

Sable Offshore Energy Project
2017 Canada-Nova Scotia Benefits Report

Submitted to the
Canada-Nova Scotia Offshore Petroleum Board

By
ExxonMobil Canada Properties

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Executive Summary

This 2017 Sable Offshore Energy Project (SOEP) Canada - Nova Scotia Benefits Report is submitted to the Canada Nova Scotia Offshore Petroleum Board (CNSOPB) by ExxonMobil Canada Properties (EMCP) as Operator. It is submitted in satisfaction of the requirements of the CNSOPB Benefits Plan Decision Report for SOEP and includes information on the SOEP offshore and onshore activities for the reporting period of January 1, 2017 to December 31, 2017.

The total SOEP related expenditures by EMCP and the Sable Owners in Nova Scotia for 2017 were \$91.3 million. This represents 53.0% of the overall SOEP expenditures for the year. The cumulative SOEP expenditures in Nova Scotia since project sanction in 1998 is \$2,975.3 million or 40.6% of the overall project expenditures.

Expenditures during the year supported on-going operations and maintenance, decommissioning planning activities as well as initiatives in areas of community support, education and training, research and development, technology transfer and support for diversity and inclusion programs.

1.0 Introduction

The SOEP 2017 Canada-Nova Scotia Benefits Report is submitted to the CNSOPB by ExxonMobil Canada Properties (EMCP), the SOEP Operator. The report includes economic impact data arising from producing operations conducted in 2017 and cumulative data compiled since project sanction in 1998.

The following SOEP facilities are included in the scope of this report:

Offshore	Onshore
<ul style="list-style-type: none"> - Thebaud Central Processing Platform - Venture Platform - North Triumph Platform - Alma Platform - South Venture Platform - Export and Inter-field Pipelines 	<ul style="list-style-type: none"> - Goldboro Gas Plant - Point Tupper Fractionation Plant - Interconnecting NGL Pipeline

EMCP is committed to procuring on a competitive basis, the goods and services needed to operate and maintain the SOEP facilities from the local supply community. Some examples of the support services provided by the local supply community to the SOEP during 2017 are listed in the table below.

Table 1 – Supply Community Services

Support Services Provided by the Supply Community	
<u>Operations</u>	<u>Business Services</u>
<ul style="list-style-type: none"> - Aviation services - Supply vessels and Marine crews - Catering personnel - Logistics and stevedoring - Staffing services - Laboratory testing and analysis 	<ul style="list-style-type: none"> - Customs clearance and brokerage - Courier services - Staffing services - On-land transportation services - Warehousing - Office materials and support - Communications services

Support Services Provided by the Supply Community	
<p><u>Maintenance</u></p> <ul style="list-style-type: none"> - Skilled Trades and services such as welding, mechanical fabrication, electrical, instrumentation, insulation and general labour - Painting and Fabric maintenance - Fabrication services - Maintenance materials and consumables - Valve and equipment services - Equipment and tool rentals - Scaffolding services - Diving services and support vessels 	<p><u>Engineering and Technical</u></p> <ul style="list-style-type: none"> - Technical support staff and engineering design services - Equipment inspection services - Data analysis - ROV inspection services and personnel - Survey services - Certification of facility design, maintenance and integrity
<p><u>Safety, Health and Environment</u></p> <ul style="list-style-type: none"> - Safety advisory services - Safety equipment - Safety training services - Environmental monitoring and testing services - Medical personnel and associated services - Weather monitoring and forecasting - Sea state monitoring – waves and currents 	<p><u>Well Services</u></p> <ul style="list-style-type: none"> - Equipment rentals and consumables - Staffing services - Logistics

2.0 Project Update

Safety performance at all SOEP facilities remained strong in 2017. There were no lost time incident (LTI) for employees or contractors during the year. It has been more than 15 years since the last LTI at the Sable operations facilities. The positive safety culture and monitoring programs that help with risk prevention and mitigation continued in 2017.

The Operations Integrity Management System has been implemented by EMCP at all Sable Project facilities. This system sets expectations and processes aimed at effectively managing safety, environment and overall facility integrity. This system, which has the active support and participation of the EMCP employees and contractors, has been instrumental in building and sustaining a safety culture.

EMCP continued with the planning and studies that will support the decommissioning of the Sable Project, and moved into the execution phase. The procurement process for long lead contracts needed to support decommissioning commenced in 2015. In 2016 contracts for engineering, procurement, construction and maintenance (EPCM) services and well plug and abandonment (P&A) services were awarded to AMEC Black & McDonald and Halliburton Group Canada respectively. Competitive bids for a jack-up drilling rig and the engineering, preparation, removals and disposal (EPRD) of offshore facilities were evaluated in 2016. During the first quarter of 2017 contracts for these services were awarded to Noble Drilling Services (Canada) Corporation and Heerema Marine Contractors Nederland SE, Corporation respectively.

