

UPDATE REPORT

**ENVIRONMENTAL IMPACT ASSESSMENT FOR MARINE 2-D SEISMIC
REFLECTION SURVEY
NORTHEAST NEWFOUNDLAND SLOPE**

MULTI KLIENT INVEST AS

Prepared for:
Canada-Newfoundland and Labrador Offshore Petroleum Board

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TABLE OF CONTENTS

	Page
1.0 INTRODUCTION.....	1
1.1 Proponent Information.....	1
1.2 Regulatory Context	1
2.0 PROJECT OVERVIEW	2
2.1 Seismic Vessel	4
2.2 2-D Seismic Survey Towed Array	4
2.3 Streamer	5
2.4 Marine Mammal Safety Zone and Ramp-up Procedure	6
2.5 Logistical Support.....	6
2.6 Emissions and Waste Discharges	6
2.6.1 Atmospheric Emissions	7
2.6.2 Liquid Emissions	7
2.6.3 Solid Waste.....	7
2.6.4 Light Emissions	7
2.6.5 Potential Malfunctions and Accidental Events	8
3.0 CONSULTATIONS	8
4.0 ENVIRONMENTAL SETTINGS.....	9
4.1 Physical Setting.....	9
4.2 Biological Environment	9
4.2.1 Species at Risk.....	9
4.2.2 Sensitive Areas	10
4.3 Ocean Resources Users	10
4.3.1 Commercial Fisheries.....	10
5.0 EFFECTS ASSESSMENT OF PROJECT ACTIVITIES	12
6.0 REFERENCES.....	14

TABLE OF CONTENTS (cont)

LIST OF TABLES

Table 1. Seismic Source Array Specifications	4
Table 2. PGS GeoStreamer® Solid Streamer Specification	5
Table 3. SARA Schedule 1-listed Species Within the Study Area	9
Table 4. Change in Domestic Landings (MT) for Main Species in Selected NAFO Divisions	11
Table 5. Change in Foreign Landings (MT) for Main Species in Selected NAFO Divisions.	11
Table 6. VEC – Specific Mitigation Measures and Follow-Up.....	12

LIST OF FIGURES

Figure 1. Location of the Northeast Newfoundland Slope 2013 Survey Lines.....	3
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LIST OF PHOTOS

Photo 1: Survey Vessel M/V Sanco Spirit	6
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LIST OF APPENDICES

Appendix A	
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1.0 INTRODUCTION

Multi Klient Invest AS (MKI), a wholly owned subsidiary of Petroleum Geo-Services ASA (PGS) and TGS-NOPEC Geophysical Company ASA (TGS), has entered into a joint venture to conduct a regional marine two-dimensional (2-D) seismic reflection survey programme. The surveys involve an offshore region that encompasses portions of the Labrador Shelf Orphan Basin (east and west), Flemish Pass Basin and Jeanne d'Arc Basin of the northeast Newfoundland Slope in the Atlantic Ocean (Figure 1). The multi-year survey commenced in September 2012 for a six-year seismic program (2012-2017) between May 1st through until November 30th each year on a seasonal basis. MKI is "The Operator". The Project received approval through the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB). The 2012 survey was conducted from September 4th to November 8th, 2012.

This document provides an Update of the environmental assessment report (YOLO Environmental 2012) prepared on behalf of MKI for the 2-D seismic reflection survey. The C-NLOPB requested a validation of the EA predictions relative to the 2013 program. MKI acknowledged in the EA report that the scope of the Project being assessed extends over several years, during which time the regulatory, biophysical, and socio-economic environment may change from that assessed in this report. MKI will periodically review the EA report, as directed by the C-NLOPB, for current applicability and will work with regulatory authorities to ensure that the EA remains fit for purpose. At the time of application for subsequent program authorizations in the Project Area, MKI will be required to provide information to the C-NLOPB regarding these activities.

1.1 Proponent Information

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1.2 Regulatory Context

A significant change in the *Canadian Environmental Assessment Act (CEAA)* occurred in 2012 coming into force on July 6th 2012. The "Regulations Designating Physical Activities" lists physical activities which require an environmental assessment under the new CEA Act 2012. Marine seismic surveys are not included on the list and therefore do not require an environmental assessment under *CEA Act 2012*. The C-NLOPB has confirmed that although

seismic surveys do not fall under *CEA Act* 2012, an environmental assessment (EA) is required before an authorization can be issued. The C-NLOPB advised that the EA for the proposed Project will follow a process that is similar to a screening EA previously undertaken under the former *CEA Act*.

2.0 Project Overview

The proposed survey season is May through November for 2013. The exact dates will depend on the location, weather conditions, and vessel availability. Based on previous work on the Newfoundland Slope, weather usually allows productive recording until approximately early November. The vessel will be at sea and operate continuously (i.e., 24-hour operations) during survey operations.

Seismic vessels typically operate on a 5/6 week crew change schedule, which will be maintained for this project. Crew changes will be made via port call.

All seismic equipment being used for the project will be the same as the 2011 and 2012 programs (Sercel - G Gun 2, 4808 Cubic Inch Array, PGS GeoStreamer®). The vessel will collect gravity data as was the case in 2011 and 2012 and the same equipment will be onboard (a CHEKAN AM GraviMeter).

All mitigations listed in the EA will continue to be adhered to as demonstrated in the 2012 program. There will be two Marine Mammal Observers, one Inuit Observer, and a Fisheries Liaison Officer onboard for the duration of the program, for each rotation.

The planned 2013 program is illustrated in Figure 1. This represents proposed survey lines in the jurisdiction of the C-NLOPB, totalling 16,724 km. As noted in the 2012 update report, these are infill lines.

