Orphan Basin
Exploration Drilling Program
Project Description

ChevronTexaco

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On behalf of

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1.0 Introduction

This document is a Project Description for the Orphan Basin Exploration Drilling Program ("the Project"). Chevron Canada Resources (CCR) and its co-venturers ExxonMobil Canada Ltd. and Imperial Oil Resources Ventures Limited are proposing an exploration drilling program within Exploration Licenses EL1073 to 1080. The sites are situated in the Orphan Basin at water depths ranging from 500 to 3,000-m. The prospect is located over 300-km northeast of St. John's. Exploratory drilling operations are scheduled to commence in either 2006 or 2007, depending on rig availability and regulatory approval. Both CCR and ExxonMobil may be the operator for all or a portion of the proposed drilling program.

This Project Description is based upon information available at the time of writing. Not all Project details are presently known because not all contractors and suppliers have been selected and the specific numbers and locations of exploratory will depend upon ongoing analyses of 3-D seismic data and the success (or lack thereof) of initial wells. Nonetheless, this Project Description is an accurate reflection of the Proponents' present level of knowledge.

2.0 Relevant Legislation and Regulatory Approvals

The Project will require authorizations pursuant to Section 138 (1) (b) of the *Canada-Newfoundland Atlantic Accord Implementation Act* and Section 134 (1) (a) of the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*. Subject to Section 5 (1) (d) of the *Canadian Environmental Assessment Act* (*CEA Act*), the Canada-Newfoundland Offshore Petroleum Board (C-NOPB, also referred to as "the Board") is a responsible authority (RA) and must undertake an environmental assessment (EA) of the Project.

Legislation that is relevant to the environmental aspects of this Project include

- *Canada-Newfoundland Atlantic Accord Implementation Acts*
- *Canadian Environmental Assessment Act*
- *Oceans Act*
- *Fisheries Act*
- *Navigable Waters Protection Act*
- *Canada Shipping Act*
- *Species at Risk Act*
- *Migratory Birds Convention Act*
- *Canadian Environmental Protection Act*

There is no federal funding for this Project. Federal lands are involved and they are administered by the C-NOPB, a federal-provincial agency operating under the *Accord Acts.* A Drilling Program Authorization (DPA) and one or more Approvals to Drill a Well (ADW) are required to operate a drilling program in the offshore.

The EA will be coordinated by the Canadian Environmental Assessment Agency (the CEA Agency), among the C-NOPB, and federal departments including Fisheries and Oceans (DFO), Environment Canada, Transport Canada, Natural Resources Canada, and the Department of National Defense. A Comprehensive Study will likely be required under the *CEA Act* because some or all of the exploratory drilling will occur in a "new" area outside of any study areas used in previous Panel Review or Comprehensive Study EAs for drilling activities.

3.0 Canada Newfoundland Benefits

Consistent with the legislative requirements of the *Canada Newfoundland Atlantic Accord Implementation Acts*, CCR and its partners are committed to enhancing the business opportunities for Canada and Newfoundland and Labrador as described in their Benefits Plan.

No direct long-term employment opportunities are anticipated as a result of this limited duration work program. Most of the local employment opportunities associated with the drilling program will be indirect and provided by the drilling contractor. CCR, its partners and its contractors are committed to full and fair opportunity with first consideration given to qualified individuals resident in Newfoundland.

The guiding principal for the tendering and contract award process will be based upon "Best Value". The procurement strategies are designed to achieve "full and fair opportunity" for Newfoundlanders and Labradorians and Canadians in terms of industrial and employment benefits.

4.0 Contacts

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5.0 Proposed Project

5.1. Name and Location

The official name of the Project is the Orphan Basin Exploratory Drilling Program. It is located in an area north of the Grand Banks known as the Orphan Basin, about 300-km northeast of St. John's, Newfoundland and Labrador (Figure 5.1). Water depths range from about 500 to 3,000-m depth, with most depths between 2,000 and 3,000-m. Offshore drilling has previously occurred at several locations within 200-km of the approximate centre of the Project Area (LGL 2003).

Specific areas have not been determined but will occur within ELs 1073, 1074, 1075, 1076, 1077, 1078, 1079 and 1080 ("the Project Area", Figure 5.1).

5.2. The Operators

The Operators are Chevron Canada Resources (CCR), headquartered in Calgary Alberta and ExxonMobil Canada Limited (EMC), St. John's, Newfoundland and Labrador. CCR also has a base in St. John's, Newfoundland and Labrador. Imperial Oil is also a partner for the Orphan Basin licenses, and the possibility always exists that additional partners may be added in the future. Chevron will serve as the lead operator for the purposes of this environmental assessment.