In April 2017, EMCP and these contractors, in collaboration with the Maritimes Energy Association, hosted the Sable Supplier Forum. The objectives of this forum were to:

- Provide an overall decommissioning update to the supply community and other interested parties;
- Discuss potential decommissioning opportunities, local capability and local capacity with the supply community;
- Reinforce our commitment to meeting the requirements of the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act and the SOEP Benefits Plan;
- Facilitate timely and meaningful dialogue and initiate effective two-way conversations between the local supply community, other stakeholders and key decommissioning contractors.

The format of the event was designed to support the above objectives by including a variety of engagement mechanisms including: presentations, question and answer sessions, networking and scheduled one-on-one meetings. There were approximately 250 registered attendees representing over 110 different local suppliers and other interested parties from across Atlantic Canada. Almost 200 one-on-one meetings were scheduled between local suppliers and the key decommissioning contractors.

EMCP and the key decommissioning contractors attended the Strait of Canso Superport Days in July. There were more than a hundred registered attendees representing industry, local suppliers and all levels of government. EMCP and the decommissioning contractors also participated in an Indigenous supplier information session in November at the Potlotek First Nation. Information on decommissioning was provided and local capability and opportunities for local participation were discussed at both sessions.

In November the jack-up drilling rig Noble Regina Allen arrived in Halifax and was mobilized to the Thebaud field to commence well plug and abandonment activities.

EMCP remains committed to providing timely communications with all stakeholders and Indigenous communities. The company is committed to providing full and fair

opportunity for the local supply community to participate in decommissioning work activities as the scope continues to be developed and implemented.

3.0 Economic Impact

This section of the 2017 Canada – Nova Scotia Benefits Report includes data on the annual and cumulative economic impact of the SOEP. Project expenditures have been classified in one of three categories (Nova Scotia, Other Canadian or Foreign) based on the *Canadian General Standards Board Method*, which has been adopted by the CNSOPB for local benefits reporting purposes.

Annual (2017) and cumulative person hours of work, headcount and new hire data is also included in this section.

In compiling the economic impact data EMCP reviewed information provided by SOEP vendors, the scope of work for the vendor and the guidance available from the Canadian General Standards Board (CGSB) reporting guidelines. Data quality assurance methods used in the preparation of previous Benefits Reports were applied in the preparation this report.

Project Expenditures

The 2017 total project expenditures and percentages in each of the categories noted above is provided in Table 2. The cumulative data is for the period 1998 – 2017 inclusive.

Table 2 – SOEP Expenditures (2017 and Cumulative)

	2017 Expenditures		Cumulative (1998-2017)	
	(\$million)	% of Total	(\$million)	% of Total
Nova Scotia	91.3	53.0%	2,975.3	40.6%
Other Canadian	30.7	17.8%	1,324.7	18.0%
Foreign	50.3	29.2%	3,031.8	41.4%
Total	172.4	100%	7,331.8	100%

Project Employment

SOEP employment data is provided in following three classifications:

a) Person Hours of Work

Person hours of work are categorized as 'Nova Scotia', 'Other Canadian' or 'Foreign' based on the residency of the person performing the work. The 2017 and cumulative data is presented in Table 3 below.

Table 3 – Person Hours of Employment (2017 and Cumulative)

	2017 Person Hours		Cumulative (1998-2017)	
	Thousands	% of Total	Millions	% of Total
Nova Scotia	819.9	85.3%	25.20	65.5%
Other Canadian	96.1	10.0%	3.86	10.0%
Foreign	45.0	4.7%	9.44	24.5%
Total	961.0	100%	38.54	100%

The Nova Scotia person hours of work conducted for SOEP activities during 2017 was 819,949 which represents 410 full-time equivalent positions.

Year End Headcount

The year-end head count is a measure the number of people on shift and scheduled to work on the Sable Project at a fixed point each year (December 31). It differs from the full-time equivalent data reported under the person hours measure because it represents a point in time as opposed to all employment activity over the full year.

Data on the year end headcount for 2017 and the previous five years (including 2017) is provided in Table 4 below.

