

# **Deepwater Port License Application Blue Marlin Offshore Port (BMOP) Project**

*Volume IIb – Appendix C*

*Submitted to:*



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***September 2020***

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## **Deepwater Port License Application Blue Marlin Offshore Port (BMOP) Project**

- Volume I: General (Public), including Deepwater Port License Application and Appendices  
*(under separate cover)*
- Volume IIa: Offshore Project Components Environmental Evaluation (Public)  
*(under separate cover)*
- Volume IIb: Onshore Project Components, Environmental Evaluation (Public) (herein)**
- Volume III: Technical Information  
[*Confidential*]  
*(under separate cover)*
- Volume IV: Company and Financial Information  
[*Confidential*]  
*(under separate cover)*

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## **APPENDIX C**

### **ONSHORE PROJECT CONSTRUCTION AND MITIGATION PLANS**

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**APPENDIX C-1**

**ONSHORE CONSTRUCTION BEST MANAGEMENT PRACTICES**

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# **Blue Marlin Offshore Port (BMOP) Project**

*Volume IIb – Onshore Project Components Environmental Evaluation  
(Public)*

*Appendix C-1*

**Onshore Construction Best Management Practice (BMP) Plan**

*September 2020*

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## **ABBREVIATIONS AND ACRONYMS**

ATWS	Additional Temporary Workspace
BMOP	Blue Marlin Offshore Port LLC
BMP	Best Management Practice
BMP Plan	Onshore Construction Best Management Practices
EI	Environmental Inspector
HDD	Horizontal directional drill
LDWF	Louisiana Department of Wildlife and Fisheries
Project	Blue Marlin Offshore Port Project
ROW	Right-of-way
SPMT	Sunoco Partners Marketing & Terminals
TPWD	Texas Parks and Wildlife Department
USFWS	U.S. Fish and Wildlife Service
WMA	Wildlife Management Area

## **1.0 INTRODUCTION**

Blue Marlin Offshore Port LLC (BMOP) is proposing to develop a deepwater port (DWP) in United States (U.S.) federal waters for the transportation of crude oil for export to the global market, referred to as the Blue Marlin Offshore Port Project (Project). The proposed Project consists of both offshore (i.e., DWP facilities) and onshore (pipeline facilities) components. The construction of onshore components that apply to this *Onshore Construction Best Management Practices Plan* (BMP Plan) consist of a new-build, approximately 37-mile long, pipeline connecting Sunoco Partners Marketing & Terminals' (SPMT) existing Nederland Terminal in Jefferson County, Texas to the existing Stingray Mainline at Station 501 (NGPL/Stingray interconnect) in Cameron Parish, Louisiana. Aboveground facilities supporting the Project include the BMOP Pump Station in Jefferson County, Texas, and Station 501 and 701 in Cameron Parish Louisiana. An existing natural gas tap located along the existing Stingray Mainline in Cameron Parish, Louisiana (Stingray Tap), will be removed by TC Energy and replaced with a pre-tested pipeline segment.

### **1.1 Purpose of this Plan**

The intent of this BMP Plan is to identify baseline mitigation measures for minimizing and avoiding impacts during construction of the onshore components of the Project. Once the Project is authorized, construction personnel may deviate from the BMPs outlined in this plan if a different measure is identified that provides equal or better environmental protection. Deviations may also be necessary if a BMP is determined to be infeasible or unworkable based on site-specific conditions. At this time, the measures outlined in this BMP Plan are considered *DRAFT* as modifications or amendments may be necessary based on future agency consultation and permit conditions issued for the Project.

### **1.2 Environmental Training**

Experienced, well-trained personnel are essential for successful implementation of the Project. Company personnel and its Contractors will undergo Project-specific environmental training. Varying levels of training will be required depending on the person's role (e.g., supervisors versus laborers). However, all workers will be required to attend a general environmental training session before beginning construction. All persons engaged in Project construction will be informed of the construction plans and permit conditions (e.g., wetland construction), as well as, the laws, rules, and regulations applicable to the work. In addition, prior to construction, all onsite personnel will be informed of the protective measures included in this BMP Plan. Refresher or supplemental training will be required if compliance is not satisfactory or as new issues arise.

## **2.0 ENVIRONMENTAL INSPECTION**

BMOP will assign at least one Environmental Inspector (EI) per pipeline construction spread. The number and experience of EIs assigned to each construction spread will be appropriate for the length of the construction spread and the number/significance of resources affected.

EIs will have peer status with all other activity inspectors. EIs will also have the authority to stop activities that violate conditions of the environmental permits or approvals, or landowner easement agreements; and to order appropriate corrective action.

EIs must have knowledge of the wetland and waterbody conditions of the Project area.

## **2.1 Environmental Inspector (EI) Responsibilities**

At a minimum, EIs will be responsible for:

- Inspecting construction activities for compliance with the environmental requirements of this BMP Plan, environmental permits and approvals, and landowner easement agreements.
- Identifying, documenting, and overseeing corrective actions, as necessary, to bring an activity back into compliance.
- Verifying that the limits of authorized construction work areas (i.e., limits of disturbance) and locations of access roads are visibly marked before clearing and maintained throughout construction.
- Verifying the location of signs and highly visible flagging that marks the boundaries of sensitive resource areas or areas with special requirements.
- Identifying erosion/sediment control and soil stabilization needs in all areas.
- Ensuring that erosion control devices are properly installed to prevent directing water and sediment flow into sensitive environmental resource areas (e.g., wetlands, waterbodies, cultural resource sites, and sensitive species habitats) and onto roads, and determining the need for additional erosion control devices.
- Verifying that dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment into sensitive environmental resource areas; stopping dewatering activities if such deposition is occurring and ensuring the design of the discharge is changed to prevent reoccurrence; and verifying that dewatering structures are removed after completion of dewatering activities.
- Ensuring that appropriate topsoil segregation and restoration is completed in designated areas.
- Ensuring restoration of contours and topsoil following installation.
- Advising the Chief Construction Inspector when environmental conditions (e.g., wet weather, frozen soils) make it advisable to restrict or delay construction activities to avoid topsoil mixing or excessive compaction.
- Verifying that the soils imported for agricultural or residential use are certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner.
- Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts.
- Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase.
- Verifying that disposal of construction-related waste is completed in accordance with federal, state, and local regulations.
- Inspecting and ensuring the maintenance of temporary erosion control measures at least:
  - On a daily basis in areas of active construction or equipment operation;
  - On a weekly basis in areas with no construction or equipment operation; and
  - Within 24 hours of each 0.5 inch of rainfall;
- Keeping records of compliance with environmental permit and approval conditions.

### **3.0 PRECONSTRUCTION PLANNING**

Prior to construction of a Project component:

#### Construction Work Areas

- Identify all construction work areas (e.g., construction right-of-way, additional temporary workspace [ATWS] areas, pipe storage and contractor yards, borrow and disposal areas, access roads) that will be needed for safe construction.
- Ensure that appropriate cultural resources and biological surveys have been conducted, as determined necessary by the appropriate federal and state agencies.
- Plan construction sequencing to limit the amount and duration of open trench sections, as necessary, to prevent excessive erosion or sediment flow into sensitive environmental resource areas.
- Attempt to locate existing drain tiles and irrigation systems.
- Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties.
- Identify the location of all waterbodies proposed for use as a hydrostatic test-water source and test-water discharge location.

#### Road Crossings and Access Points

- Plan for safe and accessible conditions at all roadway crossings and access points during construction and restoration.
- Cross public roads using either the horizontal direction drill (HDD) or bore construction technique. Should an HDD or bore be unsuccessful, BMOP personnel will coordinate with the relevant county or local highway department to determine the best times for temporary road closures in order to minimize impacts on local traffic.

#### Disposal Planning

- Determine methods and locations for the regular collection, containment, and disposal of excess construction materials and debris (e.g., timber, slash, mats, garbage, drill cuttings and fluids, excess rock) throughout the construction process. Disposal of materials for beneficial reuse is not to result in adverse environmental impact and is subject to compliance with all applicable survey, landowner or land management agency approval, and permit requirements.

### **4.0 OVERLAND CONSTRUCTION MEASURES**

#### **4.1 Approved Areas of Disturbance**

Project-related ground disturbance will be limited to the approved areas only, including the construction right-of-way (ROW), ATWS, pipe storage yards, borrow and disposal areas, and access roads. All construction or restoration activities outside of authorized areas are subject to all applicable survey and permit requirements, and landowner easement agreements.

## **4.2 Topsoil Segregation**

Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus spoil side method) in:

- Non-inundated jurisdictional wetlands;
- Agricultural areas, including managed pastures and hayfields;
- Residential areas; and
- Other areas at the landowner's or land managing agency's request.

Where topsoil segregation is required:

- Segregate up to 12 inches of topsoil; and
- Maintain separation of salvaged topsoil and subsoil throughout all construction activities.

Segregated topsoil is not be used for padding the pipe, constructing temporary slope breakers or trench plugs, improving or maintaining roads, or as a fill material.

Stabilize topsoil piles and minimize loss due to wind and water erosion with use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary.

## **4.3 Road Crossings and Access Points**

Maintain safe and accessible conditions at all road crossings and access points during construction.

If crushed stone access pads are used in residential or agricultural areas, place the stone on synthetic fabric to facilitate removal.

Minimize the use of tracked equipment on public roadways. Remove any soil or gravel spilled or tracked onto roadways daily or more frequent as necessary to maintain safe road conditions.

Repair any damages to roadway surfaces, shoulders, and bar ditches.

## **4.4 Temporary Erosion Controls**

Install temporary erosion controls either before or immediately after initial disturbance of the soil. Temporary erosion controls are to be properly maintained throughout construction (on a daily basis) and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration is complete.

### Temporary Trench Plugs

- Temporary trench plugs are intended to segment a continuous open trench prior to backfill. Position temporary trench plugs, as necessary, to reduce trenchline erosion.
- Temporary trench plugs may consist of unexcavated portions of the trench, compacted subsoil, sandbags, or some functional equivalent.

### Sediment Barriers

- Sediment barriers are intended to stop the flow of sediments and to prevent the deposition of sediments beyond approved workspaces or into sensitive resources. At a minimum, install and maintain temporary sediment barriers across the entire construction ROW at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until revegetation is successful as defined in this Plan. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.
- Sediment barriers may be constructed of materials such as silt fence, staked hay or straw bales, compacted earth (e.g., driveable berms across travelways), sandbags, or other appropriate materials.
- Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary, to prevent sediment flow into the wetland or waterbody.

### Mulch

- Apply mulch on all slopes (except in cultivated cropland) concurrent with or immediately after seeding, where necessary to stabilize the soil surface and to reduce wind and water erosion. Spread mulch uniformly over the area to cover at least 75 percent of the ground surface at a rate of 2 tons/acre of straw or its equivalent, unless the local soil conservation authority, landowner, or land managing agency approves otherwise in writing.
- Mulch can consist of weed-free straw or hay, wood fiber hydro-mulch, erosion control fabric, or some functional equivalent.
- Mulch all disturbed upland areas (except cultivated cropland) before seeding if:
  - Final grading and installation of permanent erosion control measures will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas); or
  - Construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.
- If mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre of straw or equivalent.
- If wood chips are used as mulch, do not use more than 1 ton/acre and add the equivalent of 11 lbs/acre available nitrogen (at least 50 percent of which is slow release).
- Ensure that mulch is adequately anchored to minimize loss due to wind and water.
- When anchoring with liquid mulch binders, use rates recommended by the manufacturer. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies, except where the product is certified environmentally non-toxic by the appropriate state or federal agency or independent standards-setting organization.
- Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat, unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.



#### **4.5 Trench Dewatering**

Dewater the trench (either on or off the construction ROW) in a manner that does not cause erosion and does not result in silt-laden water flowing into any wetland or waterbody. Remove the dewatering structures as soon as practicable after the completion of dewatering activities.

#### **4.6 Hydrostatic Testing**

Apply for state-issued water withdrawal permits and for National Pollutant Discharge Elimination System (NPDES) or state-issued discharge permits, as required. BMPs for hydrostatic testing include:

- If pumps used for hydrostatic testing are within 100 feet of any waterbody or wetland, address secondary containment and refueling of these pumps (see Section 12).

##### Test-water Intake

- Screen the intake hose to minimize the potential for entrainment of fish.
- Do not use state-designated exceptional value waters or waterbodies designated as public water supplies, unless appropriate federal, state, and/or local permitting agencies grant written permission.
- Maintain adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.
- Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

##### Test-Water Discharge

- Regulate discharge rate, use energy dissipation device(s), and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive streamflow.
- Do not discharge into state-designated exceptional value waters or waterbodies designated as public water supplies, unless appropriate federal, state, and local permitting agencies grant written permission.

#### **4.7 Soil Compaction**

Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to approximate preconstruction conditions. Use penetrometers or other appropriate devices to conduct tests.

Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil.

If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

#### **4.8 Cleanup**

Commence cleanup operations immediately following backfill operations. Complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls (i.e., temporary slope breakers, sediment barriers, and mulch) until conditions allow completion of cleanup.

During cleanup:

- A travel lane may be left open temporarily to allow access by construction traffic if temporary erosion control structures are installed, inspected, and maintained. When access is no longer required the travel lane must be removed and the ROW restored.
- Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. Rock that is not returned to the trench is to be considered construction debris, unless approved for use as mulch or for some other use on the construction work areas by the landowner or land managing agency.
- Remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields, and residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction work area shall be similar to adjacent areas not disturbed by construction. The landowner or land management agency may approve other provisions in writing.
- Grade the construction ROW to restore pre-construction contours and leave the soil in the proper condition for planting in agricultural areas.
- Remove construction debris from all construction work areas unless the landowner or land managing agency approves leaving materials onsite for beneficial reuse, stabilization, or habitat restoration.
- Remove temporary sediment barriers when replaced by permanent erosion control measures or when revegetation is successful.

#### **4.9 Permanent Erosion Controls**

Permanent erosion control measures include:

##### Trench Breakers

- Trench breakers are intended to slow the flow of subsurface water along the trench. An engineer or similarly qualified professional shall determine the need for and spacing of trench breakers. Otherwise, trench breakers shall be installed at the same spacing as and upslope of permanent slope breakers.
- At a minimum, install a trench breaker at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland. Install trench breakers at wetland boundaries. Do not install trench breakers within a wetland.
- In agricultural fields and residential areas where slope breakers are not typically required, install trench breakers at the same spacing as if permanent slope breakers were required.

- Trench breakers may be constructed of materials such as sandbags or polyurethane foam. Do not use topsoil in trench breakers.

## **5.0 WETLAND CONSTRUCTION MEASURES**

Wetland delineation field surveys of the Project area were completed in May through June of 2020. Mapping of the wetlands which were identified in the Project footprint is provided in Appendix A-3 of the MARAD application (Volume IIb). The Project will have to adhere to its U.S. Army Corps of Engineers (USACE) wetland crossing permit. All construction or restoration activities outside of authorized areas are subject to all applicable survey and permit requirements and landowner easement agreements.

BMPs for constructing across wetlands include:

- Wetland buffers (e.g., ATWS setbacks, refueling restrictions) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.
- If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use marsh buggies or low-ground-weight construction equipment, or operate normal equipment on timber riprap, prefabricated equipment mats, or terra mats.
- The construction ROW may be used for access when the wetland soil is firm enough to avoid rutting or the construction ROW has been appropriately stabilized to avoid rutting (e.g., with timber riprap, prefabricated equipment mats, terra mats or using a marsh buggy). In wetlands that cannot be appropriately stabilized, all construction equipment, other than that needed to install the wetland crossing, shall use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction ROW.
- The only access roads, other than the construction ROW, that can be used in wetlands are those existing roads that can be used with no modifications or improvements, other than routine repair, and no impact on the wetland.
- Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.
- Use “push-pull” or “float” techniques to place the pipe in the trench where water and other site conditions allow.
- Minimize the length of time that topsoil is segregated and the trench is open. Do not trench the wetland until the pipeline is assembled and ready for lowering in.
- Cut vegetation just above ground level, leaving existing root systems in place, and remove it from the wetland for disposal.
- Limit pulling of tree stumps and grading activities to directly over the trenchline. Do not grade or remove stumps or root systems from the rest of the construction ROW in wetlands unless the Chief Inspector and EI determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction ROW.
- Segregate up to one foot of topsoil from the area disturbed by trenching, except in areas where standing water is present or soils are saturated. Immediately after backfilling is complete, restore the segregated topsoil to its original location.

- Do not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to support equipment on the construction ROW.
- Remove all Project-related material used to support equipment on the construction ROW upon completion of construction.

#### Temporary Sediment Control

- Install sediment barriers across the entire construction ROW immediately upslope of the wetland boundary at all wetland crossings where necessary to prevent sediment flow into the wetland.
- Where wetlands are adjacent to the construction ROW and the ROW slopes toward the wetland, install sediment barriers along the edge of the construction ROW as necessary to contain spoil within the construction ROW and prevent sediment flow into the wetland.
- Install sediment barriers along the edge of the construction ROW as necessary to contain spoil and sediment within the construction ROW through wetlands. Remove these sediment barriers during ROW cleanup.

#### Restoration

- Where the pipeline trench may drain a wetland, construct trench breakers at the wetland boundaries and/or seal the trench bottom as necessary to maintain the original wetland hydrology.
- Restore pre-construction wetland contours to maintain the original wetland hydrology.
- For each wetland crossed, install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. Install a permanent slope breaker across the construction ROW at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In some areas, with the approval of the EI, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.
- Do not use fertilizer, lime, or mulch unless required in writing by the appropriate federal or state agency.
- Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after revegetation and stabilization of adjacent upland areas are judged to be successful as specified in section.

### **5.1 Post Construction**

A Project-specific *Revegetation Plan* for temporarily disturbed areas, including wetland areas has been developed for the Project. The *Revegetation Plan* includes post-construction monitoring and maintenance restoration measures and is provided in Appendix C-2 of the MARAD application (Volume IIb).

Routine vegetation mowing or clearing in wetland areas will be performed in accordance with the appropriate federal or state wetland crossing permits.

Do not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate federal or state agency.

