

INFRASTRUCTURE & MANUFACTURING CAPABILITIES STUDY

September, 2000



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October 24, 2000

Mr. Bernie MacDonald, Director, Benefits and Training
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5151 George Street
Halifax, NS B3J 3P7

Re: Nova Scotia Infrastructure and Manufacturing Capability Report

Dear Mr. MacDonald:

Attached is the final copy of the "Nova Scotia Infrastructure and Manufacturing Capability Report" as per our agreement in your letter dated March 14, 2000.

This report, for the most part, addresses the issues outlined in our original agreement. I was pleased with the reception from all parties who were interviewed or contributed to the input of this "Study". This includes representatives from SOEI, PanCanadian, the RDA,s, service companies, CNSOPB, local fabrication companies, industry associations, Enterprise Cape Breton Corporation and the Petroleum Directorate.

Throughout the course of this project, the Petroleum Directorate and Enterprise Cape Breton were commended, by individuals from all organizations involved in this project, for commissioning this undertaking. It is strongly urge that the initiatives and recommendations highlighted in this "Study" continue.

Your assistance, that of Frank Sommerville, the entire staff of the Petroleum Directorate together with that of Al England and Tim Gilfoy of Enterprise Cape Breton Corporation, were critical factors in obtaining the information required for this "Study".

Thank you for your support and cooperation and hopefully we will have the opportunity to work together again in the near future.

Yours truly,

Len Perry, P. Eng.

attachment

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1.0 EXECUTIVE SUMMARY

Representatives of the Nova Scotia business community interviewed for this "Study" were very supportive and pleased with this initiative by the Petroleum Directorate and Enterprise Cape Breton Corporation to commission this "Project". We reached many players and potential players, many of who were not informed or understood the potential of the Offshore. Our information meetings, in conjunction with participating Regional Development Agencies, proved to be an efficient and effective method to meet with interested companies.

We were able to convey to the community, the requirement and expectations of oil companies involved in offshore oil and gas development. We offered suggestions and methods as to how they can become more informed.

There is considerable manufacturing capacity in Nova Scotia with the ability to produce equipment for the offshore; however, many lack the knowledge of the industry or the players. This is more evident for companies outside the Metro Halifax region. There are many opportunities for local companies to participate as many traditional suppliers providing components to the offshore have them fabricated by others. Putting these suppliers in touch with the Nova Scotia companies must be a priority of this initiative.

Oil companies, oilfield service companies, engineering and design teams are not aware of the full extent of capabilities of Nova Scotia companies. This report suggests methods that will provide opportunities for the oil companies to become more aware of, utilize Nova Scotia companies and ultimately improve the efficiencies of their operation. To increase the participation of Nova Scotia Companies, this report recommends:

- that the design and project engineering be done in Nova Scotia, this will give more Nova Scotia manufacturing firms access to product requirements for the offshore;
- that the oil companies develop a more open policy and provide the names of potential equipment suppliers and to provide contact names to allow Nova Scotia firms to make arrangements to form joint venture partnerships;
- immediately, with industry participation, develop an inventory of available skills in the Province to ensure that the workforce is here to meet the anticipated labour demands;
- that a closer look be taken at the sites identified in this report for the assembly of major components. Provision for some financial support for infrastructure will have to be considered; and
- that the Petroleum Directorate assign a senior representative to work with industry to implement and follow-up on these recommendations.

With the present activity in the offshore, it is imperative that these recommendations be acted upon immediately.

2.0 REPORT PURPOSE AND METHODOLOGY

2.1. PURPOSE

- Review the capabilities of the Nova Scotia manufacturing industry and related service companies and assess their ability to meet the needs of companies involved in the exploration and development of oil and gas offshore Nova Scotia,
- Identify suitable sites in the Province for fabrication and assembly of larger components such as jackets, topside decks and modules.
- Review the availability of labour and supervisory personnel to meet the anticipated demand requirements of the manufacturing community,
- Identify gaps in the Nova Scotia capability and propose suggestions as to how these gaps may be filled.

2.2. METHODOLOGY

- Review the 'SOEI Assessment Reports' for the years 1998 and 1999 relative to the performance of Nova Scotia companies,
- Meet with the Executive Directors of the Regional Development Agencies (R. D. A.) throughout the Province, inform them of the objective of this "Study", solicit their support and input to identify and arrange meeting with companies in their respective regions,
- With the assistance of the RDA's, tour sites in their region that might be suitable for the assembly of larger components,
- Meet with the oil company representatives to obtain, as much as possible, information related to their needs and requirements for on going development programs,
- Meet with individual companies that are actively involved, as well as companies interested in becoming involved in the offshore,
- Develop an inventory of the capabilities of Nova Scotia companies, highlighting major equipment, employment levels, certifications and QA/QC and HS&E programs.

Notes: *Data gathered from oil company representatives for this Report was to determine, 'an order of magnitude', of the labour requirements for future projects. This was compared to the availability of labour in the manufacturing community of the Province.*

*A comparison of the person-hours required to the available manufacturing person-hours in Nova Scotia is shown in **Section 7.2 WorkForce**. Scheduling for this analysis is based upon information provided by SOEI and PanCanadian.*

A review of the anticipated components and the capability of industry in Nova Scotia to do this work have been carried out. The equipment assessment and budgeted labour-hour requirements is based upon components supplied for Sable Phase I. Should the scope of work change, the results may vary somewhat, however the order of magnitude for the labour requirements should not vary significantly.

In the process of gathering information, a number of companies without offshore experience were provided with suggestions as to how they can implement formal quality (QA/QC) systems, health, safety and environmental (HS&E) programs. The importance of sound management systems was also reviewed with the companies.

3.0 FUTURE OFFSHORE PROJECTS - SHORT AND MEDIUM TERM

The Nova Scotia offshore is currently experiencing intense seismic work to enable oil companies to identify drilling prospects over the next one to four years. Forty-two active offshore exploration licences each require a well to be drilled if the land is to be kept. Eight additional blocks of land are currently up for bid. This exploration effort is designed to prove reserves in the area surrounding the current Sable Offshore Energy Project, find new discoveries along the Scotian shelf, in the deep waters on the slope of the shelf as well as several areas off Cape Breton.

Looking out 10 to 15 years from now, Nova Scotia appears to be entering a period of sustained growth in the development of offshore projects. By 2010 or 2015 Nova Scotia could see many projects under various stages of development. However, the scope of this report is to focus on the more immediate developments: Sable Second Phase or Tier II and the PanCanadian Deep Panuke Project plus one additional project.

3.1. FUTURE OFFSHORE PROJECTS - SOEP PHASE II

The Sable Offshore Energy Project (SOEP) was designed to be implemented in two phases. Phase I which includes facilities at Thebaud, North Triumph and Venture went into production on December 31, 1999. The plan for Phase II calls for the construction of production facilities at the South Venture, Glenelg and Alma fields and a compression deck. Phase II, was originally designed to be implemented over a number of years to replace depleted production from Phase I.

Current high market demand for natural gas and the drive to increase reserves through new exploration may affect the timetable and scope of this project. For the purposes of this report, it is assumed that the production facilities will be similar to that of the first SOEP facility, hence assumptions for labour and equipment is based upon SOEP Phase I.

Components include:

- Jackets
- Platforms
- Process equipment
- Support equipment
- Compression deck, equipment and jackets for Thebaud.

3.2. FUTURE OFFSHORE PROJECTS - PANCANADIAN DEEP PANUKE

This project involves the development of PanCanadian's discovery of natural gas in an area below the Cohasset-Panuke oil project. The results of the first three wells on the structure were

very positive, and at the time of writing this report drilling was proceeding on a fourth and fifth well in an effort to prove the reserves.

A formal decision on the project is expected to be announced by year-end 2000 or early 2001. PanCanadian is actively modelling project design options to determine the most economic method of developing the fields. For the purposes of this report it has been assumed that this development will proceed and consist of the following:

- Support structures, and
- Topsides platforms and modules.

PanCanadian officials view a project at Deep Panuke as the first of a number of projects they believe possible for their company off Nova Scotia. They have indicated their strong support and desire to assist in the establishing a sustained manufacturing industry in Nova Scotia to service the offshore.

Examples of equipment packages and components that can be manufactured in Nova Scotia shops include, but are not limited to the following:

- Helicopter refuelling systems
- Separators
- Condensate equipment
- Amine Plant
- Injection systems
- Sulphur recovery equipment
- Metering systems
- Dehydration equipment
- Refrigeration systems
- Water and waste disposal systems
- Dryers and air purification systems
- Process equipment
- Escape systems
- Fire fighting systems
- Water treatment and purification systems
- Downhole equalization packages
- Power generation systems
- Wellhead equipment
- Pig launching and receiving systems
- Subsea templates
- Sewage disposal systems
- Hydraulic systems

This list is representative of equipment packages or small modules and components required for offshore projects. These items include structural frames, pressure vessels, tanks, piping, electrical, hydraulics and controls together with components supplied by others.

These small modules can be skids that vary from a couple of tons up to 50 - 60 tons; they may include specialized and proprietary items that may have to be purchased from specific vendors. Often specialized engineering design is done by a vendor or the project design team, with manufacturing by a number of manufacturing companies. Many Nova Scotia companies have the capability to manufacture components, assemble and test these modules and then provide ongoing service. This will be a benefit to the purchasing company. The element that may be missing is the knowledge of the offshore industry, engineering expertise and experience in the production of these components. Establishing a vehicle through which local companies can educate themselves and make contact with the designer of this equipment will help considerably in having more of this work done in Nova Scotia.

To date, a number of Nova Scotia companies through a license agreement or as a sub-contract have produced these items. There is considerably more of this work that can be done in this Province.

3.3. OTHER PROJECTS NOT INCLUDED

In addition to the exploration commitments by ExxonMobil in the area around SOEP and PanCanadian, a number of other firms have extensive drilling requirements and plans. Of particular interest is the effort by Shell, Marathon, Kerr-McGee in the deep waters on the Scotian slope. In addition, in the medium term, exploration off Cape Breton either in the Laurentian Sub-basin or closer to shore is likely to result in development. However, as little work has begun on these projects, it is premature to attempt to define the scope of these future developments and they have not been factored into this Study.

Nevertheless, some observations are possible. Future deep-water deep discoveries will, in all probability, utilize "sub-sea connection" systems. Considerable development work for this method of recovery is required presenting Nova Scotia with the opportunity to become a world leader in this technology for both the production and export of this equipment.

No provision has been assumed in this "Study" for the manufacture of components that may be required for spin-off or secondary industry that could locate in Nova Scotia to take advantage of relatively low energy costs. This will have an additional impact on the manufacturing industry.

4.0 NOVA SCOTIA INDUSTRY CAPABILITIES

4.1. GENERAL OVERVIEW

4.1.1. Industry Workforce

Nova Scotia industry has proven fabrication capabilities. This has been demonstrated during SOEP. Construction of the North Triumph topside deck, the accommodation modules, the construction of the Gas Plant as well as the Fractionation Plant was done by Nova Scotia companies. In addition, a local company has the ongoing contract for operational engineering.

Since the start of the Sable Offshore Energy Project, a number of companies have expanded their facilities and upgraded their plant equipment, others either in the process of upgrading or have immediate plans in place to do so.

This section of the report examines the capabilities of the workforce, the companies and identifies some of the gaps at the present time.

Many shops in Nova Scotia have the physical capability to increase production by adding more shifts. In some instances, the full benefit of multiple shifts can not be realized because of the lack of suitable first line supervision and skilled labour.

Companies located in the Halifax Regional Municipality draw from the same labour pool. These employees are highly mobile. If work is not currently available at one company, the trades move to another. Accordingly, when firms assess their available workforce, they are counting individuals who may also be counted by other firms. This possible duplication has prevented this study from being able to determine the total labour force available to the manufacturing industry in the Province. Acquiring this information is a necessary follow-up to this study.