Table 4 – Year End Headcount

Year End	Activity in Nova Scotia	Activity in the Rest of Canada	Total Project Activity
2013	265	13	287
2014	406	25	432
2015	444	23	467
2016	354	7	361
2017	564	51	682

b) Residency of New Hires

The total number of new hires reported for the Sable Project and its major contractors during 2017 was 301. Table 5 below provides the historic distribution of the Residency of New Hires for the previous five years including 2017.

Table 5 – Residency of New Hires

Year	Nova Scotia	Other Canadian	Foreign	Total
2013	74	16	5	95
2014	46	14	2	62
2015	70	17	0	87
2016	58	13	2	73
2017	208	69	24	301

4.0 Diversity and Inclusion

The Sable Project owners and the project’s major contractors support the development of a diverse and inclusive workplace. Table 6 below provides the 2017 and historical data collected from EMCP and the SOEP contractors for individuals who self-identify as members of one or more of the four designated groups identified in employment equity legislation (Aboriginal Peoples, Visible minorities, Women and Persons with disabilities).

Table 6 – Traditionally Under-represented Groups

Year	Aboriginal Peoples	Visible Minorities	Women	Persons with Disabilities
2013	5	5	40	*
2014	17	6	46	*
2015	16	9	39	*
2016	12	6	33	*
2017	24	10	73	*

Note: Those categories in which the representation is five individuals or less are marked by an asterisk (*) to protect the privacy of individual respondents.

Information regarding gender representation is gathered from existing Human Resources records. Representation of other designated groups is based on voluntary self-identification data gathered through a confidential survey employee. The information is collected and recorded on employee files in the company's human resources database, accessible only by select designated HR staff.

There has been a focus on supporting programs primarily associated with Science, Technology, Engineering and Math (STEM) that incorporate traditionally underrepresented groups. For example, in providing funding for established community organizations, we encourage or make it a condition of our support that programs are extended to traditionally underrepresented groups.

EMCP and the Sable Owners have also provided support for longer-term sustainable initiatives regarding the training, capacity building, contracting and employment of disadvantaged individuals and groups. This approach provides support for opportunities and the removal of barriers beyond the scope of the SOEP and oil and gas industry.

Some examples over the course of Sable operations include:

- Techsploration, a program aimed at school aged girls and young women that inspires and mentors them to pursue careers in science, trades and technology. Over time this program has expanded into Mi'kamq communities including We'koqma'q M'kmaw School, Eskasoni Elementary and Middle School, Indian Brook School and Wagmatcook First Nation School.
- Dalhousie SuperNova, a program which hosts science camps and takes them to communities. EMCP has supported the expansion of this program to Wagmatcook, We'koqma'q (Waycobah), Membertou, Potlotek, Sipekne'katik, Annapolis Valley, Acadia and Bear River.
- Nova Scotia Youth Experiences in Science, a program which supports participation in science fairs by youth in Nova Scotia schools. EMCP has supported expansion of this program into Mi'kmaq communities.
- Jeanine Deveau Educational Equity Endowment at St. Francis Xavier University, which is aimed at reducing barriers to post-secondary education for African-Nova Scotian and First Nations students.
- Indigenous Women in Community Leadership program offered by the Coady International Institute at St. F. X. University, is a program which Imperial Oil and EMCP provided funding to establish.
- The Aboriginal Studies Program at Cape Breton University led by Dr. Cheryl Bartlett which developed an integrated traditional knowledge and western science curriculum at the university.
- The marine cadet program, operated by the Sable supply and standby vessel contractor Secunda, was expanded into Mi'kmaq communities and opened career opportunities.

5.0 Capacity Development

Capacity development includes oil and gas related training and education activities, supplier development and technology transfer. Information initiatives carried out in these areas is provided below.

Cooperative Student Employment and Cadet Programs

Cooperative education and work placement programs were supported by EMCP and the Sable contractors in 2017. The placement programs include university students in the engineering faculty and students attending the Nova Scotia Community College (NSCC).

In 2017 there were 16 engineering and community college students placed at the EMCP Halifax office or with our major contractors in Nova Scotia. The total expenditures on these programs in 2017 was \$191,495. The 2017 and historical co-op program data is provided in Table 7 below.

Table 7 – Co-Op Work Placements

Year	Number of Placements	Cumulative Placements	Investment	Cumulative Investment
2013	4	596	\$61,900	\$5,751,091
2014	14	610	\$152,400	\$5,903,491
2015	12	622	\$184,854	\$6,088,345
2016	13	635	\$157,828	\$6,246,173
2017	16	651	\$191,495	\$6,437,668

Training and Education

Training and education programs were provided for EMCP and contractor employees throughout 2017. The 2017 training related expenditures are provided in Table 8 below. The cumulative training and education expenditures since project sanction in 1998 is \$53 million.

