



**Garden Hill Seismic Exploration Program  
on the Port au Port Peninsula**

**2D Seismic Survey**

**Environmental Protection Plan**

PAP/0003  
PR/024  
Rev. 4

**Submitted by**

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## Report Approval Cover Sheet

<b>Report Title:</b>	<b>Environmental Protection Plan</b>
<b>Project Name:</b>	Port au Port Project
<b>Client:</b>	n/a
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Rev. 1	August 3 <sup>rd</sup> , 2007	A. Pegram		V.P. Mercer
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Rev. 3	August 18 <sup>th</sup> , 2007	V.P. Mercer	A. Pegram	K. Boone
Rev. 4	August 22 <sup>nd</sup> , 2007	K. Boone	A. Pegram	V.P. Mercer

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## Report Record of Revision

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Rev 0	August 1 <sup>st</sup> 2007	Original
Rev. 1	August 3 <sup>rd</sup> , 2007	Updated to reflect comments received from government agencies consulted.
Rev. 2	August 14 <sup>th</sup> , 2007	Updated to reflect comments received from Department of Environment and Conservation
Rev. 3	August 18, 2007	Updated to reflect additional comments received from the Department of Environment and Conservation
Rev. 4	August 22 <sup>nd</sup> , 2007	Updated to reflect further comments received from the Department of Environment and Conservation

## Summary

This Environmental Protection Plan (EPP) has been prepared for the land based 2D seismic activities that are planned for the Garden Hill North (GHN) area on the Port au Port peninsula. The purpose of this EPP is to ensure that environmental impacts from seismic project activities are minimized by providing guidance on potential environmental interaction along with control and mitigation measures and procedures, company environmental policies, and permitting requirements. The EPP has been developed in line with PDIP's environmental philosophy of minimizing impacts on the natural environment wherever possible, and holding resource conservation in high regard.

Activities associated with development of the project include line layout, obtaining permits and permissions, line cutting, chaining, shot hole drilling, GPS surveying, seismic shooting, and flying the line and remediation activities. For each of these activities appropriate environmental protection measures are in place and will be followed to minimize the impact of project activities on the environment.

As per legislation and regulations, all required permits, approvals, and authorizations will be obtained and in place before project activities commence.

PDIP are environmentally responsible corporate citizens and hold personal safety, resource conservation, and protection of the environment in high regard. PDIP endeavour to undertake operations in a manner that minimizes interaction with the surrounding natural environment. Their facilities, equipment, and operating practices meet or exceed all applicable regulations and codes, and conform to good oilfield practice, and all contractors are required to adhere to the same principles. As such PDIP take every effort to carry out operations in a safe and efficient manner.

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**APPENDIX A: Rare Plant Survey Report**

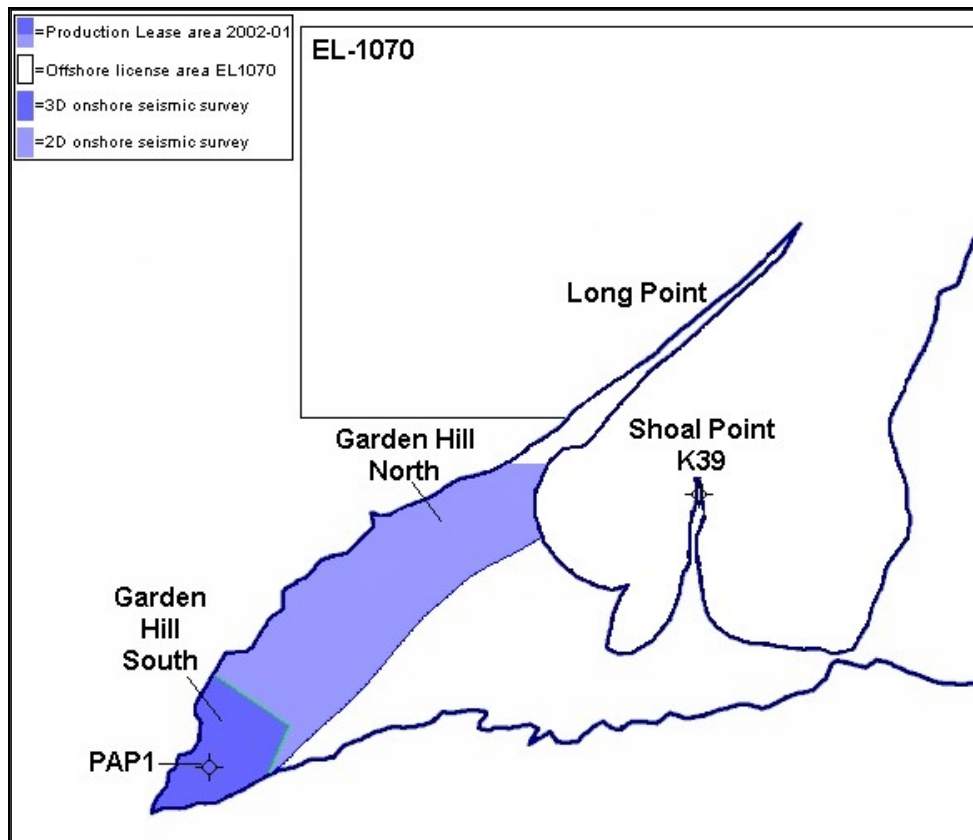
## 1. Introduction

This Environmental Protection Plan (EPP) has been prepared for the land based 2D seismic activities that are planned for the Garden Hill North (GHN) area on the Port au Port peninsula. The purpose of this EPP is to ensure that environmental impacts from seismic project activities are minimized by providing guidance on potential environmental interaction along with control and mitigation measures and procedures, company environmental policies, and permitting requirements. This EPP is intended to be a flexible document that allows personnel working on the project to respond appropriately to unanticipated changing conditions as the project proceeds.

The EPP has been developed in line with PDIP's environmental philosophy of minimizing impacts on the natural environment wherever possible, and holding resource conservation in high regard.

