

ORIGINAL

BAKER BOTTS LLP

THE WARNER
1299 PENNSYLVANIA AVE., NW
WASHINGTON, DC
20004-2400
202.639.7700
FAX 202.639.7890

AUSTIN
BAKU
DALLAS
HOUSTON
LONDON
NEW YORK
RIYADH
WASHINGTON

February 12, 2004

Ms. Magalie Roman Salas
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Room 1-A
Washington, D.C. 20426

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2004 FEB 12 P 12:49
RECEIVED

Re: Office of Energy Projects, Pipeline Certificates – Group 1, AES Ocean Express, L.L.C., Docket Nos. CP02-90, *et al.*

Dear Ms. Salas:

Enclosed for filing in the referenced proceedings are an original and seven copies of AES Ocean Express LLC's ("Ocean Express") revised Appendices D (Marine Biological Monitoring Plan) and H (Horizontal Directional Drill Monitoring and Contingency Plan) to its Environmental Construction Monitoring and Verification Plan ("ECMVP") for the Ocean Express Pipeline project, filed with the Federal Energy Regulatory Commission ("Commission") on January 15, 2004.

Appendices D and H have been revised to address additional comments from the Florida Department of Environmental Protection and other agencies. Please note that the attachments to Appendix H of the ECMVP have not been revised; therefore, the January 2004 version of those attachments remains current. Appendix D does not include any attachments.

A copy of this transmittal letter is being served on all parties on the Commission's official service list for this matter. Due to the voluminous nature of the revised Appendices D and H to the ECMVP, Ocean Express is not providing copies of those documents to the parties. Ocean Express will provide a copy of the documents to any party who requests a copy.

Also enclosed are two copies of this transmittal letter to be file-stamped and returned to the messenger.

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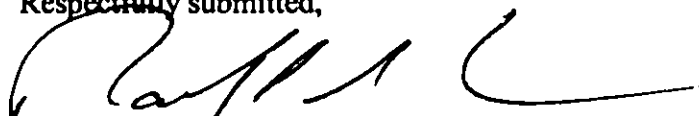
Ms. Magalie Roman Salas

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If you have any questions, please contact the undersigned at (202) 639-7725.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Randolph Q. McManus', written over a horizontal line.

Randolph Q. McManus

Enclosures

cc: Service List (transmittal letter)

Jim Martin

Chae Laird, ENSR

AES OCEAN EXPRESS LLC

AES OCEAN EXPRESS

APPENDIX D

**MARINE BIOLOGICAL (MANATEE, CETACEAN AND SEA TURTLE)
MONITORING PLAN**

January 2004

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MARINE BIOLOGICAL (MANATEE, CETACEAN AND SEA TURTLE) MONITORING PLAN

AES Ocean LNG, Ltd. (Ocean LNG), an affiliate of the AES Corporation, plans to construct, operate and maintain the Ocean Cay Pipeline, a new, 24-inch approximately 40-mile natural gas pipeline extending from a liquefied natural gas (LNG) receiving, storage and regasification facility at Ocean Cay, an industrialized island in The Bahamas, to the Exclusive Economic Zone (EEZ) boundary between the United States and The Bahamas. At the EEZ boundary, the Ocean Cay Pipeline will deliver natural gas to the Ocean Express Pipeline, a new, 24-inch approximately 54.7-mile interstate natural gas pipeline extending from the EEZ boundary to delivery points located within the Florida Power & Light Company (FPL) Fort Lauderdale Power Plant in Broward County, Florida. The Ocean Express Pipeline will be constructed, operated and maintained by AES Ocean Express LLC (Ocean Express).

In February 2002, and as amended in October 2002, Ocean Express filed with the Federal Energy Regulatory Commission (FERC) its Application for Certificates of Public Convenience and Necessity seeking authorization to construct, operate and maintain the Ocean Express Pipeline project. On December 23, 2002, Ocean Express submitted a joint application to the Florida DEP for an Environmental Resource Permit and Authorization to Use Sovereign Submerged Lands, and to the COE for a Federal Dredge and Fill Permit. This was followed, on January 28, 2003, with an application to the Broward County DPEP for an Environmental Resource License.

This Marine Biological Monitoring (MBM) plan provides specific procedures and steps to avoid or minimize project related impacts to manatees, cetaceans and sea turtles in the vicinity of the AES Ocean Express pipeline between its landfall location and the Exclusive Economic Zone (EEZ) boundary. The purpose of this plan is to define the procedures to be implemented during construction operations to avoid or minimize impacts to these species. Waterborne vessels will be required for construction and installation of structures off the Florida coast as well as construction of the pipeline itself from its landfall location to the EEZ. The Ocean Express Environmental Inspectors will submit marine mammal and sea turtle observation data sheets to the designated person at Florida Department of Environmental Protection (DEP), Lesley Bertolotti, Broward County Commission Department of

Planning and Environmental Protection (DPEP), and Florida Fish and Wildlife Conservation Commission (FWC) on a weekly basis. This plan includes monitoring and protective efforts for manatees, cetaceans and sea turtles as follows.

MANATEE PROTECTION PROGRAM

Within the United States, manatees are found along the coastal waters of peninsular Florida in the winter, and may migrate as far as Virginia and Louisiana during the summer months. They typically inhabit both fresh and saltwater streams of sufficient depth (5 feet to 25 feet) throughout their range. They may be encountered regularly within canals, rivers, estuaries, bays, and occasionally offshore. During winter months they can form large aggregations around natural springs or industrial warm water outfalls.

Within the vicinity of the project area, manatees are known to occur with regularity within the Intracoastal Waterway, the Dania Cutoff Canal, and West Lake Park. None of these water bodies are designated by the United States Fish and Wildlife Service (USFWS) as critical habitat for the West Indian manatee. In addition, no designated Manatee Protection areas are present in the offshore project area. Manatees are also known to aggregate during winter months in and near the warm water discharge from the Florida Power and Light (FPL) Fort Lauderdale Power Plant. However the FPL Cooling Canal has been designated as a year-round "No Entry Area" for manatee protection (68C-22.010(1)(a)2 F.A.C.); as such, Ocean Express does not propose to enter this waterway during construction. The proposed pipeline installation by drilling under the Intracoastal Waterway and the Dania Cutoff Canal will occur under areas of potential manatee habitat. The Dania Cutoff Canal has been designated "year-round Slow Speed zone" for Manatee protection (86C-22.010(1)(d) 11 F.A.C.), project frac-out monitoring vessels will be operating in the Dania Cutoff canal. These vessels will operate in accordance with all applicable regulatory requirements/restrictions, however no construction activities are planned within the Dania-Cutoff Canal or any other inland waterways where manatees could be present. As the offshore work will primarily occur approximately one mile or more offshore the likelihood of encountering manatee during the marine construction work is low.

All project construction personnel will be advised that there are civil and criminal penalties for

harming, harassing, or killing manatees. Prior to commencement of operations personnel will be trained on how to recognize manatees, as well as the procedures for the protection of manatees including; proper installation of siltation barriers, identification and protection of manatee essential habitat, inspection procedures, operation of vessels in manatee protection areas, proper navigation techniques, etc.

All vessels associated with the project shall operate at "no wake/idle" speeds at all times while in water where the draft of the vessel provides less than four feet clearance from the bottom and that vessels shall follow routes of deep water whenever possible, and comply with posted speed zones in inshore waters.

