# Section 7 Appendices

Appendix A: Texas Historical Commission Letter of Concurrence

Appendix B Texas Coastal Management Program Consistency Letter

Appendix C Construction Plan for Crossing Brazoria National Wildlife Refuge (BNWR) from FM 2004 to Austin Bayou

# Appendix A

Texas Historical Commission Letter of Concurrence

HRA Gray & Pape, LLC

Mr. Jeff Durst
Texas Historical Commission
108 West 16th Street
Austin, TX 78701

RECEIVED
JUL 22 2014
TEXAS HISTORICAL COMMISSION

July 21, 2014

**Re: Cultural Resources Survey Consultation for Approximately 48 miles Proposed for the Praxair Dual Pipeline Project in Brazoria and Galveston Counties, Texas.**

Mr. Durst:

HRA Gray & Pape, LLC. (HRA Gray & Pape) of Houston, Texas, on behalf of Wood Group Mustang Inc. (Mustang) and their client are submitting this letter as an initiation of consultation in anticipation of the provisions and review process provided in Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The Lead Federal Agency has not been verified but is assumed to be the United States Army Corps of Engineers (USACE).

The proposed project will consist of two pipelines that will travel from the DOW Hydrocarbon and Resources, LLC (DOW) Freeport facility in Brazoria County, Texas, to the DOW facility in Texas City, Galveston County, Texas (Figure 1). The two pipelines will be collocated with existing pipeline corridor for the entire length. The project's area of potential effects (APE) is a 60-meter (200-foot) wide corridor resulting in a total of 492.5 hectares (1,217 acres). Surveys conducted by HRA Gray & Pape have covered approximately 64.4 kilometers (40 miles) of the current project's corridor. These surveys were undertaken from between 2012 to 2014 for several DOW pipeline projects (see Scott 2012, 2013, and 2014); two of which (Scott 2012 and 2013) were conducted under Texas Antiquities Code permit numbers 6246 and 6446. The DOW surveys did not result in the identification of eligible cultural deposits within the current APE; however there are areas where the current project alignment could pose a risk to unidentified portions of previously recorded sites. These areas include portions of the project to be located near Sites 41BO159 and 41BO160. Both sites were recorded in 1986 by Coastal Environments, Inc., and were said to consist of prehistoric shell middens located along low ridges that once marked the water's edge. Besides shell, the sites were reported to contain prehistoric ceramics (Castille and Wheland 1986a, 1986b).

HRA Gray & Pape recommends no further work within the surveyed areas of the current alignment. HRA Gray & Pape proposes that survey be conducted on only those portions of the

110 Avondale Street Houston, Texas 77006/ Telephone: (713) 541-0473/ Fax: (713) 541-0479

current project that fall outside of the previous survey coverage or have a potential to impact previously unidentified portions of previously identified sites. These areas consist of a total of approximately 12 kilometers (7.6 miles) of project alignment resulting in a total area of 76.7 hectares (189.5 acres) (see Figures 2 to 12). Although portions of the project are to be located on public property or properties owned by governmental agencies or subdivisions of the State of Texas, HRA Gray & Pape believes these areas have been sufficiently covered by the previous DOW pipeline surveys and anticipates that no new Texas Antiquities Permits will be required.

Within portions of the project recommended for survey, survey will consist of a combination of pedestrian walkover and shovel testing. Walkover will be accomplished in sections of the pipeline route that show evidence of previous disturbance, are inundated, or located on excessively sloped topography. It is assumed that previous disturbance will nullify the need for survey within existing site facilities. Shovel tests will be excavated in sections of the route that appear to contain a high potential for yielding intact, buried cultural resources at an average interval of one shovel test every 30 meters (100 feet). Shovel tests will be excavated to Texas minimum standards in undisturbed settings appearing to have a lower intact archaeological potential. The overall testing interval will be increased or decreased in sections of the property as required by variations in topography and degree of prior disturbance, or as needed for site delineation. Shovel testing will be excavated to a maximum depth of approximately 1 meter (3 feet) unless restrictions are in place due to existing pipelines or utilities under which conditions tests will be to no more than 40.6 centimeters (16 inches) in depth. All shovel tests will measure approximately 30 by 30 centimeters (1 foot by 1 foot). When possible, all soil will be screened through ¼ inch wire mesh; clay soils will be hand sorted. All identified sites will be delineated within the pipeline route, and all sites will be photographed and mapped. If deeply buried deposits are encountered or buried paleosols suspected, HRA Gray & Pape will coordinate with Mustang, their client, and your office about the need for deep testing.

HRA Gray & Pape requests concurrence with these survey recommendations. If you have any questions, or are in need of additional information, please to not hesitate to contact me at (713) 541-0473 or by email at tscott@hragp.com.

Sincerely,

Tony L Scott

Tony Scott
Principal Investigator

Enc. Figures 1 through 12

CC: Matthew Burzynski: Wood Group Mustang Inc.
Joe D. Franklin: Wood Group Mustang Inc.

CONCUR
by William A. Martin
for Mark Wolfe
State Historic Preservation Officer
Date 8/8/14
Track#

# Appendix B

## Texas Coastal Management Program Consistency Letter

# CONSISTENCY WITH THE TEXAS COASTAL MANAGEMENT PROGRAM

***The applicant should sign this statement and return with application packet to:***

U.S. Army Corps of Engineers (USACE)
Regulatory Branch
P.O. Box 1229
Galveston, TX 77553-1229
Fax: (409) 766-3931

***For USACE use:***

Permit #:_____

Project Mgr._____

**Applicant's Name and Address (please print):**

Praxair, Inc. - Bryan Williams

1585 Sawdust Road, Suite 300

The Woodlands, TX 77380

The Texas Coastal Management Program (CMP) coordinates state, local, and federal programs for the management of Texas coastal resources. Activities within the CMP boundary must comply with the enforceable policies of the Texas Coastal Management Program and be conducted in a manner consistent with those policies. The boundary definition and policies are contained in the CMP rules (31 TAC §503.1 and §501, respectively). To determine whether your proposed activity lies within the CMP boundary, please see http://www.glo.state.tx.us/coastal/maps/cmp/index.html. To determine whether your proposed activity meets the CMP consistency requirements, please see the applicable policies at http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=31&pt=16&ch=501&sch=B&rl=Y .