Issues continually raised by individual companies throughout the course of this "Study" include:

- Most shops, in particular machine shops, could be operating at higher levels were more qualified machinists available. Physical plant capabilities and equipment exist to meet additional demand. In some instances, specific equipment may be required.
- The availability of qualified welders and fitters will be a problem. Some of the fabrication shops are feeling the effects of this problem now.
- In many cases there are not enough capable young trades-people coming through the system. It is recognized that there has not been a requirement of the training system to produce these skills over the last few years.

- **An ageing work force** will result in a significant number of skilled people retiring; there is a growing concern that the gap will not be adequately filled. There is hope that individuals who left the province will move back bringing the needed skills with them.
- There is a **real shortage of trained supervisory personnel** in the workplace. This issue is one that our training institutions must look into. This is a major concern for companies wishing to add additional shifts.
- A number of companies are taking advantage of the Provincial Apprenticeship program, however issues related to the skill of the individuals and the proportion of apprentices and journeymen should be reviewed.
- Expanding the apprenticeship program for skills upgrade of the existing workforce should be looked into. Developing supervisory training programs should be a priority.

4.1.2. Industry Strengths

Nova Scotia offers substantial fabrication capability. The industry's strengths include but are not limited to the following:

- Existing facilities capable of producing heavy structural components;
- The proven ability to meet the welding and quality requirements for major offshore components,
- A mix of skilled trades of a wide variety disciplines that are required to produce components and provide on-going service,
- Multiple sites within the Province can be prepared for the assembly of topside platforms and jacket legs. The costs to prepare these sites will vary depending upon the existing infrastructure,
- Existing local companies wanting to work with experienced companies having offshore experience and proprietary products. This will create local manufacturing and service capability for the oil and gas producer. This could lead into long term alliances.
- Educational institutions to provide trades training and skills upgrade.

A review of the equipment supplied for Tier I of Sable and the role played by Nova Scotia companies has verified that much of the equipment required for the offshore can be produced in Nova Scotia. Since the start of the SABLE Project many companies have upgraded their facilities, quality programs and health safety and environment programs. This program of facilities improvement is continuing with a number of companies.

We have many companies who want to partner with companies with offshore experience, however they need additional help with this.

4.1.3. Industry Gaps

This Study has indicated that the majority of work for on-going development of the offshore can be done in Nova Scotia. However the study also discovered a number of gaps that can be overcome through industry and government action. The issues that should be reviewed include the following:

- Currently, no Nova Scotia company has plate roll capacity to form plate for jacket construction. A number of companies are reviewing this requirement and this issue is expected to be addressed in the near future.
- Many smaller Nova Scotia companies are not familiar with the products or requirements for the offshore. Finding out this information has been difficult.
- Some companies have been discouraged by the apparent high cost of implementing a recognized quality program.
- Where project engineering has been done outside Nova Scotia, access to information by Nova Scotia companies is limited. Having project engineering and project management done in the Province would make information more readily available and result in more competitive bids.
- Most major oil companies appear to be unaware with the scope, depth, capabilities and potential of local firms. This lack of knowledge is also apparent in their contracting authorities. This can be overcome by establishing closer links between the oil companies, their traditional suppliers and Nova Scotia companies.
- At present, no clear organizational structure or team leader has emerged to represent the Nova Scotia fabrication industry that has the capability to take responsibility for a complete project. The creation of such leadership will be important for Nova Scotia to maximize the manufacturing benefits of full project participation.
- To meet the machining requirements for Blow-out Preventors, Completion Systems, Wellhead Systems, Subsea Wellhead Systems and Connectors, Nova Scotia companies require CNC lathes and vertical boring mill equipment capable of turning the inside and outside requirements for components of approximately 48" diameter and ten feet long. There is a CNC Horizontal Boring Mill in Trenton, Nova Scotia that appears to have the capacity for this equipment.

- Some companies will require the appropriate industry certifications and quality programs to enable them to manufacture specific products.

4.1.4. Suggestions Conveyed to Smaller Suppliers

In addition to the larger shipyards and fabricators, Nova Scotia has a wealth of capabilities in a number of small, specialized machine shops throughout the province. For the purposes of this study, it was recognized that it would not be possible to interview all these fabrication and machine shops. However, to ensure that as many shops as possible were reached, the assistance of the Regional Development Agencies throughout the Province was sought. It was felt that the RDA's would have knowledge of local industry, and in particular that of smaller companies.

A presentation was made to the general meeting of executive directors in Sydney on April 6, 2000. This forum was used to introduce the scope of this 'Project' and the role that the RDA's would be asked to play. To introduce the 'Study', Frank Sommerville of the Petroleum Directorate, Al England of Enterprise Cape Breton Corporation and the Consultant, Len Perry, reviewed the purpose of the study and scope of the work to be done. The section under Role of RDA's in this Report includes the presentation as well as follow-up information provided and requested.

Information meetings were held in regions where interest by the business community was demonstrated. Where meetings were not held, individual meetings with companies interested in becoming more informed about opportunities with the offshore were arranged.

For companies that did not have experience with the offshore and wished to gain more information, the following suggestions were presented as to how to become more informed:

- Consider subscribing to "Offshore Resources" magazine, a copy was given to each company to review, in addition a copy of the "Eastern Canada Oil and Gas Map" was left with them.
- List their company with BIDS Nova Scotia. A registration form was left with them.
- For companies that were wishing to get more involved it was suggested that they consider joining OTANS. An application form was left with them.

Presentations to companies included the importance of addressing the deficiencies outlined in the Sable Offshore Energy Incorporated (SOEI) Supplier & Infrastructure Assessment reports, namely, the importance of incorporating the following:

- An accepted quality program. It had been suggested that smaller companies need not fully implement a total ISO Program, but rather, an abbreviated program that could fall under the program of a larger fabrication company. This can be accomplished through a series of evening sessions delivered through an approved

ISO practitioner. There are a number of consultants in Nova Scotia as well as the Federal Business Development Corporation that are capable of delivering these programs at a very reasonable cost to these companies.

- The implementation of Health Safety and Environmental programs that meet that offshore industry standards. It was pointed out that these could be implemented concurrently with a quality program.
- That they implement basic management systems that track costing, scheduling, inventory and deliveries.
- The importance of quality and delivery and developing a verification program that will substantiate as well as reinforce the ability to meet stringent timeframes.

It was suggested there could be opportunities for the smaller companies to become involved as a sub-supplier to larger companies bidding on major components. The probability of two major projects running concurrently would place delivery demands on the fabrication industry in Nova Scotia, hence the need for the smaller companies to become involved.

Individual company visits were arranged to gain a better knowledge of their facilities, equipment, and capabilities and to review their plans to meet the anticipated growth in opportunities for the offshore.

The feedback from these meetings has indicated that the information presented was both informative and useful. The consensus being that this initiative of the Petroleum Directorate and Enterprise Cape Breton Corporation was very helpful and that a continuing program of "After Care Follow-up" be maintained.

5.0 GENERAL CONCLUSIONS

Phase I of the Sable Project did proceed very quickly from project final approval, through construction to completion. As a consequence many Nova Scotia companies did not have sufficient time to gain information as to the scope of the project, types of equipment required or the names of companies that they might partner with to enable them to submit a bid or joint venture.

In many instances components are not manufactured by the supplier but are subcontracted to other fabrication companies. There are Nova Scotia companies capable of producing all, or a significant portion of, a majority of these items. They require the contact names and sufficient lead-time.

Having the offshore platform decks assembled locally will improve the opportunity for smaller fabricators to compete successfully in the supply of sub-components.

Companies involved in the development of oil and gas in the waters off Nova Scotia could make a more concerted effort to identify the names of their potential suppliers well in advance of a project and make these names available to local companies. This would then allow local companies to pursue joint venture or subcontract arrangements with these companies. In addition the oil companies and their purchasing authority should encourage their suppliers, and stress the importance, for them to team up with Nova Scotia companies. The Petroleum Directorate could play a role in this by acting as a catalyst for this program and as well as mentor to help to bring the appropriate companies together.

Local companies interviewed confirmed that finding out about equipment requirements was very difficult. Smaller firms especially, did not have the marketing depth to source this information themselves.

Company managers recognize that they may have to make further investments in their company. With the identification of specific opportunities, they are ready to do this. They are prepared to meet the quality requirements and recognise that they have to be competitive. Many now export products to locations outside Canada and meet competitive and quality requirements.

The apparent promise of a sustained period of growth and development in the offshore for Nova Scotia is giving industry in this Province the confidence necessary to further develop their capability and capitalize on this business opportunity. They see opportunities both home and abroad. Many companies interviewed have expanded their facilities or have indicated their preparedness to expand their capabilities, including management systems. Many are anxious to form joint venture partners and become more involved in this business opportunity. Other Nova Scotia companies are in the process of reviewing opportunities to work together in joint venture arrangements.

Having more local companies involved in this industry will be beneficial to the oil and gas producers, service will be local, inspection costs reduced during the fabrication period, and ultimately reducing overall operating costs.

Early indications of major energy users seeing Nova Scotia as possible location for their operation also signals reason for Nova Scotia companies to develop business plans to further capitalize on this promise of additional economic growth and business opportunities. Nova Scotia should be in a position to offer natural gas to major users at a substantially lower cost than any other location on the eastern seaboard of North America. Investment in these facilities will offer further business opportunities to many of these same fabrication and machining companies.

6.0 RECOMMENDATIONS

That the Petroleum Directorate and Enterprise Cape Breton Corporation, in conjunction with other government agencies, address the following issues:

6.1. PRODUCT KNOWLEDGE

1. Develop a program to review the specific equipment and component requirements for both SOEI and PanCanadian development projects, identify the names of the supplier companies and a contact person.
2. With local companies having the appropriate capabilities, establish contact with the product suppliers to encourage sub-contract or joint venture relationships.
3. Initiate meetings with the offshore operators, contractors, and service companies with selected local companies wanting to become more involved in the offshore. This will be particularly helpful for manufacturers in Cape Breton and others outside the Metro Halifax area. This process will help all parties to become more aware of the needs of the industry. Meetings should include engineering and design consultants and be carried out in cooperation with the Offshore/Onshore Technologies Association of Nova Scotia (OTANS), other industry associations, the Petroleum Directorate, Enterprise Cape Breton Corporation as well as other government agencies.
4. Work with offshore oil and gas companies to ensure project engineering and management work is done in Nova Scotia. This will be a major factor in providing local companies the opportunity to be more competitive in the supply of components.

6.2. WORKFORCE INVENTORY

1. The Nova Scotia Petroleum Directorate in conjunction with Economic Development (which now has provincial responsibility for labour force development issues) and OTANS immediately begin work to create an inventory of available trades people. This study should identify individuals in each trade; their skill level; certifications and current place of work. A micro-analysis of this scope is required because of the mobility of the trades and the inability of an individual company to know if their fluctuating labour force includes people also counted by competing firms. Such a study would enable the province to determine immediate and or future skill strengths, capabilities and deficiencies. The major fabrication companies in the Province must be canvassed.

6.3. TRAINING ISSUES

1. Work with the Community College system to initiate skills training, and upgrade programs for all trades related to the offshore including supervisory and project management training programs for the manufacturing community,

2. The Nova Scotia Petroleum Directorate work with the Atlantic Canada Petroleum Institute to develop a program for the continuing advancement of technology within Nova Scotia related to "sub-sea completions".

6.4. GENERAL

1. Nova Scotia should promote the Province as the most economic location on the Eastern seaboard taking advantage of the economies of using natural gas at the closest point where it comes ashore. Relative to other areas, Nova Scotia should market low energy costs, a good place to locate your business.
2. The Petroleum Directorate, working with Enterprise Cape Breton Corporation together with other government agencies, be charged with the responsibility of following through on the recommendations of this "Study".
3. To ensure that the full benefit and momentum is built from this "Study", it is recommended that the Petroleum Directorate and Enterprise Cape Breton Corporation each assign a senior person to follow-up the points outlined in this "Study." An initial meeting and schedule must be developed by October 31, 2000 to arrange:
 - meetings with the Oil Companies to identify component suppliers that Nova Scotia companies can contact for the fabrication of specific items;
 - arrange meetings, with the assistance of industry associations, that will bring oil companies and local industrial suppliers together;
 - initial planning to ensure that local companies are the right companies for the specific product and that they recognize and are prepared to make the appropriate investment in time and money;
 - verify inventory of the labour force for the manufacturing community; and
 - monitor the process and the program.