The environmental inspectors will observe the area for manatees from both the barges used to locate the drilling rig or from small waterborne vessels, depending on the type and location of construction activities (e.g. HDD activities, pipelaying, mat installation). Ocean Express proposes to use a bumper system to maintain a four-foot minimum stand-off distance between vessels in order to avoid or minimize the possibility of crushing animals between vessels. The four foot stand-off distance is to be measured at the waterline. Environmental inspectors will also be on the lookout for marine animals, as it may not always be possible to use fenders to provide a four foot clearance (for example in the case of a tug that uses its bow to push a barge or other vessel). The Environmental Inspectors in the small waterborne vessels will observe for marine life from a height of approximately 15 to 25 feet above the water's surface. The Environmental Inspectors monitoring for marine life from the drill rig barges will do so from a height of approximately 30 to 50 feet above the water's surface. The Environmental Inspectors monitoring for marine animals from the work barges will do so from a height of approximately 6 to 8 feet above the water's surface. The environmental inspectors will be trained in manatee observation and be equipped with polarized sunglasses during daylight hours, a high-quality night vision scope during any nighttime operations and an immediate means of contacting the mechanical and vessel operators. Movement of work barges and associated vessels, or any in-water work, shall be minimized to the extent possible after sundown.

The environmental inspector will maintain a log of all manatee sightings (as well as the unlikely

occurrence of a collision or injury, should one occur). Following project completion a summary of all sightings and incidents, should they occur, will be submitted to the DEP, FWC, the USFWS in Vero Beach, as well as the Broward County DPEP.

If manatees are seen within 100 yards (300 feet) of active drilling operations, vessel movements or other construction activities all appropriate measures shall be taken to ensure protection of the manatee. If manatees are noted along any construction vessel path or within 50 feet of the construction area the operations other than pipe string pull-back will either cease activity (until the manatees have moved away of their own volition) or the vessel will be redirected to avoid impact to the manatees. In order to ensure a safe and technically successful horizontal directional drill (HDD) pipe pullback a continuous pullback operation must be performed. These operations involve pulling the prefabricated pipe sections back through the HDD borehole. The pullback operations are expected to take approximately three days to complete under normal conditions (wave heights less than 1.5 m) for the Landfall HDD and approximately two days to complete under normal conditions (wave heights less than 1.5 m) during the offshore HDD pullback. During pullback operations the pipe will be pulled into the hole at a very slow rate of approximately 2 to 3 feet per minute. There will be small vessels operating in the area removing flotation devices from the pipe string, these vessels will be able to avoid manatees if any are observed in the project area. Additionally, the pullback operations will be located more than one mile offshore, where the likelihood of encountering manatees is relatively low. Due to the short duration, slow pull back speed, and offshore distance of the project area the potential risk to manatees is low during the continuous pullback operations.

In the unlikely event a collision or injury to a manatee occurs it shall be immediately reported to the FWC Hotline at 1-888-404-FWCC and will also be reported to the DEP at 1-561-681-6600, Broward County Hotline at 954-519-1499, USFWS in Vero Beach at 1-772-562-3909 and the National Marine Fisheries Service (NMFS) Southeast Enforcement Division in St. Petersburg at 1-800-853-1964.

Temporary signs will be posted as described below prior to and during drilling operations and removed at the completion of drilling activities. The posted signs will include the following:

- A 3-foot by 4-foot sign that reads "Caution: Manatee Area" in a conspicuous location on all

waterborne drill rigs; and,

- An 8 ½ by 11-inch sign shall be placed visible to the operators of all waterborne vessels that reads; "Caution: Manatee Habitat. Idle speed is required if operating a vessel in the construction area. All equipment must be shutdown if a manatee comes within 50-feet of operation. Any collision with and injury to a manatee shall be reported immediately to the FWC at 1-888-404-FWCC and the U.S. Fish and Wildlife Service at Vero Beach at 1-772-562-3909."

CETACEAN PROTECTION PLAN

All personnel involved in construction on or near waterways will be advised that there are potential civil and criminal penalties for harming, harassing, or killing species of cetaceans. Prior to commencement of offshore operations, personnel will be trained to identify cetaceans that may occur in the project area as well as the proper procedures for the operation of construction vessels and equipment in areas where cetaceans may occur.

During offshore operations an Environmental Inspector will use a small waterborne vessel or be located on work barges to observe construction activities for the potential presence of cetaceans. The environmental inspectors will be equipped with polarized sunglasses during daylight hours, a high-quality night vision scope during any nighttime operations and an immediate means of contacting the mechanical and vessel operators. Movement of work barges and associated vessels, or any in-water work, will be minimized to the extent possible after sundown. The Environmental Inspectors in the small waterborne vessels will observe for marine life from a height of approximately 15 to 25 feet above the water's surface. The Environmental Inspectors monitoring for marine life from the drill rig barges will do so from a height of approximately 30 to 50 feet above the water's surface. The Environmental Inspectors monitoring for marine animals from the work barges will do so from a height of approximately 6 to 8 feet above the water's surface. The Environmental Inspectors will maintain a log of all cetacean sightings utilizing the attached observation form and incident form, including date, time, location of sighting and actions taken. Following project completion a summary of all sightings and incidents, should they occur, will be submitted to the DEP. In the unlikely event that a collision with a cetacean should occur, any collision or injury to a cetacean will immediately be reported to DEP

at 1-561-681-6600, Broward County Hotline at 954-519-1499, USFWS in Vero Beach at 1-772-562-3909, FWC at 1-888-404-3922, and the NMFS Southeast Enforcement Division in St. Petersburg at 1-800-853-1964.

If cetaceans are noted along any construction vessel path or within 50 feet of the construction area the operations other than the pipe string pull-back will either cease activity (until the cetaceans have moved away of their own volition) or the vessel will be redirected to avoid impact to the cetaceans. In order to ensure a safe and technically successful horizontal directional drill (HDD) pipe pullback a continuous pullback operation must be performed. These operations involve pulling the prefabricated pipe sections back through the HDD borehole. The pullback operations are expected to take approximately three days to complete under normal conditions (wave heights less than 1.5 m) for the Landfall HDD and approximately two days to complete under normal conditions (wave heights less than 1.5 m) during the offshore HDD pullback. During pullback operations the pipe will be pulled into the hole at a very slow rate of approximately 2 to 3 feet per minute. There will be small vessels operating in the area removing flotation devices from the pipe string, these vessels will be able to avoid cetaceans if any are observed in the project area. Due to the short duration and slow pull back speed the potential risk to cetaceans is low during the continuous pullback operations.

SEA TURTLE PROTECTION PLAN

Prior to commencement of operations, personnel will be trained on how to recognize sea turtles, as well as the procedures for the protection of sea turtles and their nesting grounds (although none have been identified in the project area), inspection procedures, operation of vessels in sea turtle nesting areas, and proper navigation techniques, etc.

An Environmental Inspector will use a small waterborne vessel or be stationed on a work barge to observe water related construction activities for the potential presence of sea turtles. The environmental inspectors will be equipped with polarized sunglasses during daylight hours, a high-quality night vision scope during any nighttime operations and an immediate means of contacting the mechanical and vessel operators. Movement of work barges and associated vessels, or any in-water work, will be minimized to the extent possible after sundown. The Environmental Inspectors in the

small waterborne vessels will observe for marine life from a height of approximately 15 to 25 feet above the water's surface. The Environmental Inspectors monitoring for marine life from the drill rig barges will do so from a height of approximately 30 to 50 feet above the water's surface. The Environmental Inspectors monitoring for marine animals from the work barges will do so from a height of approximately 6 to 8 feet above the water's surface. If sea turtles are noted along any construction vessel path or within 50 feet of the construction area the operations other than pipe string pull-back will either cease activity (until the turtles have moved away of their own volition) or the vessel will be redirected to avoid impact to the sea turtles. In order to ensure a safe and technically successful horizontal directional drill (HDD) pipe pullback a continuous pullback operation must be performed. The installation operations involve pulling the prefabricated pipe sections back through the HDD borehole. The pullback operations are expected to take approximately 2-3 days to complete under normal conditions (wave heights less than 1.5 m) for the Landfall HDD and approximately 1-2 days to complete under normal conditions (wave heights less than 1.5 m) during the offshore HDD pullback. During pullback operations the pipe will be pulled into the hole at a very slow rate of approximately 2 to 3 feet per minute. There will be small vessels operating in the area removing flotation devices from the pipe string, these vessels will be able to avoid sea turtles if any are observed in the project area. Due to the short duration and slow pull back speed the potential risk to sea turtles is low during the continuous HDD pullback operations.

