIVES ANALYSIS

EMPCo and Arcadis conducted a study to evaluate three different roadway alternatives within the project area, as well as an offsite alternative and a no-action alternative. This study included an evaluation of operational measures, technologies that could be used to construct the roadway, and the potential impacts to natural resources associated with each alternative. The currently proposed route is considered the only viable roadway alignment option for the station and critical planning efforts have been made to minimize impacts to Waters of the U.S. The evaluated alternatives and their associated impacts to resources are further discussed below.

Alternative 1 – Preferred Alternative (Route Option C)

Alternative 1, identified as the Preferred Alternative, involves the construction of an approximately 0.63-mile (3,322 feet) two-lane road across the southern portion of the existing Webster Station on the north side of Clear Creek (indicated as Route Option C on **Figure 3**). The proposed roadway will provide improved access across Webster Station to future development in the surrounding area and will connect State Highway 3 (Old Galveston Road) to an unnamed gravel road located on the west side of the project area. The roadway alignment design, planning, and roadbed construction will be conducted by EMPCo. Once the roadbed is constructed, including appropriately designed drainage/sloping, placement of road base, and culvert installation, EMPCo will turn the roadway construction project over to the City of Webster for final surfacing and maintenance.

The proposed roadway design plans are provided as Appendix A of the original PCN submittal package, dated July 9, 2020. Each finished lane will be 14 feet wide, for a total lane width of 28 feet. The lanes will be constructed with a two percent slope away from centerline to shed water off of the road surface. Roadway embankments will be constructed with a 3:1 slope and the total width of the roadway from toe to toe will be approximately 60 feet. Concrete box culverts will be used for the HCFCD canal crossing, while equalizers will be used for the pond crossings and culverts will be used on the remaining ditch/wetland crossings to prevent unintended surface water impoundment; maintain normal downstream flows; and reduce the overall permanent impacts to Waters of the U.S. The west end of the constructed alignment will have a grade elevation of 15.5 feet above mean seal level (MSL) and the east end will be 13.5 feet above MSL, which will match the grade elevations of the existing roadway tie-in locations (State Highway 3 [Old Galveston Road] to an unnamed gravel road).

The project site will be accessed via the existing State Highway 3 (Old Galveston Road), located on the east side of the project area. All work will occur on the north side of Clear Creek, above the mean high water mark (MHWM) and no impacts to Clear Creek will occur, including impacts to marine navigation within Clear Creek. All equipment and materials will be brought to the site from Old Galveston Road. During project implementation, equipment and material storage will occur in the upland environment, and appropriate soil erosion control/spill control practices will be implemented to protect the surrounding environment.

Following project completion, all equipment and materials will be removed from the project area and all areas temporarily disturbed during construction will be returned to pre-project conditions to the extent practicable. Broadcast seeding will facilitate soil stabilization in all areas temporarily disturbed during construction.

A summary of the project impacts to Waters of the U.S associated with the Preferred Alternative is presented in **Table 1** and discussed below. The HCFCD drainage canal crossing will include the construction of an appropriately designed culvert system. The OHWM width for the HCFCD drainage canal is approximately 18 feet and the OHWM width for Ditch 1 is approximately five feet.

Table 1. Alternative 1 (Preferred Alternative) - Summary of Project Impacts to Waters of the U.S.

Resource	Linear Feet	Acres	Type	Fill Material	Latitude	Longitude
HCFCD Canal (perennial)	60	0.02	Permanent	Engineered concrete box culvert	29.516703°N	-95.109319°W
Ditch – 1 (Ephemeral surface drainage ditch)	60	0.01	Permanent	Engineered concrete box culvert	29.519488°N	-95.106240°W
PEM – 1 (Emergent Wetland)	--	0.006	Permanent	Earthen fill (soil and road base material) and equalizer culvert	29.516617°N	-95.109825°W
PEM – 2 (Emergent Wetland)	--	0.012	Permanent	Earthen fill (soil and road base material) and equalizer culvert	29.516360°N	-95.109352°W
Pond – A (Open Water Feature)	--	0.3	Permanent	Earthen fill (soil and road base material) and equalizer culvert	29.519631°N	-95.106014°W
Pond – B (Open Water Feature)	--	0.43	Permanent	Earthen fill (soil and road base material) and equalizer culvert	29.519938°N	-95.105577°W

The two proposed jurisdictional PEM wetlands are located in the western portion of the roadway alignment, adjacent to the HCFCD drainage canal and within the Clear Creek mapped 100-year floodplain (**Figure 2**). Hydrologic input for these wetland features is primarily derived from surface water impoundment from rainfall and periodic overbank flood flow from the HCFCD canal. Completed wetland data forms are provided as Appendix B of the original PCN submittal package, dated July 9, 2020. Based on the proposed roadway design plan, the roadway alignment will pass between the two proposed jurisdictional PEM wetlands, but permanently impact approximately 0.006 acre of PEM 1 and 0.012 acre of PEM 2. However, planning and coordination with HCFCD is ongoing and will ensure there is no change in the base flood elevation related to the proposed roadway construction.