The proposed activity must not adversely affect coastal natural resource areas (CNRAs). CNRAs include: coastal barriers, coastal historic areas, coastal preserves, coastal shore areas, coastal wetlands, critical dune areas, critical erosion areas, gulf beaches, hard substrate reefs, oyster reefs, special hazard areas, submerged lands, submerged aquatic vegetation, tidal sand or mud flats, waters of the open Gulf of Mexico, and waters under tidal influence. These are more fully described at 31 TAC §501.3(b), available at http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=16&ch=501&rl=3. Tools for locating CNRAs may be found at http://www.glo.state.tx.us/gisdata/gisdata.html. The Coastal Management Program Permit Service Center is available to answer questions regarding compliance with the CMP policies.

The applicant affirms that the proposed activity, its associated facilities, and their probable effects comply with the relevant enforceable policies of the Texas Coastal Management Program (see 31 TAC §501), and that the proposed activity will be conducted in a manner consistent with such policies.

Date: 1/15/2015 Signature: Bryan Williams

***Any questions regarding the Texas Coastal Management Program should be referred to:***

Jesse Solis
Permitting Assistance Coordinator
6300 Ocean Drive
TAMU-CC Natural Resource Center Ste. 2800
Corpus Christi, Texas 78412-5599
Phone: (361) 825-3050
Fax: (361) 825-3465
Toll Free: 1-866-894-3578
permitting.assistance@glo.state.tx.us

Tammy Brooks
Texas General Land Office
Coastal Resources Division
1700 North Congress Avenue, Room 620
Austin, Texas 78701-1495
Phone: (512) 463-9212
Fax: (512) 475-0680
Toll Free: 1-800-998-4GLO
tammy.brooks@glo.state.tx.us

# Appendix C

## Construction Plan for Crossing
## Brazoria National Wildlife Refuge (BNWR)
## from FM 2004 to Austin Bayou

# Construction Plan for Crossing Brazoria National Wildlife Refuge (BNWR) from FM 2004 to Austin Bayou

## Praxair, Inc.

### Dual $H_2$ / $N_2$ Pipelines System from Texas City, Texas to Freeport, Texas
### Praxair Project # 17431

### Wood Group Mustang Project No. 10334201

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| B | 04-13-15 | - Corrected Ditch Number<br>- Updated Route Strip drawings Shts 1- 8 | R Kimmins | _____ | _____ | |
| A | 03-30-15 | ISSUED FOR CLIENT RE-VIEW | HD Giles | R Kimmins<br>B Kinsler | R Meriam | |
| | DATE | DESCRIPTION | BY | CHK | PROJECT MANAGER AP-PROVAL | CLIENT APPROVAL |

| PREPARED FOR: | COMPANY APPROVAL: |
|---|---|
| Praxair, Inc.<br>1585 Sawdust Rd., Suite 300<br>The Woodlands, TX 77380 | Wood Group Mustang, Inc.<br>17325 Park Row<br>Houston, TX 77084 |

| | PROJECT | DISCIPLINE | DOC TYPE | SEQ. NO |
|---|---|---|---|---|
| | 10334201 | HSE | PLN | 0001 |

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## ATTACHMENTS:

ATTACHMENT A ROUTE MAPS
ATTACHMENT B BNWR ACCESS ROUTES
ATTACHMENT C CONSTRUCTION DRAWINGS
ATTACHMENT D LIST OF WORK ACTIVITIES AND EQUIPMENT
ATTACHMENT E PRELIMINARY CONSTRUCTION SCHEDULE

## 1.0 PROJECT DESCRIPTION

The Praxair Dual $H_2$/$N_2$ Pipeline System Project includes the installation of two parallel approximately 46 mile pipelines. These lines will transport Nitrogen and Hydrogen from Dow's Texas City Operations facility in Texas City to the BASF facility in Freeport, Texas. The $N_2$ pipeline originates with two 16-inch $N_2$ pipelines connecting into one 24-inch $N_2$ pipeline in Texas City. This 24-inch $N_2$ pipeline then continues to where it terminates at the BASF facility in Freeport. The 14-inch $H_2$ pipeline also originates in Texas City and terminates at the Praxair Freeport PSA site. The $H_2$ pipeline then continues from the Praxair Freeport PSA site as a 20-inch line and terminates at the BASF facility in Freeport. These lines will be located within established pipeline corridors and will generally follow Dow Chemical Company and Gulf Coast Pipeline MSP program's Propane and Ethane lines from the Texas City Operations (TCO) facility to Freeport, TX.

See Figure 1 area map in Attachment A showing proposed pipeline routing from TCO to BASF.

## 2.0 PURPOSE OF PLAN

The purpose of this Construction Plan is to provide to Brazoria National Wildlife Refuge (BNWR) the anticipated schedule of work, construction plan, and proposed equipment to be used for installation of the segment of these lines passing through the area identified as the BNWR. This work will be planned and coordinated to provide the least disruption possible to the environmentally sensitive nature of this wildlife refuge by minimizing the disturbance of soil and disruption of bird migration and nesting. Praxair has developed this plan after careful consideration, meetings with BNWR personnel and consultation with environmental professionals to emphasize the least impact on habitat, maintaining and restricting impacts to previously disturbed areas and confining the workspace to the existing pipeline corridor.

Praxair will install the pipelines described above through BNWR using a combination of conventional open cut, push/pull, bore, and horizontal directional drilling (HDD) as appropriate. Praxair will complete all pipeline construction and complete hydrostatic testing, drying, and cleaning of the pipelines with required ditch backfill and clean-up, returning the area to existing conditions, or improved existing conditions.

In lieu of the normal sequence of this type installation which optimizes equipment types/usage and labor into the most cost effective method, the work through this area will be performed as a continuous operation from start of work to completion in order to cause minimal impact to the area for the shortest time possible.

See Figure 2 area map in Attachment A showing proposed BNWR area within the pipeline routing from TCO to BASF.

## 3.0 PROJECT LOCATION

The proposed Praxair Dual $H_2$/$N_2$ Pipelines will enter the Northern border of BNWR at approximately pipeline Mile Post 26.6, located 2,230 ft. east of the intersection of CR 208 and FM 2004. The lines will then progress in a Southwest direction, crossing CR 208 about 1,765 ft. South of the intersection of CR 208 and FM 2004. The lines will then continue in a Southwest direction, crossing the West border of BNWR at Austin Bayou, approximately 13,300 ft. South of FM 2004 at approximate Mile Post 30.9 for a total distance of 4.25 miles.