The Environmental Inspector will maintain a log of all sea turtle sightings (as well as any collision or injury in the unlikely event that one occurs) utilizing the attached observation form and incident form, including the date, time, sighting location and actions taken. Following project completion a summary of all sightings and incidents, should they occur, will be submitted to the DEP. In the unlikely event that a collision with a sea turtle should occur, any collision or injury to a sea turtle will immediately be reported to the DEP at 1-561-681-6600, Broward County Hotline at 954-519-1499, USFWS in Vero Beach at 1-772-562-3909, FWC at 1-888-404-3922, and the NMFS Southeast Enforcement Division in St. Petersburg at 1-800-853-1964.

Turtles are known to be in the project area. The nesting season for sea turtles varies depending on the species, but in Broward County nesting occurs between March 1 and October 31. In order to avoid or minimize impacts to nesting and migrating turtles that may be utilizing nesting grounds on nearby

beaches, standard measures will be taken to ensure that illumination is not disruptive to any known nearby nesting areas (e.g., reduce angle of light, decrease intensity of light). Prior to initiation of construction activities but after issuance of project permits, licenses, and certificates Ocean Express will require each contractor to submit a vessel specific lighting plan prior to mobilizing each vessel that will be developed in accordance with the guidance outlined in Florida Administrative Code (F.A.C.) Chapter 62B-55, Model Lighting Ordinance for Marine Turtle Protection. Ocean Express will submit each vessel specific lighting plan to DPEP for review. Each vessel plan will be developed and submitted to DPEP following issuance of an environmental license for the Ocean Express Pipeline project, but prior to mobilization of each vessel for project-related construction activity. Ocean Express will be authorized to mobilize each vessel once the vessel lighting plan has been submitted to DPEP, and will not be required to obtain any form of approval from DPEP of that plan before mobilizing the corresponding vessel. The FWC will be notified 48 hours in advance of the first night construction operations so they can perform an inspection and provide additional guidance as necessary, relative to the positioning of lights on work barges. From March 1 through November 30, stationary lighting on offshore equipment will be minimized through reduction, shielding, lowering, and appropriate placement of lights to minimize illumination of the nesting beach and water. FWC staff or designated personnel shall conduct a lighting inspection of the drilling platform during operation. This inspection shall occur from the beach once the platform has been positioned and is operating at the drilling site closest to shore. If inspection documents lights that could interfere with adult or hatchling marine turtles on the nesting beach, Ocean Express will modify the problem lights to resolve any such interference. Such modifications shall include, but not be limited to, shielding, changing light sources or bulb types, focusing the lights, or lowering the lights as approved by FWC, DPEP and/or DEP staff. Once a vessel has been mobilized for construction activity, DPEP and/or FWC may conduct periodic vessel lighting compliance inspections to verify compliance with the vessel plan. Any vessel found not to be in compliance will either have the lights immediately retrofitted or the vessel will be removed from construction activities until the appropriate lighting compliance has been implemented.

Location of Vessel: _____

[illegible]

Ocean Express Pipeline Project
Environmental Construction Monitoring and Verification Plan
Appendix D

Marine Biological (Manatee, Cetacean and Sea Turtle) Incident Log Form

Date: _____

Vessel Name: _____

Name of Observer: _____

Location of Vessel: _____

Description of Incident:

Corrective Actions/Measures Taken

Signature

Date

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Environmental Construction Monitoring and Verification Plan
Appendix H

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OCEAN EXPRESS PIPELINE PROJECT
APPENDIX H
Horizontal Directional Drill Monitoring and Contingency Plan

January 2004

AES Ocean Express, LLC

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ATTACHMENTS

AES Ocean Express, LLC

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ATTACHMENT H-1 - Sidescan Sonar Frac-Out Data Example

ATTACHMENT H-2 - Frac-Out Monitoring Survey Figures

ATTACHMENT H-3 - Risk Matrices

ATTACHMENT H-4 - Onshore HDD Monitoring Locations

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I. INTRODUCTION

1.01 General

In February 2002, AES Ocean Express LLC (Ocean Express) submitted an application to the Federal Energy Regulatory Commission (FERC), Docket No. CP02-90, et al., for a Certificate of Public Convenience and Necessity to construct, own, operate, and maintain a new interstate, 24-inch natural gas pipeline from a point on the Exclusive Economic Zone boundary between the United States and The Bahamas to delivery points in Broward County Florida (Ocean Express Pipeline Project or "The Project"), as shown on Drawing No. 1 of the Environmental Construction Monitoring and Verification Plan. In October 2002, Ocean Express amended the FERC application by providing additional information relevant to a 7.5-mile offshore route variation. Ocean Express also submitted an Application for an Environmental Resources Permit and Authorization to Use Sovereign Submerged Lands with the Florida Department of Environmental Protection (FDEP) and a Federal Dredge and Fill Permit with the U.S. Army Corps of Engineers (COE) on 19 December 2002. Ocean Express also submitted an application for an Environmental Resource License to the Broward County Department of Planning and Environmental Protection (DPEP) on 23 January 2003.

1.02 Purpose and Scope

The horizontal directional drill technique (HDD) is an established trenchless technology that is commonly used to install pipelines and other buried utilities with minimum environmental and construction-related impacts. This HDD Monitoring and Contingency Plan establishes specific procedures for monitoring HDD operations in order to minimize potential environmental impacts, such as impacts from unexpected releases of drilling fluid (bentonite slurry) for various waterbody and land crossings during construction of the Project.

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This HDD Monitoring and Contingency Plan includes a description of the following:

- HDD Overview
- Monitoring
- Contingency Plan and Corrective Actions;
- Abandonment;
- Notification procedures.

II. HDD SEGMENT ALIGNMENTS AND INSTALLATION PROCESS

2.01 HDD Segment Alignments

A. Onshore HDD Segments

The onshore portion of the pipeline will be approximately 6.1 miles long and will extend from the Dania Beach Boulevard traffic circle to the Florida Power and Light (FPL) Fort Lauderdale Power Plant, at which it will tie into the existing Florida Gas Transmission (FGT) and FPL pipeline systems. The majority of the onshore portion of the pipeline will be constructed and installed using conventional "trench and cover" methods. However, to avoid or minimize potential impacts to sensitive wetlands and water bodies and to avoid disruption to traffic, Ocean Express is proposing to install six (6) segments of onshore pipeline utilizing HDD methods, in the following locations (refer to the "Ocean Express Pipeline Project Onshore Installation Methods" document for drawings showing HDD locations):

- Intracoastal Waterway and Dania Beach Boulevard (HDD length approximately 1,350 feet)
- West Lake Park and Dania Cutoff Canal (HDD length approximately 3,250 feet)

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- NE 7th Avenue (HDD length approximately 2,000 feet)
- Highway 1 (HDD length approximately 1,850 feet)
- Airport South Perimeter Road and I-95 (HDD length approximately 1,700 feet)
- Wetlands at FPL (HDD length approximately 1,000 feet)

B. Offshore HDD Segments

The offshore portion of the pipeline will be approximately 48.05 miles long from the EEZ to the point of landfall at Dania Beach Boulevard traffic circle. The majority of the offshore portion of the pipeline will be constructed and installed using conventional "direct lay" methods. However, to avoid or minimize potential impacts to coastal and offshore ecosystems, including the three nearshore reef systems, Ocean Express is proposing to install two segments of offshore pipeline utilizing HDD methods, in the following locations (refer to the "Ocean Express Pipeline Project Florida Near-Shore Installation Methods" document for drawings showing HDD locations):

- Landfall, Shore crossing HDD ("the Landfall HDD Segment") (HDD length approximately 6,077 feet).
- Offshore, Water-to-water HDD ("the Offshore HDD Segment") (HDD length approximately 2,372 feet).

