Project Execution Plan

for

Beacon Port Pipeline

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1. Project Description

ConocoPhillips (CoP) plans to construct an offshore-based LNG Receiving, Storage and Re-gasification facility named Beacon Port located offshore in U.S. federal waters of the Gulf of Mexico. The regasified LNG will be exported from the facility via submarine pipeline to a new metering platform, hereafter referred to as the Riser Platform, to be installed in West Cameron Block 167. From this platform, gas will be metered and directed through new pipelines connecting the Riser Platform to the 42-inch U-T Offshore in WC 167, the 20-inch Tennessee Gas Pipeline in WC 167, and the 30-inch Michigan-Wisconsin Pipeline in WC 168

The Beacon Port gas export pipeline system will have a nominal delivery capacity of 1.5 billion standard cubic feet per day (Bscfd) of natural gas.

2. Offshore Pipeline Construction – Beacon Port Pipeline Preferred Route

Conventional installation technology will be used to install all facets of the pipeline system, including pipelay, riser installation, hot tapping of existing subsea pipelines and subsea tie-ins.

2.1. Construction Methods and Procedures

2.1.1. General

Offshore pipelay and construction vessels are typically supported by tugboats, material barges, crew boats, supply vessels and sometimes helicopters for transportation of staff and supplies to and from the vessel. The main vessel and these associated vessels constitute a “spread.”

Typical barges are held on station and advance along the proposed pipeline route with an array of eight to twelve anchors.

2.1.2. Pipelay

Pipelay will be accomplished with a conventional pipelay barge. The pipeline forms an S-curve with an “overbend” beginning on the stern of the barge, and a “sagbend” which ends where the pipeline rests on the seafloor.

Typically, a laybarge will have several welding stations, a non-destructive examination (NDE) station and a field joint coating station. All welding and coating will comply with Department of Transportation requirements set forth in Title 49 CFR, Part 192, “Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards” and with American Petroleum Institute (API) Standard 1104, “Welding of Pipelines and Related Facilities”.

Laybarges may utilize tension machines and stingers to hold the pipeline in a calculated configuration to prevent overstressing of the steel as it “leaves” the barge. As the barge moves forward and a new pipe segment is added to the front of the production area, a similar length of welded pipeline is lowered off the stern with the assistance of a stinger. The stinger is a mechanical device with rollers that protrudes off the stern of the barge providing extra support for the welded pipeline as it is lowered into the water. The stinger reduces stress from bending the pipeline.

Prior to transport offshore, the joints of pipe to be installed offshore will be coated with fusion-bonded epoxy (FBE) to protect the steel from external corrosion. Sacrificial anodes, used for cathodic protection, will be installed on the pipeline as determined by engineering calculations. Each joint of pipe will be concrete weight coated to provide negative buoyancy. After application of corrosion and weight coating to the pipe joints, they will be loaded and secured onto material barges, which will then be towed to the work location for offloading onto the laybarge.

The ends of the pipe joints will be cleaned as they are lifted onto the laybarge. The joints will be placed in the line-up station, where a line-up clamp will be utilized to align the ends of the pipe joints prior to the first welding passes. Once the initial welding passes have been completed in the line-up station, the laybarge is moved forward, incrementally moving the barge beneath the pipe string. This yields the impression that the new field joint is “moved” to the next station in the pipeline assembly line, where the assembly line process continues. The process will continue through four or five stations spaced approximately 40 feet apart until the entire welding process has been completed.

The next station through which the field joint will pass is the non-destructive examination (NDE) station. Qualified personnel examine the completed weld to verify the quality of the weld.

After completion of the NDE, the next station the field joint will enter is the coating station. The field joints between the pipe sections will be cleaned and coated using a system compatible with that applied onshore. The coating of all field joints will be visually and electronically inspected to detect coating defects, which will be repaired prior to the pipe entering the water. Additionally, “infill”, e.g. polyurethane foam, may be applied to the pipeline at the field joint to make the outside diameter of that area flush with concrete weight coating. The field joint infill provides a constant outside diameter for passage over support rollers.

2.1.3. Pipeline Lowering

The term “pipeline lowering” refers to the processes used to insure that the pipeline has been installed below the natural bottom of the seabed. Typical pipeline lowering methods anticipated for installation of the Beacon Port Pipeline include post-lay jetting / plowing, pre-lay dredging, post-lay diver hand jetting and mechanical pumping.