5.2.1. Chevron Canada Resources

CCR is a wholly owned subsidiary of ChevronTexaco Corporation and one of Canada's leading energy companies. Since 1938, CCR has been actively engaged in exploring, developing, producing and marketing crude oil, natural gas and natural gas liquids in Canada.

ChevronTexaco Corporation (NYSE: CVX), one of the world's largest integrated energy companies, is involved in every aspect of the energy industry, from oil and gas exploration and production to transportation, refining and retail marketing, as well as chemicals manufacturing and sales and power production. Active in more than 180 countries, ChevronTexaco employs more than 51,000 people worldwide.

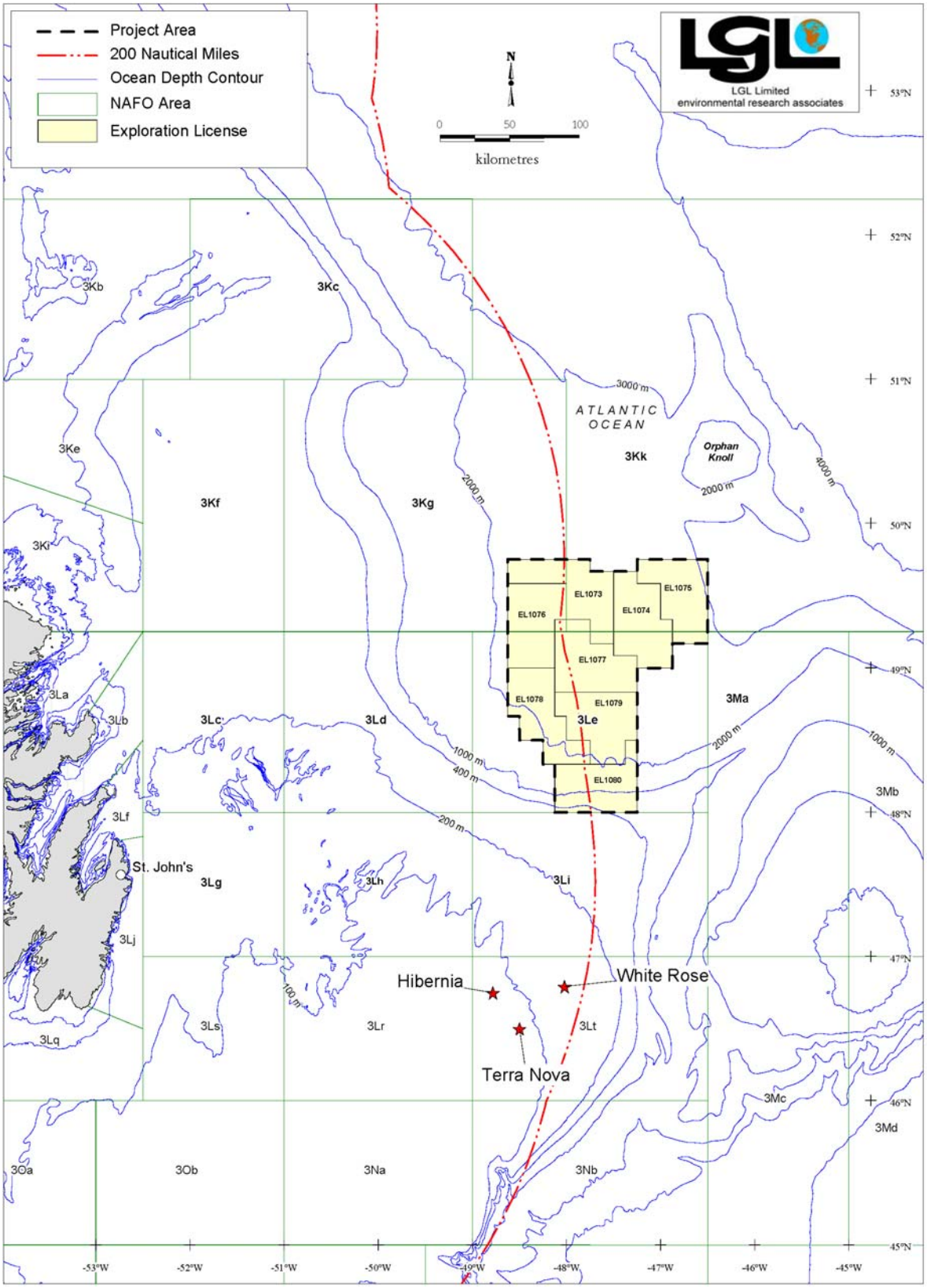

Figure 5.1 The Orphan Basin Project Area.