2.02 HDD Installation Process

HDD involves drilling a continuous borehole beneath surface obstacles, and then pulling pipeline or other utility components through the underground borehole, leaving the surface undisturbed. Detailed HDD procedures are included in the Florida Nearshore Installation Methods and the Onshore Installation Methods reports.

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III. HDD MONITORING PROGRAM

3.01 General

Monitoring for potential drilling fluid release or frac-out will occur throughout the HDD processes to ensure that any potential impacts to the environment is avoided and/or minimized.

3.02 Monitoring Responsibilities of the Environmental Inspectors

The responsibilities of the Environmental Inspectors relative to monitoring the HDD operations will be:

- Monitor vessel movements and anchoring;
- Monitor placement and anchoring of HDD barges;
- Monitor guide pile installation and removal;
- Monitor excavations in the former sand borrow pits;
- Monitor for potential drilling fluid release or frac-out;
- Collect turbidity measurements;
- Monitor for potential oil and chemical spills from the drilling barge;
- Monitor for cetaceans, manatees or turtles in the vicinity of the barges and drill rigs;
- Monitor for evidence of other potential environmental impacts;
- Monitor pipestring assembly and pull-back operations;
- Monitor the demobilization of drilling equipment and barges; and,
- Ensure Contractor compliance with Project Permits.

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Environmental Inspectors will also oversee the transfer of the drill cuttings, circulation fluids and any other wastes generated during HDD operations to an appropriate vessel or vehicle for transportation to an authorized upland disposal site.

Environmental Inspectors will monitor all phases of the HDD process to ensure adherence to the Project environmental plans and to identify and respond appropriately to any incidences of drilling fluid frac-out. The Chain-of-Command for communicating and responding to anomalous conditions detected during the course of the Monitoring Program is described in the Ocean Express Environmental Construction Monitoring and Verification Plan.

The monitoring program for the Offshore and Onshore HDD Segments is described below:

3.03 Monitoring of Offshore HDD Segments

A. Drilling Operations

Environmental Inspectors and construction personnel will continuously monitor operations during all phases of the HDD operations. In addition to the monitoring activities listed above, the following will be also be carried out:

- The Drilling Engineer will monitor drilling fluid returns and downhole drilling pressure for indications of any potential drilling fluid release;
- Ocean Express Environmental Inspectors will oversee the drilling process and, if the Drilling Engineer identifies indications of possible unexpected fluid loss , alert the frac-out monitoring vessel by radio; and
- Ocean Express will use underwater video to observe the release of drilling fluids during punch out operations for the Landfall and Offshore HDD segments.

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- Ocean Express will continuously use underwater video to monitor the drilling fluids levels within the exit pit of the Landfall HDD segment and within the entrance and exit pits of the Offshore HDD segments during pipeline pull-in operations.

One or more Environmental Inspectors will carry out inspections for evidence of frac-outs during the HDD operations from a small marine vessel as described in more detail in Section 3.03.B "Frac-Out Detection Guidelines". During nighttime operations frac out monitoring lighting will conform to the guidance outlined in F.A.C. Chapter 62B-55, Model Lighting Ordinance for Marine Turtle Protection, as referenced in the Marine Biological Monitoring Plan, page D-7.

If a frac-out is detected or turbidity exceeds the criteria established in the "Ocean Express Pipeline Project Marine Turbidity, Sedimentation and Reef Monitoring Plan" due to an inadvertent release of drilling fluid, the drill operators will perform contingency measures as described in Section IV (Contingency Plans and Corrective Actions).

Within 48 hours of completing the drilling operation, a survey of the HDD alignment will be conducted using a combination of video cameras and diver inspections. The survey will include the reef edges closest to the HDD entry and exit pits, the HDD pull-back corridors, and identified areas of hard bottom. A further description of the surveys that will be performed at the completion of the offshore construction phase is contained in the Ocean Express Mitigation and Restoration Plan.

B. Frac-Out Detection Guidelines

1. Background

The conventional approach to Horizontal Directional Drilling (HDD) involves directionally drilling a relatively small diameter pilot hole, then back reaming until the required diameter is achieved. Under normal circumstances significant drilling fluid discharges can be tolerated, as the fluid is a slurry of non-toxic Wyoming

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Bentonite clay. However, sensitive coral reefs near the Florida shoreline may be impacted by turbidity and sedimentation resulting from drilling fluid releases. Therefore, a more sophisticated approach to performing the work is needed, whereby drilling fluid releases are minimized and maintained within acceptable limits.

There are 3 stages during typical HDD drilling operations where drilling fluids could be expected to be released to the environment. These are:

- Pilot hole punch out
- Reaming
- Pipeline pull-in

During HDD operations, fluid pressures can build up within the borehole, potentially resulting in hydraulic fracturing and subsequent migration of drilling fluids to the surface. The two primary factors affecting hydraulic fracturing in soil are borehole pressure and depth of cover. When the pressure in the borehole exceeds the strength of the surrounding strata, a potential frac-out condition occurs. However, this risk decreases with increasing depth of cover.

2. Ocean Express' Assessment of Potential Drilling Fluid Releases

A sedimentation study carried out by Ocean Express indicated that the drilling fluid releases during reaming were unacceptable, while releases during punch out and pull-in operations remain within permitted limits. (Re: Sedimentation Impact Assessment for Directional Drilling Operations – April 2003). As such, an engineering solution was required to avoid and/or minimize releases during reaming operations.

For the Ocean Express Project, risk of frac-out is considered to be highest during drilling of the pilot hole when drilling fluid pressures in the borehole are the highest. There is a medium to high risk for frac-out at the entry and exit points of the HDD borehole where the overburden pressure may be lower than the borehole pressure since the depth of coverage is lowest in these areas. The frac-out risk for

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the majority of the drill alignment is considered to be low because the HDD trajectory is planned to be 80-100 feet below the ocean floor and within a limestone formation.

To minimize these risks, the Ocean Express project plan includes the use of marine risers for the shore-crossing exit, and the entrance and exit of the offshore borehole, a casing will also be installed into the limestone formation at the shore-crossing entry point. The marine riser will be installed at the HDD exit locations after completion of the pilot hole. These engineering controls will provide a closed drilling mud circulation system, which will avoid and/or minimize the frac-out potential at the pilot hole entry points and eliminate the lost of drilling fluid during reaming operations.

3. Detection Techniques

Overview

The techniques most commonly employed since the late 1980s to detect an inadvertent bentonite release are a combination of dye, sidescan sonar, and underwater video technologies.