## 4.0 ACCESS ROUTES

Access to the pipeline routing will be restricted and only identified access routes will be used. The section Northeast of CR 208 will be accessed by entry to the ROW off FM 2004 and/or off CR 208. The ROW section Southwest of CR 208 will be accessed solely off of CR 208, with all travel to Austin Bayou restricted to the pipeline Temporary Work Space (TWS) with 2-way traffic in and out from CR 208.

A third route West of Austin Bayou will be used to move the HDD drill equipment and material to the area between Austin Bayou and Bastrop Bayou. This will give access to the Austin Bayou HDD entry point for crossing Northeast across Austin Bayou to the Exit point on BNWR property. (See Figure 3 Attachment B)

See Attachment B for maps indicating these access routes.

Within this routing, we have identified FM2004 and CR 208 that will be crossed by guided bores under the road and 4 crossings that will be installed by HDD. These locations are:

| | |
|---|---|
| FM2004 | - at pipeline Mile Post 26.6 |
| Danbury Drainage Ditch #10 | - at pipeline Mile Post 26.8 |
| CR208 | - at pipeline Mile Post 27.1 |
| BNWR Otter Slough # 1 | - at pipeline Mile Post 28.4 |
| BNWR Otter Slough # 2 | - at pipeline Mile Post 29.3 |
| Austin Bayou | - at pipeline Mile Post 30.9. |

## 5.0 CONSTRUCTION PLAN

Construction within the BNWR consists of approximately 4.25 miles of dual pipelines consisting of a 24-inch OD Nitrogen and a 14-inch OD Hydrogen pipeline from the South side of FM 2004 on the North to the center of Austin Bayou on the South.

For conventional open-cut and push installation, the lines will be placed in a single ditch parallel to each other with 24-inch space wall-to-wall between them. For waterway HDDs, the lines will be installed adjacent to each other in a single drilled opening. For road bores, the lines will be installed in separate drilled openings with a 24-inch space wall-to-wall between them. The lines will be in an open slot between existing pipelines in an existing pipeline corridor and located on the west side of an existing 40” Exxon DOE line and the

east side of an 8” Buckeye pipeline. This corridor contains approximately 20 other pipelines.

The route for transport of equipment, materials and labor will be covered by temporary mats to avoid inadvertent damage to surrounding soil and wildlife and to provide a safe working surface above the aforementioned existing pipelines. For material delivery and return, the route will be limited to a double width of mats (approximately 32’ wide) and be contained within the designated temporary work space (TWS) for the pipelines. One row of mats will be used to support equipment unloading and installing the line and the other row will be for a traffic lane to allow bypassing of transport equipment.

This matted route will be used by tracked construction equipment. Contractor personnel will be staged at an off-site parking lot and transported by bus or van to the work site. All pipe material transport will be by tracked equipment with trailers or skids. Rubber tired equipment (trucks, backhoes, cherry pickers, welder trucks, etc.), will not be allowed on the property, with the exception of light weight pickups used by supervisors and inspectors and the bus/van for transport of pipeline workers.

Due to other pipelines being in this area, any work that will be performed over these adjacent lines will also require the placement of mats in accordance with other line owner / company requirements and industry safety requirements. This matting also provides a surface for placement of ditch spoils to alleviate equipment replacing this material in the ditch from rutting the surrounding soils.

County Road 208 will be used as the primary entry point for access to the BNWR pipeline work site. Workmen will not be allowed to park their personal vehicles along CR208 in order to keep the road clear for passing traffic.

The TWS needed for this installation will be evaluated and kept to the shortest width possible that will accommodate transport equipment and permit excavation space for digging of ditch with adjacent placement of excavation spoils. At this time we anticipate that a 100 ft. width will be needed with 32 ft. being used for transportation mats with the remaining 68 ft. being used for work space, ditch excavation, and spoil deposit. In addition to the matted access route along the ROW, matted areas approximately 170 ft. x 300 ft. will be required for the set-up and operation of HDD equipment at the entry of the HDDs. A larger matted area approximately 280 ft. wide by a length that varies from 590 ft. to 670 ft. will be used to set up equipment and materials for the push installation between Austin Bayou and the west BNWR Otter Slough.

All work activities shall be confined to the provided temporary work space.

The TWS preparation includes, but is not limited to, clearing timber and brush, grading where required, erecting temporary fences, gaps and barricades, and installing ramps and culverts.

The TWS shall be maintained in a clean, organized condition at all times. At no time shall litter be allowed to accumulate for more than one day.

No clearing, grading or other construction activities shall occur outside approved, surveyed and flagged or staked TWS limits as shown on the Construction Drawings, without approval of the BNWR.

All trees cut or pushed down and any brush or timber removed from the TWS during construction of the pipeline will be treated or disposed of at a location and in a manner approved by BNWR.

It is understood that BNWR will have a full-time inspector working with Praxair/WGM Construction Management and Inspectors to assure that all work within the BNWR is performed in accordance with agreed terms and conditions.

See Attachment C for Construction Drawings of proposed pipeline locations, matting access and workspace within the existing pipeline corridor crossing BNWR.

## 6.0 PIPELINE INSTALLATION

This Pipeline Construction Installation Plan has been developed to minimize temporary impacts to the BNWR. Any modifications or alternate construction methods will increase impacts.

In discussions with the BNWR, the construction window is agreed to be from May 1st to October 15$^{th}$. Mobilization and pre-work may start as early as April 15th between State F.M. Highway 2004 (FM 2004) and County Road 208 (CR 208) which has been determined to be far enough away from the migratory bird habitat to not create a disruption.

Below is Praxair's proposed method of construction and sequence of activities within the BNWR:

- The first phase of construction will begin with delivery of mats by truck to the BNWR pipeline crossing on FM 2004 at MP 26.6 and the staging area Northeast of CR 208 at MP 27.1. Mats will be off loaded and placed on the BNWR property beginning at the gates and working into the property. The staging areas adjacent to the right-of-way at FM 2004 and CR 208 will be matted first so that more mats and equipment can be stockpiled while the access lanes are being matted.