Table 8 – Training and Education Expenditures

Description of Training	Expenditures
Internal Training	\$88,030
Major Contractor Training	\$1,612,032
Co-op Programs	\$191,495
2017 Total	\$1,891,557

In addition to direct training and education activities undertaken by EMCP and our major contractors, EMCP and the Sable owners supported a number of other initiatives that assist and/or recognize the existing education and training infrastructure in Nova Scotia.

Technology Transfer

During 2017 more than 400 EMCP employees and contractors participated in a new and innovative behavioural based safety training program that introduces personal decision making styles and human performance concepts. The participants included field work staff and supervisory leadership. The training program was developed as a pilot program and with goal of eventually being implemented by ExxonMobil on a global basis across the upstream business organization.

In September 2017, EMCP attended the Engineers Nova Scotia Annual Conference and AGM to provide an overview of the Sable Project and the technical approach and challenges associated with the eventual facility decommissioning. This provided an opportunity for the engineering community to better understand scope of activities, the technologies that are currently utilized and those that will be required in the future.

Use of the site specific technology that uses digital images and footage together with associated software continued in 2017. This tool helps EMCP and the contracted engineers and technical specialist enhance their knowledge of the facility design and improve efficiency in facility maintenance and modifications without necessarily travelling to the offshore facilities.

The estimated cumulative value of the technology transfer associated with the Sable Project since sanction in 1998 exceeds \$32 million.

6.0 Research and Development (R&D) Initiatives

EMCP and the Sable owners have committed to R&D expenditures in Nova Scotia of at least \$375,000 per year and an aggregate of \$3,000,000 over the five-year period of 2013 – 2017. The CNSOPB has approved this R&D commitment as part of the plan required by Condition 4 of the SOEP Benefits Plan Decision Report. In addition to the R&D initiatives under the terms of the five-year plan, the Sable owners and the contracting community supported broader activities in Nova Scotia during 2017.

The 2017 expenditures were \$432,000. The cumulative R&D expenditures since project sanction in 1998 are more than \$31M. Please refer to Table 9 below.

Table 9 – R&D Expenditures 2017 and Cumulative

Year	Investment	Cumulative (since Project sanction)
2017	\$432,000	\$31,533,807

Examples of Supported R&D Initiatives

Geoscience Research at Nova Scotia Universities

EMCP and the Sable owners support for geological and geoscience research at Dalhousie University continued in 2017. This initiative started in 2012 and includes financial support, guest seminar instructors and access to a comprehensive set of seismic data that was collected in the offshore Nova Scotia Sable sub-basin. The combination of a financial commitment and access to company expertise and seismic data provides practical tools and research opportunities for local student researchers.

Examples of research projects have been conducted and /or are underway as a result of the support provided by the Sable owners include:

- Carbonate margin to delta transitions: Stratigraphy of the Jurassic carbonate platform and Sable delta
- Reservoir Quality and Architectural Elements of Mesozoic Rift Basin Sediments, Scotian Margin
- Reservoir Connectivity and Overpressure in the Sable Sub-basin
- Development of an Integrated GIS Database
- Reservoir Characterization
- Characterization of source rock geochemistry and potential
- Hydraulic Fracturing, Unconventional Hydrocarbon Systems and Carbon Capture & Storage
- Sequence Stratigraphy of the Banquereau Formation
- Multi-Scale Permeability Modeling of the Cretaceous Mississauga Formation
- Overpressure Conditions in the Scotian Basin
- Hydrocarbon Potential of the Sable Delta Producing Reservoirs
- Production of a Source Rock Atlas and Geochemistry of the Scotian Margin
- Reservoir Architecture of Meanderbelt Systems and Vegetation Density in the Carboniferous using Lidar Imagery and Ground Penetrating Radar
- Penobscot Seismic Attribute Study

Pengrowth Nova Scotia Energy Scholarship Programs

The Energy Scholarships and the Innovation Grants are the two components of the Pengrowth Nova Scotia Energy Scholarship Program. These components provide

financial support to high school and master's level university students in pursuing energy related studies at post-secondary institutions.

In 2017 eight high school graduates received university scholarships worth as much as \$10,000 each, \$2,500 renewable over four years. Another eight received \$2,500 non-renewable scholarships at the Nova Scotia Community College. The awards were based on a combination of extracurricular activities and academic performance. There was one recipient of the Pengrowth-Nova Scotia Petroleum Innovation Grant which supports graduate level students further their studies at the master's level.