7.0 INVENTORY OF CAPABILITIES

7.1. MANUFACTURING FACILITIES

A complete list of companies participating in this study is included in **Exhibit 7.1**. This is representative of companies that are presently active in the offshore or have expressed an interest to become involved, there are other companies not mentioned in this report that fall into this category as well.

Appendix A provides a brief description of individual companies and specific capabilities relative to each. It must be emphasized that other Nova Scotia companies are positioned and have been actively involved in the offshore.

7.2. WORKFORCE

Exhibit 7.2 compares the available work force to the anticipated labour demand for the projects highlighted. For this comparison, the existing or normal work force of the companies interviewed was used.

This chart indicates the total "person-years" required for the production of components that could be manufactured by Nova Scotia companies is 5,561 person-years (order of magnitude). For the purpose of this Study, 'the order of magnitude', for the labour requirements were confirmed by representatives of PanCanadian and SOEI based upon SOEP Phase II and PanCanadian Deep Panuke. In addition, based upon aggressive exploration plans, it is assumed that additional projects will be developing at two-year intervals. One additional project has been assumed for this Report.

The total annual person-years available from the shops listed is 2,235 and is deducted from the requirement showing the surplus of labour as indicated in **Option I and Option II**. **Option I**, assumes that each shop can expand its workforce by 10% to meet this increased demand. **Option II**, the more probable scenario, is based upon the normal workforce and indicates the balance of the workforce for the construction schedule indicated. For both Options, it is assumed that companies will devote 40% of their normal workforce to the Offshore. If these numbers are accurate, the over capacity of the workforce is only 110 people for the Year 2003. Furthermore, should the schedule of these projects be accelerated, ***a labour shortage within the manufacturing community in Nova Scotia could occur.***

Each company has the plant capacity to expand their output provided the labour force is available. Other reports analyzing the Nova Scotia fabrication capability have been produced based upon the plant capacity.

The workforce numbers used in this Study were provided by the companies and were based upon their normal operating levels. The major concern is that most of these

companies draw from the same labour pool, hence, there could be multiple counting in these totals. Other critical factors are the split of the trades and the age of the workforce.

MORE WORK IS REQUIRED TO ANALYZE THE ACTUAL WORKFORCE AVAILABLE.

7.3. ASSEMBLY SITES FOR MAJOR COMPONENTS

The following sites have been identified as having the potential for the final assembly of components such as jackets and production platforms:

- Bear Head – Richmond County
- Halifax Dartmouth Area
- Melford Industrial Land Reserve – Guysborough County
- Pictou Industries – Pictou
- Sheet Harbour
- SYDPORT – Cape Breton Regional Municipality

A detailed summary for each of the above-noted sites together with locator map NSPD Map PD 2000-2a can be found in **Appendix B** of this report.

Each of these locations, boast water accessibility as a special feature and other benefits that warrant consideration. It should be noted that transportation connections, particularly water transportation, are good for the existing sites and are included in the development plans for the "proposed" sites.

Discussions with representatives of Irving Equipment have verified that skidding components from land to barge for transport is quite feasible. They indicate that the load out costs for barge should be relatively low compared to the component costs.

Note: *One method reviewed would be to sink a barge on a prepared apron alongside a jetty and skid or roll the component onto the barge, re-float the barge and tow it to the desired location. This method could be used for jackets and topside platforms and apply to every location reviewed. Other local companies such as A.W. Leil Cranes and Equipment Limited and Mills Heavy Hauling Limited can also offer these services.*

Exhibit 7.1

Offshore Oil and Gas Project - Infrastructure & Manufacturing Capabilities

Machine Shops	Location	Capability	Contact	Phone #
Amherst Machining Ltd.	Amherst	precision machining	Gerald Gosbee	667-7936
Atlantic Hardchrome Limited	Dartmouth	oil field machining	Paul D. Ferguson	469-3606
Bartlett Plastics and Precision Machining	Truro	precision machining	Barry Bartlett	895-2977
Canadian Maritime Engineering	Dartmouth	oil field machining	Jack Nicholson	468-1888
Chester Plastics 1975 Ltd.	Chester	precision machining	Michael Johnston	275-3522
Clare Machine Works Ltd.	Metegan Centre	machining	Vincent Stewart	645-2216
Colchester Precision Components Limited	North Sydney	precision machining	Mike Elliott	423-9271
CROOKS Mechanical Systems Ltd.	Dartmouth	precision machining	John Fitzpatrick	468-5653
Custom Machine & Tool Co. Ltd.	Mount Uniacke	precision machining	Charlie Mason	866-2420
Fundy Grinding & Machining Ltd.	Truro	machining	David Drummond	865-0326
R. P. Hawboldt Machining Limited	Trenton	precision machining	Robert Hawboldt	752-6934
IMP Group Limited – Aerospace Machining Division	Dartmouth	precision machining	Denis Peverill	468-3958
MacGregor's Custom Machining Ltd.	New Glasgow,	precision machining	Andrew MacGregor	922-2029
Mobile Valve Repairs Limited	Mount Uniacke	valve repairs	Jamie Trowiss	866-0719
Quality Machining Services Limited	Windsor	precision machining	Mike Brown	798-8605
R F Ironworks Ltd.	Dartmouth	oil field machining	David Redden	461-1000
Specialty Services	Location	Capability	Contact	Phone #
Allsteel Coatings Ltd	Port Hastings	coating systems	Mark Cooper	625-1575
Brooke Ocean Technology Ltd.	Dartmouth	engineering	Geoff Lebans	468-2928
Ed's Hydraulic & Marine Services	Mabou	hydraulic service	Eddie MacDonald	945-2231
Focal Technologies Corporation	Dartmouth	rotary joints	Geoffrey H. Channer	468-2263
Pluracom Atlantic a Division of Corroless Atlantic Inc.	Sydney	coating systems	Lawrence Gilbert	564-1996
Reinforced Plastics Systems Inc.	Mahone Bay	FRP piping	W. A. Marshall	624-8383
ROPAK Canada Inc., Can-AM Division	Springhill	plastic components	Richard Harrison	800-565-5439
Trenton Works Ltd., a Greenbrier Company	Trenton	forgings	Robert MacEachern	800-536-2388

Offshore Oil and Gas Development - Infrastructure & Manufacturing Capabilities

Total shop labour force available from companies listed below is 2235 person years, this option assumes that 40% of this workforce will be dedicated to offshore work and the workforce is increased by 10% with these additional people being used for offshore work.

Projects Combined Schedules: FOR JACKETS, PLATFORMS & MODULES **ONLY!** OTHER SPIN OFF WORK FOR ONSHORE PROJECTS, UNDERWATER PIPELINES OF SECONDARY INDUSTRY IS NOT INCLUDED

PROJECTS	Total Person-Years	2001	2002	2003	2004	2005	2006	2007	2008	2009
Alma	413			138	275					
Glenelg	413				138	275				
South Venture	360					120	240			
Compression Deck	1097						274	549	274	
PanCanadian - proj # 1	1778	162	647	647	323					
- proj # 2 (assumed)	1500							333	667	500
Labour Required	5561	162	647	784	736	395	514	882	941	500
Labour Available		1118	1118	1118	1118	1118	1118	1118	1118	1118
Option I - Labour Surplus		956	471	334	382	723	604	236	177	618
20% Overlap Adjustment-note 3		179	179	179	179	179	179	179	179	179
Adjusted-Surplus/Shortage		777	293	155	203	544	425	57	-2	439

Notes:

1. Assuming that companies will not sacrifice their traditional business, in all probability 30 - 50% of this workforce will be available for offshore work. - **Option I** - 40% of work force with an additional 10% being hired for the additional work load.
2. It can be assumed that spin-off industry will be starting to impact the fabrication industry by 2004 - 5, this is not shown in these figures. No allowance is made for the anticipated retirement of individuals from the workforce.
3. **The labour-force shown, in all probability, includes overlap (range could be from 15% - 25% of workforce) as many of the companies draw on the same pool of labour.**
4. *It is highly unlikely that there can be a 10% increase in the labour pool across the entire Province.*
5. **To verify the actual available qualified labour force over this time period: A COMPREHENSIVE LABOUR ANALYSIS MUST BE UNDERTAKEN**

Fabrication Companies included in this "Analysis"

ABCO Industries Ltd.
 BANC Metal Industries Ltd. (MM Industra)
 Cherubini Group of Companies
 FABCO Industries Limited
 Hawboldt Industries (1989) Ltd.
 Irving Shipbuilding Inc.
 Lunenburg Industrial Foundries and Engineering

MacFar Industries Ltd.
 Marid Industries Ltd.
 Maritime Steel and Foundries Ltd.
 Mulgrave Machine Works Limited
 North Sydney Marine Railway Inc
 Pictou Industries, an American Eco Company
 RKO Steel Limited

EXHIBIT 7.2b - Option #2

L N Perry Consulting Inc.

Offshore Oil and Gas Development - Infrastructure & Manufacturing Capabilities

Total shop labour force available from the companies listed below is 2235 person years, this option assumes that 40% of this workforce will be dedicated to offshore work.

Projects Combined Schedules: FOR JACKETS, PLATFORMS & MODULES **ONLY!** OTHER SPIN OFF WORK FOR ONSHORE PROJECTS, UNDERWATER PIPELINES OF SECONDARY INDUSTRY IS NOT INCLUDED

PROJECTS	Total Person-Years	2001	2002	2003	2004	2005	2006	2007	2008	2009
Alma	413			138	275					
Glenelg	413				138	275				
South Venture	360					120	240			
Compression Deck	1097						274	549	274	
PanCanadian - proj # 1	1778	162	647	647	323					
- proj # 2 (assumed)	1500							333	667	500
Labour Required	5561	162	647	784	736	395	514	882	941	500
Labour Available		894	894	894	894	894	894	894	894	894
Option 2 - Labour Surplus		733	248	110	158	499	380	13	-47	394
20% Overlap Adjustment note 4		179	179	179	179	179	179	179	179	179
Adjusted-Surplus/Shortage		554	69	-69	-21	320	201	-166	-225	216

Notes:

1. Assuming that companies will not sacrifice their traditional business, in all probability 30 - 50% of this workforce will be available for offshore work. - **Option 2** - 40% of workforce used for this option.
2. It can be assumed that spin-off industry will be starting to impact the fabrication industry by 2004 - 5, this is not shown in these figures.
3. No allowance is made for the anticipated retirement of individuals from the workforce.
- 4. The labour-force shown, in all probability, includes overlap (range could be from 15% - 25% of workforce) as many of the companies draw on the same pool of labour.**
- 5. To verify the actual available qualified labour force over this time period: A COMPREHENSIVE LABOUR ANALYSIS MUST BE UNDERTAKEN**

Fabrication Companies included in this "Study"

ABCO Industries Ltd.
BANC Metal Industries Ltd. (MM Industra)
Cherubini Group of Companies
FABCO Industries Limited
Hawboldt Industries (1989) Ltd.
Irving Shipbuilding Inc.
Lunenburg Industrial Foundries and Engineering

MacFar Industries Ltd.
Marid Industries Ltd.
Maritime Steel and Foundries Ltd.
Mulgrave Machine Works Limited
North Sydney Marine Railway Inc
Pictou Industries, an American Eco Company
RKO Steel Limited

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Infrastructure & Manufacturing Capabilities Study

MANUFACTURING CAPABILITIES

The Offshore/Onshore Technologies Association of Nova Scotia (OTANS) Membership Directory contains a comprehensive list of companies having extensive capabilities and experience in the Offshore, these include companies involved in coatings; hydraulics; engineering and design; transportation and heavy lift; plus a wide variety of other related activities.

