

REPORT TITLE

**Environmental Assessment Review for 2017
New Drill Centre Construction and Operations**

SUBMITTED TO

**Ms. Elizabeth Young
Canada-Newfoundland and Labrador Offshore Petroleum Board
5th Floor, TD Place
140 Water Street
St. John's, NL
A1C 6H6**

SUBMITTED BY

**Husky Oil Operations Limited
351 Water Street, Suite 107
St. John's, NL
A1C 1C2**

Additional Comments

Revised based on comments

Signature:

Date:

Name

Title

Sr. Environmental Advisor**Corporate Responsibility Lead****HSEQ Manager****Created By****Reviewed By****Approved By Department Manager**

Date:

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1.0 Introduction

Offshore oil and gas exploration and production programs generally encompass long periods of time and multiple, successive, operational steps. As a consequence, environmental assessments of these programs address a variety of activities undertaken over a number of years.

Annual environmental assessment reviews are conducted to assist the C-NLOPB in fulfilling its responsibilities under the *Canadian Environmental Assessment Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* by ensuring that the scope of the assessment(s) and the mitigations committed to therein remain technically valid.

Table 1 lists Husky Energy's environmental assessments that have been approved by the C-NLOPB for the Husky White Rose Development Project: New Drill Centre Construction and Operations and Addenda. An amendment to extend the scope for drilling activity from 2015 to 2020 within the North Amethyst and South White Rose Extension drill centres was approved by the C-NLOPB on July 6, 2016.

Table 1 Current Environmental Assessment Approvals for the New Drill Centre EA

Screening Determination Reference	EA Report Title	Husky Document Number
CEAR No. 06-01-17410	Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment & Addenda	WR-HSE-RP-4003, WR-HSE-RP-0167 & WR-HSE-RP-4706

This EA review will address the Husky White Rose Development Project: New Drill Centre Construction and Operations Program only. EA reviews of other activities will be provided separately.

2.0 Husky White Rose Development Project: New Drill Centre Construction and Operations Program Environmental Assessment

2.1 Project Description and Scope

2.1.1 Activities Covered

In 2007, Husky Energy proposed to develop up to five new drill centres within the White Rose. However, only the North Amethyst and the South White Rose Extension drill centres have been completed. Additional drill centres contemplated in 2007 were one drill centre for the North White Rose Extension (NWRX) and two drill centres for the West White Rose Extension (WWRX). There were a total of 54 wells proposed for these five drill centres.

Construction activities assessed within the EA also included installation of drilling templates and other subsea equipment to support production operations. Subsea flowlines would also be installed to connect new drill centres with existing ones which in turn connect to the *SeaRose FPSO*. Routine maintenance of drill centres may also be required.

The Project assessment also included the use of mobile offshore drilling units, construction and diving vessels, marine support vessels, helicopter support and existing shore based facilities in St. John's Harbour.

Geohazard/well site, geotechnical and vertical seismic profiling (VSP) surveys may be required at any time during the year.

2.1.2 Geographic Scope

The geographic (spatial) scope of the Drill Centre assessment is portrayed in the inset map in Figure 2-1. Planned activities for 2017 will occur within the Project Area and specifically within the White Rose Field's safety zone.