## **6.0 WATERBODY CONSTRUCTION MEASURES**

Waterbody delineation field surveys of the Project area were conducted in May and June of 2020. Mapping of the waterbodies which were identified in the Project footprint is provided in Appendix A-3 of the MARAD application (Volume IIb). The Project will have to adhere to its USACE waterbody crossing permit. All construction or restoration activities outside of authorized areas are subject to all applicable survey and permit requirements, and landowner easement agreements.

BMPs for constructing across waterbodies include:

- Provide written notification to authorities responsible for potable surface water supply intakes located within 3 miles downstream of the crossing at least 1 week before beginning work in the waterbody, or as otherwise specified by that authority.
- Waterbody buffers (e.g., extra work area setbacks, refueling restrictions) are to be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.
- Limit use of equipment operating in the waterbody to what is needed to construct the crossing
- For minor waterbodies (10 feet wide or less), complete instream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) within 24 hours. Streambanks and unconsolidated streambeds may require additional restoration after this period. Equipment bridges are not required for minor waterbody crossings, unless required by permit or approval conditions.
- For intermediate waterbodies (over 10 feet wide, less than 100 feet wide), complete instream construction activities (not including blasting and other rock breaking measures) within 48 hours, unless site-specific conditions make completion within 48 hours infeasible. All construction equipment must cross on an equipment bridge.
- Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the EI.

### Temporary Erosion and Sediment Control

- Install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.
- Install sediment barriers across the entire construction ROW at all waterbody crossings, where necessary to prevent the flow of sediments into the waterbody. Removable sediment barriers (or driveable berms) must be installed across the travel lane. These removable sediment barriers can be removed during the construction day but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent.
- Where waterbodies are adjacent to the construction ROW and the ROW slopes toward the waterbody, install sediment barriers along the edge of the construction ROW as necessary to contain spoil within the construction ROW and prevent sediment flow into the waterbody.
- Use temporary trench plugs at all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody.

### Spoil Pile Placement and Control

- All spoil from minor and intermediate waterbody crossings must be placed in the construction ROW at least 10 feet from the water's edge or in ATWS areas to the extent practicable.
- Use sediment barriers to prevent the flow of spoil or silt-laden water into any waterbody.

### Equipment Bridges

- Equipment bridges are required for intermediate and major waterbody crossings, and any minor waterbody crossings where required by permit or approval conditions.
- Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the number of such crossings of each waterbody to one per piece of clearing equipment.
- Construct and maintain equipment bridges to allow unrestricted flow and to prevent soil from entering the waterbody. Examples of such bridges include:
  - Equipment pads and culvert(s);
  - Equipment pads or railroad car bridges without culverts;
  - Clean rock fill and culvert(s); and
  - Flexi-float or portable bridges.
- Additional options for equipment bridges may be utilized that achieve the performance objectives noted above. Do not use soil to construct or stabilize equipment bridges.
- Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts.
- Design and maintain equipment bridges to prevent soil from entering the waterbody.
- Remove temporary equipment bridges as soon as practicable after permanent seeding.
- If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the right-of-way is available, remove temporary equipment bridges as soon as practicable after final cleanup.
- Obtain any necessary approval from the USACE, or the appropriate state agency for permanent bridges.

### Restoration

- For open-cut crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing instream construction activities.
- Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the EI.
- Install erosion control fabric or a functional equivalent on waterbody banks at the time of final bank recontouring. Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.
- Application of riprap for bank stabilization must comply with USACE, or its delegated agency, permit terms and conditions. Unless otherwise specified in permits, limit the use of riprap to areas

where flow conditions preclude effective vegetative stabilization techniques such as seeding and erosion control fabric.

- Revegetate disturbed riparian areas with native species of conservation grasses, legumes, and woody species, similar in density to adjacent undisturbed lands.
- Install a permanent slope breaker across the construction ROW at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody, or as needed to prevent sediment transport into the waterbody.

### HDD Construction

For each of the proposed HDD crossings, site-specific crossing plans are provided in Appendix B-8 (Volume IIb). The site-specific plans identify all areas to be disturbed by construction for each waterbody crossing. The plans also include ATWS areas, spoil storage areas, sediment control structures, etc.

Potential construction-related impacts during HDD construction include an inadvertent release of drilling mud. An *HDD Contingency Plan* has been developed that describes measures that will be implemented to protect from and respond to an inadvertent release of drilling mud. A copy of the plan is provided in Appendix C-5 (Volume IIb).

### **6.1 Sabine Lake Construction**

The pipeline will cross Sabine Lake with pipelay using both a dredge barge and the HDD method. The conditions listed in Table 1 apply to construction within the Lake.

<b>TABLE 1</b> <b>Requirements for Construction within Sabine Lake</b>	
<b>Condition No.</b>	<b>Condition</b>
1	TBD Based on Agency Consultation
2	TBD
3	TBD

### **6.2 Post-Construction**

Limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean highwater mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent right-of-way.

Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.

## 7.0 WILDLIFE MANAGEMENT AREA CONSTRUCTION MEASURES

The pipeline will cross the Lower Neches Wildlife Management Areas (WMA), Nelda Stark and Old River Units. The Lower Neches WMA, Nelda Stark and Old River Units, are owned and managed by Texas Parks and Wildlife Department (TPWD) for research, demonstration, and/or public hunting. Consultation with the TPWD has been conducted concerning the route through the Lower Neches WMAs. The conditions listed in Table 2 apply to the construction requirements within the in the WMAs crossed by the Proect.

<b>TABLE 2</b> <b>Requirements for Construction within the Lower Neches WMA</b>	
<b>Condition No.</b>	<b>Condition</b>
1	TBD Based on Agency Consultation
2	TBD
3	TBD

## 8.0 RESIDENTIAL CONSTRUCTION MEASURES

For all properties with residences located within 50 feet of construction work areas:

- Avoid removal of mature trees and landscaping within the construction work area unless necessary for safe operation of construction equipment, or as specified in landowner agreements.
- Excavate the trench only once the pipe has been welded and is ready to lay in the trench.
- Immediately backfilling the excavated trench once the pipe is installed;
- Notify the homeowner one week prior to commencing construction activities.
- Fence the edge of the construction work area for a distance of 100 feet on either side of the residence.
- Maintain access to residential properties at all times.
- Restore all lawn areas and landscaping immediately following clean-up operations, or as specified in landowner agreements. If seasonal or other weather conditions prevent compliance with these time frames, maintain and monitor temporary erosion controls (sediment barriers and mulch) until conditions allow completion of restoration.

## 9.0 FUGITIVE DUST CONTROL MEASURES

Wet suppression is the predominate method of suppressing fugitive dust emissions through the application of water, mainly via water trucks. The amount of water required to sufficiently control fugitive dust emissions is dependent on a number of variables including; surface moisture content, ambient conditions (e.g., temperature, wind, humidity, precipitation), construction activities occurring (e.g., vehicle/equipment traffic, vehicle speeds, vehicle weight), etc. Disturbed and unpaved areas are to be kept sufficiently damp during working hours in dry conditions to minimize wind-blown or traffic-generated fugitive dust emissions. Areas to be watered include, but are not limited to:

- The construction corridor, including ATWS;



- Access roads;
- Aboveground facility sites;
- Active grading areas;
- Soil stockpiles; and
- Unpaved parking/staging areas.

The frequency of water applications will vary based on weather and site conditions. More frequent applications will be required in dry conditions and in areas with a high potential for fugitive dust generation. Water for fugitive dust control will be obtained from municipal water systems or other approved sources and will be of potable quality.

The track-out of loose materials will be controlled by installing rock or paved construction entrances on access roads that begin at a junction with paved roads. Any loose material tracked beyond the construction entrances will be recovered via sweeper trucks and/or vacuum trucks.

## **10.0 INVASIVE SPECIES CONTROL MEASURES**

The following measures are to be implemented to minimize the potential to introduce or spread noxious and invasive vegetation species located on state or public land including:

- Inform and train construction personnel regarding noxious weed and invasive species identification and the protocols to prevent or control the spread of invasive species.
- EI(s) will mark the entry and exit of areas of noxious weed infestation with signage along the construction ROW
- Vehicles and equipment will be inspected for remnant soils, vegetation, and debris, and will be cleaned of these materials before they are brought to the Project area. Vessels, vehicles and equipment will be inspected for invasive species including aquatic weeds.
- To prevent the spread of seeds, roots, or other viable plant materials, vessels, vehicle and equipment used in areas containing invasive plant species or aquatic weeds will be cleaned before moving to an uninfested area.
- Seeds for revegetation and straw or hay bales used for sediment barrier installations or mulch distribution, where appropriate, are to be certified weed-free.
- Mechanical treatment or herbicide application will be used to control the spread of invasive species during and after construction. Herbicides will be applied according to manufacturer's printed recommendations and in accordance with applicable agency regulations governing herbicide application. No herbicides or pesticides will be used within 100 feet of waterbodies or wetlands. A qualified contractor will be utilized to determine the appropriate herbicide application method.

## **11.0 REVEGETATION AND POST-CONSTRUCTION MONITORING**

A Project-specific *Revegetation Plan* has been developed for temporarily disturbed areas. The *Revegetation Plan* includes restoration and post-construction monitoring and maintenance measures, including monitoring for invasive species, and is provided in Appendix C-2 (Volume IIb).

## **12.0 SPILL PREVENTION AND RESPONSE PROCEDURES**

A Project-specific *Spill Prevention and Response (SPAR) Plan* has been developed to minimize hazards to human health and/or the environment from any unplanned sudden or non-sudden releases of oils, toxic, hazardous, or other polluting materials to the air, soil, surface water or groundwater. The SPAR Plan is provided in Appendix C-3 (Volume IIb).

## **13.0 WILDLIFE MITIGATION MEASURES**

BMPs to minimize impacts to wildlife due to pipeline construction, include:

- Restrict construction activity within 1,000 feet of an active nesting colony to the non-nesting season (September 1 to February 15) to minimize disturbance to nesting waterbirds. For colonies containing nesting gulls, terns, or black skimmers, all activity occurring within 60 feet (2,000 feet for Brown pelicans) of an active nesting colony will be restricted to the non-nesting period (i.e., September 16 through April 1) unless specifically approved in writing by Louisiana Department of Wildlife and Fisheries (LDWF) and/or TPWD.
- Minimize unnecessary lighting; lighting should only be utilized for safety and security purposes. Light will be directed downward or toward active construction to minimize impacts on wildlife and birds in adjacent habitats.
- Limit nighttime construction traffic, noise, and lighting.
- At HDD locations, direct lighting downward or directly at active construction, where feasible, while maintaining safety.
- Inspect open trenches for wildlife each morning before commencing construction activities.
- Limit access on the ROW with use of signs, fences, and/or gates.
- Enforce speed limits within, to, and from all construction workspaces when not using access roads.
- Prohibit unnecessary idling of internal combustion engines and require that all equipment be shut off when not in use to minimize noise.

**APPENDIX C-2**  
**REVEGETATION PLAN**

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# **Blue Marlin Offshore Port (BMOP) Project**

*Volume IIb – Onshore Project Components Environmental Evaluation  
(Public)*

*Appendix C-2*

**Revegetation Plan**

*September 2020*

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## ABBREVIATIONS AND ACRONYMS

BMP Plan	Onshore Construction Best Management Practices Plan
DWP	Deepwater Port
lbs	pounds
NRCS	Natural Resource Conservation Service
PLS	Pure Live Seed
Project	Blue Marlin Offshore Port Project
ROW	Right-of-way
USACE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture

## **1.0 INTRODUCTION**

Blue Marlin Offshore Port LLC (BMOP) is proposing to develop a deepwater port (DWP) in United States (U.S.) federal waters for the transportation of crude oil for export to the global market, referred to as the Blue Marlin Offshore Port Project (Project). The proposed Project consists of both offshore (i.e., DWP facilities) and onshore (pipeline facilities) components. The construction of onshore components that apply to this *Revegetation Plan* consist of a new-build, approximately 37-mile long, pipeline connecting Sunoco Partners Marketing & Terminals' (SPMT) existing Nederland Terminal in Jefferson County, Texas to the existing Stingray Mainline at Station 501 (NGPL/Stingray interconnect) in Cameron Parish, Louisiana. Aboveground facilities supporting the Project include the BMOP Pump Station in Jefferson County, Texas, and Station 501 and 701 in Cameron Parish Louisiana. An existing natural gas tap located along the existing Stingray Mainline in Cameron Parish, Louisiana (Stingray Tap), will be removed by TC Energy and replaced with a pre-tested pipeline segment.

### **1.1 Purpose of this Plan**

The purpose of this *Revegetation Plan* is to identify the revegetation measures that will be implemented following construction and the post-construction monitoring protocols which will be put into place to ensure successful restoration of temporarily disturbed upland and wetland areas. An *Onshore Construction Best Management Practices* (BMP Plan) has been developed which identifies the baseline mitigation measures that will be used to minimize and avoid impacts during construction of the onshore components of the Project. The BMP Plan is included in Appendix C-1 of the MARAD application (Volume IIb).

## **2.0 REVEGETATION PROCEDURES**

Contractor shall be responsible for ensuring successful revegetation of soils disturbed by Project-related activities. Upon completion of construction, pre-construction contours will be restored in temporarily disturbed areas, to the extent practicable. Pre-construction contours will be reestablished within 90 days of completion of active construction. Until final soil stabilization has occurred, or permanent erosion control devices are installed, the Contractor will maintain temporary erosion control devices consistent with the BMP Plan.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) recommendations regarding successful revegetation in the counties crossed by the Project area in Texas is provided in **Appendix A**. In upland areas (Jefferson and Orange County, Texas), NRCS recommends planting a 50/50 mixture of common bermudagrass (full seeding rate 3.0 pounds (lbs) Pure Live Seed [PLS] per acre) and Pensacola bahia (full seeding rate 15 lbs PLS per acre). In wetter areas a full seeding rate of common bermudagrass (3.0 lbs PLS per acre) is recommended. These mixes should provide for quick cover. The seed should be broadcast on disturbed ground (50% or less ground cover). The Louisiana portion of the Project area consists of wetlands and waterbodies only.

### **2.1 Soil Additives and Seeding Requirements**

#### **2.1.1 Upland Areas**

Upland areas will be crossed along the Texas portion of the Project. The Louisiana portion of the Project area consists of wetlands and waterbodies only. The following measures apply to upland areas.

- Contractor shall be required to revegetate all soil disturbed by construction except inundated wetlands.



- Contractor shall protect all new seeding from vehicular traffic during establishment.
- Contractor shall install permanent diversion dikes to channel runoff away from the seeded areas on slopes and to prevent erosion while vegetation is being established.
- If mulch was applied prior to seeding for temporary erosion control, the Contractor shall remove and dispose of the excess mulch prior to seedbed preparation to ensure that seedbed preparation equipment and seed drills do not become plugged with excess mulch; to ensure that seed can adequately contact the soil surface; and to ensure that seed incorporation or soil packing equipment can operate without becoming plugged with mulch.
- A seedbed will be prepared in disturbed areas to a depth of 3 to 4 inches using appropriate equipment to provide a firm seedbed. If hydroseeding, the seedbed will be scarified to facilitate lodging and germination of seed. The soil shall not be worked when it is too wet. If soil conditions do not permit an adequate seedbed to be prepared, Contractor shall increase seeding rates by fifty percent (50%).
- Contractor shall supply and apply agricultural or pelletized lime at a minimum rate of two (2) tons/acre, unless otherwise specified in the contract or by BMOP Company personnel, on all disturbed areas of the construction right-of-way (ROW), except wetlands. Lime shall be worked into the soil during application, or immediately thereafter, to prevent the possibility of exposure to storm water runoff. Suitable liming material includes dolomitic or calcitic materials. Liquid application is acceptable.
- Contractor shall supply and apply fertilizer as specified in contract or as advised by the Company to meet the nutrient requirements of the site conditions. The fertilizer shall be incorporated into the upper two (2) inches of the soil where conditions permit. Fertilizer shall not be applied to wetlands or waterbodies.
- Contractor shall supply and apply a seed mixture on all disturbed areas of the construction ROW, except wetlands, based on site specific seeding requirements identified in the contract or as specified by the Company. All seed must be used within twelve months of testing and incorporated by Contractor into the upper soil surface.
- Only weed-free native seed mixes shall be used for revegetation.
- Contractor shall select seed sources that are locally adapted to the Project area, if available. Locally adapted seed can result in much higher success of plantings and better establishment of native vegetation. Seed mixes utilizing locally adapted sources should be the first-choice product used in revegetation.
- Seed shall be broadcast utilizing a cyclone seeder or with a drill seeder. The Contractor shall operate the cyclone seeder or drill seeder such that the specified seed rate is planted. Seeds shall be incorporated by a cultipacker to ensure good ground contact.
- Contractor shall hydro seed specific areas of the construction ROW as directed by Company. Hydro seeding shall apply seed at the rates specified by manufacturer for site conditions. Fertilizer shall be included with the seed, organic fiber, tackifier and water mixture. Organic fiber content shall be applied at the rate of three thousand (3,000) lbs/acres on an air-dry weight basis. The required tackifier shall consist of biodegradable, vegetable-based material and shall be applied at the rate recommended by the manufacturer. The seed, mulch and tackifier slurry shall be applied so that it forms a uniform, mat-like covering of the ground.
- Additional measures may be needed, such as soil testing, re-application of soil additives, reapplication of seed and mulch, to ensure permanent vegetation.

### **2.1.2 Wetland Areas**

The NRCS recommends that within marsh areas, the native topsoil is to be stockpiled and used to sod mulch the area of disturbance, as the NRCS anticipates that the stockpiled topsoil will provide a sufficient seed source of locally adapted plants. Thus, wetland areas will not be seeded or planted unless post-construction monitoring (see Section 3.0) indicates that natural revegetation is unsuccessful.

## **3.0 POST-CONSTRUCTION MONITORING**

The Contractor will annually monitor the temporarily disturbed areas until the areas are successfully revegetated and to identify any problem areas in compliance with all applicable permit requirements and address any landowner concerns.

### **3.1 Upland Areas**

Conduct inspections for at least two (2) years post-construction to determine the success of revegetation. Inspections should be done following the growing season. Unless easement agreements specify otherwise, revegetation in non-agricultural areas will be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in the areas that were disturbed to adjacent undisturbed lands. In agricultural areas, if present, revegetation will be considered successful when upon visual survey, crop growth and vigor are similar to adjacent undisturbed portions of the same field.