Many of the companies listed below, through the Regional Development Agencies in their respective regions, have expressed an interest in finding out more information about the offshore and how to become involved.

This list is a condensed profile of the companies interviewed and does not represent all the companies that should be considered for work for future offshore projects in Nova Scotia.

The equipment and facilities comments are intended to highlight special features only of each organization, senior representatives of each company have indicated their desire to become involved in the offshore industry and are prepared to invest further in plant, equipment, additional certifications, quality programs and management systems as required.

Many of these companies have been or are in the process of forming partnerships or alliances with companies now working in other parts of the World in the offshore.

FABRICATION COMPANIES

The following list represents companies whose primary activities include the production of equipment or products utilizing fabricating facilities, however, many also have machining facilities to complement their operation.

Companies included have either expressed an interest in being included in this "Study" or have been involved in the exploration and development phases of the offshore. For additional companies that are not included here, the Offshore Onshore Technologies Association of Nova Scotia (OTANS) membership directory should be consulted.

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Infrastructure & Manufacturing Capabilities Study

ABCO INDUSTRIES LIMITED

P. O. Box 1120, 81 Tannery Road
Lunenburg, NS, B0J 2C0
Ph: 902 634-8821
Fax: 902 634-8583
E-Mail: info@abco.ca
Contact: J. D. (Jim) Eisenhauer, President

Plant Description: seven-acre site with 25,600 sq.-ft. of comprehensive light to medium metal fabrication, machining and assembly capabilities.

Products: specialized stainless, aluminum and mild steel components for:

- the food and beverage processing
- material handling
- marine industry and aquaculture
- mining
- waste processing, environmental and recycling
- specialized manufacturing

Sales and Service:

- Mechanical and Electronic Weighing Systems
- Forklift Trucks
- ASEA Brown Boveri Turbochargers
- Materials Handling Equipment

Certifications: Canadian Welding Bureau, CWB 47.1; CWB 47.2 (aluminum)
CSA Z299.3
Engineering and design capability

Will form joint venture partnerships of subcontracting arrangements with offshore suppliers.

Will expand and invest in facilities to meet new market opportunities.

Ideally suited for the fabrication and assembly of components with structural, mechanical, piping, electrical and electronic controls.

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BANC METAL INDUSTRIES LTD. (FORMERLY MM INDUSTRA LTD.)

3 Acadia St.

Dartmouth NS, B2Y 4L7

Ph: 902 465-7675

Fax: 902 465-4102

E-Mail:

Contact: Basim Halef, President & CEO

Plant Description: two sites comprised of 22 acres with 122,000 sq.-ft. of covered fabrication and storage area with:

- Rail access
- Water access to a common user dock, 220 meters in length with 8.8 m at low tide
- In addition to the fabrication, machine and general assembly shops the “Offshore Assembly” shop has 2 – 40 ton cranes with 52’ – 0” under the hook as well as 2 – 20 ton and 2 – 15 ton cranes with 32’ – 0” under the hook.
- Major equipment includes:
 - 55 ft. X 10 ft burning table
 - extensive sub-arc welding capability
 - plasma burning
 - 3 – axis, Wotan Tetetrol horizontal boring/milling machine, 5 1/8 spindle
 - 3 – axis, Rambaudi CNC Versamill 12/2000, horizontal spindle open-side milling and boring machine
 - Daninichi heavy duty oil country lathe, 40” swing over bed X 40’ – 0” length
 - HES 80” bed-type milling machine
 - metal rolling, shearing and forming equipment

Products:

- Heavy Industry, components for the:
 - petro-chemical,
 - power generation,
 - pulp and paper,
 - heat exchanger repairs and modifications
- Offshore: a wide variety of components including:
 - heavy wall pressure vessels,
 - storage tanks,
 - mud separators,
 - casing connectors,
 - production test equipment,
 - burner booms,
 - pipe spools,
 - specialty equipment,
 - deck modules,
 - North Triumph jacket legs for the Sable Project,
 - North Triumph platform for the Sable Project.

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Has manufactured components under license and as a joint venture partner.

Certifications:

- ISO 9002-1994 Quality Standard – Moody International Registrar
- ASME. “A”, “H”, “PP”, and “U” Stamps, Shop and Field Authorization
- National Board of Boiler & Pressure Vessel Inspectors’ authorization for “R” (repair) Stamp, plant and field.
- Canadian Welding Bureau 47.1, Div. 1 & 2 and W59
- Lloyd’s Register of Shipping
- American Bureau of Shipping
- American Petroleum Institute
- American Welding Society

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CHERUBINI GROUP OF COMPANIES

50 Joseph Zatzman Drive
Dartmouth NS, B3B 1N8
Ph: 902 468-5630
Fax: 902 468-5742
E-Mail: cmw@istar.ca
Contact: Danilo Gasparetto, President

Plant Description: Five fabrication and assembly facilities totaling over 156,000 sq.-ft. with 5 acres of yard storage. Major equipment includes:

- Press breaks up to 600 ton X 20' – 0"
- Shears and plate rolls
- CNC – plasma cutting table, 40' X 10'
- CNC – FICEP Model 903 DB 7 axis, drilling & sawing system
- CNC – 4 head deck panel sub arc welder gantry system
- FICEP computerized automatic angle line
- FICEP automated punch

Products: full line of structural steel components and plate-work including heavy girders for bridges and heavy structural components for process industries.

Projects: Major bridge structures including the Angus L. MacDonald Bridge upgrade, a variety of heavy components for the Confederation Bridge between PEI and New Brunswick, ship repair work for Secunda Marine.

Certifications:

Canadian Welding Bureau 47.1, Div. 1 & 2 and W59

Is willing to partner with companies with offshore experience.

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Infrastructure & Manufacturing Capabilities Study

FABCO INDUSTRIES LIMITED

45 Raddall Ave.

Dartmouth NS, B3B 1L4

Ph: 902 468-3222

Fax: 902 468-3328

E-Mail: fabco@ns.sympatico.ca

Contact: Len Thompson, Vice President

Plant Description:

- 30,000 sq.-ft. manufacturing metal facilities with experience in carbon steel, stainless steels and aluminum.
- Have access to the Woodside dock in Dartmouth NS, this is a common user dock, 220 meters in length with 8.8 m at low tide.

Manufacturing capability includes:

- lathes up to 45" dia swing X 196" long bed,
- milling machines,
- horizontal boring machine,
- radial drills,
- insitu machining equipment,
- plate rolls, press brake and shears

Products:

- marine related equipment,
- ship repair,
- offshore related equipment including the Thebaud and Venture offshore living quarters for the Sable project,
- oil rig-related components and repairs.

Has manufactured components under license and as a joint venture partner.

Certifications:

- ISO 9002
- Canadian Welding Bureau 47.1, Div. 1 and W59
- Lloyd's Registry

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HAWBOLDT INDUSTRIES (1989) LTD.

PO Box 80

Chester NS, B0J 1J0

Ph: 902 275-3591

Fax: 902 275-5014

E-Mail: pfb@hawboldt.ns.ca

Contact: Pernille Fischer Boulter, New Business manager, Marketing & Sales

Plant Description: 40,000 sq.-ft. manufacturing facility with:

1. Machining:
 - Lathes up to 24" swing X 160" bed
 - Facing lathes to 72" swing,
 - Vertical milling machines,
2. Fabrication
3. Hydraulic Shop
 - 125 Hp test stand
 - winch test tower
 - 50 HP cylinder bench
 - cylinder honing
4. Foundry – non-ferrous
 - Electric and oil furnaces up to 1,500 lb. capacity for brass, bronze alloys and aluminum.
 - Propellers up to 76" dia.

Certifications:

- ISO 9001
- Canadian Welding Bureau for steel and aluminum W47.1, and W47.2 and W59 certification,
- Quality programs tp CAN 3 – CSA 3 Z299.3

Products:

- Oceanographic equipment including:
 - electro-hydraulic power units
 - winches
 - spools
 - boom storage reels
 - towing and mooring winches
 - capstans
- Propellers

Has produced components to, and is looking for companies to manufacture under license and as a joint venture partner.

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Infrastructure & Manufacturing Capabilities Study

IRVING SHIPBUILDING INC. (4 LOCATIONS)

P. O. Box 9110, 3099 Barrington St

Halifax, NS, B3K 5M7

Ph: 902 423-9271

Fax: 902 422-5253

E-Mail: HUDSON.KEVIN@HALIFAXSHIPYARD.COM

Contact: Kevin J. Hudson, General Manager – Nova Scotia Facilities

This organization has formed an alliance with AMEC, a fully integrated engineering, construction and development group actively involved in the development of offshore projects throughout the World.

2. HALIFAX SHIPYARD

Plant Description:

- Six shops comprising approx. 135,000 sq.-ft. plus an additional 16,500 sq.-ft. of warehouse facilities,
- Docking facilities up to 36,000 tons,
- Over 700' of berthing facilities with 6 –7 meters of draft,
- module and fabrication shops with plate forming, rolling, burning and shearing capability,
- complete range of welding capability including: carbon and high alloy steels, aluminum and stainless steel,
- full machining capability including: Bullard 50" – turret lathe, Bertram 8' – vertical boring mill, Collet 6" spindle – horizontal boring mill with a 12' X 12' table, pipe bending equipment.

Products: Ship building and repair, semi-submersible drill rigs, drill-ships, offshore supply vessels, mine sweeper vessels for the Canadian Navy.

Certifications:

- ISO 9002 (1994) Quality Management System Registration
- Canadian Welding Bureau, Div 3 Certification (CWB W 47.1)
- Germanischer Lloyd – Approved for welding of Hull Structures (Certification No. WF0010036HH)

3. DARTMOUTH MARINE SLIPS

Plant Description:

- Four marine railways up to 4000 tons with 18' draft,
- 1200' of wharf facilities with 18' draft,
- 12,550 sq.-ft. fabrication facilities,
- machine shops
- steel shops with plate forming, rolling, burning and shearing capability,

4. STEEL AND ENGINE PRODUCTS LIMITED (LIVERPOOL)

5.

Plant Description:

- steel shops with plate forming, rolling, burning and shearing capability, serviced with overhead cranes,
- machine shop includes: CNC milling, NC milling and turning centers, 60' – 0" long-bed lathe, 110" Vertical Boring Mill plus other machining capability,
- 1800 tonne marine railway,
- foundry,
- 600' wharf facilities with 16' – 0" draft,

Products:

- ship repair,
- pressure vessels,
- fuel and storage tanks,
- general fabrication including modules.

Certifications:

- Canadian Welding Bureau, Div 2.1 Certification (CWB W 47.1).
- ASME Section VIII, Div 1, "U" Stamp.
- Canadian Standards Association CSA Z 299.3, Quality Program.

6. SHELBURNE SHIP REPAIR

7.

Plant Description:

- 12,000 sq.-ft. of fabrication and assembly facilities,
- 3000 ton marine railway,
- access to public wharf, 1500 ft. of berthing with 7 – 9 meters of draft.

Products:

- ship repair,
- general fabrication.

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Infrastructure & Manufacturing Capabilities Study

LUNENBURG INDUSTRIAL FOUNDRY ENGINEERING (LIFE)

P. O. Box 1340
53 Falkland St.
Lunenburg, NS, B0J 2C0
Ph: 902 634-8827
Fax: 902 634-8886
E-Mail: life@tallships.istar.ca
Contact: Peter Kinley, President, CEO

Plant Description:

- Ship repair,
- Metal fabrication with forming, burning and shearing capability,
- Machine shops with lathe having 53" swing X 20' – 0" bed,
- Marine railways, up to 1600 tons with 16' draft,
- 500 ft. wharf with 20' – 22' draft,
- Foundry,

Products:

- ship repair,
- marine engine sales and service.

Certifications:

- Canadian Welding Bureau.

Is willing to partner with companies with offshore experience.