### 1.1 Project Scope

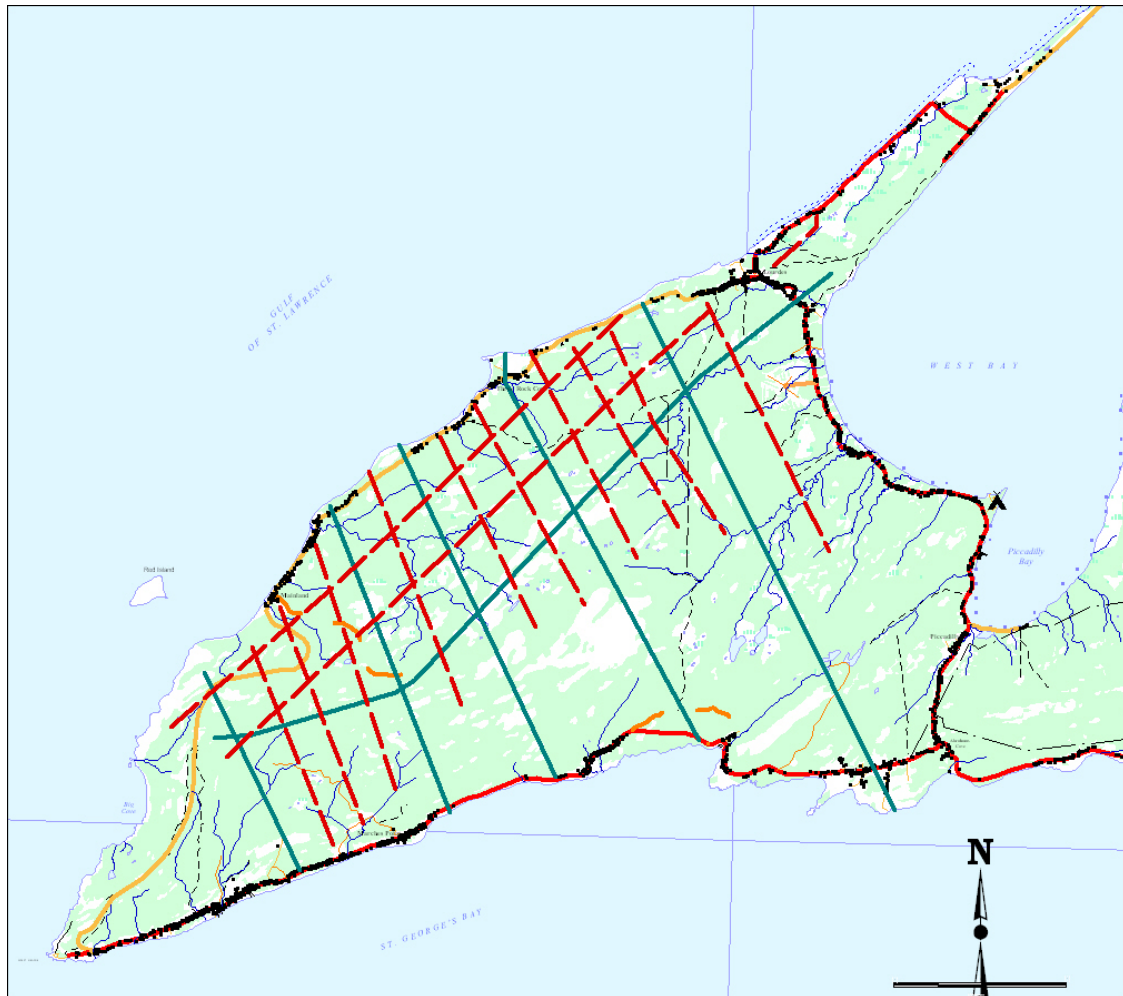
PDIP is investigating how best to develop the prospect located at Garden Hill North on the Port au Port peninsula (area shown in Figure 1-1). Existing seismic data in this area shows two different leads that indicate potential for hydrocarbon resources. However, the existing data is insufficient to show closure of the structures or to identify high quality drilling locations. Therefore, PDIP intends to undertake an onshore 2D seismic survey in this area to confirm the closure and to identify appropriate drilling locations.



**Figure 1-1: Port au Port Lease Area and Proposed Seismic Survey Areas**

In this area, it is proposed to acquire twelve onshore seismic lines totalling approximately 115 km (as shown in red in Figure 1-2).

To undertake the survey, geophone cables will be laid across the area at intervals of approximately 200 m. The source points will be located at approximately 100 m intervals along the seismic line. It is planned to use dynamite charges spaced at approximately 100 m intervals loaded down shot holes. The depth of the shot holes and charge size will be finalized when the depth of the base of weathering and penetration efficiency is established, however it is likely that the depth of the holes will be approximately 8 m and the charge size will be about 2 kg.



**Figure 1-2:** Proposed 2D Seismic Lines for Garden Hill North

## 1.2 Document Outline

This document provides specific guidance on environmental protection measures to be implemented at each stage of the work associated with PDIP's proposed seismic project. In addition, by outlining PDIP's approach to environmental protection, it provides general guidance to allow personnel to respond appropriately to address unexpected events that may occur with the potential to impact the environment.



The remainder of this section includes information on the responsibilities, with regard to environmental protection, of key personnel involved in the project, as well as a more detailed description of the activities involved and applicable legislation.

Section 2 presents information on environmental protection procedures to be employed by PDIP and all contractors, in order to ensure that negative impacts on the environment as a result of the project are minimised, whilst Sections 3 and 4 include details on environmental inspection, environmental monitoring and the environmental auditing program to be implemented.

The permits, approvals and authorizations required for the project are listed in Section 5 and Section 6 summarises the contingency plans that PDIP have in place to ensure an appropriate response to environmental emergencies and other credible unplanned events. Finally, Section 7 includes contact details for key personnel associated with the project.

This document is intended to provide practical advice to allow all personnel associated with the seismic project to respond appropriately to both expected and unexpected events with the potential to negatively impact the environment. Therefore, in order to ensure that it provides the best and most relevant guidance possible, PDIP intend to seek feedback from contractors and company personnel involved in the project and update the EPP to reflect that feedback, as and when required.

### 1.3 Responsibilities

PDIP are environmentally responsible corporate citizens and hold personal safety, resource conservation, and protection of the environment in high regard. PDIP endeavour to undertake operations in a manner that minimizes interaction with the surrounding natural environment. Their facilities, equipment, and operating practices meet or exceed all applicable regulations and codes, and conform to good oilfield practice, and all contractors are required to adhere to the same principles.

In particular, this document will be provided to all workers, employees, and contractors involved in PDIP's seismic activities, and they will be required to adhere to all of its requirements. Copies of relevant permits will also be provided to the project team as well as relevant contact information.

Responsibilities of key personnel are outlined in the following table (Table 1-1).

Responsible Person	Responsibilities
PDIP General Manager	<ul style="list-style-type: none"> <li>• Ensure contractors are issued with this document and formally state that they will comply with its provisions for protecting the environment</li> <li>• Ensure that PDIP environmental audits are carried out in accordance with Section 4.2 of this document.</li> <li>• Monitor all environmental incident and inspection reports.</li> </ul>
Seismic Contractor's General Manager	<ul style="list-style-type: none"> <li>• Ensure all necessary equipment and provisions for protecting the environment are in place before work commences.</li> <li>• Ensure the on site supervisor fully understands the provisions of the document and measures necessary to protect the environment.</li> </ul>
Seismic contractors on site project manager or supervisor.	<ul style="list-style-type: none"> <li>• Ensure that all personnel arriving on site receive a site environmental induction in accordance with this document.</li> <li>• Ensure that all persons under his control comply with the provisions of this document and undertake all necessary measures to protect the environment.</li> <li>• Carry out environmental inspections in accordance with Section 3 of this document.</li> </ul>
Environmental Monitor	<ul style="list-style-type: none"> <li>• Ensure an appropriate level of environmental monitoring is in place to minimize impact on the environment.</li> </ul>
All personnel working or visiting the site.	<ul style="list-style-type: none"> <li>• Comply with all directions and instructions regarding protection of the environment and the provisions of this document.</li> </ul>

**Table 1-1:** Responsibilities of Key Project Personnel

Personnel arriving on site for the first time will undergo a job- and location-specific environmental protection induction. This will be given by the on site supervisor and will re-iterate the provisions and requirements of this document. A checklist will be used as the basis for the induction in order to ensure consistency and provide a record of issues covered in the induction. Records will be kept for all personnel undergoing the induction.

## 1.4 Project Description

### 1.4.1 Nature of the Undertaking

Activities associated with development of the project include:

1. Line layout
2. Obtaining permits and permissions
3. Line cutting
4. Chaining
5. Shot hole drilling
6. GPS surveying
7. Seismic shoot

## 8. Fly line and remediation

Each of these activities is discussed briefly below.

### 1. Line Layout

The locations of the seismic lines have been laid out by technical consultants. The twelve seismic lines are approximately 1 km apart; ten lines with NW-SE orientation and two lines with NE-SW orientation. This data is used during operations to accurately position the lines for the seismic survey.

Environmental concerns to be considered when designing the line layout include the locations of streams, protected public water supply areas, water supply intakes, environmental buffer zones, rare plants, and nesting birds in the area.

### 2. Obtaining Permits and Permissions

Each of the 39 projected stream crossings will be described from air photos and topographic map enlargements for permitting purposes. Special attention will be paid to streams within local protected water supply areas (PWSAs).