If these revegetation goals are not met at the end of Year Two, a supplemental seeding and/or planting plan will be developed. Inspections will continue until the success criteria are met.

### **3.2 Wetland Areas**

The goal for revegetation during the first two (2) years of monitoring will be that:

- In Year One after returning of pre-construction contours wetland vegetation is at least 20 percent of either the cover documented for the wetland prior to construction, or at least 20 percent of the cover in adjacent wetland areas that were not disturbed by construction; and
- In Year Two after returning of pre-construction contours vegetation is at least 50 percent of either the cover documented for the wetland prior to construction, or at least 50 percent of the cover in adjacent wetland areas that were not disturbed by construction.

Wetland revegetation will be considered successful if all of the following criteria are satisfied after three (3) years (Year Three):

- The affected wetland satisfies the current federal definition for a wetland (i.e., soils, hydrology, and vegetation);
- Vegetation is at least 80 percent of either the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent wetland areas that were not disturbed by construction;
- If natural rather than active revegetation was used, the plant species composition is consistent with early successional wetland plant communities in the affected ecoregion; and
- Invasive species and noxious weeds (specifically Chinese Tallow, Deep Rooted Sedge and Salt Cedar) cover is less than five (5) percent of the re-vegetated area, unless these species are abundant in adjacent areas that were not disturbed by construction.

If revegetation is not successful at the end of three (3) years after construction (i.e., returning of pre-construction contours), a Company representative will coordinate with the U.S. Army Corps of Engineers (USACE) to develop and implement a remedial revegetation plan to actively revegetate wetlands.

#### 4.0 INVASIVE SPECIES MONITORING

To minimize the spread and introduction of noxious and invasive species within the Project ROW, the following procedures are recommended:

- Follow measures outlined in the Project BMP Plan.
- Following construction, backfill, and grading, prepare the Project ROW for seeding and seed with weed-free, native species suitable for rapid and competitive growth in Texas coastal plains as described above.
- Following the post-construction growing season, conduct a noxious and invasive species survey of the Project ROW and note areas of substantial noxious or invasive species presence. Employ control actions (chemical and/or mechanical control practices), if warranted.

The following recommendations concern herbicide use:

- Use a proper pre-treatment to kill existing weeds in order to encourage natural reestablishment of desirable species.
- Ensure applications are made per label rate and method.
- Select herbicides that are selective for target plants and harmless to desirable plants.
- Do not allow herbicide to enter or run off into drainage ditches, wetlands, or other surface waters beyond the intended application site. Applying the product in calm weather when rain is not predicted for the next 24 hours will help ensure that wind or rain does not blow or wash herbicide off the treatment area.

**APPENDIX A**

**Natural Resource Conservation Service (NRCS) Recommendations**

**Blue Marlin Offshore Port (BMOP) Project**  
**Appendix C-2 – Revegetation Plan**  
*Volume IIb – Onshore Project Components (Public)*

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Kim Rhodes

June 4, 2014

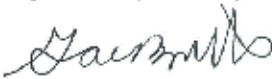
Re: Seed Mixes for Upland and Wetland Areas

NRCS policy for seed mixes on disturbed areas states that we will recommend native species where possible to reestablish a grass stand. The grasses recommended should blend in with the surrounding areas. However, in Jefferson and Orange counties there is no longer a source of native seed with the ecotypes found in Southeast Texas. The surrounding fields in the upland areas consist primarily of a mixture of annuals and introduced species. In the wetland areas there is a natural source of native seed. With this in mind we make the following recommendations.

In the upland areas we recommend planting a 50/50 mixture of common bermudagrass (full seeding rate 3.0 lbs Puro Live Seed per acre) and pensicola bahia (full seeding rate 15 lbs PLS per acre). In wetter areas a full seeding rate of common bermudagrass (3.0 lbs PLS per acre) is recommended. These mixes should provide a quick cover. The seed should be broadcast on disturbed ground (50% or less ground cover).

In the marshes the native top soil should be stockpiled and used to sod/mulch the area of disturbance. The stockpiled top soil should provide a sufficient seed source of locally adapted plants. In the high saline areas the recovery of vegetation will be slow.

If you have questions please give us a call or email.



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**APPENDIX C-3**

**SPILL PREVENTION AND RESPONSE (SPAR) PLAN**

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# **Blue Marlin Offshore Port (BMOP) Project**

*Volume IIb – Onshore Project Components Environmental Evaluation  
(Public)*

*Appendix C-3*

**Spill Prevention and Response (SPAR) Plan**

*September 2020*

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## **ABBREVIATIONS AND ACRONYMS**

BMOP	Blue Marlin Offshore Port LLC
DWP	Deepwater Port
Project	Blue Marlin Offshore Port Project
SPAR	Spill Prevention and Response
SPMT	Sunoco Partners Marketing & Terminals
U.S.	United States
USACE	United States Army Corps of Engineers

## 1.0 INTRODUCTION

Blue Marlin Offshore Port LLC (BMOP) is proposing to develop a deepwater port (DWP) for the transportation of crude oil for export to the global market in United States (U.S.) federal waters referred to as the Blue Marlin Offshore Port Project (Project). The proposed Project consists of both offshore (i.e., DWP facilities) and onshore (i.e., pipeline facilities) components. The construction of onshore components that apply to this *Spill Prevention and Response* (SPAR) Plan consist of a new-build, approximately 37-mile long, pipeline connecting Sunoco Partners Marketing & Terminals' (SPMT) existing Nederland Terminal in Jefferson County, Texas to the existing Stingray Mainline at Station 501 (NGPL/Stingray interconnect) in Cameron Parish, Louisiana. Aboveground facilities supporting the Project include the BMOP Pump Station in Jefferson County, Texas, and Station 501 and 701 in Cameron Parish Louisiana. An existing natural gas tap located along the existing Stingray Mainline in Cameron Parish, Louisiana (Stingray Tap), will be removed by TC Energy and replaced with a pre-tested pipeline segment.

### 1.1 Purpose of this Plan

This *Spill Prevention and Response* (SPAR) Plan is designed to minimize hazards to human health and/or the environment from any unplanned sudden or non-sudden releases of oils, toxic, hazardous, or other polluting materials to the air, soil, surface water or groundwater during construction. A Facility Response Plan has been prepared to cover releases that could occur during operations.

This Plan is intended to provide minimum requirements for spill prevention and response during construction activities. Contractor may develop their own spill prevention and response plan or use an existing plan provided that the plan used contains, at a minimum, all of the provisions of the Project's SPAR Plan.

This Plan identifies:

- Measures taken for spill preparedness and prevention.
- Emergency response procedures describing the actions that Contractor personnel will take in response to leaks, spills, or discharges of oil and hazardous substances/materials.
- Designated emergency coordinator(s) and his/her responsibilities.
- Spill incident reporting procedures.
- Contact numbers for the local police and fire departments, hospitals, and state and local emergency planning committees.

<p><b>CONTRACTOR will be required to comply with all applicable requirements of 40 CFR 112, Oil Pollution Prevention, for any facility set up for the storage of fuel, oil, or other hydrocarbons, or refueling of vehicles and equipment, if the facility triggers compliance with the rule. This would include the development and implementation by CONTRACTOR of a Spill Prevention, Control, and Countermeasures (SPCC) Plan if necessary.</b></p>
---

Prior to the start of construction in an area, the Contractor shall designate storage, refueling, loading, and unloading locations that minimize the environmental and safety impacts associated with releases of fuel, lubricants, or hazardous substances. These areas will be designated using the following guidelines.

- The Contractor shall attempt to fuel equipment at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. These activities can occur closer only if the Environmental Inspector determines that there is no reasonable alternative, and the Project sponsor and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill. Since the majority of the Project area consists of wetlands, it would be logistically impractical and potentially more environmentally damaging to track construction equipment long distances to refueling areas than refueling at the work area. Where conditions require that construction equipment (e.g., barge equipment, dewatering pumps) be refueled within 100 feet of water bodies or wetlands, these operations must be manned continuously to ensure that over filling, leaks, or spills do not occur.
- In inundated areas and in-water work in Sabine Lake, the Contractor shall use a floatation device such as a fuel barge to refuel each piece of equipment as work progresses. The fuel barge will have secondary containment devices, spill kits, and absorbent pads. Equipment operators will be fully trained in refueling procedures and this Plan.
- Where upland refueling sites are less than 100 feet from wetlands, the Contractor will maintain a 10-foot setback. All refueling and equipment storage procedures, irrespective of proximity to wetlands will be undertaken in accordance with this Plan to reduce the potential for spills during construction and to mitigate the environmental impacts if a spill should occur.
- Hazardous materials, including chemicals, fuels, and lubricating oils, shall not be stored within 100 feet of a wetland, waterbody, or designated municipal watershed area without the Environmental Inspector coordination and approval.
- Where stationary equipment must remain within 100 feet of a waterbody or wetland, adequate secondary containment must be provided.
- Pumps operating within 100 feet of a waterbody or wetland boundary will utilize appropriate secondary containment systems to prevent spills.
- Refueling and storage of hazardous materials, including chemicals, fuels, and lubricating oils is prohibited within 200 feet of private wells and 500 feet of community and municipal wells.
- No potentially hazardous materials, other than essential equipment fuels (gasoline, diesel, etc.) or standard lubricants (engine oils, grease, etc.) shall be transported into the right-of-way or construction area without Environmental Inspector coordination and approval.
- Concrete coating activities will not be performed within 100 feet of a wetland or waterbody boundary, unless otherwise approved by the Environmental Inspector. These activities may occur closer only if the Environmental Inspector determines that there is no reasonable alternative, and the Project Sponsor and its Contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill.

## **1.2 Employee Training**

Experienced, well-trained personnel are essential for successful implementation of the Project. Company personnel and Contractors will undergo Project-specific environmental training. Varying levels of training will be required depending on the person's role (e.g., supervisors versus laborers). However, all workers will be required to attend a general environmental training session before beginning construction. All persons engaged in Project construction will be informed of the construction plans and permit conditions (e.g., for wetland construction), as well as, the laws, rules, and regulations applicable to the work. In addition, prior to construction, all personnel involved in the construction of the proposed facilities will be

trained on the contents of the SPAR Plan. Training briefings will be conducted by the Contractor Superintendent or his designee and the Environmental Inspector on the job site. Refresher or supplemental training will be required if compliance is not satisfactory or as new issues arise.

## **2.0 SPILL AND LEAK PREVENTION AND PREPAREDNESS**

### **2.1 Prevention and Preparedness**

The Contractor will take the following precautions to prevent a spill from occurring and to be prepared in the event that a spill does occur.

#### **2.1.1 Containers**

- All containers shall be stored on pallets and surrounded with temporary containment.
  - Small cans of gasoline, diesel, solvents, etc., should be stored within the temporary containment when not in use.
  - No incompatible materials shall be stored in the same containment area.
- Containment areas shall be capable of containing 110 percent of the volume of the largest container in the storage area plus sufficient freeboard for rainfall.
- All container storage areas shall be inspected daily for leaks and deterioration.
- Leaking or deteriorated containers shall be replaced as soon as the condition is first detected.
- Container storage areas shall be secured during non-working hours.
- No storage area shall be unattended for periods longer than one (1) day.
- Any accumulated rainwater in the containment areas shall be inspected for sheens and indications of any other hazardous materials prior to release to the ground, and if a sheen or hazardous substance is detected, the contractor will properly dispose of the rainwater.

#### **2.1.2 Tanks**

- The contractor shall operate only those tanks for fuel and material storage that meet the approval of BMOP. Single wall tanks shall be provided with temporary containment as described in Section 2.1.1 for Containers.
- Self-supporting tanks shall be constructed of carbon steel or other materials compatible with the contents of each tank.
- All tanks and storage areas shall be inspected daily for leaks and deterioration.
- Vehicle mounted tanks shall be equipped with flame/spark arrestors on all vents to ensure that self-ignition does not occur.
- Tanks will not be used to store incompatible materials in sequence unless first thoroughly decontaminated.

#### **2.1.3 Loading/Unloading Areas**

- Transferring of liquids and refueling shall only occur in pre-designated locations at least 100 feet from all waterbodies and wetlands, 200 feet from any water well, and 500 feet from municipal or community water supply wells unless prior approval is obtained from the Environmental Inspector.

- All loading/unloading areas will be inspected for spills prior to and immediately after each use and closely monitored during use to prevent leaks and spills and ensure immediate response in the event of a spill.
- All hose connections shall be inspected for leaks. If leaks should occur, the operation shall cease until the leak is repaired or a containment pan is placed under the leaking connection.

#### **2.1.4 Equipment**

- Contractor is to ensure that all equipment operating on the project is in good working order and free of any leaks.
- The Environmental Inspector has the authority to ask the contractor to remove a piece of equipment from the Project if it is found to be leaking hazardous fluids on the ground and is not repaired by the contractor.

#### **2.1.5 Spill Response Kits**

- Any service vehicle used to transport lubricants and fuel must be equipped with an oil spill response kit adequately stocked to respond to a minor oil/fuel spill event.
- Chemical spill response kits, adequately stocked to respond to a minor chemical spill event, shall be available in areas where appropriate.
- Additionally, spill response kits shall be available on the right-of-way and on or near operating equipment as deemed appropriate by the Environmental Inspector.
- Equipment such as hydraulic track hoes and hydraulic pumps that could fail and cause a reportable spill must be equipped with an oil spill response kit adequately stocked to respond to a minor oil/fuel spill event.

### **2.2 Spill Response Equipment**

The construction Contractor is required to have adequate manpower and equipment necessary to divert any spill from reaching water bodies and wetland areas. Emergency equipment may include, but is not limited to, shovels, backhoes, dozers, front-end loaders, oil absorbent booms, pillows, socks and/or mats and chemical absorbent pulp, pillows, socks and/or mats.

## **3.0 INITIAL SPILL RESPONSE PROCEDURES**

This section provides a description of spill response procedures to be performed to address spills that occur during this construction Project.

### **3.1 Land Based**

On a land spill, actions will immediately be taken to physically contain the spill (i.e. absorbent pads, socks, kitty litter, etc). Personnel entry and travel on contaminated soils will be limited to that which is necessary for control and cleanup activities. Sorbent materials will be applied as needed to contain or clean up the spilled material. Contaminated sorbent materials, soil and vegetation will also be collected and disposed of at an approved facility.

### **3.2 In-Water Work**

A floating boom will be immediately deployed to provide an additional containment measure. Spilled material will be collected with the use of a suction pump, buckets, or absorbent materials and placed into a suitable container(s) and disposed of at an approved facility.

### **3.3 Company and Contractor Responsibilities**

The Contractor and BMOP's on-site personnel have responsibilities for spill prevention and response. **In addition to the oversight of initial spill response activities, BMOP's Environmental Inspector and Environmental Project Manager will determine if state and/or Federal notifications are required and make notification accordingly.**

The Contractor will have a designated Environmental Coordinator for the site. The responsibilities of the Contractor and Company personnel will be as follows:

#### **3.3.1 Contractor Responsibilities**

- The Contractor will be responsible for taking immediate action to safely control and contain any spills or releases of oil, petroleum products, and hazardous substances/materials.
- All spills or releases, including any sheen created on water or releases to the atmosphere, must be reported immediately to the Environmental Inspector.
- The Contractor shall supply necessary manpower and equipment to control, contain, and clean up all spills and releases resulting from their operations.

#### **3.3.2 Environmental Inspector Responsibilities**

- Environmental Inspector or his designee will be responsible for making appropriate agency notifications spills and releases.
- Environmental Inspector will be responsible for the oversight of the initial spill response activities.
- Environmental Inspector will provide supporting personnel and equipment to address releases as required.
- In the event of a spill, the Environmental Inspector shall obtain as much information as possible regarding the cause of the event, the type and amount of material spilled or released, and corrective measures or response activities being taken.
- Consult the Environmental Project Manager immediately and determine if the spill or release is a reportable event.
- Obtain a copy of the Contractor's written spill report as soon as it is available and forward a copy to the Environmental Project Manager.

#### **3.3.3 BMOP Environmental Project Manager Responsibilities**

- Upon receiving spill information from the Environmental Inspector, determine if the release requires reporting to any Federal, state, or local regulatory agencies.
- If reporting is required, direct the Environmental Inspector to notify the appropriate regulatory agencies. This includes both verbal and any follow-up written reports.
- Contact outside remediation services if necessary, in coordination with the Environmental Inspector, to assist with incidents that require additional resources.

### **3.4 Unplanned and Planned Crude Oil Releases**

#### **3.4.1 Unplanned Crude Oil Releases**

Unplanned crude oil releases are reportable events. In the event that an unplanned release of crude oil occurs during activities related to the Project the Contractor shall immediately notify the Environmental Inspector of the event. The Environmental Inspector will notify the Field Construction Office.



### 3.5 Spill Clean-Up and Waste Disposal

Spill clean-up and subsequent waste disposal of contaminated media will be the responsibility of the Contractor subject to the approval of the Environmental Project Manager.