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Infrastructure & Manufacturing Capabilities Study

MAC FAR INDUSTRIES

290 Brookside St

Glace Bay, NS, B1A 1M2

Ph: 902 564-8763

Fax: 902 562-6914

E-Mail: badger@fox.nstn.ca

Contact: Tom MacPherson, President, or Stephen Farrell, Vice President – Engineering

Plant Description: located at the Sydport site, (see Sydport description under the facilities section of this Report).

- Metal fabrication facilities, including cutting, shearing forming capability,
- Paint & sandblasting shop,
- Light fabrication and pipe shop, including CNC pipe profiling equipment,
- Machining facilities.

Products: interested in the fabrication and assembly of jackets, topside modules and other large components that can be shipped by barge.

Certifications:

- ISO 9002 – 1994,
- Welding to CSA W59.
- Can bring extensive capabilities to the offshore industry.

Wishes to joint venture with other companies already established in the offshore.

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Infrastructure & Manufacturing Capabilities Study

MARID INDUSTRIES LIMITED

P. O. Box 2070

Windsor Junction, Hfx. Co., NS, B2T 1K6

Ph: 902 865-0326

Fax: 902 865-1107

E-Mail: marid@marid.ns.ca

Contact: David Oulton, General Manager

Plant Description: fully integrated structural steel shop with facilities in Windsor Junction NS.

Products:

- structural steel, projects up to 1,500 tons,
- misc. metals,
- shop and field services.

Certifications:

- Canadian Welding Bureau, Div 1, CSA W47.1.

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MARITIME STEEL AND FOUNDRIES LTD. (2 LOCATIONS)

379 Glasgow St.

New Glasgow, NS, B2H 5C3

Ph: 902 752-1511

Fax: 902 755-6690

E-Mail: daler@north.nsis.com

Contact: Dale Robertson, Vice President and General Manager

1. New Glasgow, NS

Plant Description:

- Extensive facilities for the manufacture of heavy structural steel components,
- Fabrication facilities include:
 - burning tables, 500 ton press brake,
 - CNC Fabripunch,
 - drilling,
 - column facing and turning machine,
 - plate rolling capabilities,
 - Shot blast equipment,
 - Sub-arc welding.
- Machine shop facilities, including,
 - lathes including 24" swing
 - CNC, boring machines up to 90",
 - planer miller,
 - horizontal milling machines up to 5" bar,
 - gear cutting equipment,
- Steel foundry capable of producing castings up to 6,000 tons.

2. DARTMOUTH, NS

Plant Description:

- Two heavy steel fabrication facilities of 90,000 and 100,000 sq.-ft.
- CNC burning tables of 150' X 12' and 120" X 10" with plasma burning capability,
- Sub-arc welding,
- Shot blast equipment,
- Shearing and forming capability,
- Overhead crane for handling large girders,
- Access to shipping by water.

Products:

- Structural steel for heavy industry,
- Bridge and very large bridge girders,
- Mine hoists,
- Hydraulic gates for power dams,

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Infrastructure & Manufacturing Capabilities Study

- Offshore components:
 - Steel hulls sections for pontoons,
 - Drill decks,
 - Bases for revolving cranes,
 - Deck girders and ring stiffeners for the North Triumph platform,
 - Crews quarters.

Certifications:

- Canadian Welding Bureau, Div 1, CSA W47.1,
- American Institute of Steel Construction, Category III, Major Steel Bridges, with Fracture Critical Endorsement.

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Infrastructure & Manufacturing Capabilities Study

MULGRAVE MACHINE WORKS LTD.

P. O. Box 280

Mulgrave NS, B0E 2G0

Ph: 902-747-2157

Fax: 902 747-3362

E-Mail: mmw.metal@ns.sympatico.ca

Contact: Sean Reid, General Manager

Plant Description:

1. Location I: - 25 acre lot with:
 - 7,200 sq.-ft. fabrication shop with:
 - plate bending, shearing and rolling capability
 - sub-arc welding capability,
 - annealing and stress relieving equipment,
 - serviced with overhead travel crane.
 - 5,000 sq.-ft. Machine Shop with:
 - 10" hollow spindle lathe with 32" swing,
 - engine lathes up to 60" swing with 22' between centres,
 - 60" horizontal boring mill,
 - milling machines,
 - slotters.
 - 7,800 sq.-ft. Warehouse, storage and office facilities.
2. Location II: - 5 acre lot with:
 - 36,000 sq.-ft. fabrication and assembly facility,

Access to the common user wharf, which is 1,400 feet long with a water depth of 30', this facility located in Mulgrave, is on the Strait of Canso, which is an ice free harbour.

Products: manufactured and/or rebuilt:

- pressure vessels,
- fuel and storage tanks,
- B. O. P. Handling Systems,
- Flare Booms,
- Down Hole Tools,
- Guide bases,
- Marine Risers,
- Oilfield Production Skids,
- Process piping,
- Bulk handling equipment,
- Subsea Templates,
- Wellheads,
- Work on Drill Rigs.

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Certifications:

- ISO 9000 Certification in process,
- CSA Standard Z299.3 Quality Verification Program,
- ASME Section VIII, Div. 1 and ANSI/ASME B31.1 quality Control Program, including provisions to meet the requirements of the National Board Inspection Code.
- ASME Certificates of Authorization for Power Piping and unfired Pressure Vessels c/w “U” and “PP” Code Symbol Stamps,
- Canadian Welding Bureau, , CSA W47.1, Div 2.1,
- NBIC Certificate of Authorization to apply the “R” Code Symbol Stamp for repair/alteration to Power Piping and unfired Pressure Vessels,
- Have fabricated components certified by:
 - American Bureau of Shipping,
 - Det Norske Veritas (DNV).

Has extensive experience working in the Offshore with a variety of firms and organizations.

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NORTH SYDNEY MARINE RAILWAY INC.

255 Commercial St
North Sydney, NS, B2A 1B5
Ph: 902 794-8555
Fax: 902 539-0054
Contact: Jerry E. A. Nickerson, Chairman

Fabrication and machining facilities with marine railway

Products:

- Ship repair,
- Metal fabrication

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PICTOU INDUSTRIES, AN AMERICAN ECO COMPANY

P. O. Box 1150

Pictou NS, B0K 1H0

Ph: 902 485-1104

Fax: 902 485-4957

E-Mail: hector@nsis.com

Contact: Jim Theriault, Yard Manager

Plant Description: over 60,000 sq.-ft. of fully serviced covered manufacturing space including:

- 32,400 sq.-ft. assembly shop serviced by, 1 – 45 and 2 – 20 ton overhead cranes,
- 13,500 sq.-ft. fabrication shop serviced by, 2 – 20 ton cranes, equipment includes:
 - Linde CM 350 – NC Burning Table, 21' – 6" X 50' – 6" (plasma and gas)
 - 750 ton press,
 - shears,
 - plate rolls, ½" X 20' – 0" capacity,
- machine shop, equipped with:
 - lathes,
 - milling equipment,
 - shapers,
 - radial drills.
- 1,500 tonne marine railway with side transfer
- 240,000 sq.-ft. of assembly area,
- 1,000 tonne floating dry dock,
- 600' of concrete quay.

Products:

- ship building and repair,
- general fabrication of large components.

Certifications:

- Canadian Welding Bureau, Div 1, CSA W47.1.

This facility could be considered for the fabrication and assembly of larger components that must be shipped by water such as jackets and platform decks.

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Infrastructure & Manufacturing Capabilities Study

RKO STEEL LIMITED

85 MacDonald Avenue
Dartmouth, NS, B3B 1T8
Ph: 902 468-1322
Fax: 902 468-6870
Contact: Pat Cunningham

Plant Description: fully integrated structural steel shop with facilities in Dartmouth NS,

Products:

- structural steel, projects,
- misc. metals,
- shop and field services.

Certifications:

- Canadian Welding Bureau, Div 1, CSA W47.1.

Has supplied structural components to the Sable Project.

FABRICATION SUPPORT COMPANIES

These companies have expressed an interest in becoming involved the fabrication of components for the Offshore. They recognize that they do not have the capability of Prime Contractor status but wish to be considered as a sub-contractor to larger companies. Also they realize that they will have to implement formal QA/QC and HS&E programs.

ALL STEEL BUILDERS LTD.

PO Box 13, Havre Boucher
Antigonish Co. NS, B0H 1P0
Ph: 902 234-3202
Fax: 902 234-2176
Contact: Mac Fuller, Manager

Misc. metal work, fabrication and pre-engineered buildings.

BENJAMIN HEATING PRODUCTS

166 Junction Rd, PO Box 2079
Springhill, NS, B0M 1X0
Ph: 902 597-3796
Fax: 902 597-3797
E-Mail: heating@inforamp.net
Contact: Stephen Benjamin, General Manager

Plant Description: 48,500 sq.-ft. including:

- CNC plasma burning system equipped with CAD/CAM TekSoft software,
- CNC AMADA 50 ton punch,
- Devilbis 6-axis robotic welding system,
- CNC – ROBOTool milling machine,
- 5 – independent/interconnected computer stations.
- Conventional machine shop tooling and shearing, punching and forming equipment,
- 5 – stage zinc phosphate system,
- paint system, conveyed foe medium, long run with 30 ft. bake oven.

Products: Hot water boilers and heating furnaces, light metal fabrication including electrical boxes, bins hoppers etc.

Certifications:

- ISO 9002 compliant
- CSA – Canadian Standards Association
- ULC – Underwriter's Laboratory of Canada
- A.F.U.E. – Annual Fuel Utilization Efficiency

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- ETLM – Energy Testing Laboratory of Maine
- CRN – Canadian Registration Number

BORDERTOWN MANUFACTURING SERVICES

McCully St. Amherst Industrial Park
Amherst NS,
Ph: 902 667-9621
Contact: - Harvey Haynes

Misc. metal work and fabrication

MARK COMEAU WELDING

RR # 1, Saulnierville, Box 60B
Digby Co, NS, B0W 2Z0
Ph: 902 769-2493
Fax: 902 769-2493
Contact: - Mark Comeau

Misc. metal work and fabrication

COTTAGE MECHANICAL SERVICES LTD.

357 Haliburton Rd, PO Box 760
Pictou NS, B0K 1H0
Ph: 902 485-8735
Fax: 902 485-9262
E-Mail: plandry@cottagemechanical.ns.ca
Contact: Philip Landry

Miscellaneous metal work, fabrication and pipe welding.

E. L. K. S. FABRICATORS LTD.

Sydney, NS
Ph: 902 539-2064
Fax: 902 539-2064
Contact: Kevin Muise

Structural steel, fabrication and erection.

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EAST COAST HYDRAULICS MACHINERY LTD.

P O Box 130
Mulgrave NS, B0E 2G0
Ph: 902 747-3133
Fax: 902 747-2388
Contact: Mike Feltmate

Facilities include machining and fabrication capabilities.

Products: Hydraulic winches, misc. fabrications, hydraulic services and components.

LYONS BROOK PIPING AND WELDING LIMITED

RR # 2,
Pictou NS, B0K 1H0
Ph: 902 485-5460
Fax: 902 485-6065
Contact: George Corbin, President

Misc. metal work, fabrication and pipe welding

Certifications:

- CSA Standard 47.1 and W 59-M,
- ASME Code IX,
- ASME B31.3,
- CSA W178.2,
- 3-Z299.3-85.

MBB POWER SERVICES INC

11 Pond Drive
Springhill, NS, B0M 1X0
Ph: 902 597-2964
Fax: 902 597-3356
Contact: Perry J. White, Regional Manager

Boiler and Auxiliary Equipment – contracting and fabricating.

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G M MACDONALD WELDING LTD.

P O box 249
Whycocomagh, NS, B0E 3M0
Ph: 902 756-2575
Fax: 902 756-2943
Contact: Gordon M. MacDonald

Misc. metal work and fabrication.

MACGILLVRAY WELDING & METAL FAB. LTD.

PO Box 35
Advocate Harbour, Cumberland Co. B0M 1A0
Ph: 902 392-2997
Fax: 902 392-2552
Contact: Dwight MacGillivray

Misc. metal work and fabrication.