ChevronTexaco aims to be admired not only for the goals they achieve but also for the way they achieve them. ChevronTexaco pledges to conduct themselves with integrity, respect the law, support universal human rights, and responsibly manage the environmental impacts of their operations. ChevronTexaco strives to make a positive, sustainable contribution to the economic and social fabric of the communities in which they operate. In these communities, ChevronTexaco's goal is to respect and respond to the viewpoints of the many and diverse stakeholders.

Protecting the health and safety of people and safeguarding the environment are among ChevronTexaco's fundamental commitments. These values, which are part of The ChevronTexaco Way, are deeply embedded in the company's culture and are expressed in countless ways every day in their operations around the world.

One of the strategic intents of ChevronTexaco is Operational Excellence (OE). Operational Excellence is defined as the "systematic management of safety, health, environment, reliability and efficiency to achieve world-class performance". This systematic management is achieved by the Operational Excellent Management System which consists of three parts:

- Leadership Accountability
  - Leadership is the single largest factor for successful operational excellence performance. Leaders are accountable not only for getting results but getting results in the right way, behaving in accordance with the ChevronTexaco values.

- Management System Process
  - The Management System Process is a systematic approach used to drive continuous improvement. This process is driven by leaders and follows five steps: setting of vision and objective, assess performance and identifying improvement opportunities, developing improvement plans, implementing improvement plans and finally reviewing effectiveness of the changes. The cycle then repeats.

- OE Expectations
  - ChevronTexaco OE Expectations includes 13 elements. Each element contains an underlying principle and a set of expectations. These expectations clearly document the required processes which need to be implanted to insure world-class performance is achieved.

5.2.2. ExxonMobil

ExxonMobil is the industry leader in each of its core businesses and has an unmatched array of proprietary technologies aimed at increasing the productivity of its assets and employees. The company conducts business in almost 200 countries and territories around the globe in the areas of technology development, downstream refining and marketing, chemical production and upstream exploration and production.

ExxonMobil's upstream exploration and production portfolio spans more than 40 countries and includes a resource base totaling 72 billion oil-equivalent barrels, 4.2 million oil-equivalent barrels per day of production in 25 countries, more than 100 major new development projects, and global gas and power marketing.

ExxonMobil is the largest crude oil producer in Canada, a significant natural gas producer, and holds the leading proved reserve position through its wholly owned affiliate, ExxonMobil Canada Ltd. and its majority-owned affiliate, Imperial Oil Limited.

The company’s objective is to prevent all accidents, injuries, and occupational illness through the active participation of all employees. ExxonMobil is pleased that their contractors have joined them in an all-out effort to see that "Nobody Gets Hurt".

The successful management for safety starts with the involvement of everyone from the CEO to hourly workers in a systematic and continual focus on hazard recognition and mitigation. Production and profits are never more important than safety.

ExxonMobil is committed to operational excellence in all they do including continuous efforts to improve environmental performance. Governance of environmental matters is overseen by Corporate Directors and the company’s comprehensive Operations Integrity Management System (OIMS) provides the framework for our top-notch environmental management system that helps prevent all types of incidents. As a result of these efforts, their environmental performance continues to improve.

5.3. Project Overview

The Operators may drill as many as three or as few as one initial exploration well(s). Depending upon additional 3-D seismic data analyses and results of the initial drilling, additional exploration or delineation wells may be drilled. Each is expected to take from 50 to 180 days to be completed. Drilling will be conducted by one or more dynamically positioned drill rigs (semi-submersible or drill ship) each supported by three supply vessels and one or two offshore helicopters. Vertical seismic profiling (VSP) and well site surveys may also be conducted in conjunction with the drilling.

The Operators' drilling contractors will maintain a marine shore base (s) in the St. John's area during the proposed drilling campaign. The re-supply of drilling equipment and materials will be performed from this location. The transport of personnel to and from St. John's and the Project Area will be conducted mainly by helicopter, but in isolated situations, supply boats may be used. The Project Area as defined in this EA encompasses all of the Operator's land holdings in Orphan Basin, offshore Newfoundland. No new shore-based facilities will be constructed for this operation.