### 4.0 KEY EMERGENCY CONTACTS

The key personnel who will be contacted in the event of an emergency or spill incident include the following: **(Information to be provided prior to construction.)**

#### 1) Company Emergency Contacts

- Company Emergency Coordinator: **Construction Manager**
- Field Construction Office: TBD
- Environmental Project Manager: TBD
- Area Office (in case of pipeline liquid spills): **Houston office – 713-989-7475**

#### 2) Contractor Emergency Contact

- Contractor Emergency Coordinator: **Contractor Superintendent**

#### 3) Federal Authorities

- EPA – National Response Center: **800-424-8802**

#### 4) State Authorities

- Louisiana Oil Spill Coordinator’s Office: **877-925-6595**
- Texas Commission on Environmental Quality Emergency Response: **800-832-8224**

#### 5) Local Authorities

<u>Department</u>	<u>Phone</u>
Local Police	911
Local Fire Department	911
Ambulance	911
 Hospital	 409-989-5490
St. Mary’s Hospital 3600 Gates Blvd. Port Arthur, Texas	
 Doctors Hospital	 409-962-5733
5500 39 <sup>th</sup> Street Groves, Texas	
 South Cameron Memorial Hospital	 337-542-4111
5360 West Creole Highway Cameron, Louisiana 70631	

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**APPENDIX C-4**

**UNANTICIPATED DISCOVERY PLAN**

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# **Blue Marlin Offshore Port (BMOP) Project**

*Volume IIb – Onshore Project Components Environmental Evaluation  
(Public)*

*Appendix C-4*

**Unanticipated Discoveries Plan**

*September 2020*

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## **ABBREVIATIONS AND ACRONYMS**

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
AIRFA	American Indian Religious Freedom Act
BMOP	Blue Marlin Offshore Port
BMP	Best Management Practices
CFR	Code of Federal Regulation
CM	Construction Manager
DWP	Deepwater Port
e.g.	for example
EI	Environmental Inspector
EO	Executive Order
GPS	Global Positioning System
LA	Louisiana
LDOA	Louisiana Division of Archaeology (LA SHPO)
LSU	Louisiana State University
MARAD	United States Maritime Administration
NT	Nederland Terminal
THC	Texas Historical Commission (TX SHPO)
PL	Public Law
Project	Blue Marlin Offshore Port Project
PVC	Polyvinyl Chloride
SHPO	State Historic Preservation Office or Officer
TX	Texas
UDP	Unanticipated Discovery Plan
U.S.	United States
USCG	United States Coast Guard

## **1.0 INTRODUCTION**

Blue Marlin Offshore Port LLC (BMOP) is proposing to develop a deepwater port (DWP) for the transportation of crude oil for export to the global market in United States (U.S.) federal waters referred to as the Blue Marlin Offshore Port Project (Project). The proposed Project consists of both offshore (i.e., DWP facilities) and onshore components (i.e., pipeline facilities). The construction of the onshore components that apply to this Unanticipated Discoveries Plan (UDP) consists of a new-build, approximately 37-mile long, pipeline connecting Sunoco Partners Marketing & Terminals' existing Nederland Terminal (NT) in Jefferson County, Texas to the existing Stingray Mainline at Station 501 (NGPL/Stingray interconnect) in Cameron Parish, Louisiana. Aboveground facilities supporting the Project include the BMOP Pump Station in Jefferson County, Texas, and Station 501 and 701 in Cameron Parish Louisiana. An existing natural gas tap located along the existing Stingray Mainline in Cameron Parish, Louisiana (Stingray Tap), will be removed by TC Energy and replaced with a pre-tested pipeline segment.

### **1.1 Purpose of this Plan**

As part of the planning process for the Project, biological and cultural resources surveys were conducted in the proposed Project area. If previously unidentified resources, or unanticipated discoveries, are encountered, they could consist of:

- Archaeological or historical resources;
- Human remains;
- Paleontological resources; and
- Contaminated media.

This plan has been developed to address the procedures and treatment of any unanticipated discoveries that may occur during construction of the Project. It is intended to:

- Maintain compliance with applicable federal and state laws and regulations during construction of the Project;
- Describe the procedures to prepare for and deal with unanticipated discoveries; and,
- Provide direction and guidance to project personnel as to the proper procedure to be followed should an unanticipated discovery occur.

The Environmental Inspector (EI) will be responsible for advising the construction contractor's personnel on the procedures to follow in the event that an unanticipated discovery is made. Training will occur as part of the pre-construction on-site training program for foremen, company inspectors, and construction supervisors. The EI will advise all operators of equipment involved in grading, stripping, or trenching activities to:

1. Stop work immediately if they observe any indications of the presence of cultural materials (artifacts or other man-made features) or bone, or contamination.
2. Contact the EI as soon as possible.
3. Comply with unanticipated discovery procedures (see below).
4. Treat human remains with dignity and respect.



## **2.0 PROCEDURES FOR THE UNANTICIPATED DISCOVERY OF ARCHAEOLOGICAL RESOURCES AND HUMAN REMAINS**

### **2.1 Guidelines and Laws/Regulations**

The procedures guiding the unanticipated discovery of archaeological resources and human remains detailed herein were developed in consultation with the Texas Historical Commission (THC) and Louisiana Office of Cultural Development, Division of Archaeology (LDOA). These procedures summarize the approach that BMOP’s contractors or consultants will use to address unanticipated discoveries of archaeological resources during construction activities within the Project Area of Potential Effect (APE).

These Procedures will be followed in the event any archaeological resources and/or human remains are encountered during construction of the Project. The stipulations of the Procedures, as set forth below, are in accordance with the current standards and guidelines elaborated in the following standards/guidelines and laws/regulations:

#### **2.1.1 Federal**

- National Historic Preservation Act (Public Law [PL] 89-665), its implementing regulations, “Protection of Historic and Cultural Properties” (36 CFR Part 800);
- Secretary of the Interior’s *Standards for Archeology and Historic Preservation* (48 CFR 44716-42);
- ACHP: *Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects*, Advisory Council (February 23, 2007);
- Native American Grave and Repatriation Act (43 CFR Part 10);
- Archaeological and Historic Preservation Act;
- Consultation and Coordination with Indian Tribal Governments (EO 13175);
- Procedures for the Protection of Historic Properties (33 CFR 325 Appendix C); and,
- American Indians Religious Freedom Act (AIRFA).

#### **2.1.2 Texas**

- Texas Administrative Code, Title 13, Chapter 22;
- Antiquities Code of Texas, Title 9, Chapter 191, Texas Natural Resources Code;
- Chapter 711, Texas Health and Safety Code;
- Practice and procedures of the THC;
- Practice and procedures of the Texas Parks and Wildlife Department; and,
- Guidance provided by the Council of Texas Archaeologists.

### **2.1.3 Louisiana**

- Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671-871, et. Seq.); and,
- Standards and procedures of the LDOA.

### **2.2 Procedures for the Unanticipated Discovery of Archaeological Resources**

In the event that any member of the construction work force believes that an unanticipated discovery of archaeological resources has been made, the following procedures should be implemented:

1. Initially, all work in the immediate area of the discovery shall immediately cease and the EI and Construction Manager (CM) shall be notified immediately. Reasonable efforts shall be made to avoid or minimize impacts to the cultural resources (see below). An archaeological resource can be prehistoric or historic and could consist of, but is not limited to:
  - An accumulation of shell, burned rocks, or other subsistence related cultural features;
  - An area of charcoal or very dark soil with artifacts;
  - Lithic artifacts, including tools, flakes, cores and/or dense concentrations of such artifacts;
  - Bones in association with shell, charcoal, burned rocks, and/or stone artifacts; and,
  - Historic structures, concentrations of historic materials older than 50 years.
2. If the EI or CM believes that the discovery is an archaeological resource, the EI shall take appropriate measures to protect the location of the discovery and its immediate surroundings. This shall include ceasing activities which could further disturb the potential archaeological site, flagging the immediate area of discovery as an exclusion zone, recording GPS coordinates of the discovery, as well as notifying the Environmental Project Manager and Project Manager. Work in the immediate area shall not resume until the discovery location has been assessed to determine if it is an archaeological resource.
3. BMOP, or its representative, shall immediately contact a qualified Professional Archaeologist to evaluate the nature of the discovery.
4. If required due to the nature of the discovery, the Archaeologist shall then contact the Texas or Louisiana SHPO, MARAD, and USCG. Consultation with the SHPO, MARAD, and USCG should occur in order to obtain technical advice and guidance for the evaluation of the discovered archaeological resource.
5. Following evaluation, as much information as possible concerning the archaeological resource, such as resource type, location, and size, as well as any information developed regarding its potential eligibility for listing in the National Register of Historic Places, shall be provided to the SHPO, MARAD, and USCG.
6. If necessary, a mitigation plan should be prepared for the discovered archaeological resource. This plan should be sent to the SHPO, MARAD, and USCG for review and comment. The SHPO should be expected to respond with preliminary comments as quickly as possible, followed soon after with final comments.
7. If a formal data recovery mitigation plan is required, ground disturbing activities in the near vicinity of the cultural resource shall be avoided to ensure that no adverse impact to the resource occurs until the mitigation plan can be executed.

### **2.3 Procedures for the Unanticipated Discovery of Human Remains**

If human remains are encountered during site development or construction, the following plan outlines specific measures to be followed.

1. All work within a 100-foot buffer of the human remains shall immediately cease so that additional impacts to the discovery location will be avoided. The discovery location will be secured to protect the remains; remains visible on the ground surface will be covered. At no time will the remains be publicly visible.
2. The EI and CM shall be notified immediately and will take appropriate measures to protect the discovery site, as detailed above. This shall include flagging the immediate area of discovery as an exclusion zone, recording GPS coordinates of the discovery location, as well as notifying the Environmental Project Manager and Project Manager. Work in the immediate area will not resume until authorized by the applicable agencies.
3. Company personnel, or its representative, shall immediately notify local law enforcement, the County or Parish Medical Examiner, respective State Archaeologist, SHPO, and Native American Tribes (Tribes). BMOP will contact a qualified Professional Archaeologist to assist in coordinating with state and local officials and Tribes. The Archaeologist will sketch and photograph the location of the remains in situ, prior to further disturbance, record them in field notes, and note them on Archaeological Site Record Forms and/or updates to Site Record Forms.
4. A plan for the avoidance of any further impact to the human remains and/or mitigative excavation, reinternment, or a combination of these treatments shall be developed in consultation with the State Archaeologist, the SHPO, MARAD, USCG and, if applicable, appropriate Tribes or closest lineal descendants. All parties will be expected to respond with advice and guidance in an efficient time frame. Once the plan is agreed to by all parties, the plan will be implemented.
5. The County or Parish Medical Examiner shall be immediately notified as to the findings. If the remains are found to be other than human, any construction will be cleared to proceed if the location of the remains are not part of a previously unrecorded archaeological resource (i.e., a naturally skeletonized animal with no artifacts associated). If the remains are human and are less than 75 years old, the Medical Examiner and local law enforcement officials will assume jurisdiction. If the remains are found to be human and older than 75 years, the State Archaeologist shall be notified and may assume jurisdiction of the remains. The MARAD and USCG will also be notified.
6. If jurisdiction is assumed by the State Archaeologist, they will (a) determine whether the human remains represent a significant archaeological resource, and (b) make a reasonable effort to identify and locate persons who can establish direct kinship, tribal community, or ethnic relationship with the remains. If such a relationship cannot be established, then the State Archaeologist may consult with Tribes regarding the proper disposition of the remains. The remains may be reburied within the project Area of Potential Effect but outside of the direct impact footprint, or they may be respectfully transported for reburial at the location where they were recovered or some other mutually agreeable location.

### **3.0 PROCEDURES FOR THE UNANTICIPATED DISCOVERY OF PALEONTOLOGICAL RESOURCES**

A paleontological resource would be expected to be in the form of fossils. In-situ fossils are usually found within layers of geologically old sediments and rocks where the creature lived, died, and became fossilized. However, through geologic, hydrologic, and marine activity, many fossils and parts of fossils have been carried into younger geologic areas. In the event that any member of the construction work force believes that an unanticipated discovery of paleontological resources has been made, the following procedures shall be implemented:

1. All work in the immediate area of the discovery shall immediately cease and the EI shall be notified. The area of work stoppage shall be adequate to provide for the security, protection, and integrity of the suspected discovery.
2. If the EI believes that the discovery is a paleontological resource, the EI shall take appropriate measures to protect the discovery site. This shall include flagging the immediate area of discovery as an exclusion zone, as well as notifying the Environmental Project Manager and/or Project Manager.
3. Work in the immediate area will not resume until treatment of the discovery has been completed.
4. The Environmental Project Manager shall arrange for the discovery to be evaluated by a qualified geologist/paleontologist in accordance with applicable regulations. The geologist/paleontologist will evaluate the discovery and provide recommendations for how to manage the resource.

For recovery and inventorying of a specimen, the EI will record the following information:

- The location of the specimen using GPS coordinates;
- Nature of the specimen (*e.g.*, complete bone, fragment, tooth, armored plate);
- Soil depth;
- Area from which it was recovered (*e.g.*, in trench, exposed on surface, in backfill)
- Number of specimens in that location; and
- Photographs of the specimen:
  - Within the excavation;
  - Following recovery; and
  - With a scale for measurement (*e.g.*, tape measure).

Following recovery, the EI will provide a chain of custody for where the specimen is to be sent (*e.g.*, landowner, Texas Memorial Museum Hall of Geology and Paleontology, or LSU Museum of Natural Science) per the notifications listed in Section 8.0. Alternatively, the EI will record if the specimen is returned to the excavation area based on landowner request.

#### **4.0 PROCEDURES FOR THE UNANTICIPATED DISCOVERY OF CONTAMINATED MEDIA**

The EI and appropriate contractor personnel shall be trained in hazard identification and worker protection and these topics shall be discussed regularly in safety meetings. A desktop assessment for contaminated media, as well as field sampling activities at known contaminated sites, along the Project route has been completed. This plan does not address procedures for handling contaminated media at known contaminated sites along the Project route. The handling of contaminated media at known sites will be addressed on a site-specific basis and in accordance with applicable State and Local permits.

Indicators of possible contamination include, but are not limited to:

- Buried drums or containers, rusted or in otherwise poor condition
- Stained or otherwise discolored soil (in contrast to adjoining materials)
- Spoil material containing debris other than obvious construction material
- Chemical or hydrocarbon odors emanating from excavations
- Oily residues
- Visible sheen or other discoloration on groundwater
- Structures such as pipelines (concrete, PVC or steel) or underground storage tanks.

In the unlikely event that contaminated media is encountered during construction of the Project, the following procedures shall be implemented:

1. All construction activities in the immediate area of the discovery shall cease and the EI shall be notified. Work in the immediate area will not resume until an assessment of the discovery has been completed and the Company has released the site.
2. If safe to do so, the EI shall take appropriate steps to flag the area as an exclusion zone and notify the Environmental Project Manager.
3. If potentially contaminated groundwater or soil reaches (or has the potential to reach) surface waters, booms and/or absorbent materials shall be immediately deployed to contain and reduce downstream migration of the material.
4. Upon notification, the Environmental Project Manager shall perform or direct a hazard assessment to determine appropriate control measures to be implemented at the specific site. Activities may include sampling vapors, soil, sediments, groundwater, and/or wipe samples of materials.
5. Upon evaluation of the sampling results, additional notifications may be made to coordinate a work plan for measures to be implemented in the contaminated area to resume activities in a safe, environmentally compliant, and effective manner. Measures may include additional personal protective equipment, segregation of contaminated media, treatment or off-site disposal of contaminated media.
6. If warranted by the assessment, the Environmental Project Manager will notify appropriate Federal, State and Local agencies.
7. All identification /characterization, handling, labeling, storage, manifesting, transportation, record keeping, and disposal of potentially contaminated materials will be conducted in accordance with applicable federal, state, and local regulations and guidance.

## 5.0 PROJECT CONTACTS AND NOTIFICATIONS

The table below identifies key contacts that may need to be notified in the event of an unanticipated discovery of archaeological resources, human remains, paleontological resources, or contaminated media.

<b>TABLE 1</b>			
<b>Project Contacts and Notifications</b>			
<b>Contact</b>	<b>Name</b>	<b>Telephone</b>	<b>Email</b>
<b>Project Contacts</b>			
Environmental Inspector	TBD	TBD	TBD
Construction Manager	TBD	TBD	TBD
Environmental Project Manager	Justin Minter	Mobile: (409) 377-0054 Office: (409) 749-3902	<a href="mailto:justin.minter@energytransfer.com">justin.minter@energytransfer.com</a>
Project Manager (Onshore)	Cary Farber	Mobile: (337) 304-8860 Office: (337) 475-4218	<a href="mailto:cary.farber@energytransfer.com">cary.farber@energytransfer.com</a>
<b>Project Archaeologist</b>			
Senior Project Manager	Wayne Boyko	Mobile: (504) 201-1714	<a href="mailto:wboyko@rcgoodwin.com">wboyko@rcgoodwin.com</a>
<b>State Historic Preservation Offices</b>			
Texas Historical Commission/State Historic Preservation Office	Maggie Moore	Main: (512) 463-6100 Office: (512) 463-6508	<a href="mailto:maggie.moore@thc.texas.gov">maggie.moore@thc.texas.gov</a>
Louisiana Office of Cultural Development, Division of Archaeology/State Historic Preservation Office	Abigail Bleichner	Main: (225) 342-8170 Office: (225) 342-6931	<a href="mailto:ableichner@crt.la.gov">ableichner@crt.la.gov</a>
<b>Tribal Contacts</b>			
Alabama Coushatta Tribe of Texas	Bryant Celestine	(936) 563-1181	<a href="mailto:Celestine.bryant@actribe.org">Celestine.bryant@actribe.org</a>
Choctaw Nation of Oklahoma	Ian Thompson	(580-924-8280 x 2216	<a href="mailto:ithompson@choctawnation.com">ithompson@choctawnation.com</a>
Coushatta Tribe of Louisiana	Dr. Linda Langley	(337) 584-1867	<a href="mailto:llangley@coushattatribela.gov">llangley@coushattatribela.gov</a>
Jena Band of Choctaw Indians	Alina Shively	(318) 992-1205	<a href="mailto:ashively@jenachoctaw.org">ashively@jenachoctaw.org</a>
Mississippi Band of Choctaw Indians	Kenneth Carleton	(601) 650-7316	<a href="mailto:kcarleton@choctaw.org">kcarleton@choctaw.org</a>
Tunica-Biloxi Tribe of Louisiana	Earl J. Barbry, Jr.	(318) 253-8174	<a href="mailto:earlii@tunica.org">earlii@tunica.org</a>
<b>Paleontological Resources Notifications</b>			
LSU Museum of Natural Science 119 Foster Hall Louisiana State University	Dr. Judith Schiebout, Curator Emeritus or Dr. Suyin Ting, Collections Manager	Phone: (225) 578-2855	