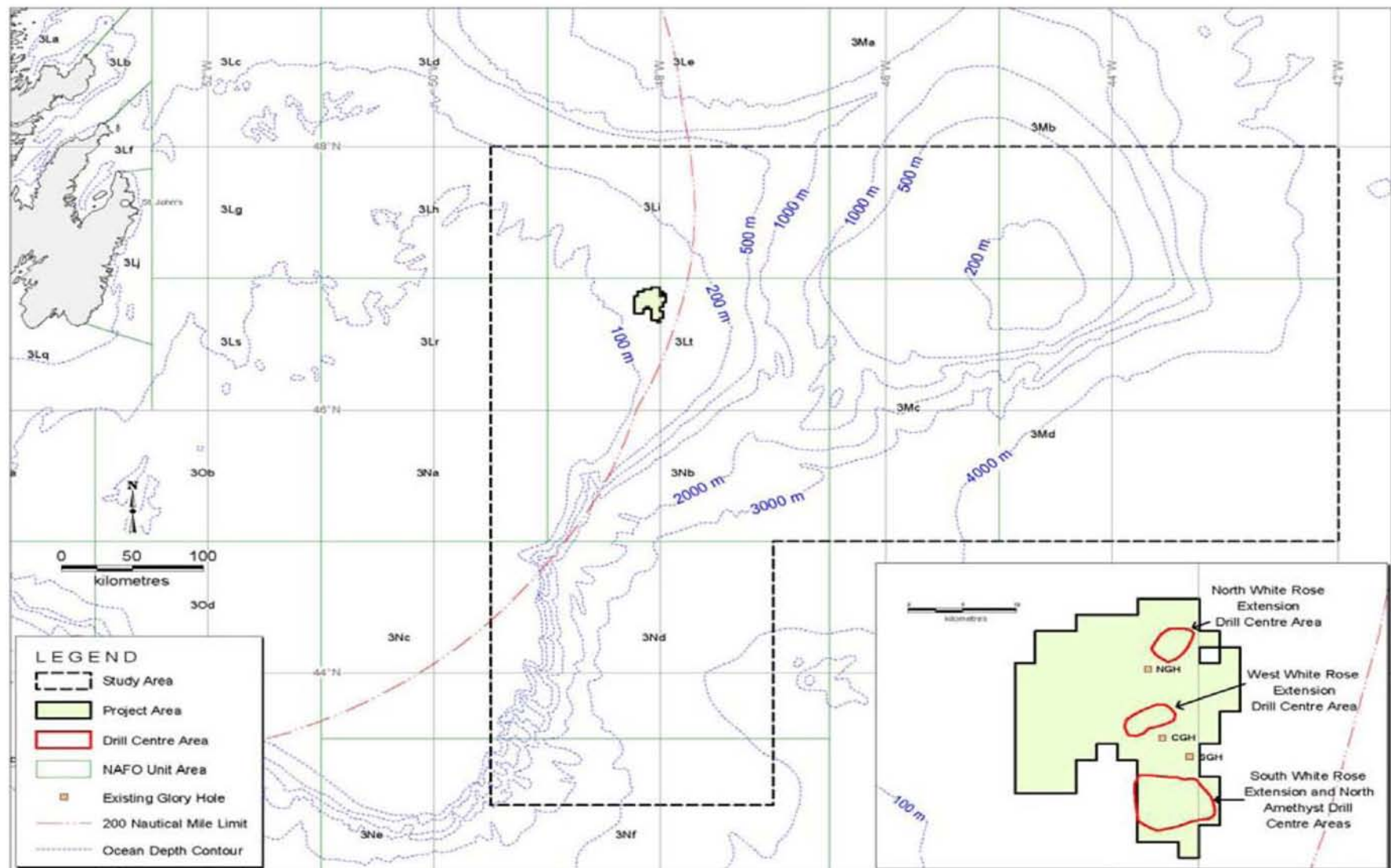


Figure 2-1 Geographic Scope of Project Area for CEAR No. 06-01-17410

2.1.3 Temporal Scope

Production and maintenance activities associated with these five new drill centres are scheduled to occur year round from 2009 and 2020. Placement of subsea equipment to support drilling and production operations and installation of flow lines to connect these drill centres was completed in 2015.

To date, development drilling activities carried out under the scope of this environmental assessment involved drilling at the North Amethyst Drill Center (NADC) and South White Rose Extension (SWRX). A total of 15 of the 54 wells estimated for up to five potential drill centres scoped under this environmental assessment have been completed (Table 2). The 2016 Amendment to the Husky Energy Drill Centre Construction Installation and Operation Program EA extends the temporal scope for drilling activities to 2020 (C-NLOPB EA Amendment Determination July 2016).

Table 2 Wells Drilled To Date in NA and SWRX Drill Centres

North Amethyst Drill Centre (NADC)	
Well Identifier	Tree Identifier
G-25-06	NAP04
G-25-02	NAP09
G-25-03	NAP07
G-25-07	NAP10
G-25-09	NAP13
G-25-04	NAW05
G-25-01	NAW06
G-25-05	NAW11
G-25-08	NAW12
G-25-10	NAP08
South White Rose Extension Drill Centre (SWRX)	
Well Identifier	Tree Identifier
J-05-03	SXP3
J-05-02	SXP4
J-05-04	SXP10
J-05-05	SXP5
	SXW8
	SXG1
	SXG2
J-05-01	SXG11
	SXG12

2.1.4 Planned Activities for 2017

The current well schedule indicates that drilling activities will occur at SWRX from March until December, 2017, with 3 wells planned within the drill centre. However, drilling schedules are subject to slight modification, based on operational requirements and conditions. The Mobile Offshore Drilling Unit (MODU) Henry Goodrich will be utilized for all drilling and completions activities in 2017.

Drilling practices employed to drill conductor and surface hole sections will continue to be applied to mitigate the impact of drill cuttings and cement spillage into the drill centre. Specifically, guar gum sweeps, cuttings transport systems and reduced excess cement will be used. Synthetic-based muds will be used to drill the intermediate and production hole sections. Best available technology will continue to be used to minimize synthetic drill mud on cuttings. Advanced directional drilling tools and systems will continue to be used to drill the deviated and horizontal wells required to develop this region of the field. Conductor and surface casing strings will be cemented to the seafloor, and subsequent strings will be cemented in such a manner to ensure that the movement of formation fluids in the casing annulus is prevented and the reservoir zone is isolated.

Well completions will be designed to maximize well productivity while maintaining the necessary standard of risk and well integrity. Detailed design of the drilling and completions program will be addressed in the individual Approval to Drill Well (ADW) applications.

2.2 Environmental Aspects

2.2.1 Fisheries

Husky's planned activities within the White Rose field for 2017 were discussed with representatives from FFAW-Unifor during meetings on January 13, 2017 regarding the ongoing environmental assessment of exploration drilling. Husky also provided plans for drilling activity within the White Rose field to One Ocean by email on January 16th and to the One Ocean Working Group on January 19th. Attendees at the Working Group meeting included representative of OCI, ASP and the FFAW. Minutes of the Working Group meeting were circulated to members not in attendance on February 21.

Figure 2-2 provides a map of fishing activity from 2005 to 2010 and Figure 2-3 to Figure 2-6 depict fishing activity from 2011 to 2014, respectively. Fisheries data post-2010 cannot be compared with previous data due to changes in the information released by DFO. Fishing activities in the Study Area have not changed significantly since the initial environmental assessment. This compilation is derived from Fisheries and Oceans Canada (DFO) databases including research vessel and underutilized species information.

As noted in previous updates, a directed fishery for American Plaice and Atlantic Cod has not existed for some time and this has not changed as of 2017. If in the future, a directed fishery is authorized then previous fishing patterns for these species may be re-established in areas in and near the Jeanne d'Arc basin.