5.3.1. Alternatives to Project/Alternative Means within Project

The alternative to the Project is to not drill any wells in these locations but to seek oil and gas elsewhere in order to satisfy market demand. However, the Operators have been awarded rights to explore in these areas through a regulated competitive bidding process and are now seeking to fulfill commitments made as part of this process.

Alternative means evaluated within the Project include such choices as drill ships, semi-submersibles, and drilling fluid systems. Evaluation of alternative means utilized the following criteria:

1. technological solutions given the environmental conditions likely to be encountered,
2. scheduling given availability of other suitable vessel types, and
3. economics compared to other qualified vessels.

The drill rigs will be selected through the competitive bidding process. The Operators are presently evaluating different drilling fluid scenarios (see "Drilling Activities" below).

5.3.2. Project Phases

For the purposes of this EA, the Project is considered to consist of two phases: (1) drilling of exploration wells, inclusive of routine activities such as well site surveys, VSP and testing, and (2) well abandonment.

5.3.3. Project Scheduling

Execution and scheduling of subsequent wells will largely be dependent on exploration success encountered by the initial wells. The EA will contain a project schedule in as much detail as known at

time of writing. The first well is tentatively planned for the second half of 2006 and the Project may extend for the life of the licenses which expire Jan 15, 2013 (Phase 1 expiry date is January 15, 2009 should no wells be drilled on individual licenses).

5.3.4. Site Plans

Site locations are presented in Figure 5.1. Specific locations are to be determined.

5.3.5. Personnel

The overall Project will be managed by CCR and EMC (and any subsequent co-venturers) managers located in St. John's. The managers have the authority to effectively manage the overall operational aspects of the Project on an ongoing basis. Day-to-day drilling operations will be directed by the Operators' drilling superintendents.

Offshore, the Management team consists of the Sr. Drilling Supervisors (Operators' offshore representative), the designated Offshore Installation Managers, and Supply Vessel Masters.

5.3.6. Mobile Offshore Drilling Units

Drilling will be conducted by one or two dynamically positioned (DP) drill ship or semi-submersible. The key difference between DP units and other drill rigs typical on the Grand Banks is that the DP vessels are not anchored to the bottom but maintain position using a system of thrusters. Although generally noisier than anchored rigs, DP vessel position maintaining activities do not disturb the seabed and may be the only practical alternative in water depths over 2000-m.

5.3.7. Seismic Survey Equipment

Vertical seismic profiling (VSP) using an airgun array may be conducted as part of the drilling activities. The VSP is used to assist in further defining a petroleum resource. The array is similar to that employed by 2-D or 3-D seismic surveys but typically is smaller and deployed in a small area for a 12 to 18 hour period. Well site surveys may also deploy a small array.

5.3.8. Well Site Surveys

Well Site Surveys are a routine activity associated with drilling. The surveys are intended to locate potential geohazards such as unstable slopes or shallow gas, pockets of gas that may cause "kickbacks."

In most cases for deepwater wells, existing high quality 3-D seismic data may be used for this purpose. In rare cases, additional seismic data are acquired with a small air gun array in a relatively small area around the proposed well site. In addition, various side scan sonars, single beam or multi-beam echo sounders are also deployed to obtain information on the seabed near-surface geology.

5.3.9. Marine Support Vessels

Supply/standby vessels will meet Canadian standards and will be managed from the Contractors' offices in St. John's. Letters of Compliance for each chartered standby vessel will be in place prior to work commencing. The vessels will be comparable to those presently operating on the Grand Banks in terms of power and capabilities. The vessels will be used for re-supply, safety stand-by, and iceberg surveillance and control.

5.3.10. Helicopter Support

Contract helicopter support will be provided by several twin-engine, offshore-rated helicopters (about six trips per week per rig). The helicopter contractor will also provide all auxiliary flight services for First Response Equipment and technicians, alternate landing sites complete with weather station, aviation fuel, helicopter passenger transportation suits and an aircraft maintenance and passenger loading terminal located at the St. John's Airport.

5.3.11. Shore base Facilities

The Project will be managed and operational decisions will be made from the Operators' offices in St. John's. The existing infrastructure and activity in St. John's harbour enables the industry to optimize the utilization of supply vessels and other logistic assets. The existing facilities are capable of servicing multiple operations with the existing infrastructure including office space, crane support, bulk storage and consumable (fuel, water) storage and delivery capability. Warehouse facilities will be provided by Project contractors as required and will consist primarily of storage for tubular goods, and the equipment belonging to the drill rigs which can be stored onshore.