Early plans developed utilized divers to swim the drill trajectory route in anticipation of visually observing drilling fluid directly exiting the seabed. This is now considered unworkable in most circumstances due to logistical and operational limitations normally associated with diving operations including lack of coverage, uncertain frac-out location, limited bottom time, variable visibility, waves, and currents. The currently accepted methodologies employ remote sensing technologies which eliminate the limitations associated with divers, providing early warning of a frac-out event before drilling fluids are actually released to the seabed. Diver based video support remains an integral part of such plans, providing direct observation and assessment of potential impact. Detection and monitoring plans including combination of dye, sidescan sonar and underwater video have been approved and successfully employed in a number of HDD projects where biological resources were at risk, including; numerous crossings in Long

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Island Sound, Connecticut; San Luis Obispo, California; and Boca Raton and Sunny Isle, Florida.

Dye

The dye product conventionally used is Rhodamine WT Red 388, ($C_{20}H_{12}N_2O_5Cl_2Na$), which is diluted and added to the drilling fluid at the drill entry point. The dosing concentration is established in consideration of the mud density and pumping rate and is determined at the time of drilling. The Rhodamine WT is supplied as a 20 % aqueous solution, which is further diluted to a few hundred parts per billion (ppb) prior to dosing. The red coloring is lost at approximately 10 ppb in open water although remains detectable by fluorometer within bentonite at 0.1 ppb.

When bentonite dosed with Rhodamine WT comes in contact with seawater, the dye immediately bleeds into the water and becomes quickly diffused and available to be transported away from the more dense and flocculating bentonite. This results in a dye plume within the water column, which can be detected by modern fluorometer systems to extremely low concentration (0.01 ppb in low turbidity seawater). This provides an early warning of potential frac-out with the mobile and diffuse Rhodamine WT occupying a rapidly expanding volume of seawater. In the case of strong unidirectional water currents (as expected offshore Dania Beach) the dye plume will align downstream (to the north) with the southern limit representing a potential frac-out source location.

For the Ocean Express Project, dye will be continually used throughout all stages of the HDD drilling process, fluorometer monitoring transects, will be carried out perpendicular to the prevailing current direction. The fluorometer survey is described in detail below in section 3.03.B.4. In addition, the separated dye detected at extremely low concentrations by a fluorometer will allow indication of a potential frac-out far earlier than a relatively localized and slowly dispersing drilling fluid release which could be visually detected by divers.

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Sidescan Sonar

High frequency sidescan sonar (>500 kHz) can be successfully employed to detect and map a frac-out. Frac-outs are expected to produce an acoustic anomaly capable of being detected and mapped by a sonar system. Drilling fluid releases are expected to remain as discrete accumulations at the seabed. Typically, a bentonite release will remain coherent, thin and close to seabed if it occurs on a slope or in low to moderate water flow. In the case of a frac-out occurring in shallow water with vigorous wave action or in high currents, the bentonite can become turbulently mixed with the seawater and suspended as a sediment plume, which may become quickly dispersed.

Sidescan sonar is a technique well suited to mapping the aerial extent of a dense bentonite accumulation on a plain sandy seabed. However, it will be limited in reef areas where acoustic backscatter from an irregular hard seabed will make interpretation difficult and subject to error. A data example of a drilling fluid patch (contained frac-out release in shallow water) on a plain sandy seabed is attached for information (see Attachment H-1). Sidescan sonar can complement both fluorometer and visual techniques in mapping the area and thickness of potential accumulation of drilling fluids on the seabed. The use of sidescan sonar can map large areas in a relatively short time. Also, this technique is not limited to nighttime/daytime working conditions as divers may be. A highly reflective background of the monitoring area facilitates the sidescan sonar detection of a drilling mud release due to the mud's comparatively low reflectivity.

Visual and Diver Confirmation

Once an anomalous dye concentration has been detected and the location of the dye release has been defined to the maximum extent practicable with a fluorometer, if Habitat A or B resources occur within the identified area, divers will be deployed to inspect these resources while video will be used in sand areas. This assessment will form the basis on which Environmental Inspectors will communicate results to the drilling operator and advise on response actions to be taken.

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In addition, frac-out monitoring will be conducted by an ROV or divers at the HDD exit location for the Landfall HDD Segment, as well as at the HDD entry and exit locations for the Offshore HDD since these areas are considered to be the areas at highest risk for frac-out during the pilot hole drilling. ROV or diver monitoring will occur at these locations within a circular zone with an approximately 250 ft. radius from the entry / exit point (see Attachment H-2).

In addition to the established diver surveillance for the HDD punch-out points, while the HDD drill head is in the vicinity of each reef system, Ocean Express will conduct diver inspections within the 600-foot-wide monitoring grid over the reef system. The inspections will be conducted by two SCUBA-equipped divers swimming routine transects back and forth from the center of the bore hole out to 300 feet on either side (twice a day, no less than 6 hours apart), conditions¹ permitting, during drilling in the vicinity of the reefs.

4. Ocean Express' Survey Planning For Frac-Out Detection

Real time, regular coordination between the Environmental Inspectors assigned to both drilling and monitoring teams is essential in communicating detected drilling circulation anomalies at the drill site to the offshore monitoring team. Awareness and technical understanding of drilling circulation anomalies by the offshore monitoring team will allow survey planning to be adjusted to respond most appropriately to such alerts.

The HDD Contractor will be required to continuously add appropriate concentrations of the Rhodamine WT Red 388, dye to the drilling fluid throughout all stages of the HDD drilling process.

The Ocean Express frac-out monitoring during the pilot hole drill and reaming operation will involve routine fluorometer traverses, spaced approximately 100 feet apart will be carried out along a series of predetermined lines, within a designated monitoring zone measuring 600 x 500 feet as shown in the Figures at

¹ Such as weather, sea state, or other conditions making it too dangerous to have divers in the water.

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Attachment H-2. The eastward limit of the monitoring zone is determined by the location of the advancing drill bit. The monitoring zone width is at least 5 times the assumed HDD target depth of 100 feet below seabed (i.e., +/- 300 feet wide centered, for a total survey width of 600 feet). On completion of each monitoring zone cycle a single traverse will be extended to monitor the already drilled section. These survey lines, offset 300 feet on either side of center line, will originate at the western edge of monitoring zone landward to a minimum safe navigational depth for the landfall HDD and for the offshore HDD to the HDD entry pit.

During these monitoring traverses, the fluorometer will be deployed to continuously survey the monitoring zone, producing a real time digitally recorded plot of fluorometer values along each line.

It is anticipated that the fluorometer data will be acquired at a minimum speed of approximately 2 to 3 knots in order to maintain steerage and line keeping, building up a series of traverses along which any anomalous dye concentration value would be plotted and tagged for immediate investigation. In the event that a suspected anomaly is detected, additional localized fluorometer traverses will be carried out to further isolate the orientation and extent of the dye plume. Once the dye plume is defined, it can be "tracked" to the source of the suspected frac-out location, and the occurrence of any potential drilling fluid release can be determined by the towed underwater video sled, divers or sidescan sonar, as appropriate. On verification of a drilling fluid release, further appropriate actions will be initiated by informing the drilling operation of the frac-out event, cessation of the drilling operation if necessary to contain the frac-out, deployment of diver and/or ROV and/or sidescan sonar at the release location for confirmation, assessment and clean up.

As mentioned above, the HDD exit location for the Landfall HDD and the HDD entry and exit locations for the Offshore HDD will be monitored by an ROV or diver since these areas are considered to be at highest risk for frac-out during the pilot hole drilling. At the appropriate time during the pilot hole drilling, the ROV or diver monitoring will be conducted at these locations within a circular zone with an approximately 250 ft. radius from the entry / exit point (see Attachment H-2).