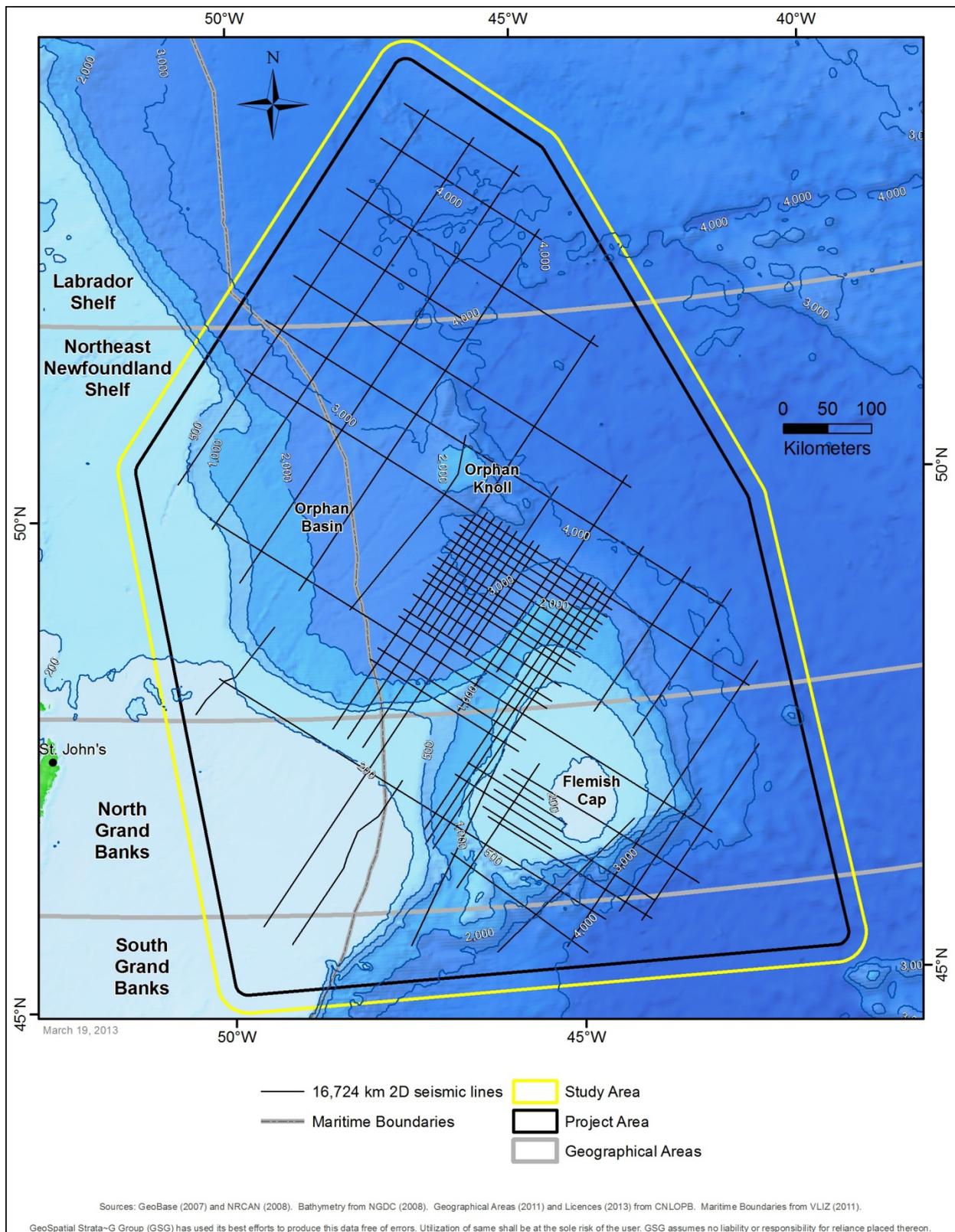


Figure 1. Location of the Northeast Newfoundland Slope 2013 Survey Lines

2.1 Seismic Vessel

The program will use the same vessel as in the 2012 survey program, the dedicated seismic research vessel, the M/V Sanco Spirit (Photo 1).



Photo 1: Survey Vessel M/V Sanco Spirit

The vessel will have equipment, systems, and protocols in place for prevention of pollution by oil, sewage, and garbage in accordance with international standards and certification authorities. With the recent changes in regards to the importation of foreign vessels, the vessel will not be subject to pre-survey audits by Transport Canada (TC), the C-NLOPB advises that a clearance letter from DNV is now the process.

The survey vessel will comply with all applicable regulations concerning management of waste and discharges of materials into the marine environment. The vessel has a ballast water management plan. The International Maritime Organization (IMO; <http://www.imo.org/>) is the United Nations specialized agency with responsibility for the safety of shipping and the prevention of marine pollution by ships. Canada became a member of the IMO in 1948.

2.2 2-D Seismic Survey Towed Array

The seismic air guns for the 2012 program are the same as last year: Sercel – G Gun 2. The guns have a working pressure of 2000 psi and the typical array is a single source array made up of 4 sub-arrays. The source was towed approximately 127 m astern of the research vessel at a depth of $9\text{m} \pm 1\text{m}$. In addition, a single 2D PGS Geo-Streamer® of 8100 m active length was towed. The survey parameters for the program are shown below in **Table 1**.

Table 1. Seismic Source Array Specifications

Specification	Value
Number of Airgun Arrays	1
Number of Airgun Subarrays	4
Number of Airguns operating at Full Power	40
Maximum Operating Volume	4808 in ³

Specification	Value
Operating Pressure	2000 psi
Shotpoint Interval	25 m
Maximum Source Output (zero to peak)	86.25 μ bar
Maximum Source Output (peak to peak)	179,1 μ bar
Peak Frequency	206 Hz

2.3 Streamer

The vessel will use the same streamer as in 2012 - the PGS GeoStreamer® which is a solid streamer. Solid streamers are less sensitive to weather-related noise than liquid streamers and eliminate the environmental impact of fluid loss from breaks or tears in conventional fluid-filled streamers. Technical specification of the streamer system is provided in **Table 2**.

Table 2. PGS GeoStreamer® Solid Streamer Specification

Skin material	Polyurethane
Outside diameter	62mm
Length of each group	12.5mm
Streamer set-up	Typical 1 x 10050 m
Manufacture and type of hydrophones	Hydrophones: Teledyne T-2BX or equivalent, Velocity Sensors: PGS confidential (Mark III)
Type of array (e.g., linear, binomial)	Linear
Number of hydrophones per group/distance apart	Hydrophones: 12 per 12.5 m, Velocity Sensors: PGS confidential
Coupling between phones and pre-amp	Capacitive
Sensitivity of near and far group at 1/P to recorder	20V/Bar
Bandwidth over which above sensitivities apply	Specified at 100Hz
Availability of shore-side spares if required	Pool system
Manufacturer and type of depth controller and compass	ION DigiCourse 5011

About 30 minutes prior to arriving at the start of a line, the source array is slowly brought up to a specified power, a ramp-up procedure referred to as a “soft start”. This procedure is an environmental protection measure to permit marine animals the opportunity to temporarily vacate that area if the sound levels are perceived as a disturbance. The Source will be shut down or reduced to a smaller source while the vessel is turning and between survey lines.

This approach is discussed in greater detail below. Vessels towing streamers have reduced manoeuvrability when the equipment is deployed. MKI will include a 10 km vessel turn-around perimeter around the survey area.