Operation and co-ordination service of all aeronautical and marine voice and data communication services will be provided from a central facility (contractor to be selected) in St. John's. The primary communications link between the drill rigs and the Project Operations offices in St. John's will be via a dedicated satellite service. Independent backup communications systems will be provided by high quality HF radio service, available through the coastal radio station. Details on communications systems are outlined in the Alert and Emergency Response Plans to be filed with the C-NOPB.

5.3.12. Drilling Activities

To date, the drill rig (s) have not been contracted but will be DP semi-submersibles or drill ships. The DP rigs are often used in water depths exceeding 500-m. They are virtually the same as anchored rigs in terms of drilling and discharge treatment equipment. The difference between the rig types is that no anchors are required for a DP drill rig and thus the drill stem and riser will be the only connection with the seafloor.

In a typical scenario, wells are drilled in stages (see Table 5.1). The well is started with a structural hole drilled to reach a depth typically 100-m below the mudline (BML). On occasion the structural pipe may be jetted in. This would be followed by the conductor hole to approximately 750-mBML, the surface hole to 3,000-mBML, the intermediate hole to 4,500-mBML and the production hole to 5,000-mBML. Typically, the structural and conductor holes are drilled, the drill string is pulled out and steel pipe called casing is inserted and cemented in place to prevent the wall of the hole from caving in, prevent seepage of mud and other fluids, and provide a foundation for subsequent casing strings. A conductor casing lines the upper section of the well and provides formation integrity to facilitate well control while drilling the surface hole.

Table 5.1 Description of Typical Drill Hole and Casings.

Possible Casing Plan and Drill Hole Characteristics					
Hole Section	**Hole Size (mm)**	**Casing Size (mm)**	**Section Depth (m Below mudline)**	**Drilling Fluid Type**	**Point of Drilling Fluid Return**
Structural	1066	914	100	WBM	Seafloor
Conductor	660	508	750	WBM	Seafloor
Surface	445	346	3000	SBM	Drilling Unit
Intermediate	311	251	4500	SBM	Drilling Unit
Main hole	216	178	5000	SBM	Drilling Unit

The next casing string is the surface casing, which ensures adequate pressure integrity to reach subsequent casing setting depths. Intermediate casings may also be required; the size, depth and number of which will vary according to expected formation depths and pressures.

If significant quantities of hydrocarbons are found, production casing may be installed or the initial well may be abandoned without casing the open hole to provide sidetrack utility from the wellbore. It is intended to gather all data possible from the well and then permanently abandon the well. If insignificant hydrocarbons are found, the well will be secured and abandoned according to the C-NOPB's regulations.

5.3.12.1. Drill Muds and Cuttings

The exploration wells covered under this assessment will likely be drilled using a combination of both water-based muds (WBM) and synthetic-based muds (SBM), depending on the hole section. This assessment covers two scenarios for the hole sections drilled below the structural and conductor sections:

(1) Surface release of synthetic based cuttings to the sea using best available technology, and
(2) Use and discharge of WBM for the entire well.

At this stage of the Project planning process, the specific drilling fluid program has not been selected. Once a candidate drilling fluid has been selected, a "generic mud composition" will be identified for each section of the hole which will undergo toxicity testing according to the Environment Canada test method EPS 1/RM/26 [9]. The results of the toxicity testing will be submitted to the C-NOPB.

A table in the EA will present the volume of muds and cuttings that may be discharged for each individual well as estimated for a typical well within the Project Area. Actual quantities of muds/cuttings requiring disposal at sea may vary.

5.3.12.1.1. Mud System for Structural and Conductor Hole Sections

The structural hole section would likely be drilled with seawater and high viscosity WBM sweeps (see next paragraph below). Since there is no way to return the mud to the rig before the first two casings are installed, the drilling mud and cuttings (broken rock) are released onto the seabed. The hole will be filled with WBM prior to running the pipe.

The conductor hole section would be drilled next without the BOPs and riser installed. As is the case with the structural hole, the returns from this section are discharged onto the seabed. This section will likely be drilled using seawater and WBM high viscosity sweeps which are typically pumped when hole conditions dictate the need. The volumes of these viscous sweeps are typically in the 8-16-m^3 range. The viscous mud has a high carrying capacity which is intended to lift or flush cuttings from the hole that are not effectively removed by the seawater. This hole section will also be filled with WBM prior to running the casing. After setting the conductor casing, the BOPs and riser will be installed. This will allow transport of the mud and cuttings to the drilling unit at surface. It is at this point that one of the scenarios below will be implemented.