<b>TABLE 1</b>			
<b>Project Contacts and Notifications</b>			
<b>Contact</b>	<b>Name</b>	<b>Telephone</b>	<b>Email</b>
Texas Memorial Museum Hall of Geology and Paleontology 2400 Trinity Street Austin, TX 78712-1621	Dr. Edward Theriot	Phone: (512) 471-1604	
<b>Medical Examiner/Coroner</b>			
Jefferson County Coroner 7933 Viterbo Rd Beaumont, TX 77705		Main: (409) 722-0451	
Orange County Coroner 190 Camp St Vidor, TX 77662		Main: (409) 769-2284	
Cameron Parish Medical Examiner & Coroner PO Box 68 Creole, LA 70632		Main: (337) 542-4201	
<b>Law Enforcement</b>			
Jefferson County Sheriff's Office 1001 Pearl St. #103 Beaumont, TX 77701		Main: (409) 835-8411	
Orange County Sheriff's Office 205 S. Border Orange, TX 77630		Main: (409) 883-2612	
Cameron Parish Sheriff's Office 124 Recreation Center Lane, P.O. Box 1250, Cameron, LA 70631		Main: (337) 775-5111	
<b>Environmental Protection Offices</b>			
Texas Commission on Environmental Quality (TCEQ) 3870 Eastex Fwy Beaumont, TX 77703-1830		Main: (409) 898-3838	
Louisiana Department of Environmental Quality Remediation Division P.O. Box 4314 Baton Rouge, LA 70821-4314 Attn: Percy V. Harris, Administrator		Main: (225) 219-5337	

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**APPENDIX C-5**

**HORIZONTAL DIRECTIONAL DRILL (HDD) CONTINGENCY PLAN**

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# **Blue Marlin Offshore Port (BMOP) Project**

*Volume IIb – Onshore Project Components Environmental Evaluation  
(Public)*

*Appendix C-5*

**Horizontal Directional Drill (HDD) Contingency Plan**

*September 2020*

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## **ABBREVIATIONS AND ACRONYMS**

BMOP	Blue Marlin Offshore Port LLC
EI	Environmental Inspector
HDD	Horizontal directional drill
IR	Inadvertent release
LCM	Lost Circulation Materials
MP	Milepost
Project	Blue Marlin Offshore Port Project
ROW	Right-of-way
SDS	Safety Data Sheets
SPMT	Sunoco Partners Marketing & Terminals
TPWD	Texas Park and Wildlife Department

## 1.0 INTRODUCTION

Blue Marlin Offshore Port LLC (BMOP) is proposing to develop a deepwater port (DWP) for the transportation of crude oil for export to the global market in United States (U.S.) federal waters referred to as the Blue Marlin Offshore Port Project (Project). The proposed Project consists of both offshore (i.e., DWP facilities) and onshore components (i.e., pipeline facilities). The construction of the onshore components that apply to this *Horizontal Directional Drill (HDD) Contingency Plan* consist of a new-build, approximately 37-mile long, pipeline connecting Sunoco Partners Marketing & Terminals’ (SPMT) existing Nederland Terminal in Jefferson County, Texas to the existing Stingray Mainline at Station 501 (NGPL/Stingray interconnect) in Cameron Parish, Louisiana. Aboveground facilities supporting the Project include the BMOP Pump Station in Jefferson County, Texas, and Station 501 and 701 in Cameron Parish Louisiana. An existing natural gas tap located along the existing Stingray Mainline in Cameron Parish, Louisiana (Stingray Tap), will be removed by TC Energy and replaced with a pre-tested pipeline segment.

### 1.1 Purpose of this Plan

This HDD Contingency Plan identifies operational procedures and responsibilities for the prevention, containment, and clean-up of an inadvertent release (IR) of drilling fluids associated with HDD operations for the Project. Prior to construction, the selected construction / drilling contractor(s) will prepare and submit a detailed HDD plan for Blue Marlin Offshore Port LLC (Company) approval that follows the requirements of this contingency plan. The purpose of this contingency plan is to:

- Establish a set of contingency procedures for the construction / drilling contractor to adopt;
- Identify key agency stakeholders that may require notification in the event the contingency procedures need to be implemented;
- Provide for the timely detection of and response to IR events and loss of drilling fluid circulation;
- Provide for the identification and response to surface depressions and subsidence areas; and
- Provide an abandonment plan in the event of HDD failure.

### 1.2 HDD Locations

The Project includes several locations where the HDD method will be used to construct the new build pipeline from the Nederland Pump Station to Station 501. Table 1-1 includes details on the HDD location. An overview of the HDD method is provided in Section 2.0.

<b>TABLE 1-1 HDD Crossing Locations</b>			
<b>HDD ID Number</b>	<b>Approximate Start Milepost</b>	<b>Approximate Length (feet)</b>	<b>Feature Crossed</b>
HDD-01	MP 1.6	3,450	Neches River
HDD-02	MP 1.6	2,075	Foreign Pipeline
HDD-03	MP 9.0	3,400	TPWD Lower Neches WMA Nelda Stark Unit
HDD-04	MP 9.5	2,300	Foreign Pipeline

<b>TABLE 1-1 HDD Crossing Locations</b>			
<b>HDD ID Number</b>	<b>Approximate Start Milepost</b>	<b>Approximate Length (feet)</b>	<b>Feature Crossed</b>
HDD-05	MP 10.5	2,120	Gulf State Utilities Road, Powerhouse Road and Canal
HDD-06	MP 14.7	3,720	SH 73/87
HDD-07	MP 19.6	4,780	ICWW
HDD-08	MP 25.5	2,520	Pipeline Crossing in Sabine Lake

### **1.3 Environmental Inspection**

It is anticipated that one Environmental Inspector (EI) will be assigned to the Texas Project facilities and one EI will be assigned to the Louisiana Project facilities. The EI’s duties will include, but are not limited to, ensuring compliance with all environmental conditions. EIs will have peer status with all other activity inspectors. EIs will also have the authority to stop activities that violate environmental conditions of the environmental permits or approvals, or landowner easement agreements; and to order appropriate corrective action.

### **2.0 HDD PROCESS**

The HDD technique is a minimal impact trenchless installation process by which a pipeline is installed along a predetermined design path below ground utilizing remote guidance drilling technology derived from the oil and gas exploration industry. HDD is often the preferred construction method to minimize disturbance to existing surface features such as roadways, parking lots, canals, rivers, levees, highly obstructed utility corridors, environmentally sensitive areas, etc.

An HDD involves a multi-stage process that consists of establishing a small diameter pilot hole along an engineered HDD crossing profile, followed by enlargement of the pilot hole (reaming) and subsequent swab pass to accommodate pull back of the proposed pipeline. The pilot hole is drilled using a rotational cutting head and/or a jetting assembly attached to drill pipe. The cutting action of the drill head is remotely operated to control its orientation, location, and direction. Enlarging the pilot hole is an incremental process, typically accomplished with multiple reaming passes, depending on the pipeline diameter and subsurface geology, to achieve the final drill hole diameter. Once the final drill hole diameter has been achieved a swab pass is used to confirm the condition of the drilled hole and lubricate the drill hole prior to the pre-assembled, hydrostatically tested section of pipeline being pulled through the completed hole.

The primary component of the drilling fluid used in HDDs for pipeline installation is water. To enhance the drilling fluid performance, bentonite (a naturally occurring, non-toxic clay) is added to the water. The bentonite drilling fluid is pumped downhole through the drill stem and is used to lubricate the drill bit, cool and clean the drill cutters, stabilize the drill hole, and transport drill cuttings to the surface as the drilling fluid flows back to the surface through the drill hole.

Definitions for terms used in this HDD Contingency Plan are provided in Table 2-1.



<b>TABLE 2-1 Definitions</b>	
<b>Term</b>	<b>Definition</b>
Annular pressure	Fluid pressure acting on the formation measured in the space between the drill stem and the wall of the hole
Bentonite	A naturally occurring, non-toxic clay, primarily montmorillonite, with high swelling properties that forms the primary component added to water to make drilling fluid used in HDDs
Hole (aka bore)	Below-ground excavation along the HDD path between the surface entry and exit points
Drill bit	A device that cuts into the subsurface geologic formation and creates the hole
Drilling cuttings	Geologic materials broken down by the drill bit
Drilling fluid	Fluid created by mixing water and bentonite, as well as other approved additives, to facilitate drilling and transport of drill cuttings from drill bit to the surface
Horizontal Directional Drill (HDD)	Trenchless method for installation of below ground pipelines or utilities
Hydraulic fracture	The process of annular pressure inducing a fracture in the geologic formation during the drilling process
Inadvertent release (IR)	Drilling fluid and cuttings that migrate from the drilled hole to the surface along a formational fracture or another path of least resistance
Pilot hole	The initial hole drilled along the HDD path
Pipe string	Section of pipe to be installed through the hole at the completion of the HDD
Reaming pass	Subsequent pass(es) through the pilot hole to increase the diameter of the pilot hole to the required size to accommodate the pipe string
Rheology	The study of the flow of matter, primarily in a liquid state

### **3.0 PERSONNEL RESPONSIBILITIES**

Company commits to implementation of qualified, responsible oversight of HDD activities by contractor and Company personnel. The responsibilities of personnel, including EIs (and/or compliance monitors), overseeing HDD activities include the following:

- Implementing the HDD Plan on behalf of the contractor;
- Ensuring that workers are properly trained, including knowledge of the procedures for response to an inadvertent return of drilling fluids to the ground surface (i.e., IR);
- Monitoring drilling fluid circulation back to the entry and exit locations;
- Communicating loss of drilling fluid circulation status to other Project staff;
- Stopping or changing the drilling program in the event of an observed or anticipated IR;
- Monitoring the HDD alignment for IRs and other signs of environmental impact (such as sinkhole development or subsidence over the alignment);
- Notifying regulatory and/or resource agency staff in a timely manner, and responding to these staff regarding observed releases in accordance with the HDD Plan; and
- Ordering and overseeing corrective actions for an IR.

The parties responsible for carrying out compliance with this HDD Contingency Plan are identified in Table 3-1.

<b>TABLE 3-1 Responsible Parties</b>			
<b>Procedure</b>	<b>Name</b>	<b>Title</b>	<b>Contact Information</b>
HDD Contingency Plan Implementation			
Employee Training			
Drill Fluid Monitoring			
Internal Communication of Fluid Loss			
Revising the Drilling Program following an			
Monitoring of the Drill Path for an IR			
Notifications			
Overseeing of Corrective Actions			

#### **4.0 PRE-CONSTRUCTION ACTIVITIES**

The following subsections highlight the pre-construction activities which will take place prior to HDD construction.

##### **4.1 Training**

Prior to HDD site set-up, HDD Contingency Plan implementation and safety training will be conducted for Company and contractor personnel, including EIs and compliance monitors (as applicable). The training will address all applicable environmental impact avoidance and minimization measures that will be implemented during drilling. The training will ensure that each person involved in HDD operations is familiar with the locations of IR containment equipment and materials, and the specific procedures for handling IRs.

A training log is included in **Appendix A**. Supplemental training sessions will be held if circumstances are encountered in the field which warrant additional environmental impact avoidance and minimization measures.

##### **4.2 Site Inspection**

The contractor and Company representatives will inspect the drill path prior to construction. Any site-specific condition(s) that impedes the ability to conduct the visual and pedestrian field inspection of any portion of a drill path will be identified, and a site-specific modification to the proposed inspection routine will be developed. As applicable, modifications will be incorporated into the site-specific HDD crossing plan prior to construction and communicated to contractors as part of training. If unique conditions or features are identified along, or in proximity to, the alignment during drill path inspections that may increase the risk of drill complications (e.g., existing contamination, karst features, slope instability, abandoned and/or orphan oil and gas wells), Company will incorporate measures into the HDD Contingency Plan that will be implemented to minimize these risks.

If such condition(s) are identified that may increase the risk of drill complications post-authorization, which require modifications to the approved HDD Contingency Plan, approval will be obtained from applicable federal and state agencies, prior to implementation.

**4.3 Landowner Notification**

Prior to HDD site set-up, adjacent landowners will be notified via mail. Further, to facilitate expedited response times in the event of an IR, or to monitor sensitive environmental resources located outside of approved work areas, Company will request landowner permission in advance to perform pedestrian surveys of any property that may be reasonably traversed to conduct monitoring or response activities.

**4.3.1 Agency Notification Procedures**

Prior to HDD site set-up, the Texas Parks and Wildlife Department (TPWD) will be notified of the planned initiation of HDD activities in the Wildlife Management Areas. The notification will include details on the anticipated timing and duration of HDD construction. All activities will adhere to the surface use agreements.

**5.0 DOCUMENTATION**

A copy of the HDD Contingency Plan will be made available and accessible to all construction personnel at the HDD crossing location. As part of the HDD Contingency Plan, at a minimum, the documents included in Table 5-1 below will be maintained. Table 5-1 also identifies the personnel responsible for maintaining the documents.

<b>TABLE 5-1 HDD Documentation Maintained</b>			
<b>Procedure</b>	<b>Documentation</b>	<b>Responsible Party</b>	<b>Location</b>
Employee Training	Record of employee training detailing when training was conducted, material covered, and employees in attendance.	TBD	Appendix A
HDD Visual and Pedestrian	The name of the inspector, time of the examination, and observations of the inspector following each inspection.	TBD	Appendix B
HDD Instrument Logs	Instrumentation logs that document pilot hole progression, drill string axial and torsional loads, drilling fluid discharge rate and pressure, and down-hole annular pressure monitoring during drilling of the pilot hole (or provide alternative monitoring methods and/or best drilling practices to ensure that the drilled and bored [reamed] holes do not become plugged with drill cuttings leading to hydrofracture and IR).	TBD	Appendix C
Drilling Fluid Composition	Monitoring logs of drilling fluid physical properties throughout drilling activities (mud weight, viscosity, sand content, and pH).	TBD	Appendix D
	A clear description of the intent to reuse drilling fluid between HDD locations, as well as documented consultation with local and state agencies for such reuse. Laboratory results of sampled drilling fluid/source water for any inorganic and organic		
Public and Agency Inquiries/Comments	A record of communication with the public and agencies that has occurred during HDD activities. This record should include inquiries and comments, as well as response actions.	TBD	Appendix E
Drilling Fluid Additives	All additives or Lost Circulation Materials (LCMs) not identified in <b>Appendix F</b> must be approved by Company, the appropriate state agencies, and federal agencies prior to being utilized.	TBD	Appendix F

## **6.0 DRILLING FLUID MANAGEMENT**

The following subsections describe the Project’s drilling fluid management plan.

### **6.1 Procedure for Additives**

Additives to the drilling fluid can enhance a drilling fluid’s density, viscosity, and rheology to allow an improved ability for solids to remain suspended and removed from the hole helping to reduce the potential for a loss of circulation and improve seal-off capability within the hole. In order to help prevent IRs or loss of circulation, the HDD contractor may request additives to be mixed with the drilling fluid or the use of Lost Circulation Materials (LCM).

In the event that the contractor requests to utilize drilling fluid additives, the contractor will utilize additives that are non-petroleum based, non-hazardous, and comply with applicable permit requirements and environmental regulations. Potential additives and LCM’s have been identified by the contractor and their respective Safety Data Sheets (SDS’s) are included as **Appendix G**. All additives or LCM’s not identified in this HDD Contingency Plan shall be approved by the Company, as well as, the appropriate state and federal agencies prior to being utilized.

### **6.2 Drilling Fluid Physical Properties**

The contractor will monitor the drilling fluid properties (e.g., fluid weight, viscosity, sand content, pH) during drilling operations. Specifically, the contractor will be required to monitor the drilling fluid properties on a daily basis. Additional details on the monitoring which will be done during HDD operations are provided in Section 5.

A drilling fluid specialist will be consulted if any changes to the fluid properties are required in order to prevent an IR from occurring or to maintain drill hole stability for successful completion of the crossing. The drilling fluid specialist will review and assess drilling mud properties and recommend changes to drilling mud properties based on conditions encountered during drilling.

### **6.3 Drilling Fluid Disposal**

Drilling mud disposal will be done at an approved waste facility or in an approved, upland location.

## **7.0 HDD OPERATIONAL CONDITIONS AND RESPONSE ACTIONS**

During drilling operations, the HDD contractor will observe and document the flow characteristics of the drilling fluid returns from the hole. A down-hole annular pressure monitoring tool will be utilized during the HDD pilot hole drilling phase to ensure that the HDD contractor can detect a decrease, loss, or spike in drilling fluid pressure and respond to potential hydrofracture, and IR at ground surface. Visual inspection will be used to confirm the occurrence of an IR. Monitoring may include, but is not limited to, drilling mud pressures, volumes, and drilling mud mixtures. Additionally, construction inspector(s) and/or EI(s) will monitor operations during HDD activities. Monitoring activities during drilling operations will include:

- Visual inspection (pedestrian surveys) along the drill path, fluid return pit(s) and wetland / waterbody surface for evidence of a release;
- Observation and documentation of drilling fluid pressures;
- Observation and documentation of drilling fluid recirculation volumes; and

- Documentation of all drilling fluid products used.

The Chief Inspector, in conjunction with designated Utility Inspectors and the EIs, will be responsible for monitoring the drilling operations, including observation and documentation of drilling fluid pressures, drilling fluid volumes, and their reporting protocols. The EI will be the one monitoring the right-of-way (ROW) for any IRs and the Utility Inspector will be the one monitoring the drilling operation.

Visual surface inspection along and in the vicinity of the drill path and monitoring of drilling pressure and return flows will occur at least once per shift will HDD activities are being conducted. Documentation of inspections/monitoring will be maintained by the HDD Contractor and/or EI. Documentation will be part of the EI's daily report as well as part of the daily HDD inspection report prepared by the Utility Inspector assigned to the HDD.

The HDD contractor will have readily available and strategically placed containment equipment to contain IRs of drilling fluid to surface features, including at the HDD entry point and exit point. Containment equipment and materials may include but are not limited to the following: earth-moving equipment, portable pumps, hoses, containment booms, hand tools, hay bales, silt fence and sandbags. The HDD contractor and inspection staff will ensure that adequate quantities of spill containment equipment and supplies are at the drilling location prior to commencement of drilling operations. Further, the EIs will ensure that all personnel involved in drilling operations are familiar with the locations of all spill containment equipment and the specific procedures for handling potential inadvertent drilling fluid releases.