Additionally, the roadway alignment would cross two proposed jurisdictional surface water detention ponds in the eastern portion of the project area (Pond A and Pond B; **Figures 2 and 3**). Although these ponds are adjacent to one another and are hydrologically separated by an earthen berm, following review of the July 9, 2020 original PCN submittal package, USACE indicated that the ponds could not be considered single and complete projects (crossings) due to their close proximity. Thus, permanent impacts would be calculated cumulatively, which would exceed the impact threshold for coverage under NWP 14. The constructed roadway would bisect each pond and be constructed using earthen fill and the placement of concrete culvert/equalizers to allow continued flow of surface water beneath the road and between each bisected pond segment. Approximately 0.3 acre of Pond A and 0.43 acre of Pond B will be permanently impacted by the roadway construction.

Temporary soil stockpiling will occur in the upland environment, as depicted on **Figure 2**. Silt curtains or other sediment control measures will be installed at the downgradient side of all active construction areas, as applicable, to reduce sediment discharges. No other temporary or permanent impacts to Waters of the U.S. are anticipated under the currently proposed project. Once the project is complete, all equipment and materials will be removed from each project area and all areas temporarily disturbed during construction will be returned to pre-project conditions to the extent practicable.

Alternative 2 – Route Option A

EMPCo evaluated roadway route Option A (**Figure 3**) during the initial project planning process. Option A involves the construction of a similarly sized approximately 0.6-mile (3,168 feet) two-lane road across the north-central portion of the existing Webster Station on the north side of Clear Creek. General roadway design and construction aspects would be the same as those provided under Alternative 1, beginning at State Highway 3 and extending to and an unnamed gravel road located on the west side of the project area. Option A would cross a Webster Station surface water drainage ditch and the HCFCD drainage canal on the western side of the facility. No wetlands would be impacted by this alternative.

Although this alternative avoids permanent impacts to jurisdictional wetlands/Waters of the U.S., existing facility infrastructure, including myriad subsurface pipelines and utilities and current facility expansion efforts, create difficult and potentially hazardous construction considerations for the roadway, and an elevated cost of construction. Additionally, the presence of multiple subsurface pipelines and

utilities would create long-term challenges for roadway (and utility) monitoring and maintenance. Therefore, this alternative was not selected as the preferred alternative.

Alternative 3 – Route Option B

EMPCo evaluated roadway route Option B during the initial project planning process (**Figure 3**). Option B involves the construction of a similarly sized approximately 0.6-mile (3,168 feet) two-lane road across the southern portion of the existing Webster Station, but approximately 450 feet north of the Preferred Alternative. General roadway design and construction aspects would be the same as those provided under Alternative 1, beginning at State Highway 3 and extending to an unnamed gravel road located on the west side of the project area. Option B would utilize/enhance an existing gravel road within the facility, which has an existing bridge across the HCFCD drainage canal (**Figure 3**). However, the existing bridge would have to be enlarged to accommodate the roadway design, and the placement of the roadway through the core facility operations and management infrastructure would bisect critical facility operational controls and site security components.

Although this alternative avoids permanent impacts to jurisdictional wetlands/Waters of the U.S., existing facility infrastructure creates potentially hazardous construction considerations, an elevated cost of construction, difficult operational challenges and potentially hazardous considerations for the facility as well as public users of the roadway. Therefore, this alternative was not selected as the preferred alternative.