Husky understands that it is important to recognize that harvesters fish a resource, and not fixed points from year to year. Licenses are issued for large areas (e.g. NAFO subdivisions 3K or 3L) and fishing activity could take place anywhere within these areas and not just at the pattern of locations fished in recent years indicated by DFO data. Hence this requires that Husky continue to consult with the fishing industry on a regular basis to keep up-to-date with trends in fishing from year to year.

With regard to the conduct of its operations, Husky will continue to keep fishing interests informed of these activities during the operational planning phases. This will be done through the established One Ocean contacts and others as deemed necessary or as advised.

Since the approval of the aforementioned environmental assessment, the fishing and oil and gas industries, through One Ocean, have completed two initiatives to help enhance communication and collaboration between the two industries. The first is a communication protocol that has been distributed to fishers and members of the petroleum industry. The protocol recommends communication procedures between fish harvesters and offshore installations and petroleum-related vessels during operational activities. The second is a risk-based decision matrix that defines the conditions under which oil and gas operators could employ either or both a Fisheries Liaison Officer or a guide vessel in support of certain oil and gas operations that have a potential to affect fisheries activities offshore.

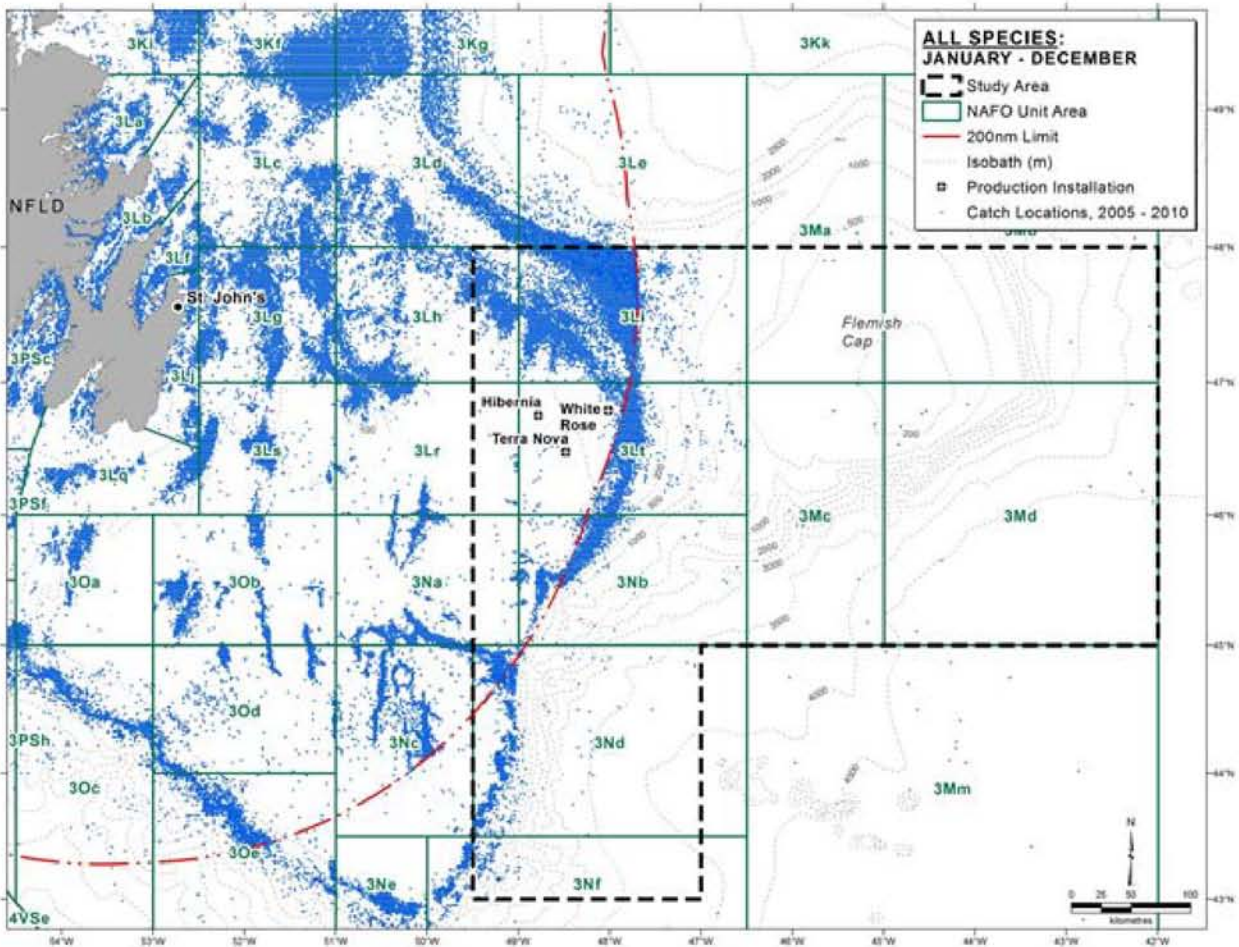


Figure 2-2 Cumulative Pattern of Fishing Activity from 2005 - 2010 in Relation to EA Study Area