## **8.0 RESPONDING TO INADVERTENT RELEASES**

All stages of HDD operations involve circulating drilling fluid from equipment on the surface through a drill stem to a drill bit or reamer and back to the surface through the annular space between the drill stem and the wall of the hole. The drilling operations are monitored to identify changes in operating parameters that may require immediate attention. Additionally, the HDD alignment / ROW is monitored to identify any IRs. The following sections outline procedures that may be implemented during HDD drilling operations.

### **8.1 Procedure for an IR of Drilling Fluid**

An IR occurs when drilling fluids are released through fractures in the geologic formation and migrate to the surface. IRs are a result of the drilling fluid following the path of least resistance through the formation and are most commonly experienced during pilot hole drilling operations. It is not uncommon to have an IR occur near the HDD entry and exit points, as this is where overburden material is the least and downhole pressures can exceed those of the surrounding and overburden soils. In some cases, loss of drilling fluid circulation can be caused by pre-existing geotechnical features even when downhole pressures are low. Drilling fluid can be lost to the formation surrounding the drill path and not lead to an IR. Once the pilot hole has been completed, the subsequent reaming passes typically experience reduced pressures because the completed pilot hole has established a path of least resistance for the drilling fluid, thus reducing the potential for IRs.

In the event of an IR, HDD drilling operations will be adjusted by implementing procedures to reduce annular pressures, reducing drilling rates, and / or temporarily suspending HDD drilling operations in order to contain and clean up the IR using the materials and equipment described above in Section 7. If a temporary drilling stoppage is required, HDD drilling operations will recommence once the IR has been contained.

In the event of an IR that reaches the ground surface in an upland area, the contractor is required to immediately contain the release utilizing sandbags, silt fence or other temporary physical barriers. If the release is outside of approved workspace, the contractor is required to limit disturbance to the extent practicable and notify any affected landowners as soon as feasible. If the release is within approved workspace, the contractor may utilize construction equipment to build earthen berms for containment. The contractor is required to utilize pumps and/or vacuum trucks to remove the mud for disposal at an off-site, approved facility or return it to circulation for drilling operations. The contractor is required to maintain containment and removal activities until the release is sealed off or until the HDD is complete. Once cleanup is completed, the contractor will restore all disturbed areas to pre-construction conditions and stabilize with appropriate vegetation.

In the event of an IR that reaches a wetland, the contractor will follow the same procedures as described above for a return in an upland area. If the release occurs outside of approved workspace in an area that is not accessible or is not accessible without significant disturbance to the wetland (e.g., clearing is required, equipment mats must be utilized to access the site) and cannot be contained, the contractor will cease drilling operations until any required agency approval is obtained to proceed with remediation activities.

In the event of an IR within a waterbody, HDD drilling operations will be temporarily suspended. The contractor will make all reasonable efforts to contain the release. If the water is shallow, sandbags, turbidity curtains or other temporary barriers would be deployed. Company representatives will immediately contact appropriate permitting agencies to report the release and coordinate appropriate remediation. HDD drilling operations will recommence once the IR has been contained and any required agency approvals have been obtained.

In the event of an IR or a loss of drilling fluid circulation impacting a drinking water source, the contractor will immediately cease drilling operations and notify appropriate regulatory agencies (e.g., county/municipal agencies, state and local health departments). Company representatives will assess impacts to the water source in conjunction with the owner/operator of the system and appropriate agencies and coordinate with affected parties to provide an alternate source of water. Company representatives will work with affected parties to repair or replace wells or other drinking water facilities impacted by construction activities. For any significant differences in the well yield and water quality between pre- and post-construction sampling that cannot be attributed to naturally occurring conditions (e.g., seasonal groundwater level fluctuations), an alternate source of potable water will be provided for the landowner until the water supply and/or well is repaired or replaced.

In the event that an inadvertent return of drilling fluid to the ground surface is detected outside of the Project's approved workspace, Company representatives will obtain necessary landowner permissions, environmental and cultural resource clearances to access and restore areas in a timely manner.

The contractor will be required to temporarily suspend/cease drilling operations if a release of drilling fluid impacts human health and safety, sensitive environmental resources, or cannot be contained.

## **8.2 Procedure for Potential Loss of Circulation**

Geological formations (clays, sands, gravels, etc.) have a natural quality to absorb a portion of the drilling fluid during HDD operations, some formations more than others. A loss of drilling fluid circulation can occur when the drilling fluid flows through pore spaces in the formation surrounding the HDD alignment or if a blockage occurs along the annular space of the drill hole. Periods of reduced and/or lost circulation are not uncommon during drilling activities, particularly during drilling of the pilot hole when fluid pressures are the greatest. Although it is desirable for the contractor to attempt to regain circulation, drilling may continue during periods of reduced or lost circulation. In the event that circulation of drilling fluids is

reduced or lost and there are no IRs to the ground surface or other impacts to environmental resources, the Chief Inspector, in conjunction with drilling personnel, will evaluate conditions and drill progress to determine whether to implement mitigative drilling procedures, such as tripping out or swabbing the hole, in an attempt to restore returns. It is not unusual for circulation to resume when the pilot hole is completed and pressures within the drill hole are relieved, and/or during the reaming process when reaming operations may seal off fractures and other voids in the formation.

The contractor will increase the frequency and geographic area (pending landowner approval) of visual inspections for IRs at the ground surface during periods of reduced or lost circulation until full circulation is restored. If, after monitoring the ROW, no IRs have been detected, drilling operations will resume and the ROW will be monitored at an increased frequency.

### **8.3 Procedure for Additives**

As described in Section 6.3, in the event that the contractor requests to utilize drilling fluid additives, additives that are non-petroleum based, non-hazardous, and comply with applicable permit requirements and environmental regulations will be utilized. All additives or LCM's not identified in Appendix F must be approved by Company representatives, as well as, the appropriate state and federal agencies prior to being utilized.

### **8.4 Procedure for Surface Depressions / Subsidence**

Surface depressions may occur due to preexisting geotechnical voids / weak soils that are exacerbated during drilling operations. Visual monitoring of the HDD alignment / ROW during drilling operations will provide an early warning detection system to identify any surface depressions / subsidence.

In the event surface depressions or subsidence areas are identified along the HDD alignment / ROW during HDD activities, the drilling operation may be adjusted, as necessary, by reducing drilling fluid pressures, reducing drilling rates, and / or temporarily suspending HDD drilling operations and increasing the monitoring frequency. Company representatives will also notify affected landowners and agencies and will return the affected area back to as close to pre-construction conditions as practicable and / or address through compensation. Depending upon the severity of the surface depression / subsidence, an alternative plan may be developed in conjunction with the applicable agencies and landowners.

## **9.0 CONTINGENCY PLANNING**

HDD contingencies may include, for example, defining a new drill path to avoid the problematic area, relocating the crossing, or defining a new method such as direct pipe installation, if feasible. Prior to using a relocated crossing location or pipe installation method, approval will be requested of the appropriate federal and state agencies.

### **9.1 Procedure for Partial Hole Recovery**

In the event that the subsurface conditions dictate abandoning a partially completed pilot hole because of an uncorrectable deviation from the HDD alignment or other issue, downhole cementing could be used to seal off the upper portion of the existing hole, if necessary. A new pilot hole could then be advanced along a different path offset from the initial path with the elevation adjusted as necessary, usually at a lower (deeper) elevation. Careful monitoring of the drilling fluids and the drill path will be carried out, in addition to monitoring of the ROW, until the new drill path is completed and the pipe has been pulled into place following the contingency procedures listed above.

**9.2 Abandonment of HDD**

In the unlikely event an HDD must be abandoned, abandonment procedures will be conducted in consultation with appropriate local, state, and federal agencies, and necessary approvals/permits will be secured prior to abandonment of a drilled hole. A new site-specific HDD alignment or an alternate construction plan will be developed by Company representatives and submitted to the appropriate agencies for approval.

**10.0 RESTORATION**

The contractor will restore all areas affected by IRs to pre-existing conditions and contours to the extent practicable. Upland areas will be restored through typical ROW restoration procedures, such as grading, seeding, and temporary and permanent erosion control devices, as necessary. Restoration of wetlands and waterbodies may vary depending on the extent of disturbance during the initial response to the IR. Recommendations will be solicited from the appropriate regulatory agencies (e.g., the U.S. Army Corps of Engineers and state permitting agencies) for restoration activities in regulated wetlands and waterbodies.

**11.0 AGENCY CONTACTS**

Table 11-1 identifies key agency stakeholders that may need to be notified in the event contingency procedures outlined in this document require implementation.

<b>TABLE 11-1 Key Agency Contacts</b>			
<b>Agency</b>	<b>Name</b>	<b>Title</b>	<b>Contact Information</b>



**APPENDIX A**  
**EMPLOYEE TRAINING LOG**



**APPENDIX B**  
**HDD VISUAL AND PEDESTRIAN MONITORING LOG**



**APPENDIX C**  
**HDD INSTRUMENT LOG**



**APPENDIX D**  
**DRILLING FLUID COMPOSITION MONITORING LOG**





**APPENDIX E**  
**RECORD OF COMMUNICATIONS**

**APPENDIX F**  
**ADDITIVES / LOST CIRCULATION MATERIAL SAFETY DATA SHEETS**

### List of Potential Additives

Additive	Description
Bentonite	Bentonite has a variety of uses. It can be used as a rheology modifier, binding agent, absorbent, filler, pharmaceutical and cosmetics, cat litter, food processing aids and feed additives.
Poly-Select DMD Soda Ash	Boosts pH level of make-up water to improve bentonite mixing and performance.
Poly-Select DMD Power Xan	Xanthan Gum; premium quality biopolymer used as a suspension enhancer and hole cleaning aid. Helps suspend cuttings, sand and gravel.
Poly-Select DMD Power PAC™ L	Dry, polyanionic-cellulose polymer that improves filtrate/water-loss control and improves borehole stability. Available in “L” grade (viscosity neutral).



## SAFETY DATA SHEET

Product Code: AB3A005 (BENTONITE)  
Updated: 5/20/13

### SECTION 1: IDENTIFICATION

**PRODUCT NAME(s):** Prime Gel API, Prime Gel Premium, Aquagel, Slikgel, AUSGEL, Quik-Gel Gold, Star Gel, Swell Plug Coarse

**GENERIC NAME:** Bentonite **MSDS CODE NO.** A202PABA005

**SYNONYMS:** Calcium Bentonite, Sodium Bentonite, Montmorillonite, Smectite Clay

**CHEMICAL NAME:** Sodium / Calcium Aluminum Silicate **CASE REGISTRY NO.** 1302-78-9

**MANUFACTURING ADDRESS:** Western Clay Company  
620 East SR 24  
Aurora, UT 84620 **CONTACT NUMBERS:** Emergency: 213-664-2121  
Western Clay: 800-982-7960

**RECOMMENDED USE:** Bentonite has a variety of uses. It can be used as a rheology modifier, binding agent, absorbent, filler and other i.e. for applications like: foundry, iron ore agglomeration, drilling, construction - civil engineering, filtration (i.e. oil, wine, beer), pharmaceutical and cosmetics, cat litter, food processing aids and feed additives.

**USE RESTRICTIONS:** There are no identified uses advised against.

### SECTION 2: HAZARD IDENTIFICATION

**GHS CLASSIFICATION** Signal: Danger  
Causes damage to the lungs through prolonged or repeated exposure if inhaled



**HEALTH/PHYSICAL HAZARDS:** Material dusts containing less than 1% free crystalline silica (quartz) are classified as nuisance particulates. Exposure to these dusts may cause irritation to eyes, ears, throat, and upper respiratory tract. This materials dust may contain more than 1% free silica as Quartz. Chronic (long term) exposure to air born free silica at levels higher than TLV=s may lead to the development of silicosis or other respiratory problems. (See Section VI)

**HAZARD LISTING:** Nuisance Particles are listed by ACGIH. Free Crystalline Silica as Quartz is listed by OSHA and ACGIH as a Hazardous Material.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCES:	CAS #	Percent (w/w)
Bentonite	1302-78-9	80-100%
Crystalline silica, quartz	14808-60-7	0-5%
Crystalline silica, cristobalite	14464-46-1	0-1%
Crystalline silica, tridymite	15468-32-3	0-1%
Water	7732-18-5	8-12%
Acrylic Polymer* (Prime Gel API)	9033-79-8	.04-.08%
Acrylic Polymer* (Slikgel, Quik-Gel, Star Gel, AUSGEL)	9033-79-8	.15-.175%
Acrylic Polymer* (Prime Gel Premium API, Swell Plug)	9033-79-8	0%

\*Acrylic Polymer has no known OSHA hazards and is not a dangerous substance according to GHS.

#### **SECTION 4: FIRST AID MEASURES**

**INHALATION:** If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

**SKIN:** Wash with soap and water. Get medical attention if irritation persists.

**EYES:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**INGESTION:** Under normal conditions, first aid procedures are not required.

**NOTES TO PHYSICIAN:** Treat symptomatically.

#### **SECTION 5: FIRE-FIGHTING MEASURES**

<b>FLASH POINT RANGE:</b>	Non-flammable Silicate Mineral	<b>FLAMMABLE LIMITS:</b>	LEL: NA UEL:NA
<b>FIRE EXTINGUISHING MEDIA:</b>	All standard firefighting media	<b>SPECIAL EXPOSURE HAZARDS:</b>	Not Applicable
<b>NFPA RATINGS:</b>	Health 0, Flammability 0, Reactivity 0	<b>HMS RATINGS:</b>	Health 0*, Flammability 0, Reactivity 0, PPE: At
<b>SPECIAL FIRE FIGHTING PROCEDURES:</b>	Not applicable		

#### **SECTION 6: ACCIDENTAL RELEASE MEASURES**

**MATERIAL SPILL OR RELEASE:** Avoid breathing dust; wear respirator approved for silica veering dust. Vacuum up to avoid generating airborne dust. Avoid using water. Product is slippery when wet.

**WASTE DISPOSAL METHOD:** Product should be disposed of in accordance with applicable local, state, and federal regulations. There are no known environmental precautionary measures. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage, and disposal.

#### **SECTION 7: HANDLING AND STORAGE**

**HANDLING PRECAUTIONS:** This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposer limits below permissible limits. Material is slippery when wet.

**STORAGE INFORMATION:** Do not reuse empty container. Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Keep from excessive heat.

#### **SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

**VENTILATION REQUIREMENTS:** Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in section VI.

**RESPIRATOR:** Use respirator approved by NIOSH/MSHA for silica bearing dust.

**EYE PROTECTION:** Use safety glasses or goggles to protect against exposure.

**HAND PROTECTION:** Normal work gloves.

**SKIN PROTECTION:** Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

**OTHER PPE:** None known.

#### **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

<b>PHYSICAL STATE:</b>	powder	<b>COLOR:</b>	Tan, Light Green, Red
<b>BULKING VALUE:</b>	90 lbs.	<b>DENSITY:</b>	70 lb/ft <sup>3</sup> powder or compact granular
<b>MELTING POINT:</b>	1450 °C	<b>pH:</b>	8-10
<b>SOLUBILITY IN WATER:</b>	Insoluble, Forms Colloidal Suspension	<b>ODOR:</b>	Mild earthy

**SECTION 10: STABILITY AND REACTIVITY**

<b>STABILITY:</b>	Stable	<b>HAZARDOUS POLYMERIZATION:</b>	None
<b>INCOMPATIBILITY:</b>	None	<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	None

**SECTION 11: TOXICOLOGICAL INFORMATION**

<b>TOXICITY TESTS:</b>	Oral	ND	Genotoxicity	ND
	Dermal	ND	Reproductive	ND
	Inhalation	ND	Primary Irritation Effect	ND

**PRINCIPLE ROUTE OF EXPOSURE:** Eye or skin contact, inhalation

**SKIN:** Possible drying resulting in dermatitis

**EYES:** Mechanical irritant

**INGESTION:** Accidentally this material will generally cause no adverse effects. Minor intestinal irritation is possible.

**INHALATION:** (Acute, Short Term) Exposure to excessive concentrations of dust may cause irritation of the Nose, Throat, and Upper Respiratory Tract. (Chronic, Long Term) Chronic exposure to crystalline silica such as quartz where levels exceed TLV=s can cause Silicosis and other respiratory problems. Short term exposure to very high concentrations may lead to increased risk and accelerated onset of silicosis and respiratory damage. Silicosis is a progressive, degenerative, disabling, and sometimes fatal lung disease characterized by coughing, shortness of breath, wheezing, and fibrotic changes in the lungs with scarring and nodular formation.

<b>PERMISSIBLE EXPOSURE LIMITS: (For air contaminants 8 hour TWA)</b>	<b>Bentonite as Nuisance Dust</b>			<b>OSHA PEL</b>	<b>ACGIH TLV</b>
	Total Dust			15mg/m <sup>3</sup>	Not determined
	Respirable Dust			5mg/m <sup>3</sup>	Not determined
	Crystalline Quartz (respirable)			0.1mg/m <sup>3</sup>	0.1mg/m <sup>3</sup>

**CARCINOGENICITY:** Bentonite is not listed by NTP, IARC, or OSHA. The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans, and experimental evidence that tridymite as a carcinogen in animals. The National Toxicology Program (NTP) classifies respirable crystalline silica as "Known to be a human carcinogen".

**SECTION 12: ECOLOGICAL INFORMATION**

<b>MOBILITY (water/soil/air):</b>	ND	<b>FISH TOXICITY:</b>	TLM96: 10000 ppm (Oncorhynchus mykiss)
<b>PERSISTENCE/DEGRADABILITY:</b>	ND	<b>CRUSTACEANS TOXICITY:</b>	ND
<b>BIO-ACCUMULATION:</b>	ND	<b>ALGAE TOXICITY:</b>	ND
<b>CHEMICAL FATE INFORMTION:</b>	ND	<b>OTHER INFORMATION:</b>	ND

**SECTION 13: DISPOSAL CONSIDERATIONS**

**DISPOSAL METHOD:** Product should be disposed of in accordance with applicable local, state, and federal regulations. There are no known environmental precautionary measures. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage, and disposal.