Alternative 4 – Offsite Roadway Construction

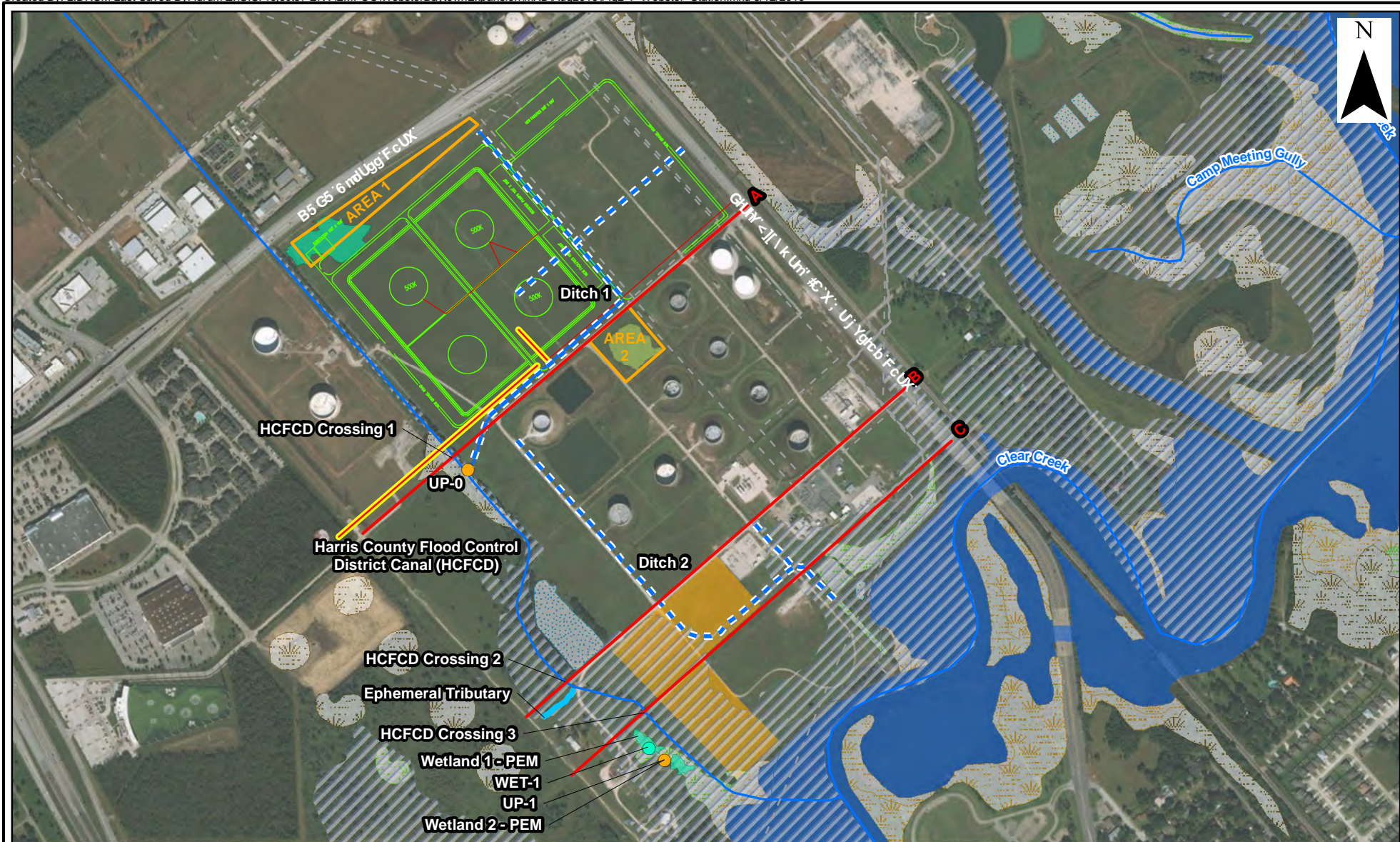
Due to the presence of Clear Creek to the south of the EMPCo facility, and the NASA Bypass Road to the north of the facility, a cross-route through the facility is the only viable option to connect State Highway 3 to the undeveloped property to the west. Therefore, offsite roadway construction was not evaluated further in the Alternatives Analysis or project planning process.

No Action Alternative

The No Action Alternative is considered a possible alternative. Under the No Action Alternative, the area would remain in its current state and there would be no additional connectivity from State Highway 3 to the undeveloped property to the west. There would be no ground disturbing activities associated with site development, thereby, there would be no impacts to local natural resources. However, this would inhibit future facility improvement and future development to the west. Additionally, the project would not contribute to a localized growth in business, an increase in jobs, and economic growth in the area.

Summary of Alternatives Analysis

The no-action alternative, which would result in no environmental impacts, is not practical to the purpose of this proposal, as it would limit regional development, access, and facility improvement capabilities. The Preferred Alternative includes measure to minimize adverse impacts to natural resources, while balancing existing facility/utility constraints, safety considerations for roadway construction, maintenance and public use, and available roadway design parameters. Therefore, EMPCo proposes to implement the project development activities described in the Preferred Alternative (Alternative 1).



LEGEND

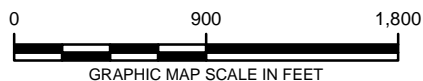
SITE VISIT DATA

- UPLAND POINT
- WETLAND POINT
- DITCH
- EPHEMERAL TRIBUTARY TO HCFCDC CANAL
- ISOLATED NON-JURISDICTIONAL PEM
- POTENTIALLY JURISDICTIONAL PEM

- PROPOSED ROAD OPTION
- PROPOSED SITE FEATURES
- PROPOSED PIPELINE
- PROPOSED 24" PIPELINE
- EXISTING EMPCO PIPELINE SYSTEM
- NHD FLOWLINE
- LAYDOWN/STAGING
- SPOILS AREA
- FLOODPLAIN

NWI WETLAND

- OPEN WATER
- ESTUARINE AND MARINE WETLAND
- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND



EXXONMOBIL PIPELINE COMPANY
HOUSTON, TEXAS
WEBSTER STATION
HARRIS COUNTY, TEXAS

ROUTE ALTERNATIVES MAP

Design & Consultancy
for natural and built assets

FIGURE
3