2.4 Marine Mammal Safety Zone and Ramp-up Procedure

MKI will implement a 500 m safety zone monitoring program for whale species at risk during survey data acquisition. The source will be shut down every time an endangered whale enters the defined safety zone. An environmental observer, trained for marine mammal observations, will watch for marine mammals from the bridge of the seismic vessel throughout the survey. Safety zones for marine mammals are commonly defined by the areas within which specific sound level thresholds are exceeded. These have been quantified by the US National Marine Fisheries Service (NMFS) (NMFS 2000). NMFS policy regarding exposure of marine mammals to high-level sounds is that whales should not be exposed to impulse sounds exceeding 180 dB re 1 μ Pa (rms). These sound levels are the received levels above which, in the view of a panel of bioacoustics specialists convened by NMFS, one cannot be certain that there will be no injurious effects, auditory or otherwise, to marine mammals.

The Statement of Canadian Practice with respect to Mitigation of Seismic Sound in the Marine Environment (DFO 2007) provides guidance to the seismic program, as stipulated in the scoping document. This DFO document aims to formalize and standardize the mitigation measures used in Canada with respect to the conduct of seismic surveys in the marine environment. It is based on a DFO-sponsored peer review by Canadian and international experts. MKI will adhere to the mitigation measures outlined in the Statement of Canadian Practice with respect to Mitigation of Seismic Sound in the Marine Environment.

2.5 Logistical Support

Details of logistical operations to support the subject geophysical program will largely depend on seismic acquisition company, season, and weather.

Shore Base

MKI will use shore facilities in St. John's, NL. Refueling will occur in St. John's, NL.

Support Vessels

The primary functions of support boats are to provide supplies for the seismic vessel and to assist in emergency situations (including oil spills). MKI operates the dedicated seismic research vessel, M/V Sanco Spirit. There will be a dedicated support vessel for the duration of the 2013 project as in the past.

2.6 Emissions and Waste Discharges

The vessels and towed array will generate underwater noise. The vessels also generate atmospheric, light, liquid, and solid emissions. Discharges and emissions from this program will be similar to those of any standard marine vessel. These emissions and discharges are described below.

2.6.1 Atmospheric Emissions

Atmospheric emissions will result from vessel and equipment exhaust. These emissions are minor and will be reduced through best management practices and preventative maintenance procedures. These include properly maintaining and routinely inspecting ship equipment, controlling vapour loss from fuel tanks, and avoiding engine idling when not in use. Emissions from ship engines and onboard equipment will comply with the Air Pollution Control Regulations (Newfoundland and Labrador Environmental Protection Act) and the Ambient Air Quality Objectives (Canadian Environmental Protection Act).

2.6.2 Liquid Emissions

Ballast water is stored in dedicated ballast tanks to improve vessel stability. No oil will be present in these tanks or in any discharged ballast/preload water. If oil is detected to be in the water, it will be tested and, if necessary, treated to ensure that oil concentrations in the discharge do not exceed 15 mg/L as required by the MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships, 1973, and the Protocol of 1978 related thereto), IMO and the Offshore Waste Treatment Guidelines (OWTG) (NEB et al. 2010).

The OWTG were developed specifically for the treatment and control of waste generated by petroleum operations related to exploration and production on Canada's offshore areas. Bilge water often contains oil and grease that originate in the engine room and machinery spaces. Before discharge, bilge water is treated in accordance with MARPOL 73/78, IMO and OWTG, using an oil/water separator. The extracted water is tested to ensure that the discharges contain no more than 15 mg/L of oil.

2.6.3 Solid Waste

All solid waste will be transferred to shore and disposed of at an approved facility. Any hazardous materials (e.g., oily rags) will be handled separately in hazardous materials containers. Sanitary and food wastes will be macerated to a particle size of 6 mm or less and then discharged as per the OWTG.

2.6.4 Light Emissions

The survey vessel will carry operational, navigation, and warning lights. Working areas will be illuminated with floodlights as required for compliance with occupational health and safety standards and will be fully equipped with emergency lighting. If a helideck is present, it will be floodlit and have omni-directional guidance lights with an average illumination intensity of between 20 and 25 candelas. Hazards in the vicinity of the helideck will also have omni-directional hazard lighting. Lighting will comply with relevant offshore standards/regulations, including Transport Canada's Guidelines Respecting Helicopter Facilities on Ships. The Geophysical Contractors will adhere to the Leach's Storm Petrel Program.

2.6.5 Potential Malfunctions and Accidental Events

There are unplanned situations that may be encountered during seismic operations. Potential hazards are addressed during site-specific planning as part of emergency response planning. Procedures are developed by MKI to ensure that such events are managed in a safe and environmentally sound manner. MKI has policies, plans, and procedures to prevent or mitigate effects of malfunctions and accidents. These policies, plans, and procedures will be located on the seismic vessel, and in MKI's St. John's shore office. During seismic surveys, there will be limited amounts of marine fuel and lube oil onboard that could potentially be spilled to the ocean. All of the vessels involved in the survey will use diesel fuel. Any accidental spill will be reported to the C-NLOPB immediately.

The contracted vessel is equipped with solid-streamer technology, as this type of streamer is not reliant on flotation fluid to achieve a neutral ballast state, thus eliminating the risk of an accidental spill from a damaged streamer.

Other accidental events could include damage or loss of seismic equipment, entanglement of seismic equipment with fishing gear, and vessel collisions. Best management practices and communications will be used on the survey vessel to avoid equipment loss or damage. Gear will be retrieved from the water if wave heights reach or exceed unacceptable limits. The unacceptable limits are generally prescribed by the Geophysical Contractor in agreement with the Contractor's and Client's HSE policies, and are based on consideration of multiple factors, including but not limited to the geophysical equipment deployed, the weather conditions at the time, and the short and long-term weather forecasts during survey operations. Generally though, unacceptable limits may occur when wave heights reach or exceed 3 to 4 metres height, though unacceptable limits may occur at shorter wave heights depending upon the above-noted considerations. In case of severe weather, the vessel may return to shore until conditions improve.

A qualified Fisheries Liaison Observer (FLO) will be onboard the seismic vessel during the seismic program to liaise with fishers who may have gear deployed in the Project Activity Area, in order to ensure effective and ongoing communication and avoid unnecessary gear conflicts and possible vessel collisions. Entanglement of marine mammals in seismic equipment is not likely since streamers have no tangle gear and marine mammals are expected to avoid the vessel during operations. The trained onboard Marine Mammal Observers will keep watch for marine mammals during the survey program.