- Once the staging area has been established on the north end of the BNWR site, the HDD at Danbury Ditch Number 10 at MP 26.8 will be the first construction effort. As the drill pad and drag section construction areas are matted, pipe will be strung on skids and welding will begin. Pipe skids will be new and free of vegetative debris. The drill rig will be placed, along with the control building, frac tanks, drill stem, and other necessities for performing the HDD. While the HDD is underway, the drag section will be welded using welding machines mounted on a tractor(s) with boom mounted welding lines so that both pipelines can be welded at the same time. The drag section will be hydro tested above ground before it is pulled into the

drilled hole. During this effort and throughout construction on BNWR property, busses, vans, or crew cab trucks will be used to transport the laborers along the pipeline in an effort to minimize traffic and noise. Welding equipment will be mounted on tractors and left on the right of way at night. Once the HDD for Danbury Ditch Number 10 is completed, the bore of FM 2004 will begin. A receiving pit and a drag section will be prepared before the ditch is opened. The construction method described above will be typical for all HDDs along this property.

- While the FM 2004 road bore is being completed, pipe will be strung for the section between Danbury Ditch 10 and CR 208, which will be installed by the open-cut construction method. Once the pipe is welded, the mats over the ditch line will be moved to the southeast over the proposed 12" Dow pipeline (that will be installed by others and is anticipated to be in place at the time of installation of the Praxair lines). The top-soil from the ditch will be stockpiled on these mats. The sub-soil from the ditch will then be placed on the mats over the existing 40" DOE and the second existing 12" Dow pipeline. For safety purposes and to minimize disturbance, the excavated trench length will be limited to the amount of pipe that has been strung, welded and prepared for installation so that the open ditch time may be limited. After the 24" and 14" Praxair pipelines are lowered into the ditch, the sub-soil on the closest row of mats will be pushed over the pipelines. The top-soil on the second row of mats will then be pushed over the pipelines to replace the seed bed that was removed. When the mats under the dirt are exposed, they will be moved ahead to the next location to be worked. The row of mats used to string and weld the pipe will also be moved to the next location. As the mats are moved to a new location, the ground will be smoothed by the mats in preparation of ground restoration. The travel lanes will be picked up when there is no longer a need for them. As these mats are removed, the ground will be smoothed and cleaned up. The construction method described above will be typical for all open-cut construction areas along this property.

- While the project is being worked between FM 2004 and CR 208, mats will continue to be placed in the staging area on the east side of CR 208. The staging area on the west side of CR 208 and the travel lanes along the route (2 mats wide) will be placed as soon as the BNWR allows access to the remainder of the property. The next HDD to be prepared will be for the eastern crossing of BNWR Otter Slough #1 at MP 28.4. While this crossing is being prepared and drilled, the access road around the south bend of the slough will be constructed and matting installed to allow access for the drag section to be placed between the sloughs. Meanwhile pipe will be strung and welded in the open cut area between CR 208 and the eastern crossing of the slough. The bore across CR 208 will be completed before pipe is lowered into the ditch south of CR 208, using the open-cut construction method described above. Each cross ditch that is encountered will have a travel crossing prepared with flume pipe or concrete pipe depending on what is appropriate to maintain water flow to establish a permanent access for future operations.

- When the HDD across the eastern crossing of the slough has been completed and pulled using the typical HDD construction procedure, the drill rig will be moved to the western crossing of the BNWR Otter Slough #2 at MP 29.3 where it will be set up for the next HDD. During that time, the new access road across the western crossing of the slough will be constructed. When the open cut crew reaches the eastern crossing of the slough HDD and ties the pipe together, it will move to the area between the sloughs to begin the open cut construction of that area.

- After the HDD of the western crossing of the slough is completed, that section will be tied together and the HDD equipment will be moved to the west side of Austin Bayou to begin the final HDD crossing.

- While the drill pad and drill rig, along with the control building, frac tanks, drill stem, and other necessities for performing the HDD is being set-up on the west side of Austin Bayou, the drag section construction area will be matted on the east side of Austin Bayou. Pipe will be strung out and placed on skids and welding will begin. While the HDD is underway, the drag section final welding will be completed using welding machines mounted on a tractor(s) with boom mounted welding lines. The drag section will be hydro tested above ground before it is pulled into the drilled hole.

- While the Austin Bayou HDD and welding of drag section is underway, pipe will be stockpiled west of the west slough in preparation for the use of a push rack to be placed on the west side of the slough. The push rack will consist of work stations along the side of the rack positioned such that different operations performed in joining the pipes together will take place at each station in the order necessary to complete the assembly of the pipe sections before pushing into the flooded ditch. If the season is wet during construction, the ditch will be flooded with fresh water from the slough, or mutually agreed upon source, at a depth necessary to float the pipe, approximately 3-4 feet. The volume of water necessary to float the pipe(s) is approximately 300,000 gallons. If the proposed push construction occurs during a dry season, an additional row of mats will be added to the access lanes to provide a larger travel lane to Austin Bayou so that the pipe may be carried down the ditch line in long sections and placed in the excavated ditch. The additional row of mats provides a safety lane while the original travel lane is occupied with equipment carrying pipe. BNWR Ditch No. 1 at MP 29.8 will be sealed with sack breakers on each side of the pipeline ditch to prevent salt water from entering the open pipeline ditch. When the pipe has been placed in the pipeline ditch, sack breakers will then be placed in the pipeline ditch to seal the excavation and avoid migration of salt water along the pipeline ditch. Anchors for buoyancy control will be installed after the pipe is lowered in the ditch and de-watered. The sack breakers will then be removed from Ditch No. 1 so the original flow can be restored. When the push section is completed, backfill will be performed in the same manner as the open

cut section with the sub-soil being pushed in first and the top-soil being pushed on top. Mats not needed for access will then be removed. When the HDD of Austin Bayou is completed and pulled, the connecting pipe from the drill exit to the push section can be completed using the open-cut construction method and the remainder of the pipeline backfilled.

- With the pipeline completed to the west side of Austin Bayou, the remainder of the access mats can be removed progressing from the west to the east with final cleanup being conducted during the removal. At this time the permanent operational access roads and ditch crossings will also be finalized once BNWR receives authorization from the USACE. Permanent double gates (16 feet wide) will be installed in the fence along the south side of FM 2004 and on each side of CR 208. At no time will working off mats be acceptable. However, due to unforeseen conditions; it may be necessary to mat areas that are not anticipated in order to safely perform the functions to achieve the intended results.