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In addition, the HDD exit location for the Landfall HDD and the HDD entry and exit locations for the Offshore HDD will also be monitored by an ROV or diver so that continuous video monitoring of these area is conducted during the pipeline pullback. As outlined in Section 4.02A, the vacuum recovery vessel will be available to respond to any drilling fluid release during the pullback stage. Additionally, the vacuum recovery vessels shall remove drilling fluid from within the Landfall HDD exit pit and within the Offshore HDD entrance and exit pits prior to the level of drilling fluid reaching to within one foot of the top of the pits. The level of the drilling fluid within each of the pits shall be continuously monitored, and shall be maintained at a level no higher than one foot below the top of the pits.

Direct communication between the Environmental Inspector and Driller will allow effective decision making in order to avoid and/or minimize potential impacts to the reef system.

Vessel navigation and positioning will be accomplished using a Global Positioning System to provide x, y coordinates which are used to guide the survey vessel accurately along the pre-selected tracklines. The fluorometer data will be logged on disk and processed in real time allowing the vessel position to be displayed on a video monitor and compared to each intended trackline and data acquired on previous lines as the monitoring survey progresses.

3.04 Monitoring of Onshore HDD Segments

The drilling operations for the HDD crossings along the onshore portion of the route will include wetlands, small water bodies, and road crossings. Monitoring procedures during onshore drilling operations will include:

- Continuous examination of drilling fluid pressures and return flows;
- Inspection along the drill path by an Environmental Inspector from roadways and developed land where appropriate and on foot or from a small boat for wetland and

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water crossings, as described in more detail in Section 3.03.B Frac-Out Detection Guidelines .

- If a frac-out is detected during wetland or water crossings, the drill operators will perform the contingency measures as described below in Section IV. (Contingency Plan and Corrective Actions).

Monitoring for the Onshore HDD segments will be from the following locations as shown on the Drawings included as Attachment H-4:

- For the HDD segment under the Intracoastal Waterway, Environmental Inspectors will patrol the waterway by boat to visually inspect for drilling fluid releases.
- For the HDD segment along the western edge of West Lake Park and under the Dania Cutoff Canal, Environmental Inspectors will be on foot on the FPL Access Road and in a small vessel on the Dania Cutoff Canal to visually inspect for drilling fluid releases.
- For the HDD segment under NE 7th Avenue, Environmental Inspectors will be on foot on roads and developed lands.
- For the HDD segment under U.S. Rt. 1, Environmental Inspectors will be on foot on roads and developed lands.
- For the HDD segment under the I-95, Environmental Inspectors will be on foot on roads and developed lands.
- For the HDD segment between Southwest 42nd Street and the FPL Fort Lauderdale Power Plant, an Environmental Inspector will observe from the drill entry and exit locations and in a vessel on the canal. To the extent practicable, without disturbing, wetlands or endangering the inspectors, on-foot access will be used to track the progress of the drill head, however observations will be limited by the presence of the existing, dense mangrove community.

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IV. CONTINGENCY PLAN AND CORRECTIVE ACTIONS

4.01 General

A number of scenarios that could occur during HDD operations have been identified and appropriate corrective measures have been prepared. A list of unlikely but possible incidents that could occur during HDD operations is as follows:

- Drilling fluid releases, or other loss of drilling fluid into the aquatic environment;
- Failure of the marine riser;
- Failure during reaming;
- Breakage of the drill bit;
- Failure of the drill head guidance and positioning system;
- Failure of the HDD;
- Failure of pipeline pull-in (pipe-stick during pull-back);
- Failure of some pipeline flotation pontoons;
- Inclement weather.

Additional discussion of a range of equipment failure and other emergency scenarios is presented in the "Ocean Express Pipeline Project Emergency Scenario and Response Plan". The Chain-of-Command for communicating and implementing corrective actions in response to releases or other problem conditions is described in the Ocean Express Environmental Construction Monitoring and Verification Plan. The means by which these contingencies will be addressed are summarized below.

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4.02 Drilling Fluid Releases

If one or more of the above events causes a release of drilling fluid or results in an exceedence of the Project turbidity standard within any wetland or waterbody, the following measures will be implemented to stop or minimize the release and to clean it up:

A. HDD Waterbody Crossings

If turbidity exceeds the criteria established in the "Ocean Express Pipeline Project Marine Turbidity, Sedimentation and Reef Monitoring Plan" in surface waterbodies due to a release of drilling fluid, the Drilling Contractor will perform one or more of the following contingency measures as necessary to prevent further discharges of drilling fluids:

- Resize the hole.
- Install surface casing/riser.
- Alter the characteristics of the drill fluid (density, viscosity, gel strength, filtration).
- Introduce Lost Circulation Materials.

To adequately assess the risks associated with the HDD's, the Reliability Matrices included as Attachment H-3 include possible associated environmental (footprint) impact. The HDD contractor typically will complete a HAZID or Hazard Identification workshop in which the contractors and owner (engineering experts, environmental managers, etc) walk through the procedures systematically and identify/weigh hazards, etc. The hazard items will be recorded and tracked to ensure they are addressed properly.

Ocean Express recommends that any determination to "cease forward motion" be made by the contractor after consultation with the Ocean Express Environmental Inspectors based on a determination of potential or actual impact to the resource, as outlined below:

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1. If inadvertent returns are detected in sandy bottom, over 200 ft. from any coral, the following will occur².
 - a. The monitoring team notifies the driller, the Environmental Inspector (EI) at the drill rig, and mobilizes the vacuum recovery vessel.
 - b. The EI contacts the appropriate agencies as per Section 12 of the Emergency Scenario and Response Plan.
 - c. The HDD contractor employs any combination of remedial actions to regain circulation.
 - d. The monitoring team as per Section 3.03B.4 of the HDD Monitoring and Contingency Plan makes a determination of the quantity released, determines whether there is little or no dispersion of the drill fluid due to the sea floor currents and an estimate of the flow rate at the release site. Based on this information, the monitoring team makes an initial assessment that no immediate danger exists to Habitat types A and B.
 - e. The monitoring team EI commences turbidity and sedimentation monitoring once per hour at the nearest down-current reef edge, or more frequently if required by the criteria pursuant to ECMVP Attachment G: 'Marine Turbidity, Sedimentation and Reef Monitoring Plan'.
 - f. The vacuum recovery vessel arrives at the site, places it's anchors as per the Nearshore Maneuvering and Anchoring Guideline and undertakes any necessary clean-up activities.
 - g. The EIs complete their evaluation of the potential risks to the resources based on confirmation of the turbidity and sedimentation monitoring results are within acceptable permit limits and gives the okay to the driller to continue the drill.
 - h. The vacuum recovery vessel completes clean up at the site.
 - i. Turbidity monitoring at the nearest down-current reef edge continues until pilot hole drilling is complete or the inadvertent fluid release ceases and clean-up is complete, whichever occurs first. Drilling may continue so long as turbidity levels at this location do not exceed 15 NTUs above background for three or more hours, in accordance with the turbidity criteria in ECMVP Attachment G: 'Marine Turbidity, Sedimentation and Reef Monitoring Plan'.
 - j. As this Drilling continues in close coordination with the monitoring team and vacuum recovery team.
2. If Inadvertent Returns are detected within 200 feet of any coral reef , the following will occur:
 - a. The monitoring team notifies the driller, the Environmental Inspector (EI) at the drill rig, and mobilizes the vacuum recovery vessel.
 - b. The Drilling ceases immediately until an impact assessment is made.