D R MARTIN'S METAL WORKS LTD.

PO Box 2193
Springhill NS, B0M 1X0
Ph: 902 597-3112
Fax: 902 597-3112
Contact: Dan Martin

Misc. metal work and fabrication

NOVA MILLWRIGHTS LIMITED

Freeman St
Middleton, NS, B0S 1P0
Ph: 902 825-2318
Fax: 902 825-4768
Contact: - Steve Horridge, President

Misc. metal work and fabrication

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PARRSBORO METAL FABRICATORS LIMITED

P O Box 637,
Parrsboro, NS, B0M 1S0
Ph: 902 254-2543
Fax: 902 254-3863
Website: www.kerrheating.com
Contact: Derek A. Flynn. P. Eng. General Manager

Plant Description: fully integrate fabrication facility for the manufacture of heating boilers, furnaces and fuel storage tanks.

SUPERPORT MARINE SERVICES LIMITED

P O Box 22, 30 Water Street
Port Hawkesbury, NS, B0E 2V0
Ph: 902 625-3375
Fax: 902 625-3339
E-Mail: spm@superport.ns.ca
Contact: Les MacIntyre

Facilities: custom fabrication of metal components including aluminum and carbon steel.

MACHINE SHOPS

Please note that a number of the machine shops listed below, although are recognized as machine shops, also have good fabrication capabilities.

AMHERST MACHINING LTD.

5 McCully Street, Amherst Industrial Park

Amherst, NS, B4H 3Z2

Ph: 902 667-7936

Fax: 902 667 4960

E-Mail: amherstmachining@ns.sympatico.ca

Contact: Gerald Gosbee, Owner

Plant Description: up to date facility located in the Amherst Industrial park in Amherst, NS.

- CNC production machining including:
 - CNC lathe – envelope size 12” X 19”
 - 3 – CNC milling machines – envelope size 20” X 40” X 20”
 - conventional precision tool making equipment,
 - surface grinding equipment,
 - 3D – CAD/CNC software, computers, small machine tools, jigs, fixtures, gauge and inspection equipment.

Products:

- business includes technically challenging prototype, tool and die, mold of similar “one-off” products.
- Precision components for:
 - communications equipment,
 - hydraulic fittings,
 - food processing equipment,
 - aerospace components
- CNC custom component manufacture,

Certifications: consistent with the standards and requirements of ISO 9002.

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ATLANTIC HARDCHROME LIMITED

5 Notting Court, Burnside Industrial Park,
Dartmouth, NS, B3B 1N2
Ph: 902 469-3606
Fax: 902 464 1951
Contact: Paul D. Ferguson, President

Plant Description: fully equipped machine shop with conventional and CNC equipment.

Products:

- Threading for rotary shoulder connections,
- Hardchrome plating,
- Oilfield threading,
- Cylindrical/surface grinding, hydraulic and sales and service,
- Dynamic balancing.

Certifications:

- ISO Registered,
- API Spec. 7 for threading for rotary shoulder connections,
- Canadian Welding Bureau Certified.

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BARTLETT PLASTICS AND PRECISION MACHINING

P O Box 802,
23 Lower Truro Rd.
Truro NS, B2N 5E8
Ph: 902 895-2977
Fax: 902 895-2458
E-Mail: plastics@bppm.ns.ca
web page: www.bppm.ns.ca
Contact: Barry Bartlett, President

Plant Description: Modern fully integrated plastic molding facility with equipped with 3-D CNC machining facilities, including:

- Trumpf Trumatic L3030 CO2 Laser Cutting Centre
 - CNC operated,
 - Cut very thin metals up to 1" thick handling 5'-0" X 10'-0" plates with laser accuracy,
- CNC machining and turning centres for the production of tool and die moulds and other precision components for either production runs or custom one off components.
- Custom or production plastic injection molding.
- Precision state of the art inspection equipment.

Products:

- Custom plastic injection molding,
- Custom CNC and conventional machining,
- Laser burning services,
- Inspection services for precision machined components.

Certifications: full ISO 9002 Certified.

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CANADIAN MARITIME ENGINEERING (FORMALLY MARSH ENGINEERING LTD.)

An affiliate of Canadian Babbitt Bearings

90 Thornhill Dr.

Dartmouth, NS, B3B 1S3

Ph: 903 468-1888

Fax: 902 468-1890

Contact: Jack Nicholson, Manager, Sales & Business Development

Plant Description: fully equipped machine shop with fabrication capability, including:

- Radial drills,
- Lathes up to 48" swing X 228" bed,
- Milling machines,
- Tos 4" horizontal boring mill with digital read-out: 65" X 45" X 52" capacity.
- Balance machine,
- Vertical boring machine 60" X 60",
- 300 ton Dodge horizontal press,
- hydraulic shear,
- plate rolls,
- cutting, burning and welding equipment,
- a comprehensive inventory of "portable field machining equipment".

Products: custom-machining services for both shop and field insitu work on components including:

- Steam turbines,
- Turbo chargers, blowers, and gas turbines,
- Reciprocating and turbo compressors,
- Pumps, boiler feed pumps,
- Gear boxes,
- Heavy rotating equipment and components in a wide variety of industrial applications,

Certifications:

- ISO 9002 Certified Quality System,
- Canadian Welding Bureau (CSA 47.1 and 47.2).

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CHESTER PLASTICS 1975 LTD.

P O Box 460, 4171 Route 3
Chester, NS, B0J 1J0
Ph: 902 275-3522
Fax: 902 275-5002
Contact: Michael Johnston, General Manager

Plant Description: CNC machine shop and fabrication facility.

Products: plastic packaging machinery and specialty aluminum foundry.

CLARE MACHINE WORKS LTD.

P O Box 146
Metegan Centre, NS, B0W 2K0
Ph: 902 645-2216
Fax: 902 645-2994
E-Mail: cmw@ns.sympatico.ca
Contact: Vincent Stewart

Plant Description: conventional machine shop with:

- 4 – lathes with capability of 40" swing X 16' – 0" centres,
- shaper,
- bandsaw,
- radial drill,
- welding equipment.

Products:

- hydraulic winches, pistons and power packs,
- metal fabrications,
- ship repair and fabrication of components.

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COLCHESTER PRECISION COMPONENTS LIMITED

80 Marine Dr., RR#1, Sydport Industrial Park,

North Sydney, NS, B2A 3L7

Ph: 902 539-9996

Fax: 902 539 9573

Website: www.cpc-canada.com

Contact: Mike Elliott, President

Plant Description: 25,000 sq.-ft. temperature controlled state-of-the-art machining facility equipped with 24 – CNC machining centres including:

- high speed horizontal and vertical milling centres,
- high speed turning centres,
- quality area with 2 – Coordinate measuring Machines including a Zeiss Prizmo 7 unit and a Starratt Manual Coordinate Measuring Machine.
- new product development centre,
- Chemical conversion coating area,
- Extensive manual equipment.

Products: precision production components for the telecommunications industry, shipping components throughout the World.

Certifications: ISO Compliant.

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CROOKS MECHANICAL SYSTEMS LTD.

70 Thornhill Dr.

Dartmouth NS, B3B 1S3

Ph: 902 468-5653

Fax: 902 468-5737

E-Mail: crooks.mechanical@ns.sympatico.ca

Contact: John Fitzpatrick, P. Eng

Plant Description: manufacturing facility producing precision machined components and fabrications, consisting of the following:

1. Machining:

- CNC mills from X – 22", Y – 16", Z – 22" up to X – 44", Y – 16", Z – 20",
- CNC turning centres with lengths up to 17.5" and diameters of 13.5",
- manual mills from X – 27", Y – 12", Z – 16" up to X – 30", Y - 15", Z – 20",
- manual lathes up to 18' swing and 80" between centres,

2. Fabrication:

- CNC band saw,
- additional cutting equipment,
- shears, rolls, forming and additional metal working equipment.

3. Engineering/Systems:

- Pentium workstations, MASTER CAM & CAD, Plotter, and software.

Products: machining and fabrication of components of:

- aluminum, stainless steels, titanium copper and other materials,
- aerospace components,
- electronic components and assemblies,
- telecommunications components and assemblies,
- meteorological and oceanographic components and assemblies.

Certifications:

- ISO 9002 Certification and Registration in process,
- AQAP-4,
- MIL-I-4520,
- Certified welding of aluminum in accordance with MIL-STD-1595A.

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CUSTOM MACHINE & TOOL CO. LTD.

Highway #1
Mount Uniacke, NS, B0N 1Z0
Ph: 902 866-2420
Fax: 902 866-0182
Contact: Charlie Mason, President

Services: precision machining services including fabrication of specialty tooling, fixtures, dies and other custom requirements.

FUNDY GRINDING & MACHINING LTD.

9 Farnham Rd.
Truro, NS, B2N 2X6
Ph: 902 895-6911
Fax: 902 893-7777
Contact: David Drummond

Plant Description: multi-disciplined machining operation with extensive shop capability and insitu tooling for carrying out field repair and modifications.

Products:

- custom machining,
- refurbishing machine shop tooling,
- sale of new machine shop tooling and equipment.

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R. P. HAWBOLDT MACHINING LIMITED

P. O. Box 248

Trenton, NS, B0K 1X0

Ph: 902 752-6934

Fax: 902 928-1519

Contact: Robert Hawboldt, President

Plant Description:

1. 5,000 sq.-ft. CNC machining facilities including:

- OKK MCH 800 Horizontal Machining Centre, featuring:
 - 4 axis automatic pallet changer,
 - travel - X – 79”; Y – 40”; Z – 32”,
 - spindle CAT 50; speed 30 – 3000 RPM,
 - chip removal system.
- 2 – CNC Turning Centres,
- 4 – CNC Vertical Machining Centres,

2. 9,000 sq.-ft. conventional machining facility including:

- 9 – lathes, up to 32” swing X 159” between centres,
- 2 – vertical turning lathes, up to 51” swing,
- 8 – milling machines of differing configuration and types,
- Planer Milling machine with travel of: X – 120”; Y – 32”; Z – 6”,
- Horizontal boring milling machine,
- Drilling, threading, keyseater and shaper,
- Surface grinder.

3. 5,000 sq.-ft. fabrication facility including:

- CNC – 4 – torch, KAIKE Mastergraph 3100 Cutting Machine,
- HYD-Mech H-12 Programmable Bandsaw,
- Conventional cutting and burning equipment,
- 150 ton ironworker.

Products: machining services to clients requirements.

Certifications: in compliance with the requirements of:

- ISO 9002
- CSN3-Z299.2
- AQAP-4

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IMP GROUP LIMITED – AEROSPACE MACHINING DIVISION

19 Akerley Blvd.
Dartmouth, NS B3B 1J6
Ph: 902 468-3958
Fax: 902 468-2261
Contact: Denis Peverill, Manager

Plant Description: 20,000 sq.-ft. environmentally controlled facility offering the following capability:

1. CNC Machining Operation with:

- 6 – Vertical machining centres up to 20" X 40" travels and 4th. axis rotating tables,
- Horizontal machining centres up to 40" X 80" travel,
- 3 – turning centres up to 22" swing.

2. Conventional Machining:

- 16 – mills up to 12" X 40" travel
- 8 – lathes, 6" up to 28" swing,
- jig bore 20" X 28",
- 4 – surface grinders, up to 12" X 24'
- cylindrical grinder, 18" X 40".

3. Measuring Equipment – Quality Control:

- 2 – co-ordinate units, up to 36" X 60" X 24" work envelope,
- optical comparator,
- digital height gauges,
- other digital and conventional tooling.

4. Fabrication Equipment:

- MIG and TIG welding equipment,
- Sub-arc hard facing equipment,
- 90 – ton ironworker.

Products: products for the Aerospace Market, including materials as follows:

- Aerospace Grade Aluminum,
- Stainless Steels,
- Commercial grades and tool steels,
- Titanium,
- Exotics, including – Inconel, Monel, Beryllium-Copper,
- Plastics, including – Vespel, Teflon, Nylon.