- It will be necessary to again enter the BNWR property at CR 208 after the entire pipeline has been hydro tested and the water removed. The valves on the south side of CR 208 will then be added to the pipeline in the proximity of the existing Dow valves. The valve station will have a pipe (~3" diameter) rail that is approximately 3 feet above ground encompassing the valves as a protective barrier.

- The completion of the valve installations and resultant final cleanup will end the need for Praxair or Contractor personnel to be on the BNWR property for construction purposes.

## 7.0 PROPOSED CONSTRUCTION EQUIPMENT

Below is a summary of equipment required for the Work. See attachment D for a more detailed list of this equipment separated by work activities.

| QUANTITY | EQUIPMENT/DESCRIPTION |
|---|---|
| 17 | UTV |
| 1 | line locator (pot holer) |
| 10 | Transporter /Skid |
| 4 | Track Hoe |
| 1 | Sky Track Loader |
| 10 | Crew Van/Bus |
| 1 | Fuel/Oil/Grease Truck |
| 1 | Mechanic Truck |
| 1 | Tool Trailer |

| | |
|---|---|
| 15 | Inspector ATVs |
| 20 | Sanitary Facilities |
| 11 | Transporter /Skid |
| 18 | Track Hoe |
| 2 | Bending Machine |
| 10 | Side Boom |
| 7 | Tractor w/ Tack Welding Rigs |
| 1 | X-Ray Equipment Skid |
| 1 | Sand Blast/Paint Equipment / Material Skid |
| 1 | X-Ray / Joint Coating Equipment/Material Skid |
| 1 | Pressure Testing Equipment Skid |
| 4 | Water Truck |
| 1 | Water Pump |
| 1 | Air Pressure Pump |
| 1 | Generator |
| 2 | Drill Rig |
| 2 | Mud Reclaimer |
| 2 | Vacuum Truck |
| 2 | Mud Tank |
| 12 | Frac Tanks |
| 1 | Mechanic Truck |
| 4 | Loads of pipe Rollers |

## 8.0 PROJECT TIMING

Commencement of Work

The Work will commence when all parties agree that proper procedures and permits are in place and the time frame accommodates wildlife needs. Based on initial conversations with BNWR, the window for construction is between May 1st and Oct 15th with the Northern portion becoming available as early as April 15th. All required permits will be approved and received prior to the construction commencement date.

Performance and Completion of Work

After commencement of the Work, it will continue with due diligence, and shall not be neglected or discontinued at any time through completion. All Work will be performed in accordance with accepted industry standards, and any special requirements determined by the BNWR and with the utmost regard for safety of life and property. The Work shall be

conducted in such a manner and with such machinery, equipment, tools, labor and supervision as is deemed necessary and sufficient to insure completion in accordance with the construction schedule.

Construction Schedule

We will develop, in conjunction with the selected pipeline contractor, a detailed installation progression schedule for the Work that instead of providing the most efficient and cost effective installation, will address the special needs of the BNWR to complete all operations within this area in the most expeditious method possible.

(See Attachment E for a preliminary schedule of the Work activities).

## 9.0 LINE BURIAL AND SPECIFIC CROSSING REQUIREMENTS

The standard minimum cover of installed pipeline is 42 inches except in cultivated fields and highly improved pasture lands where the minimum cover shall be 48-inches. Cover is measured from natural ground to top of the pipe except for locations where the pipe has weight coating or set-on weights added. In such locations, the cover is measured to the top of the weight or weight coating. Slight variations from these above requirements may be indicated on specific property deed or easement restrictions.

The minimum cover in the public road ROW from the lowest point of barrow ditches to the top of pipe in all public road crossings is 60-inches. The minimum cover between the pipeline and the driving surface of the roadway will never be less than 72-inches or as required on the specific Texas State Road Crossing Permit, whichever is greater.

The minimum cover in the ROW of all private roads from the lowest point of barrow ditches to the top of pipe in all road crossings is 60-inches.

The minimum vertical clearance between Praxair pipelines and foreign pipelines at foreign pipeline crossings shall be 24-inches, or the minimum distance required by the foreign pipeline owner/operator, whichever is greater, unless otherwise approved.

We will confirm or determine in advance of actual construction, the precise location and actual depth of all utilities and subsurface structures and pipelines that either cross or are in close proximity to the proposed pipeline.

## 10.0 HORIZONTAL DIRECTIONAL DRILLS

Certain crossings within the BNWR will be installed by HDD.

In the performance of these HDDs, a definitive procedure will be developed prior to the work execution. This procedure shall contain as a minimum the following activities:

- Utilize a “Wire Line Location” guidance process for HDDs to insure proper pipeline installation location, and as-built documentation.
- Perform a 4-hour pre-installation hydrostatic test on the welded pipe before pullback as determined by hydrostatic test procedure.
- Acquiring and hauling water to the site for mixing drilling mud. During the drilling, removal of the excess drilling mud and cuttings from the work site. During handling and disposal of such mud and cuttings, we will comply with all applicable federal, state, and local laws and regulations.
- Following completion of the pipeline post-installation system hydrostatic tests, we will dewater the pipeline in conformance with all permits and with the best management practices depicted in the SWPPP.
- All water utilized for pipeline testing, when feasible, will be returned to the sources from which it was initially obtained. The water will be cleaned, filtered and chemically tested, but not chemically treated in any manner, prior to discharging back to its original source.

## 11.0 GENERAL REQUIREMENTS

We will at all-time have a responsible foreman, supervisor, or head workman conversant in the English language at the location of the worksite for overall supervision. We will assure that personnel shall be fully skilled, trained, and qualified to do their assigned work/job. We will have documentation on the personnel "qualification" process, including education, training, and work experience of their qualified employee.

All excavation required for installation of the pipeline will be performed utilizing Top-Soil Segregation (double-ditch) for the ditch line only. Topsoil segregation depth will be not less than twelve (12) inches. Topsoil will be segregated and placed back on top of the completed backfill. The new pipeline shall be properly padded, both below and above the pipeline, and backfilled in accordance with approved industry practices.

All welding, burning, grinding, or other spark producing operations shall be controlled by our approval and issuing of a Hot Work permit which defines the controls on performance of the work. Generally, for welding, grassy areas will be scraped of all combustibles or areas will be kept wet when sparks are falling. We will have on location, during welding, a water truck of sufficient size and apparatus necessary to spray water on and put out any grass fires.