3.0 Consultations

MKI is conducting ongoing consultations with fishing representatives and organizations, representatives from users of alternative resource sectors within the Study Area, and relevant communities with an interest in the Project.

On February 12th, 2013, meetings were held with the Fish Food and Allied Workers Union (FFAW) and One Ocean together; Newfoundland Resources Limited and Fisheries and Oceans shellfish research scientists.

On February 13th, 2013, meetings were held with Canning & Pitt; DFO's vessel monitoring services; DFO ecosystem representatives; Sikumiut Environmental Services; and Ocean Choice

International. On February 14th, 2013, a meeting was convened with the C-NLOPB. Minutes of the meetings relative to this EA update report are provided in Appendix A.

4.0 ENVIRONMENTAL SETTINGS

4.1 Physical Setting

There have been no significant changes in meteorology, climate, physical oceanography, or ice condition in the Study Area from that reported in the 2012 EA report.

4.2 Biological Environment

There are no changes in populations of plankton, marine birds, marine mammals or sea turtles since submission of the June 2012 EA report.

The FFAW commented that Dr. Rose of Memorial University of Newfoundland recently reported an increase in Atlantic cod stocks in Newfoundland. DFO research scientists remarked that this increase is only in the inshore population and it may not be a sustainable increase.

4.2.1 Species at Risk

Since the update in 2012, no new species were listed on Schedule 1 of SARA under the category of special concern. **Table 3** lists the Schedule 1 species identified and updated in 2012.

Table 3. SARA Schedule 1-listed Species Within the Study Area

Common Name	Scientific Name	SARA Risk Category	COSEWIC Status
Marine Mammals			
Blue Whale	<i>Balaenoptera musculus</i>	Endangered	Endangered
Fin Whale	<i>Balaenoptera physalus</i>	Special Concern	Special Concern
North Atlantic Right Whale	<i>Eubalaena glacialis</i>	Endangered	Endangered
Sowerby's Beaked Whale	<i>Mesoploden bidens</i>	Special Concern	Special Concern
Northern Bottlenose Whale	<i>Hyperoodon ampullatus</i>	Endangered	Endangered
Marine Reptiles			
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	Endangered
Marine Fish			
Atlantic Wolffish	<i>Anarhichas lupus</i>	Special Concern	Special Concern
Northern Wolffish	<i>Anarhichas denticulatus</i>	Threatened	Threatened
Spotted Wolffish	<i>Anarhichas minor</i>	Threatened	Threatened
White Shark	<i>Carcharodon carcharias</i>	Endangered	Endangered
Sea Birds			
Ivory Gull	<i>Pagophila eburnea</i>	Endangered	Endangered

Sources: Species at Risk website

Under Section 32 of the SARA, killing, capturing, and destruction of critical habitat of extirpated, endangered, and threatened species listed under Schedule 1, is prohibited. These prohibitions do not apply to those listed as special concern. Recovery strategies are required for endangered, threatened, and extirpated species and management plans are required for special concern species. SARA is administered by Environment Canada, Parks Canada, and DFO.

The proposed recovery strategy for Ivory Gull was recently released and is current under review and consultation (Environment Canada 2013). The report notes that the primary threat to Ivory Gull recovery is illegal shooting of individuals during migration along the coast of Greenland, as well as the disturbance or anthropogenic activities near breeding colonies. Both of these threats can be mitigated.

4.2.2 Sensitive Areas

There are no new special areas established in or adjacent to the Study Area since the 2012 EA report.

The Eastport Marine Protected Area Management Plan (2013 - 2018) Draft has been revised and is currently available for public comments. This area is coastal and well outside the Study Area.

4.3 Ocean Resources Users

4.3.1 Commercial Fisheries

The commercial fisheries analysis is typically based on data derived from a DFO multi - region and multi - year catch and effort dataset (ZIFF data). The ZIFF dataset are no longer publicly available for an undetermined time period. The change in the commercial fisheries in 2011 compared to the 2005 to 2010 dataset is unknown due to the lack of high precision data formally available through Ottawa. Discussions with the harvester companies and unions indicate that the harvest time and locations will be similar as depicted in the EA and previous update reports.

Using NAFO data, **Table 4** and **Table 5** show changes in total domestic and foreign landings of the dominant fisheries per the unit areas that the Study Area falls within for 2010 and 2011. Note, that these values are not spatially geo referenced relative to the Study Area, therefore no further analysis can be performed spatially or temporally. There is also no means to differentiating catches in shrimp fishing areas from catches in the NAFO areas.

Table 4. Change in Domestic Landings (MT) for Main Species in Selected NAFO Divisions

Species	Year	2J	3K	3L	3M	3N	Grand Total
Shrimps	2010	30593	43307	13212	0	0	87112
	2011	27644	36257	9276	0	0	73177
	Change	-9.6%	-16.3%	-29.8%	-	-	-16.0%
Queen Crab	2010	2031	12427	26308	1	2626	43393
	2011	1896	10771	27266	0	3273	43206
	Change	-6.6%	-13.3%	3.6%	-	24.6%	-0.4%
Greenland Halibut	2010	2893	2266	1302	0	0	6461
	2011	1835	2579	1664	0	0	6078
	Change	-36.6%	13.8%	27.8%	-	-	-5.9%
Yellowtail Flounder	2010	0	0	115	0	5581	5696
	2011	0	0	167	0	2850	3017
	Change	-	-	45.2%	-	-48.9%	-47.0%
Atlantic Cod	2010	58	1075	1572	4	70	2779
	2011	47	1271	1613	202	34	3167
	Change	-19.0%	18.2%	2.6%	4950.0%	-51.4%	14.0%
Redfishes	2010	4	57	113	0	2	176
	2011	17	56	1958	2	0	2033
	Change	325.0%	-1.8%	1632.7%	-	-	1055.1%

Table 5. Change in Foreign Landings (MT) for Main Species in Selected NAFO Divisions.