Certifications:

- ISO 9002: 1994,
- SPAR QAS-003 & SS-SG-3015,
- Delco MIL –I-45208

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MACGREGOR'S CUSTOM MACHINING LTD.

MacLellans Brook, RR#4
New Glasgow, NS, B2H 5C7
Ph: 902 922-2029
Fax: 902 922-2324
Contact: Andrew MacGregor, Sales Manager

Plant Description: 20,000 sq.-ft. facility including the following:

1. CNC Machining:

- 2 – thru-spindle lathes up to , 2' dia. – 14" dia. X 20" long,
- Vertical mill, X – 40" X 20" x 20".

2. Conventional Machining:

- 5 – lathes, up to 25" swing X 120" bed
- 4 – milling machines, up to X – 55" , Y – 11.8", Z – 16.5",
- universal tool and grinder,
- vertical slotter,
- radial arm drill.

3. Fabrication:

- cut-off saws,
- 330 ton press brake,
- 88 – ton punch,
- 80 – ton ironworker,
- welding equipment,
- pipe bender.

Products: Custom machining and fabrication services.

Certifications: CSA Z299.3

MOBILE VALVE REPAIRS LIMITED

P O Box 90
Mount Uniacke NS, B0N 1Z0
Ph: 902 866-0719
Fax: 902 866-1091
Contact: Jamie Towriss

Company services: shop and field service, maintenance and repair services for all aspects of valve repair. Customers include pulp and paper mills, oil refineries, utilities, offshore facilities and others.

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QUALITY MACHINING SERVICES LIMITED

PO Box 271
Windsor, NS B0N 2T0
Ph: 902 798-8605
Fax: 902 798-5915
Contact: Mike Brown

Plant Description: Machining and fabrication facility consisting of the following:

1. Machine Shop:

- CNC lathe 12" swing X 12" bed
- 2 – CNC milling machines
 - 16" swing X 44" bed
 - 10" swing X 50" bed
- 9 – lathes, up to 30" swing X 120" bed
- 10 – milling machines, up to 56" length X 10" width
- horizontal boring machine, 20" X 60" X 40"

2. Fabrication Shop:

- Press break – 12 ft. X 3/8 in.
- Shear – 10 ft. X 3/8 in.
- Universal Ironworker
- Welding and burning equipment, including. mig, tig, etc.

Products: high quality custom manufactured components of a wide variety of materials requiring a high tolerance of both fabrication and machining including:

- Machinery parts,
- Gears,
- Shafts & rollers,
- Machinery beds, and frames.

Certifications: in house program, meets Michelin North American (Canada) Inc. requirements.

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R F IRONWORKS LTD.

67 Atlantic Street
Woodside Industrial Park
Dartmouth, NS, B2Y 4P4
Ph: 902 461-1000
Fax: 902 461-1001
E-Mail: dredden@rfironworks.ns.ca
Contact: David Redden, President

Plant Description: 9,600 sq.-ft. machining facility with 1 – 10 tonne crane. 1.5 acres of outside storage and Hanomag front-end loader. Shop equipped with:

- CNC – Mori Seiki SL-80C Lathe:
 - 39.4" swing over bed.
 - 35.4" swing over cross slides.
 - 35.4" turning dia.
 - 14" spindle bore.
- CNC – Boehringer VDF V-800-15 NC Lathe
 - 3000mm centre to centre X 800mm swing.
 - 200mm spindle bore.
- Demoor Type 825A-S-360 Lathe, c/w Hydraulic Coping Attachment & SMW Pneumatic Chuck.
 - 2000mm centre to centre X 970mm swing.
 - 360mm spindle bore.
- Universal Gap Bed Lathe, CY 16 GB600, digital Readout.
 - 1500mm centre to centre X 400mm swing.
 - 635mm swing over gap.
 - 80mm spindle bore.
- Universal Precision Lathe, J1-360A
 - 1000mm centre to centre X 360mm swing.
 - 500mm swing over gap.
 - 40mm spindle bore.
- Radial Universal Milling Machine.
- Radial Drill.
- Horizontal Band Saw
- ARGUS 250 ton Swaging Press.
- 40 – Litre Zinc Phosphating Tank.
- PMC Contour Reader Model 150.
- API and Premium Thread Gauges.
- Welding Equipment and Machines.

Products: Pipe Threading, Tool Manufacturing and Repair Services for the Oil and Gas Industry.

Certifications:

- API approved for Q1 Standard and Specification Q7 and 5CT.
- Premium Threading for Premium Connectors.
- ISO Compliant

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RELATED SPECIALTY SERVICES

Listed are companies that responded to the "Study" notice in OTANS Bulletin or RDA contracts. For additional companies, reference OTANS Membership Directory.

ALLSTEEL COATINGS LTD.

P O Box 84
Port Hastings, NS, B0E 2T0
Ph: 902 625-1575
Fax: 902 625-3616
Contact: Mark Cooper

Company services: specialty coating systems for industrial applications for oil and gas pipelines, pulp and paper and other industrial applications.

BROOKE OCEAN TECHNOLOGY LTD.

P O Box 2220 East,
Dartmouth, NS, B2W 3Y2
Ph: 902 468-2928
Fax: 902 468-1388
E-Mail: glebans@brooke-ocean.com
Website: <http://www.brooke-ocean.com>
Contact: Geoff Lebans, P. Eng. Partner

Company Description: Engineering design company specializing in marine related services and products, including:

- Launch and recovery systems,
- Cable handling systems,
- Moving Vessel Profiler,
- SeaHorse™ Wave Powered Moored Profiler,
- Cable metering sheaves,
- Towed Bodies,
- Water Sampling Bottles,
- Seabed sampling equipment,
- Mechanical Systems Design,
- Machine Design,
- Mechanical Packaging,
- Towed System Development,
- Hydraulic system Design, Hydrodynamic Analysis,
- 3-D Rendering and Animation.

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ED'S HYDRAULIC & MARINE SERVICES

P O Box 196, 63 Mabou Ridge Road
Mabou NS, B0E 1X0
Ph/Fax: 902 945-2231
Contact: Eddie MacDonald

Company Services: hydraulics sales and service.

FOCAL TECHNOLOGIES CORPORATION

40 Thornhill Drive, Unit 7
Dartmouth NS, B3S 1S1
Ph: 902 468-2263
Fax: 902 468-2249
E-Mail: gchanner@focaltech.ns.ca
Website: www.focaltech.ns.ca
Contact: Geoffrey H. Channer, P. Eng. Director of Operations

Products and Services:

- fibre optic rotary joints,
- electrical slip rings,
- fluid rotary unions,
- video/data multiplexers.

PLURACOM ATLANTIC A DIVISION OF CORROLESS ATLANTIC INC.

P O Box 374, 26 Harbour Dr.
Sydport Industrial Park
Sydney NS, B1P 6H2
Ph: 902 564-1996
Fax: 902 564-5524
E-Mail: info@pluracom.ns.ca
Contact: Lawrence Gilbert, Technical Service Manager

Facilities: shop and field application equipment designed for the application of 15 second gel and 2 minute drying time, the design and operation of the plural component spray equipment.

Products: specialty Polymer coating systems for industrial applications for oil and gas pipelines, pulp and paper and other industrial applications.

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REINFORCED PLASTICS SYSTEMS INC.

P O Box 299, 740 South Main Street
Mahone Bay, NS, B0J 2E0
Ph: 902 624-8383
Fax: 902 624-6395
Contact: W. A. (Sandy) Marshall, Mgr. Research & Development

Facilities: more than 100,000 sq.-ft. manufacturing facility to fabricate fibreglass reinforced plastic (FRP) process equipment.

Products: custom designed and standard piping systems, stacks, duct and tanks from 1 inch diameter to 18 foot diameter. Industries include pulp and paper, chemical process, chloro-alkali, power utility.

Certifications & Quality Standards:

- ISO 9002 certified
- Societe Generale Surveillance
- Lloyds of London
- American Bureau of Shipping
- Technischer Uberwachungsverein
- American Society of Mechanical Engineers
- American Society for Testing and Mechanical Materials
- American Water Works Association
- Deutsches
- Institut fur Normung
- National Bureau of Standards
- British Standards Institute
- American Society of Civil Engineers

ROPAK CANADA INC, QUANTUM DIVISION

29 Memorial Crescent
Springhill NS, B0M 1X0
Ph: 1 800 565-5439 (Can) - 1 800 565-1420 (US)
Fax: 902 597-8318
E-Mail: richard_harrison@ropakcorp.com
Contact: Richard Harrison, Divisional Sales Manager

Facilities:

- fully integrated plastic injection molding operation producing a wide variety plastic products serving the food and beverage processing, paint and chemical industries, retail sales of containers, totes, baskets and barrels.
- Machining facilities for the production and repair of molds and associated equipment.

Certifications:

ISO 9002 Registered

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TRENTON WORKS LTD., A GREENBRIER COMPANY

P O Box 130, 34 Power Plant Rd.

Trenton NS, B0K 1X0

Ph: 800 536-2388

Fax: 902 755-3262

E-Mail: rmaceachern@trentonworks.ca

Contact: Robert MacEachern, P. Eng. Manager, Marketing & Sales, Trenton Works Forge

Plant Description: open-die forging facility with a capacity of 7,000 tons and the capability to forge ingots up to 100 tons.

Products:

- Forgings of carbon and alloy steels up to 55 tons forged weight,
- Rough machining capability,
- Full range of shafts and specialty products.

Certifications and Quality Standards:

- ISO 9002 Registered
- American Society of Mechanical Engineers
- American Society of Testing Materials
- American Bureau of Shipping
- DNV
- Lloyds Register

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MARK COMEAU WELDING	21
COTTAGE MECHANICAL SERVICES LTD.	21
E. L. K. S. FABRICATORS LTD.	21
EAST COAST HYDRAULICS MACHINERY LTD.	22
LYONS BROOK PIPING AND WELDING LIMITED	22
MBB POWER SERVICES INC	22
G M MacDONALD WELDING LTD.	23
MACGILLVRAY WELDING & METAL FAB. LTD.	23
D R MARTIN'S METAL WORKS LTD.	23
NOVA MILLWRIGHTS LIMITED	23
PARRSBORO METAL FABRICATORS LIMITED	24
SUPERPORT MARINE SERVICES LIMITED	24
MACHINE SHOPS	25
AMHERST MACHINING LTD.	25
ATLANTIC HARDCHROME LIMITED	26
BARTLETT PLASTICS AND PRECISION MACHINING	27
CANADIAN MARITIME ENGINEERING (FORMALLY MARSH ENGINEERING LTD.)	28
CHESTER PLASTICS 1975 LTD.	29
CLARE MACHINE WORKS LTD.	29

APPENDIX A

MANUFACTURING FACILITIES

Infrastructure & Manufacturing Capabilities Study

COLCHESTER PRECISION COMPONENTS LIMITED	30
CROOKS MECHANICAL SYSTEMS LTD.	31
CUSTOM MACHINE & TOOL CO. LTD.	32
FUNDY GRINDING & MACHINING LTD.	32
R. P. HAWBOLDT MACHINING LIMITED	33
IMP GROUP LIMITED – AEROSPACE MACHINING DIVISION	34
MACGREGOR’S CUSTOM MACHINING LTD.	35
MOBILE VALVE REPAIRS LIMITED	35
QUALITY MACHINING SERVICES LIMITED	36
R F IRONWORKS LTD.	37
RELATED SPECIALTY SERVICES	38
ALLSTEEL COATINGS LTD.	38
BROOKE OCEAN TECHNOLOGY LTD.	38
ED’S HYDRAULIC & MARINE SERVICES	39
FOCAL TECHNOLOGIES CORPORATION	39
PLURACOM ATLANTIC A DIVISION OF CORROLESS ATLANTIC INC.	39
REINFORCED PLASTICS SYSTEMS INC.	40
ROPAK CANADA INC, QUANTUM DIVISION	40
TRENTON WORKS LTD., A GREENBRIER COMPANY	41

BEAR HEAD HEAVY INDUSTRIAL COMPLEX, RICHMOND COUNTY, NS (PROPOSED)

This undeveloped site is located on the Strait of Canso approximately 3.5 km south of Statia Terminals in Richmond County and is considered as having the potential for the assembly of major components required for the development of oil and gas.