During the construction period we will assume full responsibility for site dust control measures and for any and all pollutants caused by this Work which may be detrimental to the environment. We will provide dust control measures and shall dispose of possible pollutants in accordance with all governmental agencies and to our standards.

We will comply with all permits, foreign pipelines and utility Owners requirements during the course of the work.

We will be responsible for the installation and maintenance of environmental control methods such as silt fence, straw wattles or other devices in accordance with the Storm Water

Pollution Prevention Plan (SWPPP) developed for the project and the Construction Drawings. We will comply with the environmental plans and permits and with the environmental compliance procedures and reporting.

No fishing or hunting will be allowed on the BNWR. All wildlife encountered shall be left undisturbed.

We will provide all necessary construction mats.

- All mats shall be new and cleaned of all soil or contaminates prior to delivery to site.
- The total pipeline route through the BNWR will be matted for movement of equipment, labor, and materials.
- The HDD drill sites and equipment temporary work space for operation and movement in and out of the sites will be matted.
- Roads, pipeline crossings, or drainage feature crossings will be matted.
- Temporary access and exit roads will be matted.
- 3rd party pipelines and utilities will be matted for protection.

We will implement adequate control measures to avert accelerated erosion and sediment movement in all areas disturbed by construction activities.

We will execute and comply with the environmental plans and permits and with the environmental compliance procedures and reporting.

All equipment will be in sound and good working order with any fluid releases controlled.

We will provide portable restroom facilities for all personnel working on site.

We will be responsible for carefully dismantling and restoring all fencing at any existing fence line, foreign pipeline or utility facilities.

## 12.0 USE OF DESIGNATED PUBLIC AND PRIVATE ROADS

We will restore State, County, private and access roads, bridges, and ancillary sites to their original condition. This Work shall meet with the approval of applicable landowner(s) and/or agencies.

We will provide vehicle escorts for stringing trucks and flag persons where needed and shall supply, install and maintain all temporary signs and other devices necessary for warning public and private road users of construction activities. Such signs and devices and placement thereof shall conform to the Specifications of the agency having jurisdiction over the crossing.

The traveled surfaces of roads, streets, highways, shall be cleaned free of mud, dirt or any debris immediately after such material has been deposited by equipment traversing these said roads or exiting from the ROW.

Construction entrances are required, as detailed in the SWPPP, where equipment exits the construction area onto roads. Geotextile fabric will be used beneath these pads to separate the rock from the underlying soils. Unless otherwise directed, all rock and geo-textile materials will be removed and disposed of in an approved off-site location after completion of construction activities.

## 13.0 ENVIRONMENTAL

We will employ in accordance with common industry practices and BNWR specific request to return all areas disturbed during the Work to pre-construction contours, re-vegetated, and stabilized per the SWPPP, US Army Corps of Engineers Nationwide 12 General Permit, the BNWR Special Use Permt and all applicable permits.

The SWPPP includes the Environmental details for each typical crossing. We will install, maintain, and remove temporary erosion and sediment controls as required and shall assure compliance with required erosion and sediment control.

## 14.0 SAFETY

We will ensure compliance with approved safety requirements with respect to conduct of its activities on the BNWR property.

We will follow all safety requirements and procedures of all right-of-way grantors and local rules and requirements.

We will adhere to all aspects of Praxair Contractor Rules for Construction P-15-264-D or latest revision.

## 15.0 QUALITY ASSURANCE RESPONSIBILITIES

We will make the final decision on questions concerning quality of construction and shall have right of rejection of any Work contrary to the Specifications, not within code, or is considered not to be within good pipeline industry practices.

We will may make inspections of Work in progress and carry out final inspections. Praxair recognizes that a third party inspector approved by BNWR will be contracted to conduct inspection of all construction activities on the refuge.

Praxair Inspectors or any company personnel have the right to stop the work at any time if they feel:

- The work does not meet specification;
- The work is not being performed in a safe manner;
- The work is not being performed per acceptable industry standards;
- Receipt of third party requests is valid.

**Construction Plan Attachments (A through E) are available from the refuge upon request.**

Due to file size limitations for posting 508 compliant documents, the Construction Plan Attachments (maps, graphics, etc.) are not included here. A verbal description of Attachments A, B and C is provided below.

**Attachment A: Route Maps (2)**

*Figure 1 Texas City Operations (TCO) to BASF*

This route map indicates the general location of the entire pipeline route as proposed from the Texas City Operations to BASF in Clute, Texas. The route map consists of an aerial photograph background sufficient to indicate the location of Texas City, Clute, and major roadways as well as the previously mentioned proposed pipeline route. The proposed pipeline route is indicated by a line that extends in a generally in a southwesterly direction originating in Texas City, then passing through La Marque, Hitchcock, Ineos, Freeport and terminating at the Dow Chemical Company in Clute, Texas.

*Figure 2 BNWR Route*

This route map is a subset of the previous route map and also consists of an aerial photography background. However, the scale of the map has been increased to isolate the view of the proposed pipeline route across the Brazoria National Wildlife Refuge. This map indicates the proposed pipeline, mileposts, and proposed horizontal directional drill (HDD) locations. The location of the Brazoria National Wildlife Refuge is also indicated. The proposed pipeline enters the southwest corner of the Brazoria National Wildlife Refuge at approximately milepost 27 of the pipeline, trends in a general southwest direction and exits the Brazoria National Wildlife Refuge at approximately milepost 31 for a total distance across the wildlife refuge of about 4 miles. There is a proposed valve located at about milepost 27.5 and is indicated by a valve symbol. There are three HDD's proposed within the Brazoria National Wildlife Refuge and occur at approximate mileposts 29, 30 and 31.

**Attachment B: BNWR Access Routes (3)**

*Figure 1 Access route for equipment from CR 208 northwest to FM 2004*

This map indicates a route of proposed access for project related equipment, materials and labor for the portion of the right-of-way (ROW) between FM 2004 and CR 208. FM 2004 extends in an east, northeast directions and serves as the northern boundary of the Brazoria National Wildlife Refuge in the vicinity of the proposed pipeline. CR 208 extends in a south, southeast direction and bisects the Brazoria National Wildlife Refuge. Access will be along and within the proposed ROW limits for the approximate 0.5 mile stretch of the proposed pipeline route. This map possesses the same elements of the Figure 1 (previously described) but incorporates symbology to indicate proposed access.