### 3. Line Cutting

In order to effectively carry out seismic operations, it must be possible to lay geophones and seismic cables directly on the ground. Where required, a passage must be cut to the ground in order to satisfy this requirement and to allow workers to safely carry out seismic operations.

Where possible, cutters hired will be local crews who will use chain saws to cut lines using UTM coordinate headings, eliminating the need to flag out the lines in advance. Wood resulting from the cutting must be handled according to the requirements of the Newfoundland Department of Natural Resources, Forestry Branch and therefore will be stacked vertically in piles not less than 100m apart so that it may be recovered by local users as part of their domestic cutting allotment.

When cutting the lines, cutters must give special consideration to minimizing the impact on the environment. These considerations include minimizing the width of the cut lines, minimizing interaction with sensitive spawning areas and rare plant habitat and minimizing travel along cut lines.

### 4. Chaining

After line cutting is completed, one or two chaining crews of two persons each will enter the area to 'chain' the lines for the drilling and recording crews. This process involves measuring out the lines at 25 metre intervals, marking a ground location, or picket, with flagging or stakes and a location number. The pickets indicate where the recording equipment will be placed and where the holes will be drilled for the dynamite.

Environmental concerns to be considered during chaining are the disturbance of stream beds by machinery transit, disturbance of wildlife and nesting birds, and travel along cut lines.

### 5. Shot Hole Drilling

A specialized seismic rig will be secured to drill the previously marked shot holes at 100 metre intervals and 8 meters deep. The shot holes will be loaded with 2 kg of dynamite required for the survey. The holes will be backfilled with gravel, to ensure that all energy is directed downward.

The drills will travel each line only twice; once on the way in, once on the way out again. All-terrain vehicles (ATVs) or snowmobiles will be used for access during the course of drilling.

During shot hole drilling, damage to existing structures such as waterwells, driveways, survey monuments or buried service lines is an environmental concern for the project and should be taken into consideration. Damage to the grounds by the seismic drill rig is also a concern during this phase of the seismic program.

#### 6. GPS Survey

Following the drilling, a survey crew will survey the shot holes to obtain precise positions and elevations. This will be done with a differential GPS instrument, by one surveyor and a local assistant. This information is critical to the processing of the data and later in determining the position of underground structures.

#### 7. Seismic Shoot

Once the shot holes have been drilled and the GPS survey has been completed, a seismic contractor and line crew will come in to do the actual seismic survey. One line is "shot" at a time. A small "doghouse" or CRU (central recording unit) is placed on the line by helicopter (unless road access is possible). Seismic crews will lay out a cable along the line, place a geophone at each previously marked 25 metre interval, and connect it to the cable. A licensed blaster, or "shooter", usually travelling on an ATV, will arm one shot at a time and inform the technician in the doghouse, who will then set off the shot electronically. Recording of the returning echoes takes place for approximately 6 seconds. The shooter then travels to the next shot hole to arm it and carry out the procedure again. In the meantime, the crew (of approximately 20) are laying out other lines with cables and geophones, to prepare for the remaining parts of the survey.

Environmental concerns during the seismic shoot include the dynamite detonating prematurely as well as damage to the grounds by traffic along the seismic lines.

#### 8. Fly Lines and Remediation

When all the work is complete, an aircraft will be used to fly over the lines to assess any damage that may have occurred so that appropriate remediation measures can be undertaken.

#### 1.4.2 Proposed Schedule of Activities

The following table (Table 1-2) shows a schedule for obtaining approvals and permits for the seismic work described in this document.

<b>2007 Approvals and Permits Schedule</b>						
	A	M	J	J	A	S
<b>Approvals and Permits</b>						
ER* Preparation Work						
ER Submission			▼			
DOEC ER Review						
ER Approval					▼	
Geophysical Program Application						
Geophysical Program Approval					▼	
Stream Crossing and Cutting Permits						

\* ER - Environmental Registration document

**Table 1-2: 2007 Approvals and Permits Schedule**

Table 1-3 shows a schedule for the planned project phases for the 2D seismic activities.

	<b>2007</b>			<b>2008</b>			
	A	S		J	F	M	A
Line Cutting							
Chaining			B				
			R				
Shothole Drilling & Loading			E				
			A				
GPS Survey			K				
Seismic Acquisition							
Fly Lines							

**Table 1-3: 2D Seismic Planned Project Phases Tentative Schedule**

When all permits and permissions are in place, cutting the survey lines will commence. It is anticipated that cutting activities will start on **August 6, 2007**.

Chaining and shot hole drilling is planned to be undertaken during winter to help alleviate impacts on the streams in the area. Chaining will take place two weeks before shot hole drilling. It is estimated that shot hole drilling will take approximately three weeks to complete and the GPS survey will take approximately 1 month to complete.

After this time, the seismic acquisition can begin. It is anticipated that the acquisition will continue for about two weeks. When the survey is complete, the lines will be flown to assess any damage that may have occurred. Any damage discovered will then undergo remediation.

Following the survey, the seismic data acquired will be interpreted. It is estimated that this interpretation will take approximately three months.

### 1.5 Legislation

Approvals are required for various seismic activities from agencies of both the provincial and federal governments. The legislation, regulations, and acts governing the required approvals are listed in Table 1-4 below.

<b>LEGISLATION AND APPROVALS</b>		
<b>Applicable Legislation</b>	<b>Relevant Activity</b>	<b>Responsible Agency</b>
<b>Provincial</b>		
<i>Environmental Protection Act, Environmental Assessment Regulations</i>	Proceed to Permitting	DOEC
<i>Petroleum and Natural Gas Act, Petroleum Regulations</i>	Exploration Survey	DNR
<i>Water Resources Act</i>	Stream Fording Stream Crossings Activities within Protected Water Supply Areas	DOEC
<i>Forestry Act and Cutting of Timber Regulations</i>	Seismic line cutting	DNR
<b>Federal</b>		
<i>Fisheries Act</i>	Stream Fording	DFO
<i>Explosives Act and Explosives Regulations</i>	Blasting Materials Storage Blasting Materials Transportation	DNR

**Table 1-4: Applicable Legislation for Seismic Activities**

In addition, there are a number of other acts and regulations governing aspects of the proposed seismic activities, which have been set forth by the provincial and federal governments. Other relevant legislation, regulations, and acts include:

- Storage and Handling of Gasoline and Associated Products Regulations under the Environmental Protection Act
- Occupational Health and Safety Act
- Motorized Snow Vehicles and All-Terrain Vehicles Act
- Air Pollution Control Regulations under the Environmental Protection Act
- Used Oil Control Regulations under the Environmental Protection Act
- Migratory Birds Convention Act

## 2. Environmental Protection Procedures

Environmental protection procedures will be employed throughout the duration of the project. The following subsections describe the environmental protection measures that will be in place during each of the project phases.

### 2.1 Line Layout

In designing the placement of the survey lines, special consideration will be given to minimizing impact on the environment, whilst still achieving the goals of the seismic program. The layout of the seismic lines will be designed, for example, to minimize the number of stream crossings and to minimize interactions with sensitive areas (e.g., wildlife areas, PWSAs, areas of importance to natural history etc.). The seismic contractor will specifically review survey designs while in draft to identify and minimise any potential negative impact on the environment. Where necessary, they will seek guidance from an environmental professional to identify technologies or activities to minimise environmental damage.

### 2.2 Line Cutting

To minimize impact on the environment, the width of the lines to be cut will be minimized. Therefore, a line width of 2.5 metres will be cut, which is considered sufficient to allow the safe passage of equipment and undertaking of operations. Lines will be cut close to the ground, but ground cover will not be removed in order to prevent erosion.