5.3.12.1.2. Scenario 1 – Use of SBM

The preferred option is to use SBM for the hole sections below the conductor, incorporating the best available, proven technologies to reduce the Cuttings Oil Retention (COR) on the cuttings. The cuttings would be disposed of at sea provided the COR's meet the requirements of the C-NOPB.

The drilled cuttings are pumped to surface using SBM. Once at surface, the cuttings are removed from the drilling fluid (SBM) in successive separation stages through the use of shale shakers, hydrocyclones, centrifuges and possibly other specialized separation equipment.

The drilling fluid is reconditioned and reused continuously while drilling. Spent SBM (whole muds) will be returned to shore for treatment and disposal at approved land based facilities. SBM contaminated cuttings that do not meet the COR requirements are typically returned to shore for disposal at approved land based facilities. SBM cuttings that meet the C-NOPB requirements will likely be disposed of at sea.

Drilling fluid technologies continue to evolve. Fluid systems that are not classified as SBM or WBM could be developed during the life of this Project. Every consideration will be given to using a system that can be implemented safely and which minimizes the impact on the receiving environment.

5.3.12.1.3. Scenario 2 – Use of WBM

If the Operator determines that the use of WBM for the entire well is technically feasible, WBM may be used for the hole sections below the conductor. WBM typically consists of water, bentonite (clay), polymers and barite. Other additives such as glycols and salts may be used to combat potential problems like hydrate formation. Any additives would be screened using the C-NOPB's Offshore Chemical Selection Guidelines (NEB et al. 1999 and subsequent updates) before they are considered for use and discharge.

5.3.12.2. Well Testing

Deep water exploratory wells are not typically tested (if approval not to test is granted by the C-NOPB), however delineation wells may be tested. Once a well has been drilled to total depth and the initial geological evaluation has been completed, a decision on whether to test the well will be made. The decision to test a well is dependent on the quality, quantity and content of the hydrocarbon-bearing formations encountered. If well testing is deemed necessary, the Operator would return to the location at a later date with a suitably equipped drilling unit. During typical well testing operations test tools are installed in the cased well bore and are used to perforate the casing, cement and formation at the

specified zone of interest. Once the well has been perforated, formation fluids are allowed to flow to the drilling deck surface test facility in a controlled manner. These fluids may contain hydrocarbons (oil and gas) and/or formation water. The produced hydrocarbons are separated from the produced water in the test unit. Hydrocarbons and small amounts of produced (formation) water are flared using high efficiency igniters to ensure relatively complete combustion of hydrocarbons and minimize emissions. Produced water will be treated in accordance with the *Offshore Waste Treatment Guidelines* (*OWTG)* prior to ocean discharge.

5.3.13. Well Abandonment

Following completion of drilling and well testing activities many exploration wells are permanently abandoned. The well abandonment procedures follow industry standard practices and are in accordance with the *Newfoundland Offshore Petroleum Drilling Regulations*. Abandonment procedures are designed to prevent hydrocarbons from flowing out of the well. Well log information is used to determine how the hole should be plugged to ensure isolation of the formations that may contain hydrocarbons.

Offshore wells are typically abandoned in two stages. During the first stage, the wellbore is isolated using mechanical and cement plugs in accordance with existing regulations. During the second stage the wellhead and any associated equipment items are removed from the seabed. Removal of the wellhead will routinely involve the use of mechanical cutters. In some circumstances, however, subsurface cutting using shaped charges may be required. Wellheads may be left in place, subject to approval from the Board, if it is determined that they do not create an obstruction on the seafloor (e.g., in the case of water depths significantly beyond the capabilities of bottom draggers) and are beyond the water depths associated with iceberg scour. The preferred alternative for deeper water is to keep the wellheads in place.

5.4. Emissions and Waste Discharges

Waste discharges will include drill muds and cuttings, produced water, grey and black water, ballast water, bilge water, deck drainage, discharges from machinery spaces, cement, blowout preventer (BOP) fluid, and air emissions. All discharges will be in compliance with the *OWTG* developed jointly by the National Energy Board (NEB), the C-NSOPB, and the C-NOPB (NEB et al. 2002). Details are provided in the following sections on the discharges that have not been discussed above.

Discharges from the rig will be managed in accordance with the *OWTG*. Other requirements may be attached to operational permits.