² While these procedures are presented here sequentially, in practice many of these activities will occur concurrently.

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- c. The EI contacts the appropriate agencies as per Section 12 of the Emergency Scenario and Response Plan.
- d. The monitoring team as per Section 3.03B.4 of the HDD Monitoring and Contingency Plan makes a determination of the quantity released, determines whether there is any significant dispersion of the drill fluid due to the sea floor currents and an estimate of the flow rate at the release site.
- e. The monitoring team EI commences turbidity and sedimentation monitoring once per hour at the nearest down-current reef edge, or more frequently if required by the turbidity criteria pursuant to ECMVP Attachment G: 'Marine Turbidity, Sedimentation and Reef Monitoring Plan'
- f. The vacuum recovery vessel arrives at the site, places it's anchors as per the Nearshore Maneuvering and Anchoring Guideline and undertakes any necessary clean-up activities.
- g. The EIs complete their impact assessment of the potential risks to the resources based on confirmation of the turbidity and sedimentation monitoring results are within acceptable permit limits.
- h. The HDD Contractor provides details to the Environmental Inspector of recommended remedial action(s) to gain circulation
- i. The EIs, and Ocean Express Construction Manager will give the okay to the driller to restart the drill
- j. Drilling recommences in close coordination with the monitoring team and vacuum recovery team.
- k. The vacuum recovery vessel completes clean up at the site.
- l. Turbidity monitoring at the nearest down-current reef edge continues until pilot hole drilling is complete or the inadvertent fluid release ceases and clean-up is complete, whichever occurs first. Drilling may continue so long as turbidity levels at this location do not exceed permitted levels, in accordance with the turbidity criteria in ECMVP Attachment G: 'Marine Turbidity, Sedimentation and Reef Monitoring Plan'.

Forward advance will not recommence until the divers confirm the frac-out has been contained, clean-up has been initiated, and the permitting agencies have been notified of the accident and supplied with the following information: 1) an explanation as to the cause, 2) what measures were taken to correct the problem, and 3) assurances that drilling can continue without further incident. If the HDDs prove unsuccessful, the permittee shall abandon the currently proposed construction techniques, and reapply under separate application for any alternative construction method. The specific condition will identify the number of re-boring

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attempts that will be allowed prior to requiring abandonment of the currently proposed construction techniques.

If necessary to prevent further releases of drilling fluids, an Environmental Inspector will require that drilling operations be reduced or suspended so that the extent of the release can be assessed and corrective actions, if any are required, can be implemented. If the measures described above are not sufficient to halt the frac-out, the Environmental Manager may require that an adjustment be made to the drilling alignment.

The Environmental Inspector will determine when a vacuum recovery vessel, which will be on stand-by at all times during HDD operations, will be deployed to remove released drilling fluid at the location of the release. The vacuum vessel will be deployed if the release causes turbidity or sedimentation exceeding the Project criteria, or occurs close to hard bottom with medium or high levels of blota. A vacuum recovery vessel will be available in close proximity to the drilling location.

For the Offshore HDD segments, the clean-up of any frac-out will include drilling fluid recovery using the vacuum recovery vessel. This vessel will consist of a barge outfitted with submersible hydraulic pump equipment, suitable lengths of flexible 4"-6" hose/pipe, and a frac-out clean-up team composed of divers to manipulate the suction hose/pipe at the location of the frac-out, or equivalent. The clean-up team will be monitored by the Environmental Inspectors to ensure that the clean-up efforts avoid impacts to sensitive habitat areas. The Contractor will determine the final specifications for the configuration of the vacuum recovery apparatus, as well as specify whether divers will be equipped with SCUBA gear or surface air supplied equipment.

Based on the specific location of any identified frac-out, the Contractor under the supervision of the Environmental Inspectors would immediately identify anchoring areas and transit routes

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for the vacuum recovery vessel within the established work areas, prior to the arrival of the vacuum recovery vessel to the affected area of the frac-out. This information will be communicated by radio to the vacuum recovery vessel while it is in transit to the affected area of the frac-out, and confirmed by Environmental Inspectors upon arrival of the vacuum recovery vessel. All anchoring and vessel transit for the vacuum recovery vessel will be performed in accordance with the "Ocean Express Florida Nearshore Maneuvering and Anchoring Guideline".

In the event that a frac-out were to occur in an area beyond the anchoring and transit areas established for the Project, such as within a reef area (although the probability of such an event is considered to be low due to the depth of drilling at these locations), the Contractor, under supervision of the Environmental Inspectors, will identify the nearest suitable sand patch areas that could be used for anchoring until such time that the clean-up effort is complete. Refer to Section 6.0 regarding agency Notifications and Reporting for the specific agencies to be notified in the event of a frac-out. The vacuum recovery vessel Contractor will be required to have adequate backup pumps available, of varying sizes and power ratings, and additional adequate lengths of flexible hose/pipe. The Contractor will also be required to have available a system of floats to be attached along the length of the flexible hose/pipe to prevent contact with reefs or other sensitive resources, in the event that the flexible hose/pipe would need to traverse such areas.

Upon deployment of the frac-out clean-up team to the location of a frac-out, Environmental Inspectors will monitor the clean-up process, identify priority areas, and monitor the cessation of the frac-out. At least two other individuals will remain on the surface, to direct the operation, manage the surface air supply, oversee the recovered material storage and filtration process, and serve as replacement divers. The hydraulic pumps will propel the recovered material through the flexible hose/pipe to a container on the recovery vessel. Sediment and drilling mud will probably constitute 30-40% of the recovered material. Recovered material

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would be processed through either a series of filters, settling chambers, or shakers and hydrocyclones in order to separate the seawater from the recovered solids. The treated, filtered seawater will then be discharged from the recovery vessel at a shallow depth below the water surface at a depth and rate that will not result in disturbance of bottom sands or sediments. The discharge of treated, filtered seawater will be visually monitored by Environmental Inspectors to ensure compliance with Project permits and standards for wastewater discharges (NPDES).

In addition, after completion of the pilot hole punch out, the contractor will initiate removal of the drilling fluid that has accumulated in the borrow pits by utilizing the vacuum recovery vessel and procedures described above. The drilling fluid released during punch out will be recovered prior to commencing the reaming operations.

B. HDD Land Segments

Should a release of drilling materials occur on land that can be accessed without impact to wetlands, barriers (i.e. hay bales, sand bags, silt fences, etc.) will be placed by hand immediately or berms will be constructed around the site to contain the release. Collected or contained drilling fluids will be removed by pump or vacuum truck positioned landward of any waterbody system so as not to disturb any wildlife habitat. The drill operators will perform the following contingency measures as necessary to stop discharges of drilling fluids:

- Decrease the drilling fluid circulation pressures;
- Size the drill hole to remove blockages (i.e. cleaning the drill hole to remove potential blockages, thereby allowing the fluid to flow within the drill hole and not into the geologic formation);
- Thicken the drilling fluid properties by adding bentonite pellets; and
- If necessary, make adjustments to the drilling alignment.

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If necessary, the Environmental Inspector will require that the drilling operations be reduced or suspended so that the extent of the release can be assessed and corrective actions, if any are required, can be implemented.

Containment equipment including moving equipment, portable pumps, hay bales, silt fencing, etc. will be readily available and stored at the drilling sites. If an onshore release impacts a surface water body or wetland the reporting procedures referenced in Section 6.0 will be followed. If the amount of an upland release does not allow practical collection, the affected area will be diluted with fresh water and allowed to dry.