Cutting times have been scheduled to take into account the local environment and population, and avoid for example sensitive times for wildlife, fish spawning, nesting birds, hunting and recreational use. During the cutting of the survey lines, crews will respect raptor nest sites (leaving large nest trees where necessary) and ensure that no raptor nest is disturbed. In addition, crews will take care not to disturb any nesting bird. Crews will also avoid contact with wildlife.

Stream crossing sites, particularly within PWSAs, will be chosen to minimise interaction with sensitive spawning areas and to minimize sedimentation resulting from soft river banks. For this reason, where possible, ground conditions at each stream crossing will be described by the project managers and provided to cutting crews prior to the commencement of work. Where conditions are such that environmental damage may occur as a result of the cutting operation, the project manager will ensure that any damage is kept to an absolute minimum by implementing whatever additional measures are required, including those detailed below.

Where necessary, the lines will be offset so that the actual crossing for equipment is at a more suitable location, creating a "dog leg" in the cut line for the movement of equipment and personnel. In these cases, it may be necessary to cut a much smaller width line for the passage of the seismic cable only, as the seismic cable must be laid in a straight line.

Should cutting crews encounter wet areas during the undertaking of the work, including intermittent streams, care will be taken to avoid the area as much as possible. Traffic will be minimised in these areas, and the locations will be flagged so that care can be taken to avoid the areas during subsequent work stages.

If ATVs are used to access more remote sections in the survey area, crews will be advised to use local ATV woods trails rather than travelling along the cut lines, where possible. In all cases,

travel along the survey lines will be minimized, especially over areas of soft ground. This will be achieved by daily planning of the work by the project managers.

Activities in PWSAs and impact on rare plants/rare plant habitats have been identified as particular areas of concern, both during line cutting and during later project stages. These issues are therefore discussed in more detail in the following subsections.

#### 2.2.1 Rare Plants and Rare Plant Habitat

Rare plants have been identified on the Port au Port Peninsula (see Figure 2-1) and these are mainly located on limestone barrens. However, not all of the limestone barrens in the Port au Port area have been surveyed for rare plants, and it is therefore recognised that there may be other areas where rare plants and rare plant habitat is found. Figure 2-1 shows the geology of the area, with areas of rock and soil barrens identified from Department of Forestry data overlaid, in order to identify barren areas on limestone. Figure 2-1 also presents the location of the proposed 2D seismic lines, indicated in red.

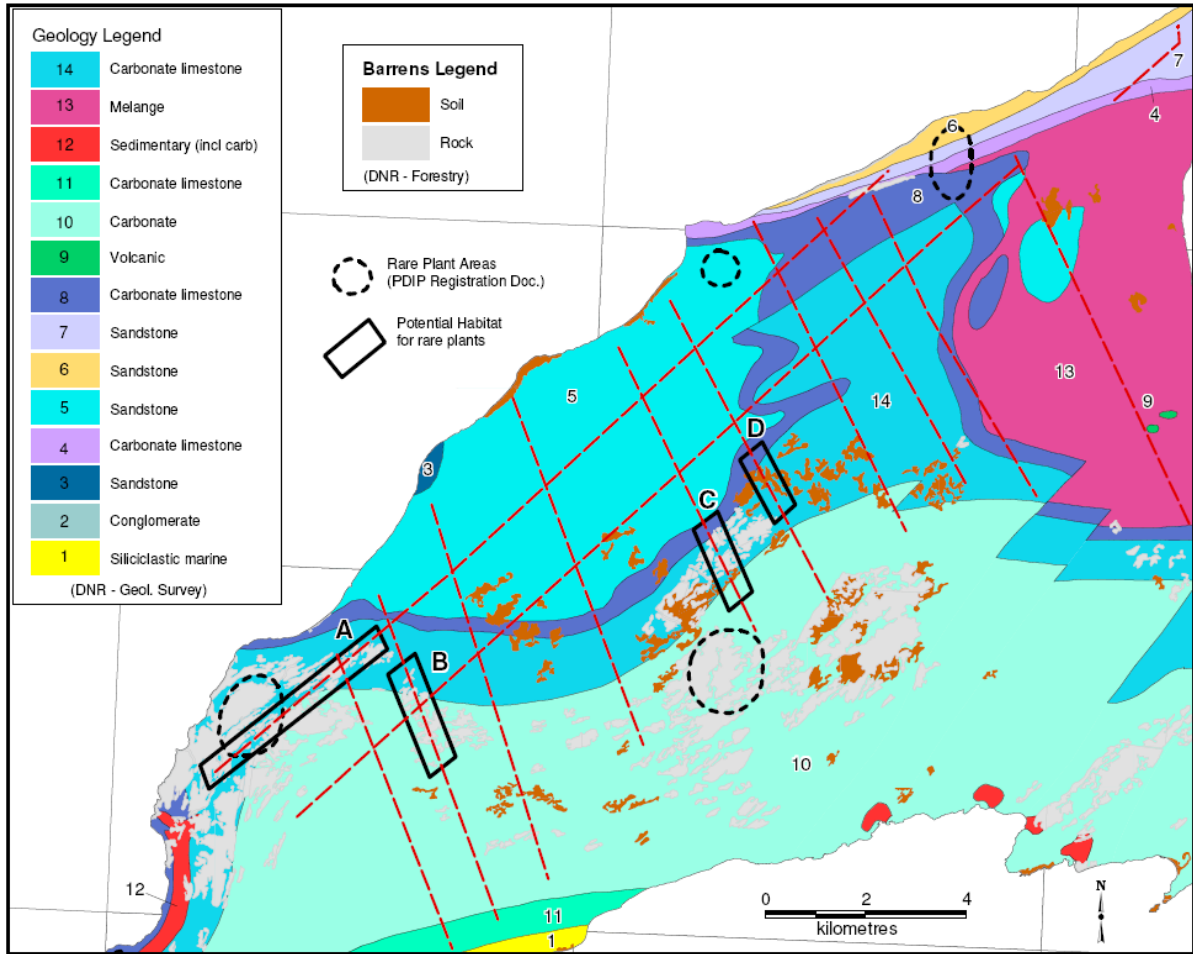
PDIP will ensure that all reasonable measures are taken to avoid damage to or destruction of rare plants and habitat. Movement of traffic over areas identified where rare plants exist or where potential rare plant habitat exists will be minimised by avoiding the area completely wherever possible, by traversing the area, if necessary, by foot rather than vehicle if possible and by ensuring in all cases that the number of vehicle crossings and the speed of vehicles is kept to a minimum.

Through discussions with the Department of Environment and Conservation's Wildlife Division, four specific areas have been identified where seismic activities have the potential for interaction with rare plant or rare plant habitat. These areas are identified by letters A through D in Figure 2-1.

PDIP have visited the areas of concern with a botanist from the Wildlife Division of the Department of Environment and Conservation to undertake a rare plant survey aimed at identifying rare plants occurring in these areas that have the potential to be affected by the proposed activities. The botanist has significant field experience in the Province of Newfoundland and a good understanding of plants that are considered rare. PDIP and their consultants under the guidance of the botanist developed appropriate mitigation measures on site to prevent negative interaction with the plants identified.

If, for any reason, traffic associated with the survey needs to utilise areas of limestone barrens not previously considered, these areas will also be surveyed in advance by an appropriately qualified individual, in order to ensure that appropriate mitigation measures can be implemented.