Species	Year	2J	3K	3L	3M	3N	Grand Total
Atlantic Cod	2010	0	0	61	5241	542	5844
	2011	0	0	292	9775	546	10613
	Change	-	-	378.7%	86.5%	0.7%	81.6%
Redfishes	2010	0	0	473	8154	2484	11111
	2011	74	0	1590	9670	1819	13153
	Change	-	-	236.2%	18.6%	-26.8%	18.4%
Greenland Halibut	2010	0	0	6035	2315	765	9115
	2011	0	0	6296	2022	1314	9632
	Change	-	-	4.3%	-12.7%	71.8%	5.7%
Shrimps	2010	0	0	6533	1976	0	8509
	2011	1002	208	3738	0	0	4948
	Change	-	-	-42.8%	-	-	-41.8%
Skates	2010	0	0	146	255	4787	5188
	2011	0	0	95	193	5126	5414
	Change	-	-	-34.9%	-24.3%	7.1%	4.4%
Blue Shark	2010	0	0	0	1219	1202	2421
	2011	0	0	0	1753	872	2625
	Change	-	-	-	43.8%	-27.5%	8.4%

5.0 EFFECTS ASSESSMENT OF PROJECT ACTIVITIES

The potential effects of the MKI seismic survey was assessed in the EA report, which concluded that the vessel presence, noise emissions, and accidental events associated with the proposed seismic surveys are not predicted to result in significant adverse environmental effects on fish and shellfish, marine and migratory birds, marine mammals, sea turtles, species-at-risk, sensitive areas, or fisheries in the Northeast Newfoundland Slope Study Area following mitigation (Table 6). Ecological processes will not be disturbed outside natural variability, and ecosystem structure and function will not be critically affected. All effects are reversible, of limited duration, magnitude, and geographic extent.

Table 6. VEC – Specific Mitigation Measures and Follow-Up

VEC	Mitigation Measures	Follow-Up
Species at Risk	<p>Marine Mammal Observers will be present throughout the duration of the survey and they will record sightings of marine mammals, seabirds and sea turtles on a daily basis.</p> <p>Adherence to the Statement of Canadian Practice with respect to Mitigation of Seismic Sound in the Marine Environment, to the extent reasonably practical.</p> <p>A 20 to 40 minute ramp-up procedure will be undertaken.</p> <p>Ramping up will be delayed if a marine mammal at risk or sea turtle is observed in the 500 m safety zone.</p> <p>Source will be shut down or reduced to a smaller source while the vessel is doing turns between survey lines.</p> <p>The Marine Mammal Observers will ensure the delay or shut down of seismic operations if endangered or threatened whales are present within 500 m.</p> <p>Any re-start of the source array will follow the ramping up procedure.</p> <p>The vessel will maintain a steady course and speed, and use existing travel routes, where possible.</p> <p>Compliance with CCR WMP, Canada Shipping Act and MARPOL for all discharges.</p> <p>Turtle/debris guard attached to tail buoy</p>	<p>Records of sea turtle sightings will be reported to the Atlantic Leatherback Turtle Working Group.</p> <p>Sightings data for seabirds, marine mammals, and sea turtles will be summarized in a monitoring report which will be made available to C-NLOPB for their distribution to DFO and CWS.</p> <p>All spills will be reported.</p>
Sensitive Areas	Operations will not take place within the EBSA until after July.	

VEC	Mitigation Measures	Follow-Up
Ocean Resource Users	<p>Before start of the operations, a meeting will be held with MKI representatives to review sail lines, scheduling, anticipated fishing vessels and gear types, mitigating measures, expectations of all parties and Emergency Response Plans.</p> <p>The Fisheries Liaison Officer will be onboard the seismic vessel</p> <p>A Notice to Mariners on the location and scheduling of seismic activities will be issued.</p> <p>Communication mechanisms will be developed with the fishing industry and DFO research surveys.</p> <p>Fisheries observers on the seismic vessel will monitor fishing activity and serve as a liaison between the fishing and seismic vessels;</p> <p>A Notice to Shipping and notification on the CBC Fisheries Broadcast on the location and scheduling of seismic activities will be issued.</p> <p>MKI will comply with C-NLOPB's compensation guidelines.</p>	<p>The FLO report will be document daily vessel activities and fisher interactions and submitted to the C-NLOPB upon completion of the program</p>

An environmental observation report was submitted to the C-NLOPB under separate cover that describes the marine mammal observation, seabird observations and fisheries liaison officer communications with commercial vessels for the 2012 survey program. Mitigation actions and compliance are described in that report.

During September, to help with monitoring the fishing activities and avoiding potential conflicts, the vessel was receiving maps from Canadian Department of Fisheries and Oceans (DFO) showing fishing vessels' distribution. The maps were delivered daily except for the weekends. However, at the end of September the DFO changed their operating procedures and the KLM files were no longer available to the vessel on a daily basis.

Weekly meetings were held between MKI and the fishery representatives (FFAW). Additional contacts with local fishers groups were made by the shore-based Vessel Supervisor. Updates of the operations were submitted to Canning and Pitt Ltd who were the Single Point of Contact (SPOC) for the vessel and liaison with the fishing communities. The vessel information was distributed at noon and midnight every day and included: vessel's position, heading, and estimated position at the end of each 12 hour period.

Independently to the above communications, daily and weekly reports from the onboard FLO were submitted to MKI and FFAW. 17.38 hours of stand-by were attributed to fishing activities as a result of extended line changes to avoid specific areas where the DFO end of season crab survey was being performed.

In summary, there were no observed significant effects imposed on any VECs, no compensation claims made for gear damage or loss, and no spills were reported. The effects assessment remains consistent as predicted in the EA report.

In conclusion, the residual effects summaries of the EA and addendum reports remain valid.

6.0 REFERENCES

DFO. 2007. Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment.

Environment Canada. 2013. Recovery Strategy for the Ivory Gull (*Pagophila eburnean*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. iv+ 22 pp.

National Energy Board, CNSOPB, C-NLOPB. 2010. Offshore Waste Treatment Guidelines.

Appendix A Consultation Report

Consultation Report
For the
Northeast Newfoundland Slope Survey Program 2013
&
Labrador Sea Survey Program 2013

1. INTRODUCTION

MKI received approval from the C-NLOPB for two seismic surveys offshore Newfoundland and Labrador in 2012. MKI is proposing to return to the Northeast Newfoundland Slope and the Labrador Sea surveys in June of 2013. It is anticipated that the M/V Sanco Spirit will arrive in Newfoundland on June 1st, 2013. The geophysical data to be collected are within the previously assessed study areas approved in the individual multi-year environmental assessments.

2. CONSULTATIONS

In preparation to provide the C-NLOPB with an update on the existing multi-year environmental assessments for both programs, MKI travelled to Newfoundland to begin the consultations with stakeholders. MKI representatives included Jerry Witney, Garry Morrow (Petroleum Geo-Services), Darlene Davis (RPS Energy), and Sue Belford (YOLO Environmental Ltd.).