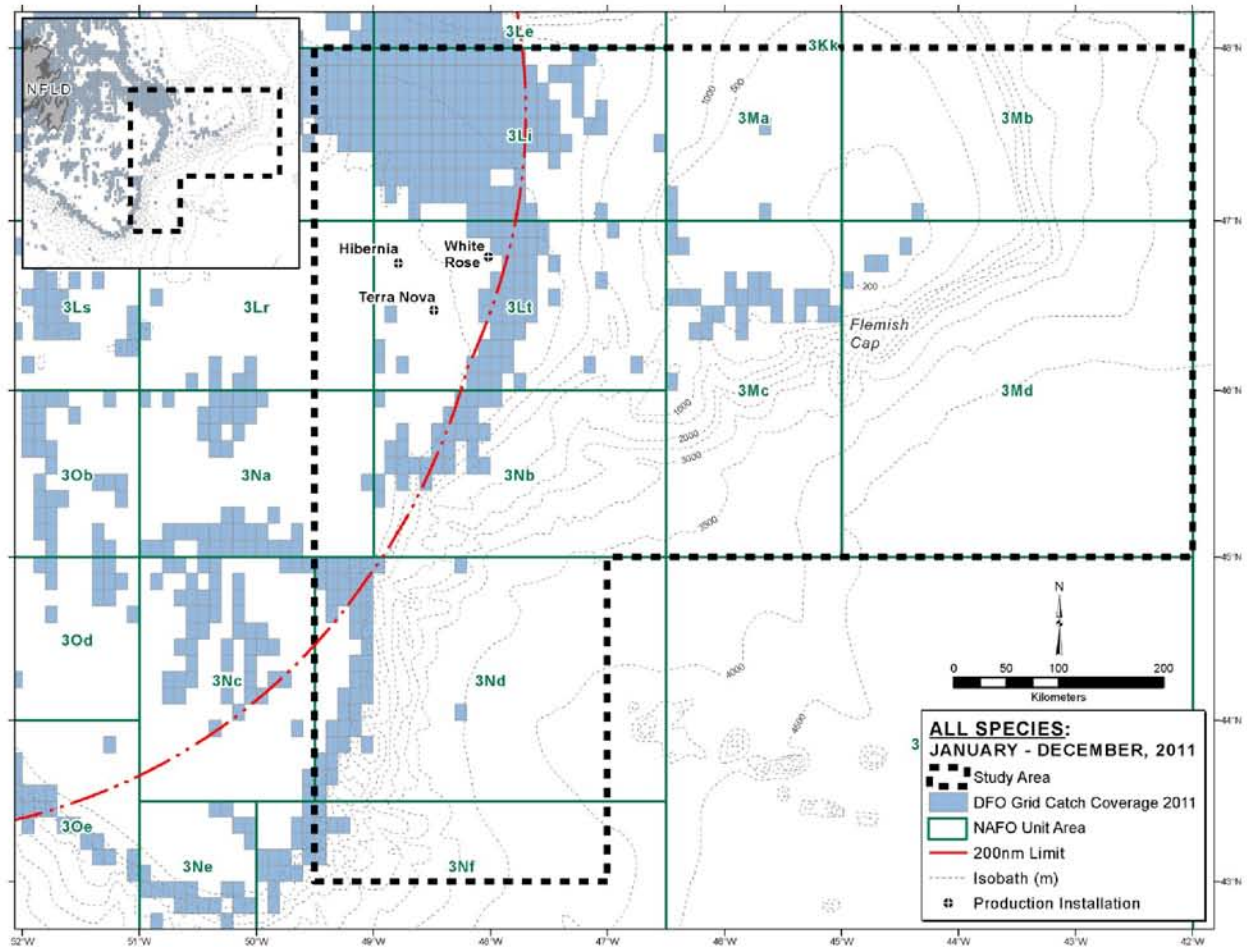


Figure 2-3 Pattern of Fishing Activity in 2011 in Relation to the EA Study Area

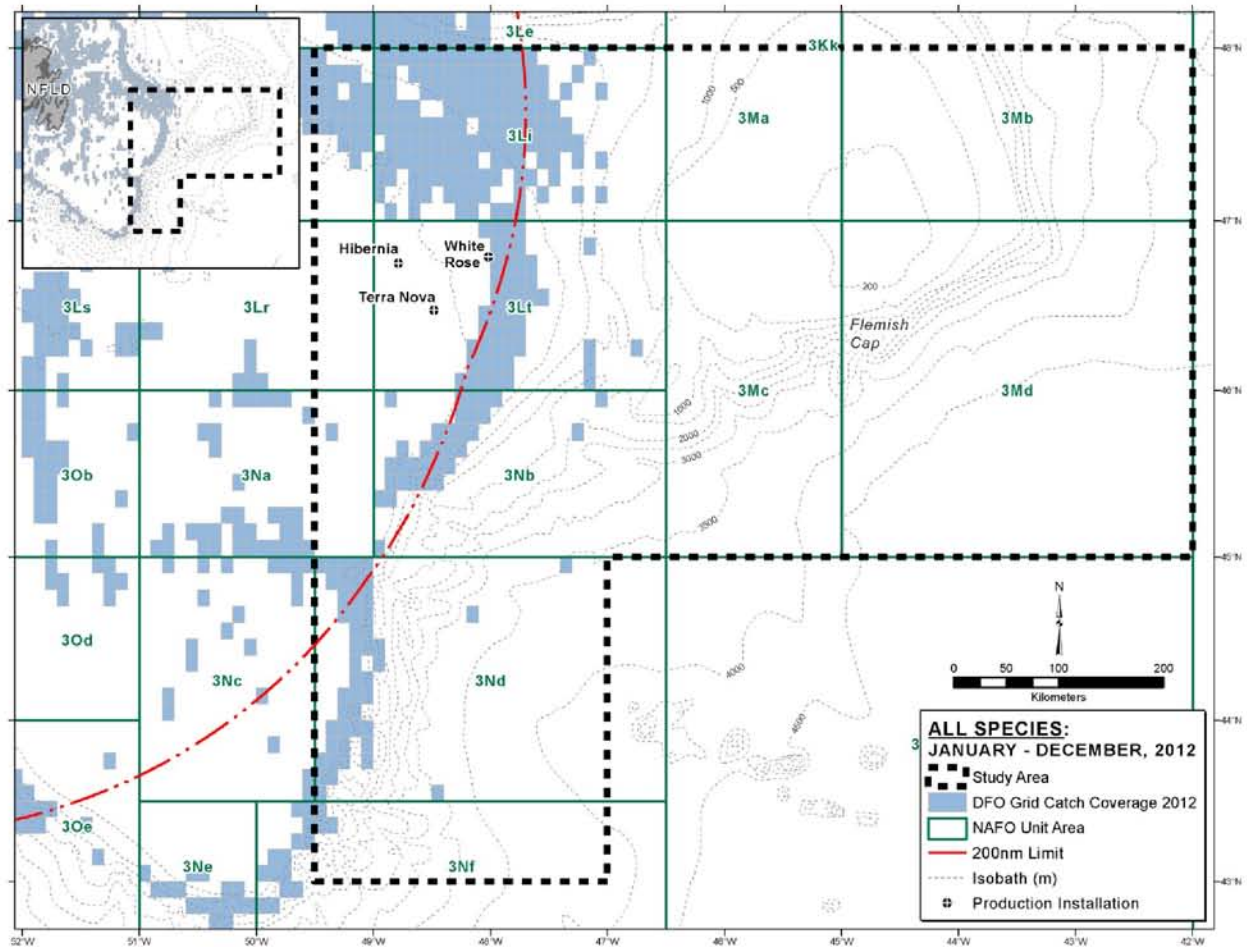


Figure 2-4 Pattern of Fishing Activity in 2012 in Relation to the EA Study Area

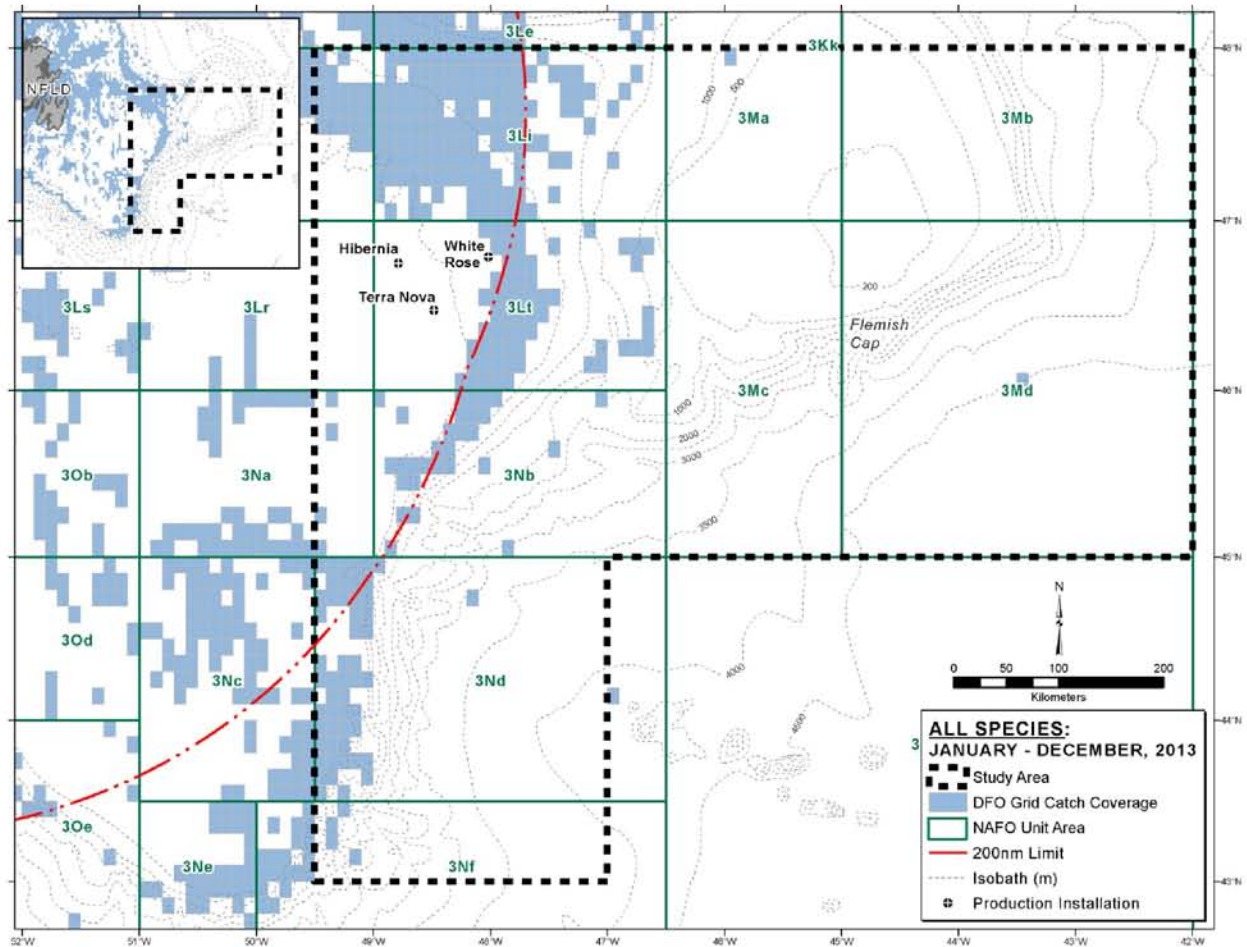


Figure 2-5 Pattern of Fishing Activity in 2013 in Relation to the EA Study Area

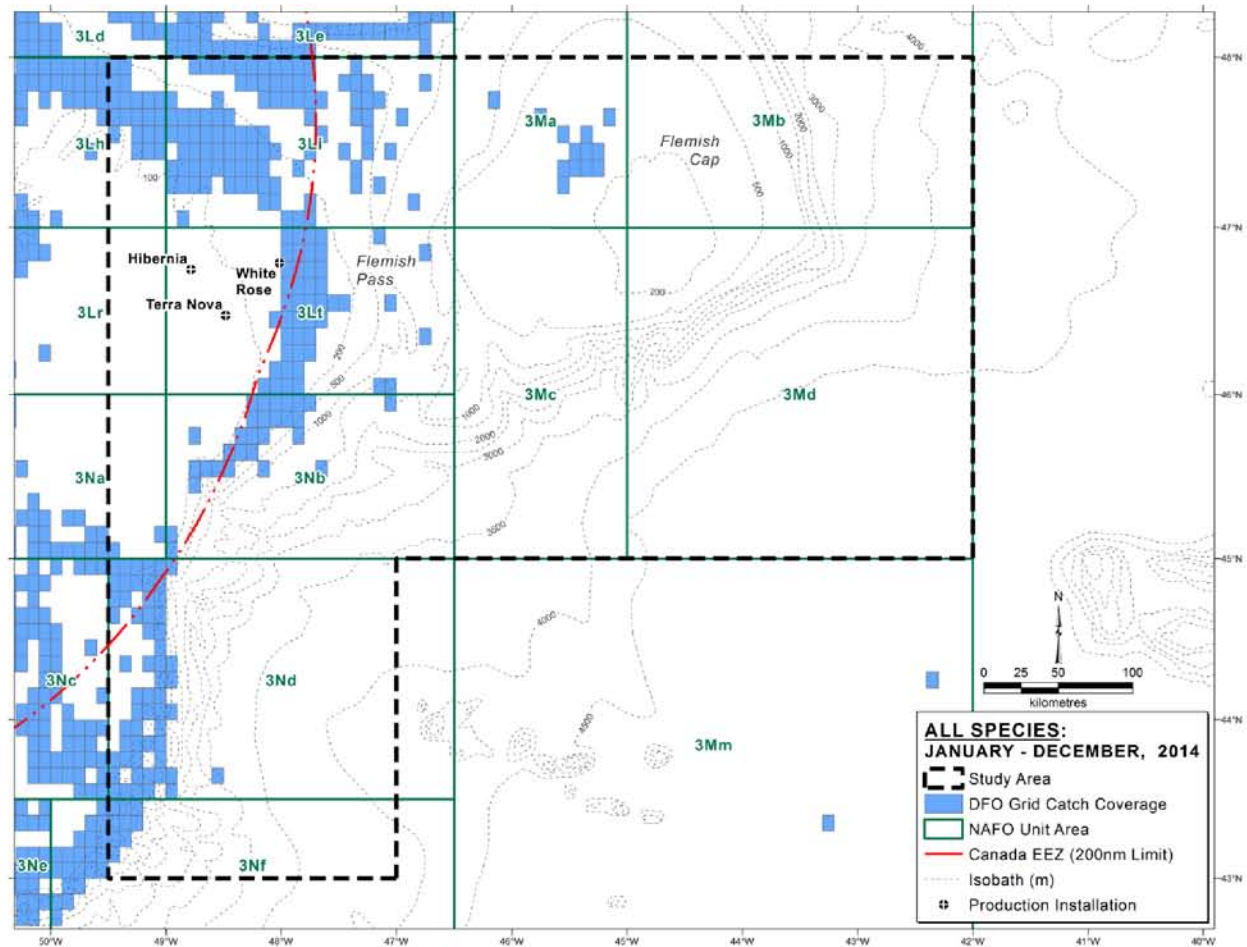


Figure 2-6 Pattern of Fishing Activity in 2014 in Relation to the EA Study Area

2.2.2 Species at Risk

An updated listing of SARA and COSEWIC species for the Grand Banks area of relevance to this assessment is provided in Appendix 1. SARA-listed species with final recovery strategies in place are noted. None of the SARA-listed species relevant to the spatial scope of this assessment has an overlapping critical habitat description or an action plan in place. Appendix 1 also provides the updated COSEWIC candidate species under consideration.

There are no additional species legally protected under Schedule 1 of SARA since the 2016 EA Update (Husky 2016). There are two cetacean species (blue whale, and North Atlantic right whale), one sea turtle species (leatherback), one seabird species (Ivory Gull), and three fish species (white shark, northern wolffish and spotted wolffish) that are legally protected under Schedule 1 of SARA and have potential to occur in the Study Area. Atlantic wolffish, the Atlantic population of fin whales and Sowerby's beaked whale are designated as special concern on Schedule 1 of SARA.

There are no new or updated recovery strategies for species potentially occurring in the Study Area designated as either endangered or threatened under Schedule 1 of SARA since the 2016 EA Update (Husky 2016). Final recovery strategies are in place for the Ivory Gull, leatherback sea turtle, spotted wolffish, northern wolffish, blue whale and

North Atlantic right whale. A management plan has also been prepared for the Atlantic wolffish, currently designated as special concern on Schedule 1 of SARA.