**Figure 2-1: Map Depicting Barren Areas over Limestone Geology with 2D Seismic Lines**

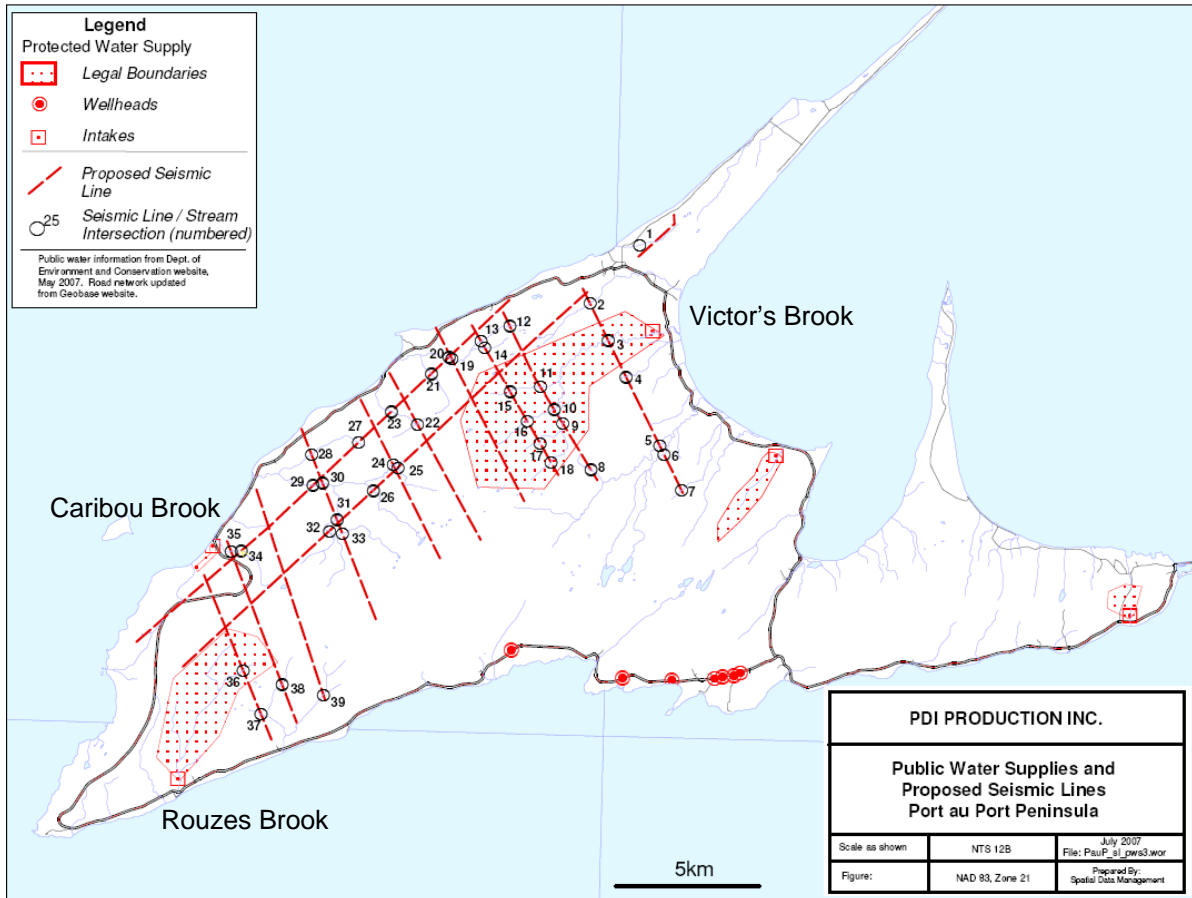
### 2.2.2 Water Supply Areas

PDIP's planned 2D seismic activities in the Garden Hill North area cross a number of PWSAs as shown in Figure 2-2. PDIP have consulted with the Department of Environment and Conservation's Water Resources Management Division on appropriate measures to be taken in order to minimize impact on these areas and will ensure that particular care is taken to minimize movement along cut lines in sensitive areas.

Three PWSAs are within the proposed study area and are as follows:

- Victor's Brook – Town of Lourdes
- Rouzes Brook – Town of Cape St. George
- Caribou Brook – Town of Mainland

There are no ponds in the PWSAs.



**Figure 2-2: Map Depicting Seismic Lines, PWSAs and Stream Crossings**

The Water Resources Management Division identified Stream Crossing #3 as an area of particular concern due to its proximity to a local water intake. To ensure that the water intake remains unaffected, PDIP will put in a temporary bridge during cutting activities, and ensure that this bridge is left at the site for the duration of the project. If ice break-up in the spring poses a threat to the bridge, it will be temporarily removed but restored as soon as possible and prior to the seismic acquisition activities.

The Water Resources Management Division also identified the section of line between Stream Crossings #9 and #10 as an area of concern, as at this point the line runs parallel to a stream, with parts of the line within the buffer zone. PDIP have adjusted the line in question to ensure that cutting and drilling activities are undertaken a minimum separation distance of 15 meters from the stream to ensure that there is no damage.

### 2.3 Chaining

During chaining, temporary bridges will be built using locally available materials from site at stream crossings where needed to ensure that stream beds will not be disturbed by machinery transit during shot hole drilling. Bridging activities are scheduled for winter months in order to take advantage of ice conditions at streams and prevent siltation within the stream (streams will be frozen).

Temporary bridges will be constructed on the land, and rest on each side of the shore to avoid contact and activities occurring within the water. When the seismic shoot has been completed, any temporary bridges will be removed from site.

In addition, care will be taken by chaining crews to avoid the disturbance of wildlife and nesting birds. As with line cutting, travel along lines using motorized equipment will be minimized and all personnel will be informed as to wildlife protection measures before work commences.

Particular measures to minimise the impact of activities in water supply areas and to protect rare plants and rare plant habitat will also be taken where appropriate, as discussed in Sections 2.2.1 and 2.2.2.

#### **2.4 Shot Hole Drilling**

A setback distance for the shot holes of 180 meters from any structure, waterwell, driveway, survey monument or buried service line of any kind will be implemented to ensure there is no damage to existing structures during shooting. The minimum required buffer zones indicated by the Water Resources Management Division will be respected from any water body within protected public water supply areas and no shot holes will be drilled within the required buffer zones.

Shot hole drill rigs known as "enviro-drills" (small rigs mounted on rubber tracked carriers) will be utilized for shot hole drilling as they are designed to exert low ground pressure so that they generate minimum damage to the surface and only leave a very light footprint. In addition, the movement of drill rigs for shot hole drilling will be minimized by prior planning to help prevent ground damage and, in particular over limestone barrens, to avoid destruction of rare plant habitat.

Shot holes will be drilled to a depth of 8 m. Shot holes will be loaded with dynamite by an individual holding a valid blasting certificate. When the shot holes are loaded, they will be backfilled using pea gravel to ensure the energy is directed downward during the seismic shoot and to prevent hole blow outs. Shot holes that are located in PWSAs will be backfilled with at least 1 m of bentonite.

Other measures to minimise the impact of activities in water supply areas and to protect rare plants and rare plant habitat will also be taken where appropriate, as discussed in Sections 2.2.1 and 2.2.2.

#### **2.5 GPS Survey**

There are no additional significant environmental concerns associated with carrying out the GPS survey.

As in other phases of the project, if ATVs are used crews will be advised to use local ATV woods trails rather than travelling along the cut lines, where possible, and in all cases travel along the survey lines will be minimized.

## **2.6 Seismic Shoot**

A particular type of dynamite charges called 'cut to fit' will be used wherever possible as they are safer and will not detonate unintentionally. There is no cap on the fuse line, so there is no way of prematurely triggering the shot. The material in this type of dynamite will begin to biodegrade after six months, so any misfires are rendered harmless. Dynamite charges will not be located within 22 m of a watercourse or within the prescribed buffer zones within a water supply area.

Should any hole be blown out during the firing, it will be backfilled at the site.