Table 1 – Meeting Schedule

Date	Time	Stakeholder	Attendees
Feb 12 th	10:00	FFAW One Ocean	Mr. Johan Joensen Ms. Maureen Murphy
	13:00	Department of Fisheries & Oceans- Post crab season	Mr. Earl Dawe Mr. Darrell Mallowney
	15:00	Newfound Resources	Mr. Brian McNamara Mr. Jeff Simms
Feb 13 th	09:30	Canning Pitt & Associates	Mr. Strat Canning
	11:00	Sikumiut Environmental Management	Mr. Le Roy Metcalf Mr. Grant Vivian
	14:00	DFO – Vessel Monitoring Services	Mr. Larry Vaters
	15:00	DFO – Ecosystem Group	Ms. Shawna Powell Ms. Sara Lewis
	16:00	Ocean Choice	Mr. Rick Ellis

2.1 PRESENTATION

In preparation for the meetings with all stakeholders, PGS designed a PowerPoint presentation for the meetings. The PowerPoint presentation was designed to:

- a) Explain the relationship between the proponents
- b) Review the 2012 surveys offshore Northeast Newfoundland Slope and Labrador Sea
- c) Explain PGS GeoStreamer technology
- d) Give an overview of the proposed plan for the resumption of both surveys in 2013
- e) Show the previously collected programs and the proposed 2013 programs in relation to Fisheries Catch Data
- f) Confirm the communication commitments followed in 2012 will continue in 2013
- g) Show preliminary maps of both locations and discuss timing based on fisheries and other activity in the area;

2.2 FISH FOOD & ALLIED WORKERS

The meeting began with introductions, and then MKI representative Jerry Witney went through the presentation prepared for the meetings reviewing 2011 & 2012 and looking ahead to the upcoming 2013 programs.

Following the presentation, there was a discussion on last year's survey and communications, and a commitment made by MKI to continue this process in 2013. The FFAW was asked if they had any concerns from the communications established last year, and agreed that the same process in 2013 was satisfactory. It was agreed by MKI that a map of the preliminary proposed survey lines would be provided to FFAW once they were finalized, which was expected to be well in advance of the start of the program. The plan also entails to hire Inuit marine mammal observers, provided they are available.

There were discussions following the presentation of the survey in relation to catch data plotted on the maps shown. It was confirmed that the data was 2005-2010 when the question was asked by Maureen Murphy, One Ocean, what years this represented?

Jerry discussed the restricted access to the southern part of the survey due to the post season Snow Crab Survey, and how emphasis was placed on acquiring this area towards the later part of the season. Based on activity, acquisition started in this area late in the season, September 30th, 2012, (Area 3L).

Jerry pointed out that there was very little interaction with harvesting vessels and a communication on October 12th was the only time it was necessary during the 2012 for the FLO to make contact with a harvesting fishing vessel.

It was explained that the survey would commence in the Northeast Newfoundland Slope area tentatively June 1st, and move to the Labrador Sea approximately August 1st. It was communicated that the survey would begin in Northeast Newfoundland Slope in the northern part of the survey to keep away from the heavily fished areas.

It was communicated that commencing the survey in the northern part of the survey would avoid snow crab and shrimp harvesters around shelf break in NAFO area 3L.

It was proposed by MKI and agreed by FFAW that weekly meetings between MKI and FFAW would commence each week as a 'look ahead' to the weeks activities and open communications.

In addition to the weekly meetings, MKI would continue to provide daily position and status reports, as was done in 2012.

The proposed program for Northeast Newfoundland Slope and Labrador Sea represents a total of approximately 22,700 km. It was explained by MKI that this was more kilometres than could be collected in a single season, and that MKI would need to prioritize certain lines.

MKI confirmed their commitment that the Fisheries Liaison Officer would be contracted for the projects onboard the Research Vessel and that two Marine Mammal Observers would also be contracted onboard the Research vessel and Support Vessel. MKI confirmed its commitment to the Inuit Marine Mammal Observers to be onboard for the duration of both surveys.

The comment was made by Johan with the FFAW, that he thought MKI was done with the Labrador Sea? MKI representative explained that the line grid in the program was very coarse

and the proposed additional lines was an infill program as preliminary interpretation of the data acquired to date has shown some areas would benefit from reducing the current grid size.

When asked about timing, MKI confirmed the start of the program to be in early June and break to the Labrador Sea survey (based on permitting) early August. That after acquisition in Labrador, the vessel may return to the NE NL Slope survey in October.

There was a discussion on the 2013 post-season Crab Survey, and MKI confirmed that they are aware of the survey. The process was explained to MKI that the harvesters have an open season between June –November to harvest the fish and perform the sampling after this. Since the harvester's priorities are to harvest the fish first, scheduling of the sampling is difficult. MKI expressed that if this was managed or planned in a fashion that allowed scheduling this would assist in the pre planning of the survey. It was explained that these surveys have been being done this way for the past ten years, and that DFO would need to assist in better planning.

Maureen Murphy with One Ocean, explained that she had met with DFO last year as the harvesters had completed their harvesting sooner than expected, she wanted DFO to agree that FFAW could get harvesters out their earlier, she advised there are so many issues concerning this study. DFO Scientific License (Sept 1st) delayed the sampling.

Sue Belford with YOLO Environmental, currently on contract to assist MKI with the Environmental Assessment commitments of the programs, discussed the concerns with trying to obtain updated Fisheries Catch Data from DFO. Maureen agreed that some of the DFO access to data is "closed". She is currently working with the DFO office in Newfoundland on this issue.

In conversation on the harvester's season, it was stated that in area 3K, harvesters met their quotas, however, catch per unit effort appeared to be down.

Maureen shared with MKI that the harvesters in the areas 2J and 3K have had some lean years and are expected to have another one coming up. Any interference or perceived interference from seismic activity would be likely to be ill-received.

The FFAW indicated that it would be important to consult with Ocean Choice about their harvesting plans. MKI confirmed that they had a meeting planned with them also; that was sufficient for the FFAW, they just wanted to ensure that all were given consideration in this.

Maureen advised that Husky, White Rose may have a small program in the 3L area as well. MKI confirmed they will contact Husky and coordinate operations.

Maureen with One Ocean shared with MKI that they have put tremendous efforts forward to create a "Seismic Protocol " for operators to include processes from A – Z, One Ocean fact sheet, consultation expectations, and follow up for information purposes to all operators. It was asked in relation to this if One Ocean had a working group that would include individuals representing seismic, who are probably best placed to comment on seismic survey activity. Maureen confirmed that the IAGC had provided One Ocean with a very informative video.

Maureen also shared with MKI that the FLO roles and responsibilities and final reporting expectations would be soon available on their website.

FFAW and One Ocean and MKI agreed that if there were comments on the EA Update for the projects they would be directed to MKI in order to allow a timely response in the process.