As per the 2016 EA Update (Husky 2016), none of the recovery plans for SARA-listed species in place materially change the mitigation measures currently committed by Husky for the scope of the operations addressed by the environmental assessment because critical habitat has not been identified within the Study Area.

2.2.3 Mitigations

Husky regards the environmental predictions and consequent mitigations cited in the environmental assessment and subsequent significance determination that relates to CEAR No. 06-01-17410 as still valid and re-commits to implementing these mitigation measures for the activities to be carried out under the scope of this assessment this year.

The potential environmental effects of drilling activities as described in Section 0 are assessed to be *not significant* when evaluated against the assessment definitions and criteria applied to the valued ecosystem components addressed in the original assessment.

3.0 Concluding Statement

The activities Husky plans to carry out in 2017 have been reviewed and assessed to be within the spatial and temporal scope of the environmental assessments referenced herein.

The environmental effects predicted in the currently valid assessments are still valid. Husky reaffirms its commitment to implement the mitigation measures proposed in these assessments and in the Screening Decisions made by the C-NLOPB.

4.0 References

4.1 Original Husky Environmental Assessments

1. LGL Limited. 2012. Environmental Assessment of Husky's Jeanne d'Arc Basin/Flemish Pass Regional Seismic Program, 2012-2020. LGL Rep. SA1144. Prepared by LGL Limited in association with Canning & Pitt Associates Inc., St. John's, NL, and Oceans Ltd., St. John's, NL, for Husky Energy, St. John's, NL. 320 p. + appendices.
2. LGL Limited. 2006c. Husky White Rose Development Project: New Drill Centre Construction & Operations Program Environmental Assessment. LGL Rep. SA883. Rep. by LGL Limited, St. John's, NL, for Husky Energy Inc., Calgary, AB. 299 p. + App.
3. LGL Limited. 2007. Husky White Rose Development Project: New Drill Centre Construction & Operations Program Environmental Assessment Addendum. LGL Rep. SA883a. Rep. by LGL Limited, St. John's, NL, for Husky Energy Inc., Calgary, AB. 126 p. + App.
4. LGL Limited. 2007. Husky Delineation/Exploration Drilling Program for Jeanne d'Arc Basin Area, 2008-2017, Environmental Assessment. LGL Rep. SA935. Prepared by LGL, St. John's, NL, in association with Canning & Pitt Associates, Inc., Oceans Ltd., and PAL Environmental Services. Prepared for Husky Energy Inc., Calgary, AB. 231 p. + Appendices.
5. Husky Energy. 2012. Husky Energy East Coast Operations Newfoundland & Labrador Offshore Area Environmental Assessment Review for 2010. Doc. No. WR-HSE-RP-1886.
6. Husky Energy. 2001. White Rose Oilfield Comprehensive Study Report.

4.2 Other References

1. Husky (Energy). 2016. Amendment to the Husky White Rose Drill Centre Environmental Assessment. Rep. No. WR-HSE-RP-4706. 10 p.
2. Stantec. 2010. Hebron Project Comprehensive Study Report. Prepared by Stantec Ltd. on behalf of ExxonMobil Canada Properties

4.3 Species at Risk Recovery Strategies

- DFO. 2013. Report on the progress of implementation of the Recovery Strategy for northern wolffish (*Anarhichas denticulatus*) and spotted wolffish (*Anarhichas minor*), and Management Plan for Atlantic wolffish (*Anarhichas lupus*) in Canada for the period 2008-2013. Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ottawa. vi + 16 p.
- DFO 2012. Assessment of Leatherback Turtle (*Dermochelys coriacea*) Fishery and Non-fishery Interactions in Atlantic Canadian Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/041.
- Environment Canada. 2013. Recovery Strategy for the Ivory Gull (*Pagophila eburnea*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. iv+ 22 pp.
- Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.
- DFO 2008. Recovery Strategy for the Atlantic walrus (*Odobenus rosmarus rosmarus*), Northwest Atlantic population, in Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa, ON. x + 11 pp.
- Beauchamp, J., Bouchard, H., de Margerie, P., Otis, N., Savaria, J.-Y., 2009. Recovery Strategy for the blue whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada [FINAL]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. 62 pp.
- Brown, M.W., Fenton, D., Smedbol, K., Merriman, C., Robichaud-Leblanc, K., and Conway, J.D. 2009. Recovery Strategy for the North Atlantic Right Whale (*Eubalaena glacialis*) in Atlantic Canadian Waters [Final]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada. vi + 66p.

5.0 Appendices

Appendix 1 - Current Listing of SARA and COSEWIC Listed Species in the Husky Project Areas.

Appendix 1: Current SARA¹ Listed and COSEWIC Assessed Species² in the Husky Project Areas

Species		New Since Last Update			SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name	Drill Centres	Exp Drilling	Seismic	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ³
Birds											
Ivory Gull	<i>Pagophila eburnea</i>				1			X			
Marine Fish											
White shark (Atlantic population)	<i>Carcharodon carcharias</i>				1			X			
Northern wolffish ⁴	<i>Anarhichas denticulatus</i>					1			X		
Spotted wolffish ⁴	<i>Anarhichas minor</i>					1			X		
Atlantic wolffish	<i>Anarhichas lupus</i>						1			X	
Atlantic cod	<i>Gadus morhua</i>						3				
Atlantic cod (NL population)	<i>Gadus morhua</i>							X			
Atlantic bluefin tuna	<i>Thunnus thynnus</i>							X			
Porbeagle shark	<i>Lamna nasus</i>							X			
Roundnose grenadier	<i>Coryphaenoides rupestris</i>							X			
Cusk	<i>Brosme brosme</i>							X			

¹ Current as of 15 February 2017. Sources: SARA website (<http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>) and COSEWIC website (http://www.cosepac.gc.ca/eng/sct5/index_e.cfm), accessed 15 February 2016. The following species, previously included in Appendix 1 of the 2015 EA Update as High and Mid Priority Candidate species, respectively, are no longer being considered by COSEWIC and were removed from the table: Northwest Atlantic lumpfish (*Cyclopterus lumpus*) and spinytail skate (*Bathyraja spinicauda*).