As with other components of the survey, travel along the cut survey lines, and in particular over limestone barrens, will be minimized by prior planning. Particular measures to minimise the impact of activities in water supply areas and to protect rare plants and rare plant habitat will also be taken where appropriate, as discussed in Sections 2.2.1 and 2.2.2.

## **2.7 Fly Lines and Remediation**

Once the survey is complete an aircraft will be used to fly over the lines to assess any damage. If any damaged areas are noted, a remediation plan will be developed and implemented. This plan will also account for any damage noted during the course of the work and results of inspections and audits. Remediation measures will be implemented as soon as possible and in accordance with timescales laid out in the remediation plan. Remediation may involve raking over and/or seeding any damaged areas. Other remediation measures will be considered and implemented on a case by case basis.

## **2.8 Waste**

Burning and burying of waste will not be permitted and waste will not be permitted to accumulate. All waste will be removed from site and disposed of in an appropriate manner.

The seismic contractor will provide adequate receptacles (including bags in vehicles) for all anticipated waste, which will be sealed and removed from site by a competent waste contractor at appropriate intervals. Any waste accumulated when working away from the main camp or site will be placed in appropriate bags and brought back to the main site for placing in the disposal receptacles. Industrial waste, including oils and greases, will be fully segregated and disposed of through authorised routes.

Where practicable, all waste will be segregated for disposal or recycling.

## **2.9 Other Mitigation Measures**

In addition, a number of general principles and measures will be implemented to minimise the environmental impact of activities associated with the GHN seismic activities:

- PDIP will conduct the seismic survey operations as per the Department of Natural Resources Draft Newfoundland and Labrador Exploration Survey Regulations.
- Vehicular travel should avoid sensitive areas such as wetlands and bogs.
- Vehicles and/or ATVs should avoid wildlife wherever possible and yield to wildlife in any encounter that does occur.
- No hunting, feeding or harassment of wildlife will be permitted.

- Good communication practices will be utilized for all field work to ensure safety to personnel and the environment during operations.
- PDIP have developed a Cultural Sensitivity Awareness training program for the workers involved in this project, which will inform them of the heritage and culture of the Ktaqamkuk people who live in the area.

All the above measures will be discussed in site inductions or in daily work planning. The effectiveness of plans will be reviewed during environmental audits.

### 3. Environmental Inspection

Environmental inspection will be the responsibility of the designated environmental monitor as described in Section 4. Inspections of the site will be required in order to ensure that areas of potential concern are identified and associated mitigation measures are being implemented effectively. A specific environmental inspection checklist will be used as an aide memoir and to provide a record for audit purposes. Any issues identified during the inspection process will also be fed back to site personnel to ensure not only that any deficiencies are rectified as soon as possible but also that they do not recur. Any unforeseen or unusual circumstances, impacts, or concerns will be promptly reported to PDIP management, to ensure that they are appropriately addressed, accounted for in the remediation plan, if necessary, and reported to appropriate authorities.

### 4. Environmental Monitoring and Audit Programs

#### 4.1 Environmental Monitoring

The described project activities will be undertaken by small groups of people. The estimated number of people for each of the main field activities is indicated in Table 4-1.

<b>Activity</b>	<b>People</b>
Cutting	10-12 (cutting team of 8-10, plus geophysicist, cutting foreman, environmental monitor).
Chaining	2-3 people
Drilling	10 people (2 per drill x 3 drills, plus a foreman, and some miscellaneous individuals (monitoring, backfilling holes etc.).
Seismic shoot	20 people (4-10 people in the front end, and 4-10 in the back end) plus some miscellaneous individuals (PDIP & GeoScott representatives etc.).

**Table 4-1:** Estimated Numbers of Individuals Present for Activities.

PDIP will designate a responsible and qualified person to be in charge of monitoring compliance with the EPP. As a minimum, this person will have a background in an environmental field of study (for example, biology, ecology, or environmental science) and experience working in the field, making field decisions to ensure the protection of the environment.

Potential risk to rare plants and/or rare plant habitats was identified as a particular issue to be monitored in order to minimise the impact of the proposed activities. PDIP therefore identified areas of concern that have the potential to contain rare plants and have visited the site with a

botanist to identify these plants. Appropriate mitigation measures, including the flagging of relevant areas and restriction of traffic, have been developed under the guidance of the botanist and these will be implemented during the various project activities (see Appendix A). Compliance with these measures will be monitored as part of the environmental monitoring process.. PDIP will therefore also ensure that the person in charge of environmental monitoring has appropriate experience and/or educational background to allow them to identify rare plants.

In all cases, any unforeseen or unusual circumstances, damage, impacts, non-compliance with the EPP or concerns must be promptly reported to the PDIP head office, so that they can be appropriately addressed and accounted for in the remediation plan, if necessary.

PDIP head office will also be responsible for reporting specific incidents of environmental concern to the appropriate regulatory bodies where required.

#### **4.2 Environmental Auditing**

Environmental audits will be conducted at appropriate intervals during the proposed work. The first will take place within 2 to 4 weeks of commencement of operations. The audits will be carried out by appropriate competent personnel in accordance with international protocols and appropriate standards (such as ISO 18001 or EMAS). Each audit will assess the effectiveness of the compliance procedures and success of the environmental protection procedures that have been implemented.

The audit team will produce an audit report that will note any environmental damage and potential risks, as well as any identified non-conformances with the requirements of this document. Recommendations for improvement will also be made where appropriate. Audit reports will be reviewed by the management of both the contractors and PDIP, who will be responsible for agreeing on any remedial actions to be undertaken.

### **5. Permits, Approvals, and Authorizations**

Permits, approvals, and authorizations that are relevant or may be relevant to PDIP's seismic activities in Newfoundland and Labrador are listed in Table 5-1. Copies of all relevant permits will be made available as an attachment to this document as they are available.

PDIP are responsible for obtaining the Authorization to Proceed to Permitting and the Exploration Licence. All other permits, approvals, and authorizations will be obtained by GeoScott Exploration Consultants Inc. (GeoScott), whom PDIP have contracted to undertake the design and management of the seismic survey.

<b>PERMITS, APPROVALS, AND AUTHORIZATIONS</b>	
<b>Permit, Approval, Authorization Required</b>	<b>Relevant Activity</b>
<b>Provincial</b>	
Authorization to Proceed to Permitting (environmental assessment release)	Proceed to Permitting
Exploration Licence	Onshore Seismic Exploration
Stream Fording Permit	Stream Fording
Small Bridges	Stream Crossings
Commercial Cutting Permit	Seismic line cutting
Blasters Safety Certificate	Blasting
Development Activity In A Protected Public Water Supply Area	Activities within Protected Water Supply Areas
<b>Federal</b>	
“Request for Project Review” Application	Stream Fording
License for a Temporary Magazine	Blasting Materials Storage
Permit to Transport Explosives	Blasting Materials Transportation

**Table 5-1:** Potential Permits, Approvals, and Authorizations for GHN Seismic Activities

## 6. Contingency Plans

It is PDIP’s aim to provide operating services for the development of hydrocarbon assets, working to the highest design, safety and environmental standards and investing in local people to deliver returns. As such PDIP take every effort to carry out operations in a safe and efficient manner. PDIP recognise, however, that unplanned events can still occur and therefore also have contingency plans to ensure that the response to such events is appropriate and minimises their impact on personnel and the environment.

This section summarises PDIP’s environmental policy, as well as contingency plans in place to respond to credible events that may occur during the proposed seismic activities.

### 6.1 Environmental Statement

PDIP are environmentally responsible corporate citizens and hold personal safety, resource conservation, and protection of the environment in high regard. PDIP endeavour to undertake operations in a manner that minimizes interaction with the surrounding natural environment. Their facilities, equipment, and operating practices meet or exceed all applicable regulations and codes, and conform to good oilfield practice, and all contractors are required to adhere to the same principles.