#### SECTION 14: TRANSPORTATION INFORMATION

**SHIPPING NAME:** Common Ground Clay (NOIBN)      **HAZZARD CLASS:** Not Hazardous      **CAUTIONARY LABELING:** None required

**LAND TRANSPORTATION RESTRICTIONS:**      **DOT:** Not Restricted      **CANADIAN TDG:** Not Restricted      **ADR:** Not Restricted

**AIR TRANSPORTATION RESTRICTIONS:**      **ICAO / IATA:** Not Restricted

**SEA TRANSPORTATION RESTRICTIONS:**      **IMDG:** Not Restricted

#### SECTION 15: REGULATORY INFORMATION

##### **U.S. REGULATIONS:**

<b>US TSCA Inventory</b>	All components listed on inventory or are exempt.
<b>EPA SARA Title III Extremely Hazardous Substances</b>	Not applicable
<b>EPA SARA (311, 312) Hazard Class</b>	Acute Health Hazard, Chronic Health Hazard
<b>EPA SARA (313) Chemicals</b>	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372)
<b>EPA CERCLA/Superfund Reportable Spill Quantity</b>	Not applicable
<b>EPA RCRA Hazardous Waste Classification</b>	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA
<b>California Proposition 65</b>	The California Proposition 65 regulations apply to this product.
<b>MA Right-to-Know Law</b>	One or more components listed.
<b>NJ Right-to-Know Law</b>	One or more components listed.
<b>PA Right-to-Know Law</b>	One or more components listed.

##### **CANADIAN REGULATIONS:**

<b>Canadian DSL Inventory</b>	All components listed on inventory.
<b>WHMIS Hazard Class</b>	D2A Very Toxic Materials Crystalline Silica

#### SECTION 16: OTHER INFORMATION

**ADDITIONAL INFORMATION:** This MSDS was updated on 5/20/13. For additional information on the use of this product, or for questions about the Material Safety Data Sheet for this or other Western Clay Company products, please contact:



#### **Western Clay Company**

Toll Free 1-800-982-7960 Telephone 435 529-3281 Fax 435 529-3714  
620 East SR 24 • PO BOX 127 • AURORA, UT 84620-0127

This information is taken from sources or based upon data believed to be reliable, however, Western Clay Co. makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other special protective measures may not be required under unusual or particular conditions which may be associated with normal use of this product. Since the use or misuse of this product is not within the control of Western Clay Co. it is the users' obligation to assure conditions of safe use and disposal of this product. Seller warrants that this product conforms to the specifications stated herein. Buyer assumes all risks associated with the possession, use, mixing, blending, treatment, storage, disposal, transportation, and handling of the product, whether alone or in combination with other substances. SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED AND ALL OTHER WARRANTIES, INCLUDING WARRANTIES OF QUALITY MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED. Seller's liability is limited to the product price.

## SAFETY DATA SHEET

### POLYSELECT DMD SODA ASH

Product Trade Name:

Revision Date: 07-Oct-2015

Revision Number: 3

#### 1. Identification

##### 1.1. Product Identifier

Product Trade Name: POLYSELECT DMD SODA ASH  
Synonyms: None  
Chemical Family: Carbonate  
Internal ID Code: HM008028

##### 1.2 Recommended use and restrictions on use

Application: Buffer  
Uses Advised Against: No information available

##### 1.3 Manufacturer's Name and Contact Details

###### Manufacturer/Supplier

Halliburton Energy Services Inc.  
P.O. Box 1431  
Duncan, Oklahoma 73536-0431  
Emergency Telephone: 1-866-519-4752 (US, Canada, Mexico) or 1-760-476-3962

Halliburton Energy Services  
645 - 7th Ave SW Suite 2200  
Calgary, AB  
T2P 4G8  
Canada

Prepared By: Chemical Stewardship  
Telephone: 1-281-871-6107  
e-mail: fdunexchem@halliburton.com

##### 1.4. Emergency telephone number

Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962

#### 2. Hazard(s) Identification

##### 2.1 Classification in accordance with paragraph (d) of §1910.1200

Serious Eye Damage / Eye Irritation

Category 2 - (H319)

##### 2.2. Label Elements

###### Hazard Pictograms





<b>Signal Word</b>	Warning
<b>Hazard Statements</b>	H319 - Causes serious eye irritation

**Precautionary Statements**

<b>Prevention</b>	P264 - Wash face, hands and any exposed skin thoroughly after handling P280 - Wear protective gloves/protective clothing/eye protection/face protection
<b>Response</b>	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P337 + P313 - If eye irritation persists: Get medical advice/attention
<b>Storage</b>	None
<b>Disposal</b>	None

**Contains****Substances**

Sodium carbonate

**CAS Number**

497-19-8

**2.3 Hazards not otherwise classified**

None known

**3. Composition/information on Ingredients**

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Sodium carbonate	497-19-8	60 - 100%	Eye Irrit. 2 (H319)

The exact percentage (concentration) of the composition has been withheld as proprietary.

**4. First-Aid Measures****4.1. Description of first aid measures**

<b>Inhalation</b>	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
<b>Eyes</b>	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
<b>Skin</b>	Wash with soap and water. Get medical attention if irritation persists.
<b>Ingestion</b>	Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

**4.2 Most important symptoms/effects, acute and delayed**

Causes eye irritation.

**4.3. Indication of any immediate medical attention and special treatment needed**

**Notes to Physician** Treat symptomatically.

**5. Fire-fighting measures****5.1. Extinguishing media****Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**

None known.

**5.2 Specific hazards arising from the substance or mixture**

**Special Exposure Hazards**

Decomposition in fire may produce harmful gases.

**5.3 Special protective equipment and precautions for fire-fighters**

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**6. Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

See Section 8 for additional information

**6.2. Environmental precautions**

Prevent from entering sewers, waterways, or low areas.

**6.3. Methods and material for containment and cleaning up**

Scoop up and remove.

**7. Handling and storage**

**7.1. Precautions for Safe Handling**

**Handling Precautions**

Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

**7.2. Conditions for safe storage, including any incompatibilities**

**Storage Information**

Store away from acids. Store in a cool, dry location. Product has a shelf life of 36 months.

**8. Exposure Controls/Personal Protection**

**8.1 Occupational Exposure Limits**

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Sodium carbonate	497-19-8	Not applicable	Not applicable

**8.2 Appropriate engineering controls**

**Engineering Controls**

Use in a well ventilated area. Localized ventilation should be used to control dust levels.

**8.3 Individual protection measures, such as personal protective equipment**

**Personal Protective Equipment**

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection**

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or

other qualified professional.

<b>Hand Protection</b>	Normal work gloves.
<b>Skin Protection</b>	Normal work coveralls.
<b>Eye Protection</b>	Dust proof goggles.
<b>Other Precautions</b>	Eyewash fountains and safety showers must be easily accessible.

## 9. Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

<b>Physical State:</b> Powder	<b>Color:</b> White
<b>Odor:</b> Odorless	<b>Odor</b> No information available
	<b>Threshold:</b>

<u>Property</u>	<u>Values</u>
<u>Remarks/ - Method</u>	
<b>pH:</b>	11.5
<b>Freezing Point/Range</b>	No data available
<b>Melting Point/Range</b>	851 °C
<b>Boiling Point/Range</b>	No data available
<b>Flash Point</b>	No data available
<b>Flammability (solid, gas)</b>	No data available
upper flammability limit	No data available
lower flammability limit	No data available
<b>Evaporation rate</b>	No data available
<b>Vapor Pressure</b>	No data available
<b>Vapor Density</b>	No data available
<b>Specific Gravity</b>	2.5
<b>Water Solubility</b>	Partly soluble
<b>Solubility in other solvents</b>	No data available
<b>Partition coefficient: n-octanol/water</b>	No data available
<b>Autoignition Temperature</b>	No data available
<b>Decomposition Temperature</b>	No data available
<b>Viscosity</b>	No data available
<b>Explosive Properties</b>	No information available
<b>Oxidizing Properties</b>	No information available

### 9.2. Other information

<b>Molecular Weight</b>	105.99 g/mole
<b>VOC Content (%)</b>	No data available

## 10. Stability and Reactivity

### 10.1. Reactivity

Not expected to be reactive.

### 10.2. Chemical Stability

Stable

### 10.3. Possibility of Hazardous Reactions

Will Not Occur

### 10.4. Conditions to Avoid

None anticipated

### 10.5. Incompatible Materials

Strong acids.

**10.6. Hazardous Decomposition Products**

Carbon monoxide and carbon dioxide.

**11. Toxicological Information****11.1 Information on likely routes of exposure****Principle Route of Exposure** Eye or skin contact, inhalation.**11.2 Symptoms related to the physical, chemical and toxicological characteristics****Acute Toxicity**

<b>Inhalation</b>	May cause respiratory irritation.
<b>Eye Contact</b>	Causes eye irritation.
<b>Skin Contact</b>	Prolonged or repeated contact may cause skin irritation.
<b>Ingestion</b>	Irritation of the mouth, throat, and stomach.

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.**11.3 Toxicity data****Toxicology data for the components**

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium carbonate	497-19-8	4090 mg/kg (Rat) 2800 mg/kg (Rat)	2210 mg/kg (Mouse) > 2000 mg/kg (Rabbit)	2.3 mg/L (Rat) 2h

Substances	CAS Number	Skin corrosion/irritation
Sodium carbonate	497-19-8	Non-irritating to the skin

Substances	CAS Number	Eye damage/irritation
Sodium carbonate	497-19-8	Irritating to eyes.

Substances	CAS Number	Skin Sensitization
Sodium carbonate	497-19-8	Not classified

Substances	CAS Number	Respiratory Sensitization
Sodium carbonate	497-19-8	No information available

Substances	CAS Number	Mutagenic Effects
Sodium carbonate	497-19-8	In vivo tests did not show mutagenic effects.

Substances	CAS Number	Carcinogenic Effects
Sodium carbonate	497-19-8	No information available.

Substances	CAS Number	Reproductive toxicity
Sodium carbonate	497-19-8	Did not show teratogenic effects in animal experiments.

Substances	CAS Number	STOT - single exposure
Sodium carbonate	497-19-8	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	STOT - repeated exposure
Sodium carbonate	497-19-8	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Sodium carbonate	497-19-8	Not applicable

**12. Ecological Information****12.1. Toxicity**

**Ecotoxicity Effects****Product Ecotoxicity Data**

No data available

**Substance Ecotoxicity Data**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Sodium carbonate	497-19-8	EC50 242 mg/L (Nitzschia)	TLM24 385 mg/L (Lepomis macrochirus) LC50 310-1220 mg/L (Pimephales promelas) LC50 (96h) 300 mg/L (Lepomis macrochirus)	No information available	EC50 265 mg/L (Daphnia magna) EC50 (48h) 200 – 227 mg/L (Ceriodaphnia sp.)

**12.2. Persistence and degradability**

Substances	CAS Number	Persistence and Degradability
Sodium carbonate	497-19-8	The methods for determining biodegradability are not applicable to inorganic substances.

**12.3. Bioaccumulative potential**

Substances	CAS Number	Log Pow
Sodium carbonate	497-19-8	No information available

**12.4. Mobility in soil**

Substances	CAS Number	Mobility
Sodium carbonate	497-19-8	No information available

**12.5 Other adverse effects**

No information available

**13. Disposal Considerations****13.1. Waste treatment methods**

**Disposal Method** Bury in a licensed landfill according to federal, state, and local regulations.  
**Contaminated Packaging** Follow all applicable national or local regulations.

**14. Transport Information****US DOT**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**US DOT Bulk**

**DOT (Bulk)** Not applicable

**Canadian TDG**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**IMDG/IMO**

UN Number: Not restricted  
 UN Proper Shipping Name: Not restricted  
 Transport Hazard Class(es): Not applicable  
 Packing Group: Not applicable  
 Environmental Hazards: Not applicable

**IATA/ICAO**

UN Number: Not restricted  
 UN Proper Shipping Name: Not restricted  
 Transport Hazard Class(es): Not applicable  
 Packing Group: Not applicable  
 Environmental Hazards: Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not applicable

**Special Precautions for User:** None

**15. Regulatory Information**

**US Regulations**

**US TSCA Inventory** All components listed on inventory or are exempt.

**TSCA Significant New Use Rules - S5A2**

Substances	CAS Number	TSCA Significant New Use Rules - S5A2
Sodium carbonate	497-19-8	Not applicable

**EPA SARA Title III Extremely Hazardous Substances**

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Sodium carbonate	497-19-8	Not applicable

**EPA SARA (311,312) Hazard Class**

Acute Health Hazard

**EPA SARA (313) Chemicals**

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Sodium carbonate	497-19-8	Not applicable	Not applicable

**EPA CERCLA/Superfund Reportable Spill Quantity**

Substances	CAS Number	CERCLA RQ
Sodium carbonate	497-19-8	Not applicable

**EPA RCRA Hazardous Waste Classification**

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

**California Proposition 65** All components listed do not apply to the California Proposition 65 Regulation.

**MA Right-to-Know Law** Does not apply.

**NJ Right-to-Know Law** Does not apply.

**PA Right-to-Know Law** Does not apply.

**NFPA Ratings:** Health 2, Flammability 0, Reactivity 0

**HMIS Ratings:** Health 2, Flammability 0, Physical Hazard 0, PPE: B

## Canadian Regulations

**Canadian DSL Inventory** All components listed on inventory or are exempt.

### 16. Other information

#### Preparation Information

**Prepared By** Chemical Stewardship  
Telephone: 1-281-871-6107  
e-mail: fdunexchem@halliburton.com

**Revision Date:** 07-Oct-2015

**Reason for Revision** Update to Format  
SECTION:  
1

#### **Additional information**

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

#### **Key or legend to abbreviations and acronyms**

bw – body weight  
CAS – Chemical Abstracts Service  
EC50 – Effective Concentration 50%  
ErC50 – Effective Concentration growth rate 50%  
LC50 – Lethal Concentration 50%  
LD50 – Lethal Dose 50%  
LL50 – Lethal Loading 50%  
mg/kg – milligram/kilogram  
mg/L – milligram/liter  
NIOSH – National Institute for Occupational Safety and Health  
NTP – National Toxicology Program  
OEL – Occupational Exposure Limit  
PEL – Permissible Exposure Limit  
ppm – parts per million  
STEL – Short Term Exposure Limit  
TWA – Time-Weighted Average  
UN – United Nations  
h - hour  
mg/m<sup>3</sup> - milligram/cubic meter  
mm - millimeter  
mmHg - millimeter mercury  
w/w - weight/weight  
d - day

#### **Key literature references and sources for data**

[www.ChemADVISOR.com/](http://www.ChemADVISOR.com/)

#### **Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**End of Safety Data Sheet**



## SAFETY DATA SHEET

### POLYSELECT DMD POWER XAN

Product Trade Name:

Revision Date: 07-Oct-2015

Revision Number: 3

#### 1. Identification

##### 1.1. Product Identifier

Product Trade Name: POLYSELECT DMD POWER XAN  
Synonyms: None  
Chemical Family: Polysaccharide  
Internal ID Code: HM008029

##### 1.2 Recommended use and restrictions on use

Application: Viscosifier  
Uses Advised Against: No information available

##### 1.3 Manufacturer's Name and Contact Details

###### Manufacturer/Supplier

Baroid Fluid Services  
Product Service Line of Halliburton  
P.O. Box 1675  
Houston, TX 77251  
Telephone: (281) 871-4000  
Emergency Telephone: 1-866-519-4752 (US, Canada, Mexico) or 1-760-476-3962

Halliburton Energy Services  
645 - 7th Ave SW Suite 2200  
Calgary, AB  
T2P 4G8  
Canada

Prepared By: Chemical Stewardship  
Telephone: 1-281-871-6107  
e-mail: fdunexchem@halliburton.com

##### 1.4. Emergency telephone number

Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962

#### 2. Hazard(s) Identification

##### 2.1 Classification in accordance with paragraph (d) of §1910.1200

Combustible dust

##### 2.2. Label Elements

Hazard Pictograms

Signal Word: Warning

Hazard Statements

May form combustible dust concentrations in air.

**Precautionary Statements**

<b>Prevention</b>	None
<b>Response</b>	None
<b>Storage</b>	None
<b>Disposal</b>	None

**Contains Substances**  
Xanthan gum

**CAS Number**  
11138-66-2

**2.3 Hazards not otherwise classified**

None known

**3. Composition/information on Ingredients**

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Xanthan gum	11138-66-2	60 - 100%	Combustible Dust

The exact percentage (concentration) of the composition has been withheld as proprietary.

**4. First-Aid Measures****4.1. Description of first aid measures**

<b>Inhalation</b>	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
<b>Eyes</b>	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
<b>Skin</b>	Wash with soap and water. Get medical attention if irritation persists.
<b>Ingestion</b>	Under normal conditions, first aid procedures are not required.

**4.2 Most important symptoms/effects, acute and delayed**

May cause eye, skin, and respiratory irritation.

**4.3. Indication of any immediate medical attention and special treatment needed**

**Notes to Physician** Treat symptomatically.

**5. Fire-fighting measures****5.1. Extinguishing media****Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**

None known.

**5.2 Specific hazards arising from the substance or mixture****Special Exposure Hazards**

Decomposition in fire may produce harmful gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

**5.3 Special protective equipment and precautions for fire-fighters**

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**6. Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

See Section 8 for additional information

**6.2. Environmental precautions**

Prevent from entering sewers, waterways, or low areas.

**6.3. Methods and material for containment and cleaning up**

Scoop up and remove.

**7. Handling and storage****7.1. Precautions for Safe Handling****Handling Precautions**

Slippery when wet. Avoid creating or inhaling dust. Avoid contact with eyes, skin, or clothing. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

**7.2. Conditions for safe storage, including any incompatibilities****Storage Information**

Store away from oxidizers. Store in a cool, dry location. Product has a shelf life of 24 months.

**8. Exposure Controls/Personal Protection****8.1 Occupational Exposure Limits**

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Xanthan gum	11138-66-2	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>

**8.2 Appropriate engineering controls**

**Engineering Controls** Use in a well ventilated area.

**8.3 Individual protection measures, such as personal protective equipment**

**Personal Protective Equipment** If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection** Not normally needed. But if significant exposures are possible then the following respirator is recommended:

Dust/mist respirator. (N95, P2/P3)

**Hand Protection**

Normal work gloves.

**Skin Protection**

Normal work coveralls.

**Eye Protection**

Wear safety glasses or goggles to protect against exposure.

**Other Precautions**

None known.