In summary, the meeting went very well. FFAW and One Ocean voiced no concerns on last year's program. All parties agreed that the mitigation methods, communication meetings, sharing of program map (confidentially) were the way forward in 2013. Maps of the provisional survey lines for the 2013 programs were sent to One Ocean and FFAW after the meeting.

2.3 DEPARTMENT OF FISHERIES & OCEANS POST SEASON CRAB SURVEY

Present in the meeting from DFO was Research Scientists Earl Dawe and Darrell Mallowney. The meeting started with introductions of the MKI representatives and a discussion on the brief Power Point presentation given by MKI representative Jerry Witney.

MKI, in discussion of the vessel, M/V Sanco Spirit, gave an invitation for DFO to visit the vessel in June of this year, and they expressed an interest in coming onboard to view the vessel.

Further discussion on the post Season Crab Survey was discussed with regards to scheduling. Again, it was explained to MKI that the same process had been in place for the past ten years and there was little that could likely happen to allow advanced notice and better scheduling to assist with early planning for MKI.

Earl Dawe asked MKI what they do to effectively communicate with Fishers outside the 200 mile limit. MKI representative explained that they can see them on their radar, and the support vessel can make visual and voice contact if necessary to confirm what is going on.

MKI confirmed that the NE NL Slope survey would commence in early June and start in the northern end of the survey.

Darrell asked the question, "Is there anyone in our department that could facilitate in helping to get a schedule of the sampling?" The answer provided by Earl, was they could try. The FFAW arranges the harvesters, boats, and FFAW facilitate the work. DFO mainly pays for the service.

Darrell shared with MKI that it is a goodwill gesture in proposing preplanning to better collect the survey for all parties, thus DFO should make efforts to facilitate, if possible.

There was a brief discussion on the cod resurgence reported by Dr. George Rose, in which it was explained that DFO think this is a brief phenomenon and evident only in the inshore coastal water, not in the offshore cod stocks.

2.4 NEWFOUND RESOURCES

MKI, in preparation for this upcoming season, wanted to meet with Newfound Resources to update them on the 2012 surveys, and share information and plans for the MKI 2013 surveys.

The meeting began with introductions and immediately moved onto the Power Point presentation prepared in preparation for the meeting by MKI representatives. Mr. Brian McNamara and Mr. Jeff Simms were present for the meeting with MKI representatives.

The PowerPoint presentation generated a discussion and some questions. It was explained by MKI what was meant by the licensing of data. MKI explained the various seismic companies within the industry.

When asked who owned the Sanco Spirit, it was explained by MKI that the vessel belonged to Sanco Holdings and was under long term contract with Petroleum Geo-Services. The relationship between the proponents was explained. MKI explained that PGS owned a number of vessels, a fleet of 11 Ramform, 3D vessels and that the Sanco Spirit was a single streamer 2D vessel.

The GeoStreamer technology was explained.

There was a discussion on the three new basins announced in the local paper by Ed Marin, Nalcor. MKI confirmed that this was indeed a direct result of the previous year's work in Labrador Sea.

Newfound Resources explained their concern with the Shrimp Fishery. They admitted that they knew very little about the process for operators to obtain approval from the C-NLOPB to conduct seismic surveys. It was recommended by Sue Belford, YOLO Environmental, that they get on the distribution list with the C-NLOPB to become stakeholders to make comments on the Environmental Assessments and they also have public access to the C-NLOPB website to provide comment. Brian felt that they preferred to make statements collectively through the Canadian Association of Prawn Producers. They admitted that they have not spent a lot of time getting involved but intended to do so in the future.

Newfound Resources pointed out that the FFAW involves a small vessel fleet. That all of Newfound Resource vessels are much larger vessels (65-70 m). It has been reported to them by Captains of the vessels that seismic is having an impact on their harvest. MKI representative asked, "Did any of your vessels report having seen the Sanco Spirit in the 2012 season? The response was that he thought it was sighted a couple of times. He indicated that the year before they had some concerns and issues with the Western Geco vessel.

Newfound Resources expressed a huge concern with the term "dispersment" used in the EA for the project. He stated, "That this tells him that this will hurt them commercially". It added, "You are only assuming that shrimp will return". He again stated, "We believe that disbursement is concern, we believe this is an impact".

Jeff asked if MKI knew when the Shrimp study would be conducted. Sue Belford, YOLO Environmental advised that as far as she knew, DFO had put this on hold that data had been withheld within DFO in Ottawa. She also explained that there is not a lot of literature out there on the effects on shrimp, specifically.

Brian shared with MKI, “that he would like to hope that industry would be heading in the direction of research studies to find out if seismic is having an impact on the shrimp fishery”.

He pointed out that he had reviewed the update from last year 2012 survey (Labrador) and the final analysis that there would be no effect, and the fact that it had passed already through the C-NLOPB he did not agree”. Sue Belford, YOLO Environmental again, suggested that they get on the stakeholders list and have the opportunity to share their comments when the EA is in the early stages of filing with C-NLOPB. She explained that this is an opportunity for Newfoundland Resources to become involved in the process and share their opinions and ask questions with regards to their concerns. She advised him that he should go to the C-NLOPB website and follow the process. He admitted that they had no spent time on this, even since last year but they intended to in the future.

Brian asked,” what MKI thought of the comparison with the amount of seismic that has happened in NAFO area 3L?” MKI representative responded, “based on the amount of production licenses in this area he would suspect that seismic has been more intense in the Jean D’ Arc Basin.”

MKI representative offered that given all the activity in the Gulf of Mexico that the shrimp industry appears to co-exist with all that seismic activity. Brian pointed out that you don’t get the same concentration in warm water as in cold water. Again, expressing the concern with the term “disbursement”. He explained that here in Newfoundland, they had cold water shrimp and that they congregate differently than in the GOM. He stated that, “it is all about density”.

Brian stated, “That the shrimp fishery in Norway is good, that this was what he considered a better comparison to Newfoundland shrimp fishery.” He asked, “If there were any studies done in Norway on shrimp impacts? He stated that, “NAFO 3L has a lot of problems.”

Brian shared that, “the FFAW has less than half the shrimp fishery landings.

MKI provided the vessel schedule; the vessel would begin acquisition in the northern portion of the NE NL Slope survey shown in the map provided tentatively June 1st, they would transit to Labrador Sea survey tentatively early August and come back to NE NL Slope survey, area 3L once the largest fishery is completed.