Since its inception, the program has supported more than 200 students and researchers with more than \$1 million in funding.

Sable Island Research

EMCP and the Sable owners continued to support research activities conducted on Sable Island in 2017.

One project that has been carried out for a number of years is comprised of regular surveys to gather data on beached birds. The data which is collected is part of an effort to monitor trends in the number and rates of oiling in beached seabirds.

A second project was focused on analysis of air quality data collected from monitoring equipment located on Sable Island. This project included analysis of air quality and meteorological data and a cross referencing of the data to wind direction / wind speed to assess whether the observed data could be attributed to offshore operations. The analysis concluded that there were no instances of exceeding air quality standards and no indication of offshore operations contributing adversely to the air quality on the Island.

7.0 Community Education and Participation

EMCP, the Sable owners, many of the Sable Project major contractors and their employees support the communities in which we live and work by donating time, talent or money. This helps strengthen the many organizations that provide needed services or enhance the culture of the community. Some of the highlights from 2017 are provided in the table below.

<i>Supporting the Community</i>	
United Way	Metro United Way and the United Way of Pictou County
CIBC Run for the Cure	ExxonMobil Canada staff, their families and friends support the CIBC Run for the Cure in Halifax
Guysborough and Area Communities	<ul style="list-style-type: none"> - Goldboro / Isaac's Harbour Community Development Association - Guysborough Food Bank - Guysborough Come Home Week Society - Harbourview Community Centre - La Societe des Acadiens de la Region de Tor Baie - Canso & Area Minor Hockey Association
<i>Supporting Education</i>	
Bursaries for High School Graduates	Awarded to qualifying students graduating from seven high schools in Guysborough, Inverness, Antigonish and Richmond counties.
Junior Achievement – Nova Scotia	Junior Achievement delivers four programs for students from grades 6 through 12 - Our Business World, Dollars With Sense, Economics for Success, and Company Program.
Techsploration	A not-for-profit organization that provides young women from grades nine through twelve with opportunities to explore science, trades and technology occupations, while creating awareness about the critical role of work in their lives.
<i>Supporting the Arts</i>	
Stan Rogers Folk Festival	A 3-day music festival, held annually in Canso that honours the legacy of Stan Rogers, an artist that managed to influence a whole generation of performers.
Neptune Theatre	Atlantic Canada's largest professional regional theatre and home to a year-round Theatre School which operates classes, camps and workshops as well as coordinating elite training programs.
Festival Antigonish	A place where Nova Scotia artists can create dynamic new works and gain valuable experience performing in works produced to the highest artistic and technical standards.
Mulgrave Road Theatre	A professional touring theatre that has enabled a wide audience to experience acclaimed works by some of Atlantic Canada's most respected playwrights.

APPENDICES

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Appendix 1

Sable Project Person Hours 2017 EMCP and Major Contractors

	NS	OC	FOR	TOTAL
AMEC Black and MacDonald	172,661	0	0	172,661
AMEC Foster Wheeler Environment & Infrastructure	2,945	443	0	3,387
AOMS	4,400	0	0	4,400
Blue Water Agencies	26,129	0	0	26,129
Cougar Helicopters	18,981	7,025	0	26,006
Dominion Diving Ltd.	12,100	0	0	12,100
East Coast Catering	17,500	0	0	17,500
EM&I	44,800	7,380	6,868	59,048
Envirosystem Inc.	3,200	0	0	3,200
ExxonMobil Canada (Sable Project)	244,000	12,000	8,000	264,000
Halliburton	11,284	22,482	4,872	38,638
Heerema	0	0	22,186	22,186
Hercules	26,200	0	0	26,200
HNZ	15,685	985	0	16,670
Lloyd's Register	2,200	500	400	3,100
London Offshore Consultants	112	2	114	227
Noble Drilling	14,179	2,986	2,556	19,721
Reliance Offshore Canada	87,576	0	0	87,576
Secunda Canada	108,778	42,303	0	151,081
SGS	7,220	24	0	7,244
TOTAL	819,949	96,129	44,996	961,073

Appendix 2

2017 Research and Development Initiatives

Recipient	Program Description	Investor
Dalhousie University	Geoscience Research	Sable Owners
Zoe Lucas	Beached Bird Survey	Sable Owners
Nova Scotia Students	The Pengrowth - Nova Scotia Scholarships	Pengrowth
Nova Scotia University Students	The Pengrowth-Nova Scotia Innovation Grant	Pengrowth
Kingfisher Environmental Health Consultants	Sable Island Air Monitoring Data Analysis	Sable Owners