PDIP make every effort to minimize waste produced and always ensure that any waste produced while carrying out activities is disposed of in accordance with relevant regulations. PDIP aim to reuse and recycle wherever possible and ensure that domestic waste generated during activities is stored and removed by an appropriate waste management contractor. Hazardous wastes are



removed from project areas using appropriate waste management contractors and are treated and disposed of in accordance with relevant regulations

## **6.2 Contingency Plan for Forest Fires**

As personnel will be interacting with area forests to carry out the seismic activities, preventative measures will be taken to help ensure a forest fire does not occur. All flammable waste will be removed from site on a daily basis and disposed of in an appropriate manner. In addition, any items that are flammable will be treated with care and will be stored appropriately during all seismic activities. Personnel involved in line cutting will be equipped with appropriate fire suppression equipment as per the conditions of the commercial cutting permit issued by the Department of Natural Resources.

If a fire occurs, the designated site supervisor will be responsible for informing all personnel working on site of the occurrence. He will also take immediate action to extinguish or limit the extent of the fire if and only if it is safe to do so. If the fire cannot be put out immediately, the site supervisor will report the fire to the local RCMP branch and to the Department of Natural Resources using the 24-hour emergency phone number and will indicate the name and telephone number of the person calling, the time of the fire, the approximate size of the fire, and the exact location of the fire. In this case, all personnel will leave the site and will not return until the site has been deemed safe to return to by either the RCMP or by personnel from the local fire department.

## **6.3 Contingency Plan for Wildlife Encounters**

As seismic work will be carried out in areas inhabited by wildlife, preventative measures will be taken to minimize the amount of negative encounters with local wildlife. Feeding wildlife will not be permitted during any seismic activities. Any food brought into site and not eaten will be carefully stored during the day and removed from site on a daily basis so as not to attract wildlife to the project area. All waste will be disposed of in an appropriate manner.

In the event that wild animals cross paths with site workers on ATVs or other vehicles, all site traffic will yield the right-of-way to any wildlife encountered. In addition, no hunting, feeding or harassment of wildlife will be permitted.

## **6.4 Contingency Plan for Accidental Spills**

It is PDIP's aim to achieve zero spills of hydrocarbon or other hazardous materials. In order to meet this objective, PDIP ensure that only qualified personnel operate equipment at site, by employing suitably qualified personnel and providing additional training whenever required. As well, to ensure the long life of equipment and infrastructure, regular maintenance and servicing are carried out to help reduce the risk of spills and leaks.

During the seismic activities, however, there is the potential for fuel to be released in the event of an accident involving one of the vehicles on site. If an accident occurs and gasoline or other pollutants are spilled, spill kits will be available to remediate the spill. In the event of an accident, the safety of personnel is, of course, of the highest priority. However, personnel will be advised to take appropriate actions to minimise the quantity of oil spilt and the potential for ignition, if possible, provided that it is safe to do so.



## 7. Contact List

The table below (Table 7-1) includes the names, positions, and contact information for key personnel associated with the project.

<b>Contact List</b>		
<b>Name</b>	<b>Address</b>	<b>Phone/Fax</b>
Mick Hibbert General Manager	PDI Production Inc. Suite 201, Baine Johnston Centre 10 Fort William Place St. John's, NL A1C 1K4	Phone: 709.754.8162 Fax: 709.754.8170
Vanessa Pennell Mercer Environmental and Planning Manager	PDI Production Inc. Suite 201, Baine Johnston Centre 10 Fort William Place St. John's, NL A1C 1K4	Phone: 709.754.8162 Fax: 709.754.8170
W.J. (Bill) Scott President	GeoScott Exploration Consultants Inc. Suite 100, 67 LeMarchant Road St. John's, NL A1C 2G9	Phone: 709.739.3355 Fax: 709.739.3354
Leona Stead Geologist	Petroleum Development Section Department of Natural Resources Natural Resources Building P.O. Box 8700 St. John's, NL A1B 4J6	Phone: 709.729.6877 Fax: 709.729.2508
Milt Crew Environmental Scientist	Environmental Assessment Division Department of Environment and Conservation 3 <sup>rd</sup> Floor, Noton Bldg 133 Riverside Dr PO Box 2006 Corner Brook NL A2H 6J8	Phone: 709.637.2375 Fax: 709.637.2541
Darrin Sooley Area Habitat Coordinator	Department of Fisheries and Oceans, Canada 1 Regent Square Corner Brook, NL A2A 7K6	Phone: 709.637.4860 Fax: 709.637.4445
Christine Doucette Senior Wildlife Biologist	Wildlife Division Department of Environment and Conservation PO Box 2007 117 Riverside Dr. Corner Brook, NL A2H 7S1	Phone: 709.637.2372 Fax: 709.637.2080
Paula Dawe Protected Water Supply Officer	Dept of Environment and Conservation Water Resources Management Division PO Box 2006 Corner Brook NL A2H 6J8	Phone: 709.637.2542 Fax: 709.637.4541

**Table 7-1: Contact List for Key Personnel Associated With the Project**

Relevant emergency contacts and numbers are included in Table 7-2 below.

<b>Contact List</b>	
24 hour forest fire emergency line	Phone: 800.898.4528
Emergency contact for fire/medical	Phone: 911
Hazardous material spills:	
Canadian Coast Guard Spill Response	Phone: 800.563.9689
Environment Canada	Phone: 709.772.4285
Town mayors:	
Deborah Snook (Lourdes)	Phone: 709-642-5812
Peter Fenwick (Cape St. George)	Phone: 709-644-2290
Rose Benoit (LSD Mainland)	Phone: 709-642-4979
Christine Bourgeois	Phone: 709-642-5803