In summary, Newfoundland Resources has many concerns about the future of the Shrimp Fishery in Newfoundland & Labrador. They believe that research studies need to be conducted to ensure that seismic is not impacting their livelihood. They admit that they have not been actively involved in the process, but intend to educate themselves and become more involved. MKI has committed to continuing the process adhered to in the 2012 season in avoiding the heavily harvested areas on NAFO 3L during their busy harvesting by working in the northern part of the survey and entering 3L for line collection later in the season.

2.5 SIKUMIUT ENVIRONMENTAL MANAGEMENT

MKI met with Sikumiut Environmental Management in preparation for the potential 2013 surveys offshore Newfoundland & Labrador.

The meetings commenced with a brief introduction of those present. MKI expressed to Sikumiut that they were very satisfied with the MMOs being provided for their survey in previous years, and would like to count on them for support again this year.

In keeping their commitment to enhance benefits offshore Newfoundland & Labrador, MKI committed that as in the past, Inuit Observers would be included in both the NE NF Slope survey as well as the expected Labrador Sea program.

Sikumiut shared with MKI their appreciation to the advanced preparation and planning of the survey to assist them with scheduling and their ability to provide the MMOs for the project. They also explained that in keeping the MMOs employed for both projects this assisted them to ensure that candidates would be available. Thus, longer term work, than short term on only one survey.

There was a discussion as to whether or not the observers had concerns with the quality of the Support vessel provided and explained by MKI representative that any concerns should be directed and they would be addressed. In short, the observers would obviously rather be onboard the newly built Sanco Spirit Research vessel than the smaller older Support vessels. MKI explained that they make an effort to rotate the Inuit observers as best they can, and would continue with this process in 2013.

In summary, Sikumiut and MKI are happy with the relationship that has been established in these past two years and will continue to work together to enhance benefits for Newfoundland and Labrador in 2013.

2.6 DEPARTMENT OF FISHERIES & OCEANS VESSEL MONITORING SERVICES

MKI, in preparation for this upcoming season, wanted to meet with the Vessel Monitoring Services division of DFO to discuss the VMS data provided to the Sanco Spirit in 2012 and thank them, as it proved to be very helpful during the program.

Introductions were made, and MKI proceeded to share with them their intentions for the 2013 upcoming season. MKI and DFO agreed that they would provide them with the VMS data again this year for the 2013 survey.

There were discussions on the method in which the VMS data was provided as this process changed during the season, and a future conference call will be set up for both parties to determine if MKI can better work with the data provided on the shore in preparation for its delivery to the vessel.

DFO explained that the new system makes data readily available. The system updates every four hours and reports the position of all the vessels in the NAFO zones. It reports the position of a particular VMS unit in a particular block, makes it easier to map and the individual zones are broken out. It also allows it to be directly downloaded and no one at DFO needs to be working, for example, on the weekends to keep everyone informed.

In summary, DFO would be happy to continue to provide MKI with the Vessel Monitoring Data for the 2013 survey. They will work together to ensure that MKI gets the data and understands the best methods in downloading on the shore to provide to the vessel.

MKI inquired as to a two week window of a particular station that MKI could stay away from. Again, the discussion on the process of sampling was discussed.

2.7 DEPARTMENT OF FISHERIES & OCEANS Ecosystem Group / ENVIRONMENTAL ASSESSMENT DEPT.

The meeting began with introductions, and MKI representative Jerry Witney went through the presentation prepared for the meetings.

It was explained to DFO representative, Shauna Powell (Environmental Manager) and Sara Lewis (Habitat Section) that MKI intended to return to the Northeast Newfoundland Slope survey and Labrador Sea survey. MKI explained that the EA for the Labrador Sea was (2011-2013) and the NE NL Slope was approved (2012-2017) and that updates were currently being prepared to provide to C-NLOPB, in preparation for the 2013 work.

A discussion followed the presentation with MKI explaining the licensing of data, Nalcor's vested interest in the project as a pre-committed company, meaning that they agreed to license the data before collection and have input into the line collection. The technology of the PGS GeoStreamer® was also explained. In particular, it was explained that the GeoStreamer® has hydrophones and velocity sensors, thus enabling the cable to be towed much deeper (+/-20m) than traditional streamers (+/-9) depth. Typically, data is compromised when the streamer is this deep in the water, however with the GeoStreamer® you don't get this, re: Broadband solution.

MKI confirmed their commitment to "The Canadian Statement of Practice". MKI explained their commitment to FLOs and MMOs for the duration of the surveys. MKI explained the communication process followed last year with FFAW, One Ocean, and Ocean Choice. MKI provided twice daily position reports, daily status reports, and held weekly "look ahead" meetings for the collection of lines to avoid highly harvested area, snow crab study (NAFA 3L) areas.

It was explained that the vessel would arrive approximately June 1st, 2013 and start work on the Northeast Newfoundland Slope early June through until early August. The vessel would then head further north to the existing Labrador Sea program under C-NLOPB jurisdiction, and would return back to the Northeast Newfoundland Slope program later in the season to collect data in 3L after the snow crab season. The vessel would begin acquisition on the north end of the program and avoid 3L until later in the season.

DFO was advised that this meeting was in preparation of an update being prepared by YOLO Environmental for the proposed 2013 work.

In summary, DFO appreciated the efforts of MKI to come and meet with them and share information on the upcoming surveys. DFO expressed that they expect operators follow the "Statement of Canadian Practice" and that C-NLOPB would advise them when an update was filed with the board.

2.8 OCEAN CHOICE INTERNATIONAL

The meeting began with introductions, and MKI representative Jerry Witney went through the presentation prepared for the meetings.

In the discussion that followed the presentation, MKI representative's renewed their commitment to maintain the same communication regime as last year which both parties agreed worked well.

MKI confirmed that they would provide maps of both the Northeast Newfoundland Slope & Labrador surveys, and could supply these in digital format. It was also confirmed that MKI could also provide start and end points to make it easier for OCI to map out the positions. MKI would also provide twice daily position reports and status update. Weekly "look ahead" meetings would include MKI, FFAW & Ocean Choice International.

MKI confirmed that they had too much work laid out in 2013 to complete in one season, and that they would need to prioritize the lines.

MKI confirmed that they would begin the season in the Northeast Newfoundland Slope survey tentatively June 1st in the northern portion of the survey to avoid sensitive harvesters in 3K and 3L.

During the presentation maps were presented of the survey lines in relation to Fisheries Catch data. The question was asked of MKI if this data included DFO data outside the 200 mile limit. They indicated that they wanted to see all NAFO data on the map. MKI confirmed that Sue Belford, YOLO Environmental could contact them to discuss this further.

OCI is concerned about shrimp and Redfish in NAFO 3L area. They indicated that June – August is a closure on yellow tail flounder.