The drill cuttings generated from the drilling operations will be stockpiled in water-tight containers at locations onshore in a manner that prevents their release into the waters of the state. Excess drilling fluid and cuttings will be transported to an authorized disposal site. No discharge of water or drill cutting to the waters of the State will be allowed from onshore HDD operations.

4.03 Equipment Failure

A detailed description of contingencies, reliability issues, and corrective actions associated with HDD operations and pipeline pullback is attached as Attachment H-3. However, in general, if there is a failure of part of the equipment such as the marine riser, drill bit or drill head guidance system, the HDD operations will be suspended if continued operation would pose a risk of releasing drilling fluid at levels that exceed the applicable permit conditions. For a malfunction involving the drill head, the drill string will be withdrawn and the drill head repaired or replaced. For a failure of the marine riser, drilling fluid that is released, if any, will be contained using the measures outlined above and if necessary a vacuum vessel will be

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deployed to recover released drilling fluids. A damaged riser will be repaired or replaced prior to work recommencement.

If the pipe becomes stuck during pull-back, efforts will be made to restart the movement by adding additional drilling fluid or by reaming ahead of the pipe or by using a hydraulic hammer. If the pipe has only been pulled part of the way into the hole, it may be possible to recover the pipe from the entry point. If the pipe becomes irretrievably jammed, the measures described in Section 5.0 to abandon the original hole and redrill a new one will be implemented.

A description of contingencies, reliability issues, and corrective actions associated with the float over system contained in the Florida Nearshore Installation Report. However, in general, if there is a failure of part of the pipeline flotation system, the flotation system has been designed with adequate redundancy ensuring that other elements of the flotation system and/or mooring/anchoring will support the pipe above the sensitive hard bottom resources. Potential emergency scenarios are discussed further in the Emergency Scenario and Response Plan (Appendix K to the Environmental Construction Monitoring and Verification Plan). Additional discussion of installation procedures is presented in the "Florida Nearshore Installation Methods". If reef damage occurs, the measures described in the Ocean Express Mitigation and Restoration Plan will be applied.

4.04 Inclement Weather

To reduce the risk of potential impacts to the Project posed by inclement weather, wind speeds, water currents, and weather forecasts will be monitored continuously by the contractor during HDD operations. At the discretion of the Ocean Express Environmental Manager and in coordination with the Ocean Express Construction Manager, construction activities may be curtailed or temporarily shut-down due to inclement weather, in accordance

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with section 2.03 of the "Ocean Express Environmental Construction Monitoring and Verification Plan". Responses to potential inclement weather could range from temporary shut-down of only certain construction activities, to temporary shut-down of all activities and demobilization of certain vulnerable resources, such as smaller-sized support vessels or other vulnerable equipment. The contractor will be responsible for developing and implementing detailed action plans for responding to inclement weather scenarios appropriate for the specific equipment utilized on the Project.

V. ABANDONMENT

If corrective actions do not prevent or control unacceptable releases of drilling fluid from occurring into the waterbody, Ocean Express may opt to redrill the hole along a different alignment. The HDD borehole would not simply be abandoned completely if difficulties were encountered during drilling or reaming of the borehole, or during pipe pullback operations. In fact, complete abandonment of an HDD borehole rarely occurs within the industry. Instead, prior to abandoning a borehole, the HDD contractor would implement remedial measures to attempt to resolve the problems without the need for abandonment of the borehole. However, if problems with the borehole or section of the borehole could not be resolved, the affected section of the borehole would be filled with grout, consisting of non-toxic, non-hazardous materials, to preclude communication between nearby boreholes. The following procedures will be implemented to abandon the drill hole:

- The method for sealing the abandoned drill hole is to pump thickened drilling fluid into the hole as the drill assembly is extracted, and using enviro plug to create a cap.
- Closer to the surface at onshore drilling locations (within approximately 10 feet of the HDD entrance), a soil cap will be installed by filling with soil extracted during construction of the pit and berms.

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- The borehole entry location for Onshore HDD Segments will be graded and seeded by the contractor to its original grade and condition after the drill hole has been abandoned.
- The contractor will drill a second pilot hole beginning near the initial entry point along a track that parallels the initial borehole.

A root cause analysis of the failed HDD will be conducted in order to minimize the risk of subsequent failure. The root cause analysis will guide the development of potential alternatives for the drilling plan. Ocean Express has undertaken a more detailed evaluation of the remedial measures that would be implemented in the event problems with a borehole or section of a borehole were to arise as outlined in Attachment H-3

Depending on the cause of a failure, it would be preferable to continue to use the partially drilled Pilot Hole already underway, and simply redirect the drilling deeper or laterally around the cause of the failure, if possible, rather than initiate a secondary Pilot Hole.

If the cause(s) of the failure indicate that a completely new, "secondary" Pilot Hole is necessary, the separation distance required will depend entirely upon the cause of the failure. Ocean Express anticipates that only the drill alignment between the original entry point and exit point will be adjusted deeper or laterally such that no additional work areas will be required. Prior to the initiation of a completely new "secondary" Pilot Hole, a modification must be authorized by the appropriate agencies.

VI. NOTIFICATION AND REPORTING PROCEDURES

6.01 Notifications

Upon visual detection of an inadvertent release of drilling fluids the Environmental Inspector will contact the drilling engineer. The location and time of the start of the release will be recorded. The drilling engineer will note the drilling fluid pressures and return flows for

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indication of volume lost during release. Upon identification of a situation that has the potential to exceed applicable permit conditions or cause significant harm to the environment, the Environmental Inspector will inform the Environmental Manager, who will notify the appropriate regulatory agencies pursuant to the procedures described in the "Ocean Express Environmental Construction Monitoring and Verification Plan" and "Ocean Express Pipeline Project Marine Turbidity, Sedimentation and Reef Monitoring Plan".

Corrective action and mitigation steps will be implemented in accordance with Section 4.0 above.

6.02 Reporting

The construction monitoring team will produce a series of reports detailing field observations, construction progress, and environmental monitoring results. This will include a daily turbidity monitoring report, a weekly report summarizing environmental monitoring results, and a summary report at the end of the HDD operations. The details on turbidity monitoring and reporting procedures, and other reporting responsibilities are contained within the "Ocean Express Pipeline Project Marine Turbidity, Sedimentation and Reef Monitoring Plan", and the "Ocean Express Environmental Construction Monitoring and Verification Plan".

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Ocean Express Pipeline Project
Environmental Construction Monitoring and Verification Plan
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REFERENCES

1. "Ocean Express Pipeline Project Florida Near-Shore Installation Methods", Intec Engineering.
2. "Ocean Express Pipeline Project Onshore Installation Methods", Intec Engineering.
3. "Ocean Express Pipeline Project Marine Turbidity, Sedimentation and Reef Monitoring Plan".
4. "Sediment Impact Assessment for Directional Drilling Operations", AES Ocean Express Pipeline Project, Han-Padron Associates, LLP, April 2003.
5. "Florida Nearshore Maneuvering and Anchoring Guideline", Intec Engineering.
6. "AES Ocean Express Natural Gas Pipeline & Ocean Cay Pipeline Hydrotesting and Pre-Commissioning Plan", Intec Engineering.
7. "AES Ocean Express Marine Biological (Manatee, Cetacean and Sea Turtle) Monitoring Plan".
8. "Ocean Express Pipeline Project Offshore Mitigation and Restoration Plan".

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ATTACHMENT H-1

Sidescan Sonar Frac-Out Data Example

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ATTACHMENT H-2

Frac-Out Monitoring Survey Figures

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ATTACHMENT H-3

Risk Matrices

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ATTACHMENT H-4

Onshore HDD Monitoring Locations