*Figure 2 Access route from CR 208 Austin Bayou*

This map indicates the second proposed access route to serve equipment, material and labor from CR 208 south, southwest to Austin Bayou, which is the southwestern boundary of the Brazoria National Wildlife Refuge in the vicinity of the proposed project. All access along this route will be within the proposed ROW limits. Access will be bi-directional and all descriptive elements referenced in Figure 1 above are applicable to this map.

*Figure 3 Access route from FM 2004 to east of Austin Bayou*

This drawing depicts an access route from Highway 2004 to the entry pad for the Horizontal Directional Drill (HDD) crossings of Austin and Bastrop Bayous. Equipment, material and labor will exit Highway 2004 in a south easterly direction, cross Highway 224, and proceed approximately 3.55 miles to the previously referenced HDD entry pad for the crossing of Austin and Bastrop Bayous. This access route will be bidirectional to serve as both ingress and egress to the drill site. Total round trip distance is 7.1 miles.

**Attachment C: Construction Drawings (7)**

*103342-99-0017 – BNWR Typical Mat Layout – (Open Cut)*

This drawing indicates the typical matting configuration for an Open Cut construction method. The proposed pipeline ROW is located over multiple existing pipelines and is 96 feet in width. The westerly 56 feet of ROW will be utilized as the "working side" of the ROW which will accommodate half (approximately 8 feet) of the pipeline trench and travel lanes and work area for construction equipment and includes space for welding the pipe together and equipment to lower the welded pipe string into the trench. The remaining easterly 40 feet of the ROW will accommodate the remaining 8 feet of trench width and serve as spoil placement for soils removed from the excavated ditch (total 16-feet wide).

For matting purposes, the ROW has been divided into 6, 16 foot wide sections across the width of the ROW. At any given time, 64 feet of the ROW width will be matted with 4 rows of 16 foot wide mats. Working from west to east, the first 16 foot section will serve as a travel lane for construction personnel and equipment. The second 16 foot section will accommodate equipment utilized for handling the pipe string. The third 16 foot section will serve to accommodate the pipe string and is also where the joints of pipe will be welded together to form the pipe string. The fourth 16 foot section of the ROW will be matted where the excavator will be positioned to dig the trench. The fifth 16 foot sections of the ROW will be matted for the entire length of the ROW and will serve as the placement area for the subsoil excavated form the trench. Matting from the excavated portion of the fourth 16 foot section of the ROW will be moved to the sixth 16 foot wide section to accept the top spoil removed from the trench.

The proposed 24-inch and 14-inch pipelines will be laid among multiple existing pipelines and at a depth of cover of 42-inches from top of pipe to natural ground.

*103342-99-0018 – BNWR Typical Mat Layout – (Push)*

This drawing indicates the typical matting layout for a Push construction method. The proposed pipeline ROW is located over multiple existing pipelines and extends eastward for a total width of 64 feet. The

westerly twenty-four feet of ROW will be utilized as the "working side" of the ROW which will accommodate half (approximately 8 feet) of the pipeline trench and travel lanes for construction equipment. The remaining easterly 40 feet of the ROW will accommodate the remaining 8 feet of trench width and serve as spoil placement for soils removed from the excavated ditch (total 16-feet wide).

At any given time, forty-eight feet of the ROW width will be matted with 3 rows of 16 foot wide mats. Working from west to east, the first and third 16 foot sections of the ROW will be matted for the entire length of the ROW. The second 16 foot wide section will be matted over the proposed trench with the mat directly over the active trenching operation being moved to the fourth 16 foot section to accept the top spoil removed from the trench. The third 16 foot section will be used to stockpile subsoil removed from the trench.

The proposed 24-inch and 14-inch pipelines will be laid among multiple existing pipelines and at a depth of cover of 42-inches from top of pipe to natural ground.

*103342-99-0019 – BNWR Typical Mat Layout – (Access Rd., Push Rack, & HDD Entry Pad)*

This drawing depicts the matting layout for access roads, push racks and horizontal directional drill (HDD) entry pads. Access roads will be matted with 2, 16 foot wide sections of mats for total access road width of 32 feet and will extend from the points of ingress/egress from previously established access to the work pad.

Push racks and HDD entry pads will be fully matted with dimensions of 300 feet by 192 feet.

*103342-99-0020 – BNWR Typical Mat Layout – (HDD Entry Pad)*

This drawing depicts the typical mat layout for a horizontal directional drill (HDD) on the Brazoria National Wildlife Refuge. An area 160 feet by 300 feet will be matted and includes an access road to facilitate ingress to and egress from the drill pad. The HDD entry point will be approximately 40 feet from the closest edge of the access road and 88 feet from opposite edge of the HDD pad.

*103342-99-0021 – BNWR Typical Mat Layout – (2$^{nd}$ Drag Section)*

This drawing depicts the typical mat layout for the drag section (2$^{nd}$ drag section) on the Brazoria National Wildlife Refuge. An access road leading into the work site will be matted to a width of 32 feet. This access road leads into an area of matting approximately 50 feet wide and centered over the proposed pipeline trench and still maintains the 32 foot wide access road for a total width of 82 feet. Two additional levels of matting, approximately 300 feet long and 82 feet wide (50 feet wide on one side and 32 feet wide on the opposite side), will be added to the previously described areas for a total width of 160 feet.

*103342-99-022 – Mainline Backfill Sack Breakers*

This drawing depicts the proper installation of mainline backfill sack breakers for trenches under 48 inches in width as well as trenches over 48 inches in width. Sacks are to be filled with earth or sand placed into the trench and around the pipe from trench wall to trench wall and from the bottom of the trench to natural grade of the earth. A footnote on the figure indicates that these breakers are to be installed wherever Praxair determines that they are appropriate and all materials are to be furnished by the contractor.