2.1.3.1. <u>Seabed Soils in the Area</u>

Pipeline lowering operations for the Beacon Port Pipeline project are expected to generally impact the upper eight to ten feet of seabed soils and, at most, the upper fifteen feet of the seabed where additional lowering through the shipping fairway is required. These soils are composed primarily of grayish clay of varying properties with some intermixed sand as would typically be expected within areas of deltaic influence.

2.1.3.2. Pipeline Lowering Requirements

In all cases, the pipeline will be lowered such that the top of pipe is a minimum of three feet (3') below pre-disturbed natural bottom in Federal Waters. The pipeline will be lowered such that the top-of-pipe is a minimum ten feet (10') below natural bottom through shipping fairways. Jetting will be the predominant method utilized to lower the pipeline.

2.1.3.3. Pipeline Lowering

Pipeline "jetting" is one method used to lower the pipeline below the seafloor after the pipeline has been laid on the sea bottom. Jetting requires water to be pumped at high pressure through pipe nozzles, which partially encompass the pipeline, to displace the soil around the pipeline. A high volume of air may be used in conjunction with the high-pressure water. The air is compressed into "air lifts" which are located adjacent to the water jet nozzles. The rising column of air bubbles creates a vacuum at the base of the airlift that assists the water jets by lifting the soil away from the pipe. In both cases, the displacement of the soil around the pipeline will allow the pipeline to settle to the bottom of the trench.

Another method that could be used to lower the pipeline below the seafloor is plowing. The plowshares are hinged such that they can be lowered over the pipeline and hydraulically closed to encapsulate the pipe (rollers allow safe movement along the coated pipeline). An umbilical connecting the plow to the towing vessel control room allows monitoring and control of the plow functions. Adjustments can be made to the plowshare and moldboard positions from the control room. The moldboards are components of the plow that move spoil away from the trench; thereby allowing a level surface for the plow skids during subsequent lowering passes. Video monitors and instrument readouts furnish the plowing operators information on the status of the plowing functions, such as angle and position of shares, position of moldboards, pulling forces and pressure exerted on the pipeline.

To facilitate setting the plow onto the pipeline, a transitional trench approximately 200 feet long may be required. This trench would be constructed by a shallow water dredge, allowing the plowshares to be positioned at the required first-pass depth, usually 4 to 5 feet below natural seabottom.

Once the plow is in place, the towing vessel moves along the pipeline (pulling in the bow anchor lines and releasing the stern anchor lines) to a pre-determined distance ahead of the plow. The plow tow cable is secured and the towing vessel commences the plowing operations. As the towing vessel moves itself forward by pulling and releasing anchor lines, the AHTs begin the routine of moving the anchors ahead of the towing vessel. The spoil resulting from the plowing operation is spread to both sides of the trench by the moldboards.

The type of seabottom sediment will affect the depth of the trench and speed of the plow. The depth of cut is hydraulically controlled using the skid position on the natural bottom as a base line. If high-density sediments (soft rock, dense material, etc.) are encountered, the depth of the plowshares and/or speed of the plow may have to be reduced. Plowing operations will be discontinued approximately 100 feet before any foreign utility, pipeline, cables or other protected obstacles. Plowing operations will commence approximately 100 feet past the obstruction. This is to insure that no damage is inflicted on the foreign utility crossing.

Multiple passes of the lowering vessel are often required to attain sufficient depth of the pipeline below the seafloor.

Since pipeline lowering with jetting methods will likely not produce significant spoil mounds, natural tidal and current movement will be utilized for backfill of the trench.

2.1.4. Foreign pipeline and Utility Crossings

At each foreign pipeline and utility crossing, the proposed pipeline will be installed such that positive separation and protection is maintained between the two systems. A minimum of eighteen inches separation will be accomplished with two layers of 9-inch thick articulated concrete mats. The pipeline will transition from the trench, over the foreign utility on the concrete mats and then transition back into the trench. Concrete mats and/or sand-cement bags will be installed on top of the newly installed pipeline as required to provide adequate protection.

2.1.5. Tie-ins

The Beacon Port Pipeline will deliver regasified LNG from the proposed GBS facility to a new platform proposed for installation in West Cameron Block 167 (WC-167). Both ends of the pipeline will be connected to above-water facilities and systems on the deck of these structures via vertical runs of piping that are referred to as "risers". The risers will be pre-installed on the relevant structure during onshore construction of that structure, terminating at a flange just above the seabed. After the structure and the pipeline have been installed, a tie-in spool (pipe assembly composed of the appropriate lengths of pipe with flanges at each end) will be used to connect the pipeline to the riser.