The Strait of Canso Industrial Development Authority commissioned O'Halloran Campbell Consultants Limited to prepare a detailed study on the development of this site. This report is available through the office of the Strait-Highlands Regional Development Agency or Enterprise Cape Breton Corporation in Port Hawkesbury.

This identified possible development opportunities offering deep water, ice-free harbour with substantial land being available for development. Details and features of this proposed site include:

- Deep water, - 15m. L. N. T.
- Transportation, including rail, highway and ocean shipping,
- Water services,
- Availability of labour,
- Support infrastructure.

Municipality of the County of Richmond

P. O. Box 120
Arichat, NS B0E 1A0

Contact: Alan MacDonald, Senior Economic Development Officer

Ph; 902 345-0745

Fax: 902 345-1510

E-mail: amacdon@ns.sympatico.ca

APPENDIX B

ASSEMBLY SITES

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Infrastructure & Manufacturing Capabilities Study

HALIFAX DARTMOUTH AREA

Companies in this area with previous experience and capabilities in the fabrication and assembly of major components for the Offshore include:

- BANC Metal Industries Limited (Formally MM Industria)
- FABCO Industries Limited
- Irving Shipbuilding Inc.

Other companies are reviewing options to become involved in this aspect of the Offshore.

Please refer to the section "Manufacturers" of this report for particulars on these companies.

MELFORD INDUSTRIAL LAND RESERVE – GUYSBOROUGH COUNTY, NS (PROPOSED)

This undeveloped property is located on the west side of the Strait of Canso and Chebucto Bay in Guysborough County. There are three sites identified as possible development opportunities, each offering deep water, ice free harbour with substantial land being available for development.

Representatives of the Guysborough County Regional Development Authority (GCRDA) have a detailed Assessment report that outlines the potential opportunities with a number of scenarios that should be considered for future development. This report details features of this land reserve including:

- Deep water,
- Transportation, including rail, highway and ocean shipping,
- Water services,
- Availability of labour,
- Support infrastructure.

The GCRDA have been holding discussions with companies that have expressed serious interest in developing one or more of these sites. Development will include the construction of a rail line to the site.

For additional information contact:

Guysborough County Regional Development Authority
46 Main Street
P. O. Box 49
Guysborough, NS B0H 1N0

Contact: Gordon MacDonald, Special Projects Manager
Ph; 902 533-2890
Fax: 902 533-2705
E-mail: gordonlm@gcrda.ns.ca
Web Address: www.gcrda.com

PICTOU INDUSTRIES – PICTOU COUNTY

Located at Pictou NS, Pictou Industries is an operating shipbuilding, ship repair and manufacturing facility with capability of fabricating major components and assembly of major components for the offshore.

Assembly facilities include:

- 60,000 sq. ft. covered assembly and manufacturing facilities,
- assembly shop equipped with 2 – 40 ton overhead cranes,
- 240,000 sq. ft. assembly area,
- 600 ft. long concrete quay,
- 300 ft. – 1500 LT marine railway (to be upgraded to 3000 LT) with side transfer,
- 200 ft. – 200 ft. long floating dry dock,
- water depth of 20 – 25 feet,

Manufacturing facilities include:

- NC Burning Table, 21.5' X 50.5' (Plasma & Gas)
- 3 – hydraulic presses, up to 750 tons,
- 2 – PTL Shears, up to .5" X 20'-0" plate,
- conventional machining capability,

For additional information on this facility, refer to the "Manufacturing" section of this Report.

Comments:

- conventional machining capability,
- Located in an industrial centre of Nova Scotia Pictou Industries can draw on an experienced work force.
- This facility does experience winter freeze up in the harbour, however, shipping of major components can be carried out during spring, summer and fall periods.
- Some work will be required on the site to allow for the movement of heavy components from the shops to the barge load-out area.
- A soils check may be required to ensure that land is sufficiently stable to accommodate these heavy loads.
- This location offers the good potential for assembly of major components with a minimum of site and facilities upgrade.

For additional information contact:

Pictou Industries
P. O. Box 1150
Pictou, NS B0K 1H0
Contact: Jim Theriault, Yard Manager
Ph: 902 485-1104
Fax: 902 485-4957

SHEET HARBOUR – HALIFAX COUNTY

This is an existing wharf facility located at Sheet Harbour, NS. This facility includes the following:

- approximately 600' common user wharf,
- approximately 11 meters of water,
- 12 acres of wharf area,
- an additional 40 acres of prepared storage and lay down area,
- 17,000 sq. ft. assembly / fabrication building with;
 - 9,000 sq. ft. of assembly area,
 - crane runway designed to accommodate 110 ton overhead travel cranes ,
- additional buildings;
 - 13,000 ft. sq.

Comments:

- this is a new facility with a concrete wharf and ample lay-down area,
- has land available for future development,
- should assembly take place at this site and barges be used for transportation of heavy components some site work may be required to accommodate loading of the barges,
- this is an ice free harbour capable of operating year around.

For additional information contact:

1. Malcolm Swinemer, Vice-President, Marketing
CERES – Cerescorp Company

4755 Barrington St
Halifax, NS B3K 5M6
Ph: 902 453-4590
Fax: 902 454-4772
E-mail: mswinemer@ceresglobal.com

2. Greg Brown, General Manager
Halifax Regional Development Agency

11 Glendale Ave., Unit 9
Lower Sackville, NS B4C 3P2
Ph: 902 869-4040
Fax: 902 869-4091
E-mail: hrda@chebucto.ns.ca

SYDPORT INDUSTRIAL PARK (PLUS LOUISBOURG)

Located in Cape Breton Regional Municipality, this is an existing facility that offers the following;

1. Facilities:

- 260 meter long jetty, with a water depth of 12 meters,
- 550 berthing space with 6 meters of water depth,
- site area is 600 acres,
- industrial site usable is 540 acres,
- services include;
 - fresh water,
 - fuel,
 - electrical power,
 - rail service,
- existing buildings for manufacture of components,
- ample storage and lay-down area,

2. Infrastructure:

- established skilled workforce,
- an established community with the support infrastructure of a metropolitan area.

Comments:

- This location offers facilities that are suitable for the assembly of major components required for the offshore,
- The Sydney area basically represents a major untapped region of Nova Scotia for the manufacture and assembly of major components for the offshore,
- Should a backup port for shipping of smaller components be required, or be more convenient, the Port of Louisbourg offers this capability. Louisbourg is an ice free harbour and shorter steaming time to current offshore production sites.

Contacts:

1. SYDPORT Industrial Park

P O Box 154,
Sydney, NS, B1P 6T7
Ph: 902 564-3636
Fax: 902 564-3612

2. Louisbourg Harbour Board

P O Box 347
Louisbourg, NS, B0A 1M0 Attn: H. Carter Stevens
Ph: 902 733-2436
Fax: 902 773-2679
E-mail: hcarter@atcon.com

ROLE OF THE REGIONAL DEVELOPMENT AGENCIES

In addition to the larger shipyards and fabricators, Nova Scotia has a wealth of capabilities in a number of small, specialized machine shops throughout the province. For the purposes of this study, it was recognized that it would not be possible to interview all these fabrication and machine shops. However, to ensure that as many shops as possible were reached, the assistance of the Regional Development Agencies throughout the Province was sought. It was felt that the RDA's would have knowledge of local industry, and in particular that of smaller companies.

A presentation was made to the general meeting of executive directors in Sydney on April 6, 2000. This forum was used to introduce the scope of this 'Project' and the role that the RDA's would be asked to play. To introduce the 'Study', Frank Sommerville of the Petroleum Directorate, Al England of Enterprise Cape Breton Corporation and the Consultant, Len Perry, reviewed the purpose of the study and scope of the work to be carried out.

Information meetings were held in regions where interest by the business community was demonstrated. Where general meetings were not held, individual meetings with companies interested in becoming more informed about opportunities with the offshore were arranged. Companies already involved with the offshore were also included.

Continuing discussions were held with other RDA representatives, not listed below, to insure that companies were not being missed, in these cases meetings with individual companies were held.

The following is a summary of the respective role played by the Regional Development Agencies:

CAPE BRETON COUNTY ECONOMIC DEVELOPMENT AUTHORITY-AUGUST 9, 2000

A copy of the attendees is attached. This meeting was very well attended thanks to the efforts of Eileen Lannon Oldford, Executive Director and Cindy O'Quinn who arranged a number of site visits.

There was a great deal of interest by many companies as to how they might become involved in the offshore, clearly many companies are interested in doing what is required to become qualified.

Prior to this visit other visits to the Cape Breton region were made and a number of plant and company visits were made.

APPENDIX C

ROLE OF RDA'S

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Infrastructure & Manufacturing Capabilities Study

This region offers a lot of potential to assist in the development of the offshore, including an existing infrastructure, a labour force, good training facilities and a site for the assembly of major components. More work is required to educate both the local business community and the oil companies as to the benefits of this region.

CUMBERLAND REGIONAL ECONOMIC DEVELOPMENT ASSOCIATION – AUGUST 1, 2000.

Rhonda Kelly, Executive Director and Kathy Douglas, Administration Officer were unable to arrange a general meeting however a number of companies were interested in site meetings, these were arranged through Kathy Douglas. These companies have been included in the list of manufacturers.

GUYSBOROUGH COUNTY REGIONAL DEVELOPMENT AUTHORITY – AUGUST 15, 2000

A meeting was held in Guysborough with Gordon MacDonald, Special Projects Manager and William Connolly, Special Advisor to review the Melford Industrial Land Reserve.

HALIFAX REGIONAL DEVELOPMENT AGENCY – JULY 5, 2000

A site visit to the Sheet Harbour was made with John Kean, Training Benefits Officer of the Petroleum Directorate, Paul Wamback, Development Officer, Community Economic Development and Malcolm Swinemer, Vice President, Marketing North American Terminals (CERES)

LUNENBURG QUEENS REGIONAL DEVELOPMENT AGENCY.

Throughout the course of this ‘Study’ meetings were arranged with companies and fully supported by Jim Brown, Business Development Officer. These companies have been included in the list of manufacturers.

MUNICIPALITY OF THE COUNTY OF RICHMOND.

Working with Al England, Enterprise Cape Breton Corporation and Alan MacDonald, Senior Economic Development Officer meetings were arranged with companies in this region. These companies have been included in the list of manufacturers.

APPENDIX C ROLE OF RDA'S

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Infrastructure & Manufacturing Capabilities Study

PICTOU REGIONAL DEVELOPMENT COMMISSION – AUGUST 3, 2000

A copy of the attendees is attached. This meeting had good representation from the local business community, following the meeting a number of site visits were arranged. The Pictou Industries facility was reviewed both as a location for the assembly of major components and as a location for the fabrication of components.

Jana Shaw of the PRDC was very helpful in arranging site meetings and also attended a number of them.

This area of the Province has a significant number of very competent companies that can play a significant role in the manufacturing of components for the offshore.

STRAIT-HIGHLANDS REGIONAL DEVELOPMENT AGENCY.

Working with Al England, Enterprise Cape Breton Corporation, Phil MacDonald, Executive Director and Francis Gillis, Resources Development Officer, meetings were arranged with companies in this region. These companies have been included in the list of manufacturers.

WESTERN VALLEY DEVELOPMENT AUTHORITY–JULY 6, 2000.

A copy of the attendees is attached. This meeting was reasonably well attended, however representatives of Nova Millwrights Limited could not attend this meeting, a site visit was arranged at a later date.

Janet Larkman, Executive Director and Michael Comeau, Economic Development Officer, were very helpful in trying to involve the local business community.