*103342-99-0023 – BNWR Typical Mat Layout – (Push Rack)*

This drawing depicts the typical mat layout for a Push Rack used on the Brazoria National Wildlife Refuge. This drawing indicates that there are a total of 21 existing pipelines within the ROW of the proposed 24 inch and 14 inch pipelines. The existing pipelines are as follows:

1. Kinder Morgan Pipeline – 20 inch diameter with 5 feet of cover
2. Buckeye Pipeline – 8 inch diameter with 5 feet of cover
3. Buckeye Pipeline – 6 inch diameter with 5 feet of cover
4. Buckeye Pipeline – 8 inch diameter with 5 feet of cover
5. Buckeye Pipeline – 4 inch diameter with 5 feet of cover
6. Buckeye Pipeline – 8 inch diameter with 5 feet of cover
7. DOW Pipeline – 4 inch diameter with 2 feet of cover
8. DOW Pipeline – 6 inch diameter with 3 feet of cover
9. DOW Pipeline – 8 inch diameter with 3 feet of cover
10. DOW Pipeline – 4 inch diameter with 3 feet of cover
11. DOW Pipeline – 6 inch diameter with 3 feet of cover
12. DOW Pipeline – 16 inch diameter with 4 feet of cover
13. Air Liquide Pipeline – 14 inch diameter with 4 feet of cover
14. Chevron Pipeline – 6 inch diameter with 4 feet of cover
15. Air Products Pipeline – 12 inch diameter with 3.8 feet of cover
16. Equistar Pipeline – 10 inch diameter with 4.4 feet of cover
17. Exxon Mobil Pipeline – 6 inch diameter with 4.6 feet of cover
18. Buckeye Pipeline – 8 inch diameter with 4.7 feet of cover
19. Exxon Mobil Pipeline – 40 inch diameter with 5 feet of cover
20. DOW PDH-1 Pipeline – 12 inch diameter with 4 feet of cover
21. Proposed DOW LHC-9 Pipeline – 12 inch diameter with 4 feet of cover

All existing pipelines detailed above are located within an area approximately 184 feet in width. The proposed 24 inch and 14 inch Praxair pipelines will be located between the existing 8 inch Buckeye Pipeline (number 18 above) and the 40 inch Exxon Mobil Pipeline(number 19 above).

The Push Rack will be matted over a maximum area of 667 feet by 277 feet reducing to 539 feet by 277 feet. This configuration includes matting an area of 218 feet by 667 feet over and beyond pipelines 1 through 18 and 59 feet by 539 feet over pipelines 19 through 21 described above. A 32 foot wide access road has also been included and will be matted to provide ingress to and egress from the proposed push rack.

**Attachment C: Route Strip Drawings (8)**

*PAGE 1*

This figure, overlaid on an aerial photograph, depicts the pipeline crossing Farm to Market Road (FM) 2004 in a southwesterly direction into the Brazoria National Wildlife Refuge (BNWR) via horizontal bore. Once inside the boundary of the BNWR, additional temporary workspace is present to accommodate the boring exit and pipe staging/stringing area. The pipeline continues in a southwesterly direction towards Ditch #10 which the pipeline crossed via Horizontal Directional Drill (HDD). In addition, the figure indicates a railroad car bridge will be used to allow vehicles to cross the ditch. After the crossing of Ditch #10 and the exit of the HDD, the figure depicts the typical open cut workspace configuration to the crossing location of County Road 208 via horizontal bore. Just east of the County Road 208 crossing, there is a staging area and workspace to accommodate the crossing. The figure also indicates that FM2004 and County Road 208 will be used as access roads for the project.

This figure has insets of typicals 103342-99-0017 and 103342-99-0021. Please refer to those figures for descriptions.

*PAGE 2*

This figure, overlaid on an aerial photograph, depicts the crossing of County Road 208 via horizontal bore. To the east and west of the County Road 208 crossing, there are staging areas and additional temporary workspaces to accommodate the crossing. An access point from County Road 208 to provide equipment access to the ROW is located on the western side of County Road 208. The figure indicates that new permanent double gates will be installed on both sides of the ROW at the crossing of County Road 208. After exiting the additional workspace and staging areas, the figure depicts the typical open cut workspace configuration. In addition, the figure indicates that County Road 208 will be used as an access road for the project.

This figure has an inset of typical 103342-99-0017. Please refer to that figure for descriptions.

*PAGE 3*

This figure, overlaid on an aerial photograph, depicts the typical open cut workspace configuration passing mile marker 28 and Ditch #12 just east of Otter Slough and the HDD entry location and associated additional temporary workspace required to accommodate the HDD for the first crossing of Otter Slough.

This figure has insets of typicals 103342-99-0017 and 103342-99-0020. Please refer to those figures for descriptions.

*PAGE 4*

This figure, overlaid on an aerial photograph, depicts the first crossing of Otter Slough, the HDD entry and exit locations and associated additional temporary workspace required to accommodate the HDD.

In addition, the figure depicts the new access road to be constructed to allow for construction equipment to bypass otter slough to the east. There is no workspace depicted between the HDD entry and exit locations for the Otter Slough crossing. Upon exiting the HDD exit location, the figure depicts the typical open cut workspace configuration.

This figure has insets of typicals 103342-99-0017, 103342-99-0019 and 103342-99-0020. Please refer to those figures for descriptions.

*PAGE 5*

This figure, overlaid on an aerial photograph, depicts the typical open cut workspace configuration passing mile marker 29 to the HDD entry and associated additional temporary workspace required to accommodate the HDD entry for the second crossing of Otter Slough. In addition, the figure depicts a new access road to be constructed to across Otter Slough to allow for construction equipment crossing. On the western side of the slough, in addition to the HDD exit location, additional workspace is depicted to accommodate the HDD exit, and a staging area including a push rack to be utilized for push construction methodology west of this location.

This figure has insets of typicals 103342-99-0017, 103342-99-0019 and 103342-99-0023. Please refer to those figures for descriptions.

*PAGE 6*

This figure, overlaid on an aerial photograph, depicts the eastern portion of the additional workspaces associated with the push rack and then depicts the limits of the workspace associated with push construction methodology. This extends west past Ditch #1 and mile marker 30.

This figure has insets of typicals 103342-99-0017 and 103342-99-0022. Please refer to those figures for descriptions.

*PAGE 7*

This figure, overlaid on an aerial photograph, depicts the limits of the workspace associated with push construction methodology. On the southern portion of the figure, an additional temporary workspace is depicted associated with the push construction methodology drag section.

This figure has an inset of typical 103342-99-0017. Please refer to that figure for descriptions.

*PAGE 8*

This figure, overlaid on an aerial photograph, depicts the limits of the workspace associated with push construction methodology and the approach towards the BNWR boundary at Austin Bayou. Just north of Austin Bayou, additional temporary workspace associated with the drag section and HDD Exit is present. South of Austin Bayou, the HDD Entry is visible. At the crossing of Austin Bayou, the pipeline exits the BNWR.

This figure has an inset of typical 103342-99-0017.  Please refer to that figure for descriptions.