5.4.1. Produced Water

If hydrocarbons are present and testing is conducted then small amounts of produced water may be discharged by atomizing with hydrocarbons and flared. If the flare capacity is exceeded, then small amounts of treated produced water will either be brought ashore for disposal or treated to meet the *OWTG* and disposed of at sea.

5.4.2. Grey/Black Water

The rigs will accommodate up to 150 personnel, depending upon the rig. Each rig will discharge up to approximately 50-m^3 of grey water per day. Black water or sewage will be macerated to 6-mm particle size or less and discharged as per the *OWTG*. Estimated amounts of black water are up to 25-m^3 per day per rig.

5.4.3. Machinery Space Discharges

Machinery space drainage will be through a closed system and treated to 15-mg/L of oil or less.

5.4.4. Bilge Water

Bilge water will be treated to *OWTG* standards (15-mg/L or less).

5.4.5. Deck Drainage

Any deck drainage such as the rotary table floor and machinery spaces will undergo treatment as per the *OWTG*.

5.4.6. Ballast Water

Water used for stability purposes in both supply boats and drilling rigs is stored in dedicated tanks and thus does not normally contain any oil. If oil is suspected in the ballast water it will be tested and if necessary treated to *OWTG* standards.

5.4.7. Cooling Water

Top drives and draw-works on rigs are cooled by pumping water through a set of heat exchangers; the water is then discharged overboard in accordance with the *OWTG*. Other equipment is cooled through a

closed loop system which may use chlorine for disinfection purposes. Water from closed systems will be tested prior to discharge and will comply with the *OWTG*. Any proposals for alternate disinfection chemicals will be submitted to C-NOPB for consideration prior to use.

5.4.8. Garbage

All waste materials, including organic waste from galleys, will be containerized and transported to shore for disposal in approved landfills. Combustible waste such as oil rags and paint cans will be placed in hazardous materials containers for transport to shore. The rig will have a recycling program with an estimated total recycling rate of 5-10%.

5.4.9. Air Emissions

The Project will produce emissions from fugitive emissions (e.g., from fuel storage tanks) and from helicopter, supply vessel, and drill rig engines, generators, and machinery. Flaring may also occur if petroleum hydrocarbons are encountered. The specific amounts and types of emissions are not known at this time because vessel and rig contractors have not yet been selected. However, marine diesel will be the primary fuel and operational discharges will be similar to other marine operations using vessels of this size and power.

5.4.10. Miscellaneous

BOP test fluid (glycol/water) is released at intervals (typically three pressure and three function tests per 40-day drilling). About 1.0 m^3 is released per test (Husky 2000). Chemicals used offshore will conform to the NEB et al. (1999) chemical selection guidelines. Excess chemicals or chemicals in damaged containers will not be discharged into the sea but returned to shore on supply boat. Any spent or excess acids will be neutralized as approved by C-NOPB and discharged.

No other substances not discussed above or covered in the *OWTG* will be discharged without prior notification and approval of the C-NOPB. Additional information on discharges and treatment is contained in the environmental assessment sections.

5.4.11. Waste Management Plan

The waste streams will be managed according to the Operator's Waste Management Plan. The purpose of the Waste Management Plan is to provide guidance on effectively dealing with waste from the facility and avoiding environmental pollution. A Waste Management Plan will be submitted to the C-NOPB as part of the DPA requirements. Wherever possible, waste streams will be kept independent of one another so as not to create the additional problem of expensive decontamination or separation onshore.

5.5. Project Site Information

5.5.1. Environmental Features

The Project has the potential to affect air, water, plankton, fish and fish habitat, fisheries, marine birds and mammals through emissions and discharges, both routine and accidental. There are no known special or unique resources in the Project Area although several species listed on Schedule I of the *Species at Risk Act* may occur there (e.g., Leatherback turtle, Ivory Gull, Atlantic wolffish). Potential interactions and effects will be discussed in detail in the EA.

5.5.2. Physical Environment

A detailed description of the physical environment for the Orphan Basin will be contained in the EA sections to follow.

5.5.3. Multiple Ocean Uses

Current and past uses of the area include marine shipping, oil and gas activity, defense-related ship traffic, and commercial fisheries. Hunting of murres, waterfowl, and seals has occurred for many years further inshore from the Project Area.

There are no known sources of contamination in the Project Area although there is a continuing problem on the Grand Banks and the approaches to the Gulf of St. Lawrence in general with oily discharges from disreputable ships. Previous disturbance of the seabed may have occurred from bottom trawling or dredging activity associated with commercial fisheries.