² Green shade means a final Recovery Strategy is in place but no Critical Habitat has been identified nor have Action or Management plans been finalized for these species with the exception of Atlantic wolffish (Management Plan), and North Atlantic right whale and northern and spotted wolffishes (Critical Habitat; see footnote 4). Note that two other species that have recovery strategies, Atlantic walrus and grey whale, have been extirpated from Eastern Canadian waters and therefore are not listed in the above table.

³ Candidate COSEWIC species are classified as High (H), Medium (M), or Low (L) Priority Candidate (PC) species.

⁴ A critical habitat statement exists for North Atlantic right whale; however, the critical habitats are near Nova Scotia and extend south into the U.S., well outside of the Study Areas. Critical habitat for northern and spotted wolffishes in Newfoundland and Labrador waters and the Gulf of St. Lawrence have been established but not yet published; this critical habitat will be included in the updated Recovery Strategy for these species (DFO 2013).

⁵ Leatherback sea turtle has recently been split into two entries; one with no specific population and the Atlantic population, to reflect the listing for this species as it appears on the SARA website.

Species		New Since Last Update			SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name	Drill Centres	Exp Drilling	Seismic	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ³
Smooth skate (Funk Island Deep population)	<i>Malacoraja senta</i>	X	X	X				X			
Winter Skate (East Scotian Shelf – NL population)	<i>Leucoraja ocellata</i>	X	X	X				X			
Atlantic salmon (southern NL pop)	<i>Salmo salar</i>								X		
Shortfin mako shark (Atlantic population)	<i>Isurus oxyrinchus</i>								X		
American eel	<i>Anguilla rostrata</i>								X		
American plaice (NL population)	<i>Hippoglossoides platessoides</i>								X		
Acadian redfish (Atlantic population)	<i>Sebastes fasciatus</i>								X		
Deepwater redfish (Northern population)	<i>Sebastes mentella</i>								X		
White hake (Atlantic and Northern Gulf of St. Lawrence population)	<i>Urophycis tenuis</i>								X		
Roughhead grenadier	<i>Macrourus berglax</i>									X	
Smooth skate (Laurentian-Scotian population)	<i>Malacoraja senta</i>									X	
Thorny skate	<i>Amblyraja radiata</i>									X	
Blue shark (Atlantic population)	<i>Prionace glauca</i>									X	
Spiny dogfish (Atlantic population)	<i>Squalus acanthias</i>									X	
Basking shark (Atlantic population)	<i>Cetorhinus maximus</i>									X	
Pollock	<i>Pollachius virens</i>	X	X	X							MPC
Atlantic mackerel	<i>Scomber scombrus</i>										MPC
Greenland shark	<i>Somniosus microcephalus</i>										MPC
American Shad	<i>Alosa sapidissima</i>										MPC
Alewife	<i>Alosa pseudoharengus</i>										MPC
Marine Mammals											
Blue whale (Atlantic population)	<i>Balaenoptera musculus</i>				1			X			
North Atlantic right whale ⁴	<i>Eubalaena glacialis</i>				1			X			
Sowerby's beaked whale	<i>Mesoplodon bidens</i>						1			X	
Fin whale (Atlantic population)	<i>Balaenoptera physalus</i>						1			X	

Species		New Since Last Update			SARA Status noted as Schedules 1, 2 or 3			COSEWIC Status			
Common Name	Scientific Name	Drill Centres	Exp Drilling	Seismic	Endangered	Threatened	Special Concern	Endangered	Threatened	Special Concern	Candidate ³
Harbour porpoise (Northwest Atlantic population)	<i>Phocoena phocoena</i>					2				X	
Humpback whale (Western North Atlantic population)	<i>Megaptera novaeangliae</i>						3				
Killer whale (NW Atl./East Arctic populations)	<i>Orcinus orca</i>									X	
Northern bottlenose whale (Davis Strait/Baffin Bay/Labrador Sea)	<i>Hyperoodon ampullatus</i>									X	
Northern bottlenose whale (Scotian Shelf)	<i>Hyperoodon ampullatus</i>				1			X			
Sei whale (Atlantic population)	<i>Balaenoptera borealis</i>										HPC
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	X	X	X							HPC
Ringed seal	<i>Pusa hispida hispida</i>	X	X	X							HPC
Hooded seal	<i>Cystophora cristata</i>	X	X	X							MPC
Sperm whale	<i>Physeter macrocephalus</i>										MPC
Bearded seal	<i>Erignathus barbatus</i>										MPC
Harp seal	<i>Phoca groenlandica</i>	X	X	X							LPC
Reptiles											
Leatherback sea turtle (Atlantic population) ⁵	<i>Dermochelys coriacea</i>							X			
Leatherback sea turtle ⁵	<i>Dermochelys coriacea</i>				1						
Loggerhead sea turtle	<i>Caretta caretta</i>							X			