**Table 7-2:** Relevant Emergency Contact Numbers

# **Appendix A:**

## **Rare Plant Survey Report**

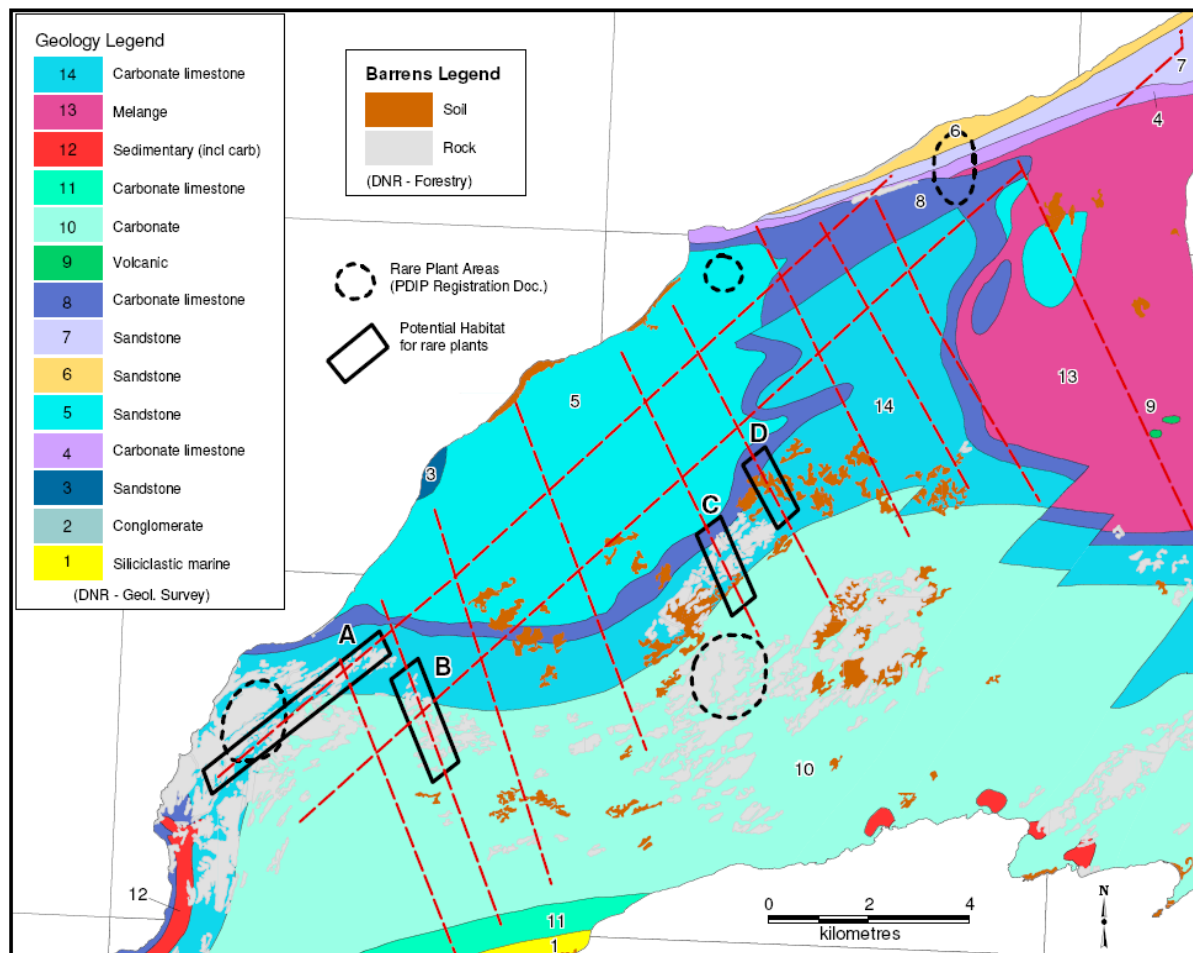
## REPORT DETAILS

Exploration Licence No: 07-124-01-ES  
Lease Area: PL2002-01  
Survey Dates: August 11-12, 2007

## REPORT SUMMARY

### Introduction

PDIP are undertaking a 2D seismic survey on the Port au Port Peninsula, within the area covered by lease PL2002-01. During the environmental registration process, which has included the development of an Environmental Protection Plan, PDIP have consulted with the Department of Environment and Conservation's Wildlife Division in order to determine whether the seismic survey poses any threat to rare plants or rare plant habitat and, if necessary, to agree on suitable mitigation measures. The Wildlife Division have identified four areas within the survey that have the potential to contain rare plants, as shown in Figure 1. The remaining portions of the lines are not considered to be a concern due to thick tuckamore and wooded terrain.



**Figure 1: Map Depicting Areas that have the potential to be affected by Rare Plants**

PDIP invited the Wildlife Division botanist, Claudia Hanel (CH), to visit the areas of concern to undertake a rare plant survey aimed at identifying rare plants occurring in these areas that have the

potential to be affected by the proposed activities. This report summarises the findings of the rare plant survey and the mitigation measures that have been agreed with the Wildlife Division.

## **Details of Survey**

The rare plant survey took place on August 11 and August 12, 2007. On the first day, PDIP chartered a helicopter from Pasadena to travel to Areas C and D and the least accessible parts of Sections A and B. The remaining sections were covered by foot on the second field day.

Individuals present on the field trip were:

### *August 11, 2007*

Vanessa Pennell Mercer (PDIP, Environmental Manager)  
Travis Young (PDIP, Garden Hill South Site Supervisor)  
Claudia Hanel (Department of Environment and Conservation Wildlife Division, Botanist)  
Thomas McGarry (GeoScott Exploration Consultants Inc., Geophysicist)  
Francois Gautier (Universal Helicopters, Pilot)

### *August 12, 2007*

Vanessa Pennell Mercer (PDIP, Environmental Manager)  
Travis Young (PDIP, Garden Hill South Site Supervisor)  
Claudia Hanel (Department of Environment and Conservation Wildlife Division, Botanist)  
Thomas McGarry (GeoScott Exploration Consultants Inc., Geophysicist)  
Tony Kendall (White's Wood Harvesting, Cutting Coordinator and Flagman)

During the survey, CH identified a few rare plants on the lines proposed for the seismic survey that had the potential to be affected. The plants identified were:

- *Symphotrichum ciliolatum* (Figure 2)  
Common Names: Lindley's Aster or Fringed Blue Aster
- *Potentilla neumanniana* (Figure 3)  
Common Names: Crantz's Cinquefoil or Northern Cinquefoil
- *Tanacetum bipinnatum* subsp. *huronense* (Figure 4)  
Common Names: Dwarf Tansy or Lake Huron Tansy

In addition, a Sweetvetch was also found in one location. It was not located directly on the seismic line, but along a ridge that would likely be used by the drill rig to navigate around a very steep area on the line. The plant discovered was small, and difficult to identify and so CH was unsure whether or not it was a more common species (commonly known as "Alpine Sweetvetch") or, the less common species (commonly known as "Mackenzie's Sweetvetch"). To err on the safe side and to potentially prevent damage to a rare plant, it is assumed that the plant identified is of the rare variety:

- *Hedysarum boreale* subsp. *mackenzii* (Figure 5)  
Common Names: Mackenzie's Sweetvetch

In addition to those rare plants mentioned above, a few "uncommon" plants were acknowledged but these were not identified as a concern.





**Figure 2: Rare Aster**



**Figure 3: Crantz's Cinquefoil**



**Figure 4: Dwarf Tansy**



**Figure 5: Mackenzie's Sweetvetch (?)**

PDIP and their consultants under the guidance of CH developed appropriate mitigation measures on site to prevent negative interaction with the plants identified. These measures are described below.

#### ***Lindley's Aster***

Lindley's Asters were scattered in areas C and D and a small portion of area A. PDIP and their consultants flagged areas where clusters of these plants occurred and agreed to the following mitigation measures with CH:

- For specific areas of concern where the Asters are more concentrated, the areas were flagged to indicate that no motorised traffic is permitted. Foot traffic was not indicated to be a concern, and cutting of brush is to be limited to areas where the brush is taller than approximately 18 inches above the ground. Cutting of trees remains unaffected. The path for the drill rig and other vehicles will be dog legged around the flagged area.
- In other areas the plants were found throughout, but were more scattered. In these locations, it was agreed that motorised traffic would be limited to two passes of the drill rig (once in along the line and once out in winter months only). Cutting of brush will be restricted to areas where the brush is taller than approximately 18 inches above the ground. Cutting of trees will remain unaffected. This mitigation measure will be extended to other portions of areas C and D that were not visited but have similar habitat.

CH also agreed to provide specific GPS coordinates for the locations of the plants.

***Crantz's Cinquefoil, Dwarf Tansy and Mackenzie's Sweetvetch***

The areas containing the other rare plants were localised. PDIP and their consultants flagged the areas of concern. The following mitigation measure was identified:




- Areas containing these rare plants are marked for fencing. A small fence constructed of stakes and flagging tape, and/or snow fencing, will be erected around the areas to divert the passage of motorised vehicles (including drill rigs) and foot traffic.

PDIP also agreed that if, for any reason, traffic associated with the survey needs to utilise other areas of limestone barrens near those surveyed, activities will be halted and/or prohibited over such areas until the Wildlife Division has been notified and has given clearance to proceed.

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**REPORT SIGN OFF**

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<b>Company</b>	<b>Representative Name</b>	<b>Signature</b>	<b>Date</b>
PDI Production Inc.	Vanessa Pennell Mercer		August 13, 2007
GeoScott Exploration Consultants Inc.	Thomas McGarry		August 13, 2007
Department of Environment and Conservation Wildlife Division	Claudia Hanel		August 13, 2007

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