The product delivered to the WC167 structure will subsequently be distributed to existing, nearby pipelines to complete the system proposed by Beacon Port. Similar to the pipeline from the GBS facility, the ends of the distribution pipelines will be connected to risers on the proposed platform via subsea tie-in spools. The opposite ends of the distribution pipelines will be tied in to existing subsea pipelines via hot taps.

2.1.6. Support Equipment

Selection of vessels used to transport personnel, equipment, and supplies to and from the worksite will be based upon the water depth in which the vessels are operating. A crew / supply boat will likely be approximately 100 feet long with a draft of approximately 6 feet, supply boats will likely be approximately 180 to 220 feet long with a 12-foot draft and typical pipe transportation barges will be 250 feet long by 72 feet wide and draft roughly 12 feet.

2.1.7. Preparation of Installation Vessels.

All contractors' personnel will receive safety and environmental orientations and training prior to start of the work to insure they are fully aware of the project requirements. Each vessel will be inspected for proper functioning of equipment and cleanliness prior to arrival on site.

Tug and crew boats will not be required to have a perimeter deck coaming due to stability concerns if excessive water were retained on deck. Overboard discharge of cooling water is acceptable as long as the system is in good working order and no fluids are exchanged between the primary and secondary systems.

If the installation vessel is not equipped with appropriate treatment facilities, gray and black water will be collected in separate holding tanks until it can be disposed of onshore in an appropriate manner. Wastes other than sewage will be collected in plastic garbage bags and disposed of in an approved metal waste container for transport to shore and onward to an approved disposal site.

2.1.8. Hydrostatic Testing

One hundred percent nondestructive inspection will be accomplished on all pipeline welds during the installation process, thereby providing assurance of pipeline integrity prior to the start of the hydrostatic testing program. Testing of all newly constructed natural gas pipelines is required by Title 49 CFR, Part 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards". The testing medium for the Beacon Port Pipeline project will be water. The construction of the offshore portion of the project will most likely be divided into specific sections. During detailed design, a testing plan will be developed that identifies the number and location of test sections, however, for the purposes of this application the test segments and locations are as defined below.

Prior to hydrostatic testing of offshore pipe segments, a sizing plate, normally 95% of the minimum inside diameter of the pipeline, may be installed on a "pig" and pushed through the pipeline. The pig is installed into the open end of the pipeline prior to completing the final weld on the pipeline. A pig may be considered as a swab that is sealed inside the pipeline to permit pressure behind the pig to propel it forward in the pipeline. This sizing plate will verify that the pipeline did not sustain any unforeseen mechanical damage during the installation process. Filtered seawater will be used to propel the sizing plate pig and to fill the pipeline for the hydrostatic test.

A high-pressure pump will be used to pressurize the test section to design test pressure. The minimum test pressure will be maintained for a minimum of 8 hours. After the testing is complete, the water in the pipeline will be discharged with a dewatering pig propelled through the pipeline with air pressure.

Hydrostatic tests anticipated on the project are as follows:

- The export pipeline system after tie-in of the riser connections.
- The distribution pipelines after tie-in of the riser connections.

Beacon Port Pipeline project personnel will notify all regulatory agencies as these plans are developed.

All practical attempts will be made during the permit application phases of the project to develop plans to return the hydrotest water to the source from which it was drawn. Seawater will be taken from and returned to the Gulf of Mexico in the vicinity of the proposed WC167 riser platform.

A mesh screen will surround the pump suction during all offshore hydrostatic tests to protect fish from being drawn into the system. The water will also be filtered to remove fine-grained sediments that may be entrained in the water column. After completion of offshore hydrostatic testing, the discharge piping will terminate sufficiently high above the seabed and/or be fitted with a velocity diffuser device such that the discharge stream will not affect the seabed.

Prevention of microbiologically induced corrosion (MIC) requires that water injected into the pipeline be treated with biocide if the water will be held in the system more than approximately 14 days. Beacon Port Pipeline Personnel anticipate this to be necessary for the export pipeline because it will be flooded prior to pipeline lowering operations. This will be done so the added weight in the pipeline may expedite the lowering process. The anticipated biocide will be a tetrakis hydroxymethyl phosphonium sulphate (THPS)-based biocide. In order to obtain appropriate levels of treatment, the THPS biocide should be injected at a dosage of 125 to 250 ppm as the pipeline is being flooded. The toxicity of this biocide will be neutralized by addition of a neutralizing agent, resulting in a concentration that will have no adverse effect on the environment caused by disposal. The neutralizing agent, hydrogen peroxide (H_2O_2), will be injected into the hydrostatic test water as it is being discharged from the pipeline. The exact concentration of hydrogen peroxide required to deactivate the biocide will be determined at the time of discharge but would be in the magnitude of four parts H_2O_2 to one part active biocide, based upon field measurements.