**9. Physical and Chemical Properties**

**9.1. Information on basic physical and chemical properties**

<b>Physical State:</b> Powder	<b>Color:</b> White to off white
<b>Odor:</b> Slight	<b>Odor</b> No information available
	<b>Threshold:</b>

<u>Property</u>	<u>Values</u>
<u>Remarks/ - Method</u>	
<b>pH:</b>	7 (1%)
<b>Freezing Point/Range</b>	No data available
<b>Melting Point/Range</b>	No data available
<b>Boiling Point/Range</b>	No data available
<b>Flash Point</b>	No data available
<b>Flammability (solid, gas)</b>	No data available
upper flammability limit	No data available
lower flammability limit	No data available
<b>Evaporation rate</b>	No data available
<b>Vapor Pressure</b>	No data available
<b>Vapor Density</b>	No data available
<b>Specific Gravity</b>	1.6
<b>Water Solubility</b>	Soluble in water
<b>Solubility in other solvents</b>	No data available
<b>Partition coefficient: n-octanol/water</b>	No data available
<b>Autoignition Temperature</b>	204 °C / 400 °F
<b>Decomposition Temperature</b>	No data available
<b>Viscosity</b>	No data available
<b>Explosive Properties</b>	No information available
<b>Oxidizing Properties</b>	No information available

**9.2. Other information**

<b>Molecular Weight</b>	1000000
<b>VOC Content (%)</b>	No data available
<b>Bulk Density</b>	52.4 lbs/ft3

**10. Stability and Reactivity****10.1. Reactivity**

Not expected to be reactive.

**10.2. Chemical Stability**

Stable

**10.3. Possibility of Hazardous Reactions**

Will Not Occur

**10.4. Conditions to Avoid**

None anticipated

**10.5. Incompatible Materials**

Strong oxidizers.

**10.6. Hazardous Decomposition Products**

Carbon monoxide and carbon dioxide.

**11. Toxicological Information****11.1 Information on likely routes of exposure**

**Principle Route of Exposure** Eye or skin contact, inhalation.

**11.2 Symptoms related to the physical, chemical and toxicological characteristics****Acute Toxicity**

<b>Inhalation</b>	May impede respiration.
<b>Eye Contact</b>	May cause mild eye irritation.
<b>Skin Contact</b>	None known.
<b>Ingestion</b>	None known.

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

**11.3 Toxicity data****Toxicology data for the components**

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Xanthan gum	11138-66-2	> 5000 mg/kg (Rat) > 45000 mg/kg (Rat)	No data available	> 21 mg/L (Rat) 1h > 4.25 mg/L (Rat) 4h

Substances	CAS Number	Skin corrosion/irritation
Xanthan gum	11138-66-2	Not irritating to skin in rabbits.

Substances	CAS Number	Eye damage/irritation
Xanthan gum	11138-66-2	Non-irritating to rabbit's eye

Substances	CAS Number	Skin Sensitization
Xanthan gum	11138-66-2	Did not cause sensitization on laboratory animals (guinea pig)

Substances	CAS Number	Respiratory Sensitization
Xanthan gum	11138-66-2	No sensitization responses were observed

Substances	CAS Number	Mutagenic Effects
Xanthan gum	11138-66-2	No information available

Substances	CAS Number	Carcinogenic Effects
Xanthan gum	11138-66-2	Did not show carcinogenic effects in animal experiments

Substances	CAS Number	Reproductive toxicity
Xanthan gum	11138-66-2	Animal testing did not show any effects on fertility.

Substances	CAS Number	STOT - single exposure
Xanthan gum	11138-66-2	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	STOT - repeated exposure
Xanthan gum	11138-66-2	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Xanthan gum	11138-66-2	Not applicable

**12. Ecological Information****12.1. Toxicity****Ecotoxicity Effects****Product Ecotoxicity Data**

No data available

**Substance Ecotoxicity Data**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Xanthan gum	11138-66-2	No information available	TLM96 320-560 ppm	No information available	TLM96 > 75000 ppm

			(Oncorhynchus mykiss) LC50 (96h) 490 mg/L (Oncorhynchus mykiss)		(Mysidopsis bahia) LC50 (48h) 980 mg/L (Daphnia magna)
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**12.2. Persistence and degradability**

Substances	CAS Number	Persistence and Degradability
Xanthan gum	11138-66-2	No information available

**12.3. Bioaccumulative potential**

Substances	CAS Number	Log Pow
Xanthan gum	11138-66-2	No information available

**12.4. Mobility in soil**

Substances	CAS Number	Mobility
Xanthan gum	11138-66-2	No information available

**12.5 Other adverse effects**

No information available

**13. Disposal Considerations****13.1. Waste treatment methods**

**Disposal Method** Bury in a licensed landfill according to federal, state, and local regulations.  
**Contaminated Packaging** Follow all applicable national or local regulations.

**14. Transport Information****US DOT**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**US DOT Bulk**

**DOT (Bulk)** Not applicable

**Canadian TDG**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**IMDG/IMO**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**IATA/ICAO**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable

**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not applicable

**Special Precautions for User:** None

## 15. Regulatory Information

### US Regulations

**US TSCA Inventory** All components listed on inventory or are exempt.

#### TSCA Significant New Use Rules - S5A2

Substances	CAS Number	TSCA Significant New Use Rules - S5A2
Xanthan gum	11138-66-2	Not applicable

#### EPA SARA Title III Extremely Hazardous Substances

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Xanthan gum	11138-66-2	Not applicable

#### EPA SARA (311,312) Hazard Class

None

#### EPA SARA (313) Chemicals

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Xanthan gum	11138-66-2	Not applicable	Not applicable

#### EPA CERCLA/Superfund Reportable Spill Quantity

Substances	CAS Number	CERCLA RQ
Xanthan gum	11138-66-2	Not applicable

#### EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

**California Proposition 65** All components listed do not apply to the California Proposition 65 Regulation.

**MA Right-to-Know Law** Does not apply.

**NJ Right-to-Know Law** One or more components listed.

**PA Right-to-Know Law** Does not apply.

**NFPA Ratings:** Health 1, Flammability 1, Reactivity 0

**HMIS Ratings:** Health 1, Flammability 1, Physical Hazard 0, PPE: B

### Canadian Regulations

**Canadian DSL Inventory** All components listed on inventory or are exempt.

## 16. Other information

#### Preparation Information

Prepared By

Chemical Stewardship  
 Telephone: 1-281-871-6107  
 e-mail: fdunexchem@halliburton.com

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**Revision Date:** 07-Oct-2015

**Reason for Revision** Name change

**Additional information**

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key or legend to abbreviations and acronyms**

bw – body weight

CAS – Chemical Abstracts Service

EC50 – Effective Concentration 50%

ErC50 – Effective Concentration growth rate 50%

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL50 – Lethal Loading 50%

mg/kg – milligram/kilogram

mg/L – milligram/liter

NIOSH – National Institute for Occupational Safety and Health

NTP – National Toxicology Program

OEL – Occupational Exposure Limit

PEL – Permissible Exposure Limit

ppm – parts per million

STEL – Short Term Exposure Limit

TWA – Time-Weighted Average

UN – United Nations

h - hour

mg/m<sup>3</sup> - milligram/cubic meter

mm - millimeter

mmHg - millimeter mercury

w/w - weight/weight

d - day

**Key literature references and sources for data**

[www.ChemADVISOR.com/](http://www.ChemADVISOR.com/)

NZ CCID

WHO/FAO

**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**End of Safety Data Sheet**



## SAFETY DATA SHEET

Product Trade Name: POLYSELECT DMD POWER PAC™ L

Revision Date: 04-May-2015

Revision Number: 2

### 1. Identification

#### 1.1. Product Identifier

Product Trade Name: POLYSELECT DMD POWER PAC™ L  
Synonyms: None  
Chemical Family: Carbohydrate  
Internal ID Code: HM008023

#### 1.2 Recommended use and restrictions on use

Application: Fluid Loss Additive

Uses Advised Against: No information available

#### 1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier: Baroid Fluid Services  
Product Service Line of Halliburton  
P.O. Box 1675  
Houston, TX 77251  
Telephone: (281) 871-4000  
Emergency Telephone: (281) 575-5000

Prepared By: Chemical Stewardship  
Telephone: 1-580-251-4335  
e-mail: fdunexchem@halliburton.com

#### 1.4. Emergency telephone number

Emergency Telephone Number: (281) 575-5000

### 2. Hazard(s) Identification

#### 2.1 Classification in accordance with paragraph (d) of §1910.1200

Combustible dust

Combustible dust

#### 2.2. Label Elements

Hazard Pictograms

Signal Word: Warning

Hazard Statements

May form combustible dust concentrations in air.

Precautionary Statements

Prevention: None

**Response** None

**Storage** None

**Disposal** None

**Contains**

**Substances**

Polysaccharide

**CAS Number**

Proprietary

**2.3 Hazards not otherwise classified**

None known

### 3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Polysaccharide	Proprietary	60 - 100%	Combustible Dust

The specific chemical identity of the composition has been withheld as proprietary. The exact percentage (concentration) of the composition has been withheld as proprietary.

### 4. First-Aid Measures

**4.1. Description of first aid measures**

**Inhalation** If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

**Eyes** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**Skin** Wash with soap and water. Get medical attention if irritation persists.

**Ingestion** Under normal conditions, first aid procedures are not required.

**4.2 Most important symptoms/effects, acute and delayed**

May cause mild eye, skin, and respiratory irritation.

**4.3. Indication of any immediate medical attention and special treatment needed**

**Notes to Physician** Treat symptomatically.

### 5. Fire-fighting measures

**5.1. Extinguishing media**

**Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**

None known.

**5.2 Specific hazards arising from the substance or mixture**

**Special Exposure Hazards**

Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

**5.3 Special protective equipment and precautions for fire-fighters**

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**6. Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

Use appropriate protective equipment. Avoid creating and breathing dust. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.  
See Section 8 for additional information

**6.2. Environmental precautions**

Prevent from entering sewers, waterways, or low areas.

**6.3. Methods and material for containment and cleaning up**

Scoop up and remove.

**7. Handling and storage**

**7.1. Precautions for Safe Handling**

**Handling Precautions**

Avoid creating or inhaling dust. Avoid dust accumulations. Ensure adequate ventilation. Slippery when wet. Avoid contact with eyes, skin, or clothing. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

**7.2. Conditions for safe storage, including any incompatibilities**

**Storage Information**

Store away from oxidizers. Store in a dry location. Product has a shelf life of 36 months.

**8. Exposure Controls/Personal Protection**

**8.1 Occupational Exposure Limits**

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Polysaccharide	Proprietary	Not applicable	Not applicable

**8.2 Appropriate engineering controls**

**Engineering Controls**

A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.

**8.3 Individual protection measures, such as personal protective equipment**

**Personal Protective Equipment**

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

**Respiratory Protection**

Not normally needed. But if significant exposures are possible then the following respirator is recommended:

Dust/mist respirator. (N95, P2/P3)

**Hand Protection**

Normal work gloves.

**Skin Protection**

Normal work coveralls.

**Eye Protection**

Wear safety glasses or goggles to protect against exposure.

**Other Precautions**

None known.

**9. Physical and Chemical Properties**

**9.1. Information on basic physical and chemical properties**

<b>Physical State:</b> Powder	<b>Color:</b> White to off white
<b>Odor:</b> Odorless	<b>Odor Threshold:</b> No information available
<u>Property</u> <u>Remarks/ - Method</u>	<u>Values</u>
<b>pH:</b>	6.5-9 (1%)
<b>Freezing Point/Range</b>	No information available.
<b>Melting Point/Range</b>	No data available
<b>Boiling Point/Range</b>	No data available
<b>Flash Point</b>	221 °C / 430 °F
<b>Flammability (solid, gas)</b>	No data available
upper flammability limit	No data available
lower flammability limit	No data available
<b>Evaporation rate</b>	No data available
<b>Vapor Pressure</b>	No data available
<b>Vapor Density</b>	No data available
<b>Specific Gravity</b>	1.6
<b>Water Solubility</b>	Soluble in water
<b>Solubility in other solvents</b>	No data available
<b>Partition coefficient: n-octanol/water</b>	No data available
<b>Autoignition Temperature</b>	400 °C / 752 °F
<b>Decomposition Temperature</b>	No data available
<b>Viscosity</b>	No data available
<b>Explosive Properties</b>	No information available
<b>Oxidizing Properties</b>	No information available

**9.2. Other information**

<b>VOC Content (%)</b>	No data available
<b>Bulk Density</b>	40-55 lbs/ft3

**10. Stability and Reactivity****10.1. Reactivity**

Not expected to be reactive.

**10.2. Chemical Stability**

Stable

**10.3. Possibility of Hazardous Reactions**

Will Not Occur

**10.4. Conditions to Avoid**

None anticipated

**10.5. Incompatible Materials**

Strong oxidizers.

**10.6. Hazardous Decomposition Products**

Carbon monoxide and carbon dioxide.

**11. Toxicological Information****11.1 Information on likely routes of exposure**

**Principle Route of Exposure** Eye or skin contact, inhalation.

## 11.2 Symptoms related to the physical, chemical and toxicological characteristics

### Acute Toxicity

**Inhalation** May cause mild respiratory irritation.  
**Eye Contact** May cause mild eye irritation.  
**Skin Contact** May cause mild skin irritation.  
**Ingestion** None known.

**Chronic Effects/Carcinogenicity** No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

## 11.3 Toxicity data

### Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Polysaccharide	Proprietary	27000 mg/kg (Rat)	2000 mg/kg (Rabbit)	5800 mg/m <sup>3</sup> (Rat) 4h

Substances	CAS Number	Skin corrosion/irritation
Polysaccharide		Not irritating to skin in rabbits.

Substances	CAS Number	Eye damage/irritation
Polysaccharide		Non-irritating to rabbit's eye

Substances	CAS Number	Skin Sensitization
Polysaccharide		Did not cause sensitization on laboratory animals

Substances	CAS Number	Respiratory Sensitization
Polysaccharide		No information available

Substances	CAS Number	Mutagenic Effects
Polysaccharide		In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects. (similar substances)

Substances	CAS Number	Carcinogenic Effects
Polysaccharide		Did not show carcinogenic effects in animal experiments (similar substances)

Substances	CAS Number	Reproductive toxicity
Polysaccharide		Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.

Substances	CAS Number	STOT - single exposure
Polysaccharide		No information available

Substances	CAS Number	STOT - repeated exposure
Polysaccharide		No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Polysaccharide		Not applicable

## 12. Ecological Information

### 12.1. Toxicity

**Ecotoxicity Effects****Product Ecotoxicity Data**

No data available

**Substance Ecotoxicity Data**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Polysaccharide	Proprietary	No information available	TLM96: 10000 ppm (Oncorhynchus mykiss) LC50 (96h) 20000 mg/L (Oncorhynchus mykiss)	No information available	EC50 (48h) 1000-3300 mg/L (Crangon crangon)

**12.2. Persistence and degradability**

Substances	CAS Number	Persistence and Degradability
Polysaccharide	Proprietary	No information available

**12.3. Bioaccumulative potential**

Substances	CAS Number	Log Pow
Polysaccharide	Proprietary	No information available

**12.4. Mobility in soil**

Substances	Mobility
Polysaccharide	No information available

**12.5 Other adverse effects**

No information available

**13. Disposal Considerations****13.1. Waste treatment methods**

**Disposal Method** Bury in a licensed landfill according to federal, state, and local regulations.  
**Contaminated Packaging** Follow all applicable national or local regulations.

**14. Transport Information****US DOT**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**US DOT Bulk**

**DOT (Bulk)** Not applicable

**Canadian TDG**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable

**Environmental Hazards:** Not applicable

**IMDG/IMO**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**IATA/ICAO**

**UN Number:** Not restricted  
**UN Proper Shipping Name:** Not restricted  
**Transport Hazard Class(es):** Not applicable  
**Packing Group:** Not applicable  
**Environmental Hazards:** Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not applicable

**Special Precautions for User:** None

<b>15. Regulatory Information</b>
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**US Regulations**

<b>US TSCA Inventory</b>	All components listed on inventory or are exempt.
<b>EPA SARA Title III Extremely Hazardous Substances</b>	Not applicable
<b>EPA SARA (311,312) Hazard Class</b>	None
<b>EPA SARA (313) Chemicals</b>	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
<b>EPA CERCLA/Superfund Reportable Spill Quantity</b>	Not applicable.
<b>EPA RCRA Hazardous Waste Classification</b>	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
<b>California Proposition 65</b>	All components listed do not apply to the California Proposition 65 Regulation.
<b>MA Right-to-Know Law</b>	Does not apply.
<b>NJ Right-to-Know Law</b>	One or more components listed.
<b>PA Right-to-Know Law</b>	Does not apply.

**Canadian Regulations**

<b>Canadian DSL Inventory</b>	All components listed on inventory or are exempt.
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<b>16. Other information</b>
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**Preparation Information****Prepared By**

Chemical Stewardship  
Telephone: 1-580-251-4335  
e-mail: fdunexchem@halliburton.com

**Revision Date:**

04-May-2015

**Reason for Revision**

Update to Format  
SECTION:  
2  
3  
4  
6  
7  
8  
10  
12  
16

**Additional information**

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

**Key or legend to abbreviations and acronyms**

bw – body weight  
CAS – Chemical Abstracts Service  
EC50 – Effective Concentration 50%  
ErC50 – Effective Concentration growth rate 50%  
LC50 – Lethal Concentration 50%  
LD50 – Lethal Dose 50%  
LL50 – Lethal Loading 50%  
mg/kg – milligram/kilogram  
mg/L – milligram/liter  
NIOSH – National Institute for Occupational Safety and Health  
NTP – National Toxicology Program  
OEL – Occupational Exposure Limit  
PEL – Permissible Exposure Limit  
ppm – parts per million  
STEL – Short Term Exposure Limit  
TWA – Time-Weighted Average  
UN – United Nations  
h - hour  
mg/m<sup>3</sup> - milligram/cubic meter  
mm - millimeter  
mmHg - millimeter mercury  
w/w - weight/weight  
d - day

**Key literature references and sources for data**

www.ChemADVISOR.com/  
NZ CCID



**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**End of Safety Data Sheet**