The closest (sensitive) area (Bonavista Cod Box) is about 75-km west of the western boundary of the Project Area and the closest major seabird colony (Baccalieu) is about 250-km to the west. The closest urban centre is St. John's, about 300-km to the southwest (Figure 5.1).

5.5.4. Navigable Waters

The physical presence of the rig and supply boats affects navigable waters in Orphan Basin to a small degree. The Project Area is close to major North Atlantic shipping lanes and may receive ship traffic from fishing vessels, tankers, freighters, naval vessels, private yachts and others. The detailed physical characteristics of the waterway will be provided in EA (e.g., Physical Oceanography).

5.5.5. Fish and Fish Habitat

The Project Area is to the east of the NE Newfoundland shelf and slope and north of the Flemish Cap, regions known to support large and diverse commercial fisheries. Most of the Project Area is beyond the 1,000-m depth contour which is beyond the depth limit of most fisheries. In recent years, the most valuable commercial species in the vicinity of the Project Area are northern shrimp, snow crab, and turbot. Fish and fish habitat, and fisheries will be covered in detail in the EA.

5.6. Effects of the Environment on the Project

Effects of the physical environment on the Project include those caused by wind, ice, waves, and currents. A description of these components, including extreme events, will be contained in the EA. The Operators will develop an Ice Management Plan to be submitted under separate cover to the C-NOPB.

Effects of the biological environment on the Project are primarily those related to biofouling. Biofouling may affect rig stability and corrosion and may also affect the interior of pipes as well as water intakes and outlets.

5.7. Environmental Monitoring

An onsite Environmental Observer will be onboard the Drilling Units to record and report 24-hour weather, oceanographic and ice parameters. During potential ice-infested water periods, additional Environmental/Ice Observers may be stationed on the Drilling Units as deemed necessary by the OIM to assist the Drilling Operations personnel in strategic and tactical planning along with the recording and reporting the weather and oceanographic duties. As part of these duties these personnel will also assist in vessel monitoring under the Project Collision Avoidance Procedures outlined in the Alert and Emergency Response Plan.

Environmental Observers will also conduct seabird and marine mammal observations on a daily basis in accordance with established protocols. The data compiled from these observations will be provided to the C-NOPB, the Canadian Wildlife Service, and Fisheries and Oceans Marine Mammals Section.

In addition, an Oceanographic Monitoring Program will be conducted in accordance with the NEB et al. (2004) “Guidelines Respecting Physical Environment Programs during Petroleum Drilling and Production Activities on Frontier Lands.”

5.8. Effects of the Project on the Environment

The predicted effects of the Project on the environment will be detailed and discussed in the EA. The scope of the EA, the issues and factors to be considered, the spatial and temporal boundaries, and the determination of significance are contained in the Scoping Document which is to be prepared by the C-NOPB

5.9. Information on Consultations

For the Orphan Basin program, the following organizations, as a minimum, will be consulted during the preparation of the environmental assessment:

- Natural History Society
- Environment Canada
- Fisheries and Oceans
- One Ocean
- FPI
- Fish, Food and Allied Workers (FFAW)

In addition, the public will have three opportunities for comment during a comprehensive study process: (1) scoping, (2) draft EA, and (3) the Comprehensive Study Report (administered by the Agency).

6.0 References Cited

Husky. 2000. White Rose Comprehensive Study – Part One (Environmental Impact Statement).

LGL 2003. Orphan Basin strategic environmental assessment. LGL Limited Report No. 767. Prepared for the Canada-Newfoundland Offshore Petroleum Board, St. John's, NL. 229 p.

NEB, C-NOPB and C-NSOPB. 1999. Guidelines respecting the selection of chemicals intended to be used in conjunction with offshore drilling and production activities on frontier lands. Prepared by National Energy Board, Canada – Newfoundland Offshore Petroleum Board and the Canada – Nova Scotia Offshore Petroleum Board. 16 p.

NEB, C-NOPB and C-NSOPB. 2002. Offshore waste treatment guidelines. Prepared by National Energy Board, Canada – Newfoundland Offshore Petroleum Board and the Canada – Nova Scotia Offshore Petroleum Board. 11 p + App.

NEB, C-NOPB and C-NSOPB. 2004. Guidelines respecting physical environment programs during petroleum drilling and production activities on frontier lands. Prepared by National Energy Board, Canada – Newfoundland Offshore Petroleum Board and the Canada – Nova Scotia Offshore Petroleum Board. 28 p.