2.2. Seabed Impacts

Seafloor impacts due to marine pipeline construction will be temporary. Pipeline lowering by jetting operations are expected to backfill naturally by deposition of jetted sediments during the burial operation and by subsequent redistribution of adjacent sediments via currents and wave action. Areas disturbed by anchoring would likewise be expected to naturally return to predisturbed conditions.

The estimated impacted area will be the sum of the areas impacted during installation, assuming a uniform placement of anchors by the construction vessels on the various passes. These estimates are affected primarily by number of passes as well as width of anchor corridor and water depth. All anchor-moored installation vessels are assumed to utilize ten (10) anchors.

3. Environmental Plan

3.1. Marine Vessel Cleanliness Measures

Beacon Port will specify and institute measures to insure that all vessels and equipment on the project comply regulatory requirements prior to arrival at the job site. All Contractor personnel will receive environmental orientations and training prior to commencement of the work to insure they are fully aware of these requirements. SPCC plans shall be developed prior to the start of work to identify actions to be undertaken should a spill occur.

Each vessel shall be inspected for proper functioning and cleanliness prior to arrival on site. The marine installation contractor shall thoroughly clean the vessel prior to arriving at the worksite.

To eliminate detrimental impacts to the environment during periods of extremely heavy rainfall, the contractor shall utilize appropriate measures to insure surfaces that may be exposed to weather, rain and seas are free of contaminants. In the event that the exposure to the weather, rain and seas becomes so excessive as to endanger the vessel, thereby risking greater negative consequences, these clean surfaces will allow clean, naturally occurring water to proceed overboard without detriment to the environment. Cooling water systems that take seawater directly from the surrounding waterbody and subsequently discharge same overboard are permitted. All wastes will be collected and disposed of in an appropriate manner.

3.2. Project Work Plan in Fairways and State Waters

Adverse impacts to shipping and navigation during installation activities will be minimized by adhering to the following safety precautions while working in or near navigation channels:

In all cases prior to a vessel commencing operations within a fairway, notification will be provided to the United States Coast Guard (USCG) Captain of the Port in the appropriate office so that Notice to Mariners may be broadcast per standard USCG policy.

Personnel onboard the work vessel who are responsible for monitoring positioning of that vessel will monitor their vicinity using radar and visual methods for vessel traffic in their vicinity. UHF Channel 16 will also be monitored for voice communications. For anchored operations, the anchor handling tugs will likewise monitor Channel 16.

Anchor buoys placed in a fairway will be marked and lighted during nighttime operations. Additionally, an anchor-handling tug will remain in the immediate vicinity to warn off approaching vessels.

3.3. Transportation

Access to and from the work sites is planned to occur primarily via existing boat channels. The table below presents the frequency of operation for the boat types to be used during installation.

Table: Frequency of operation of vessels during construction.

Type of equipment	Round trips / day from Port of entry
Laybarge and anchor tugs	Stay offshore
Jet or Plow Barges and tugs	Stay offshore
Dredges and pushboats	Stay offshore
Supply / crew boats	4 trips/day
Pipehaul vessels	2 trips/day

The table below lists the types of vessels anticipated for use on the Islander East Project:

Table: Vessels Anticipated to be used During Installation.			
Location	**Type of Vessel**	**Vessel Size**	**Vessel Draft**
Throughout Route	Laybarge	~ 260' x 72' to 400' x 100'	~16 ft
	Jet or Plow barge	~ 260' x 72' to 400' x 100'	~16 ft
Nearshore waters	Supply/crew boat	~ 60 ft	~4 ft
	Pipe barge	~140 ft x 40 ft	~4 ft
Offshore waters	Crew boat	~100 ft	~6 ft
	Supply boat	~180-220 ft	~12 - 14 ft
	Pipe barge	~250 x 72 ft	~12 - 14 ft

3.4. Offshore Anticipated Effects

This section describes anticipated effects to natural resources due to the pipeline construction.

3.4.1. Hydrology

Generally, no adverse hydrological impacts are expected because the pipeline will be lowered below the seabed. An exception to the proposed lowering of the pipeline may occur where it crosses over existing pipelines. At these locations, the pipeline will be laid on the seabed and covered with concrete mats to protect the pipe.

3.4.2. Water Quality - Pipeline Installation

The most significant potential impacts to water quality from pipeline construction are from sediment re-suspension/re-deposition from pipeline lowering activities, accidental fuel spills and discharges of hydrostatic test waters.

Jetting will suspend all sediments in the water column for a brief period. Coarser sediments (sand size particles) will fall out and resettle quickly, while finer sediments (silt, clays) remain suspended for longer periods.

3.4.3. Spill Prevention

All vessels will have a supply of oil absorbent pads. Any oil or fuel spilled on the deck, particularly inside the deck equipment coaming, will be wiped clean. Periodic inspections of all areas of coaming will be made to ensure they remain in compliance with the intent of this section. The periodic inspection and thorough cleaning of the equipment coaming areas will allow the excess rainwater to be discharged overboard without further treatment.

Spill response plans will be developed in consultation with the selected contractors prior to the start of work. The spill response plans will clearly outline monitoring, containment, recovery and reporting activities for the range of materials expected to be present.

Gray and black water will be collected in appropriate storage facilities on all vessels that are not equipped with suitable treatment facilities, after which those liquids will be disposed of on-shore in an appropriate manner. For these purposes, black water is defined as hydrocarbon-containing liquids and gray water is defined as all human and kitchen waste liquids. All other wastes will be collected in appropriate waste containers and properly disposed of on-shore. Cooling water discharged from closed-loop cooling water systems may be discharged overboard as long as there is no exchange of fluids between the two systems.

3.5. Geology and Surficial Sediments

No significant long-term impacts to geology and surficial sediments are expected to occur from the construction and operation of the Beacon Port Pipeline. However, areas of the seafloor will be disturbed, primarily as a direct result of two processes: 1) the trenching and burial of the pipeline, which will be conducted by plowing or jetting; and 2) the mooring of vessels involved in the conduct of trenching, installation (pipelay), or burial operations, with anchors or spuds.

3.5.1. Trenching and Burial

The excavation of the pipe ditch will directly impact the seafloor, by the side casting of materials removed from the ditch, and by backfilling. We assume that the typical dimensions of a trench created by jetting for the installation of the pipeline will be approximately six to eight feet wide at the bottom of the ditch by twenty to twenty-five feet wide at the top, depending on the soil conditions.

3.5.2. Barge Mooring Systems

Potential impacts to seafloor features from anchoring result from both the anchor and the anchor cable. Anchor impacts result from the anchor penetrating the seafloor, from the anchor dragging until embedded, and final “breaking out” of the anchor when it is removed from the seafloor for relocation. Impacts from the anchor cables result from it settling into the seafloor from any dragging of the cable along the seafloor as the anchor is transported to or from the barge, and from “sweeping.” Sweeping is a lateral movement of the cable, particularly the breast anchor cables, that occurs when the barge is winched along the route using the fore and aft anchors. It also can occur when anchors are set, and force is subsequently applied to tighten the cable. The point at which the sweeping action occurs is in the area where the anchor cable contacts the seabed, rarely at the anchor itself. The impact that the anchors and anchor cables have on the seafloor is visible as disturbed area immediately after anchor removal. The area of the impact is dependent on the size and type of the anchor, the sediment type, and the forces applied to the anchor (barge size/weight, sea state, current).

The size of anchor impact can be estimated from several studies of anchor impacts using post installation geophysical surveys. These studies indicate a typical anchor impact for a 20,000 lb. stockless anchor would typically be 10 ft wide, 20 ft long, and up to 8 ft deep. A typical laybarge anchor may have a maximum drag distance up to 100 feet, although under extreme conditions, the length of the impact could be as great as 150 feet. These dimensions are consistent with disturbances observed in studies of offshore Norway, United Kingdom and Japan (Centaur Associates, Inc. 1984).

Any impact to the seafloor from pipeline construction will be temporary. An anchor-handling plan will be prepared in conjunction with the installation contractor. The anchor-handling plan will prescribe measures to reduce potential impacts to the seafloor and any natural and cultural resources.

4. Project Schedule

4.1. Estimated Completion Dates – Base Case

Construction of the marine pipeline, i.e., Beacon Port Pipeline, segment of the system, including testing and drying of the system after tie-in to onshore segments, is anticipated to take five months.

Base Case Marine Pipeline Construction Schedule		
Task	**Start Date**	**End Date**
Prelay Survey	06/01/09	06/13/09
Prepare utilities crossings and hot tap existing pipelines	06/13/09	07/25/09
Install pipeline in Federal waters	06/13/09	07/23/09
Lower pipeline in Federal waters	06/20/09	10/06/09
Complete Tie-ins and Crossings	07/25/09	09/01/09
Final Hydrotest, dewater and dry pipeline	10/06/09	10/30/09