SUMMARY
OF PUBLIC PARTICIPATION

ENVIRONMENTAL IMPACT ASSESSMENT

PROPOSAL BY
IRVING OIL LIMITED TO CONSTRUCT A LIQUEFIED NATURAL GAS (LNG) MARINE TERMINAL AND MULTI-PURPOSE PIER

JULY 2004

New Nouveau Brunswick
Environment & Local Government

BACKGROUND

In its Environmental Impact Assessment Report to the Minister, Irving Oil Limited has proposed to construct a Liquefied Natural Gas (LNG) marine terminal and multi-purpose pier. Natural gas from the Project would be destined for the Irving Refinery, to meet local demand, and to meet demand along the existing pipeline corridor.

Liquefied natural gas (LNG) is natural gas that has been cooled to the point that it condenses to a liquid. This reduces the volume by approximately 600 times, making natural gas available by tanker. The Project facilities would receive and store LNG that is unloaded from tankers, and regasify the LNG into natural gas for delivery to a pipeline. The proposed project has a 42-month construction period scheduled and is estimated to cost $750 million.

On July 25, 2001, the Irving Oil LNG Project was registered for screening under the provincial Environmental Impact Assessment Regulation of the *Clean Environment Act*. A decision by the Minister of the Environment and Local Government on December 14, 2001 required that the Project undergo a full Environmental Impact Assessment as per the Regulation. On November 19, 2001 it was determined that an environmental assessment must also be completed in accordance with the Canadian Environmental Assessment Act (CEAA) at the comprehensive study level. It was agreed at the provincial and federal level that a harmonized review of the project would be advantageous, with coordinated public input opportunities and the production by Irving Oil of one Environmental Impact Assessment Report/Comprehensive Study Report (EIA/CSR) referred to as an Environmental Impact Statement (EIS) to satisfy both the federal and provincial processes.

Initial public consultation on the Project began on January 23, 2002 with the release of the Draft Guidelines and a 30-day period for public comment. This period allowed members of the public to provide comment on what should or shouldn't be included in the EIS. Final Guidelines with the public's input considered were issued to Irving Oil Limited on March 25, 2002. After a self-imposed pause in the EIA process to continue feasibility assessment, Irving Oil continued the EIA review in September 2003, with a change to the scope of the project. The project was expanded to include the offloading of Orimulsion at the LNG multi-purpose pier. Irving Oil prepared Terms of Reference which were reviewed by the Departmentally-appointed Technical Review Committee (TRC) and provided by Irving to the public for input in October 2003. The company then proceeded to conduct the study.

Irving Oil submitted the first draft Environmental Impact Statement (EIS) on November 4, 2003 for review by the TRC, which consists of representatives from provincial, municipal and federal government departments and agencies with various areas of expertise. As a result of deficiencies noted, clarifications sought and additional work identified by the Committee, the EIS was revised in order to satisfy the Guidelines. The Minister of the Environment and Local Government accepted the final EIS on May 4, 2004 as a document that satisfied the requirements set out in the Final Guidelines and in accordance with the EIA Regulation.

Copies of the complete EIS, a Summary of the EIS and the TRC's General Review Statement were distributed and made available to the public at various locations in the Saint John region,

including the Department of the Environment and Local Government Branch office in Saint John. Information was also made available on the Department's Internet site. A link was also provided to the CEAA website which contained an electronic version of the complete EIS. Concurrently, a news release was issued and paid advertisements were taken out to inform citizens that this information was available, of the upcoming public meeting, and where they could view and/or pick up information. Interested parties were encouraged to contact the Department if they intended to make a formal presentation at the meeting.

The release of the EIS and General Review Statement and the announcement of the date of the public meeting on May 19, 2004, marked the beginning of the second phase of the formal public consultation process. The Minister of the Environment and Local Government then proceeded with the appointment of an Independent EIA Panel to preside at the provincially mandated public meeting held on June 29th at the Simonds Lions Auditorium, Loch Lomond Villa in Saint John.

The 3-person Panel was chaired by Dr. Pierre-Marcel Desjardins, Associate Director of the Canadian Institute for Research on Regional Development, Université de Moncton. The other Panel members were Dr. John Terhune, Associate Dean of Graduate Studies, University of New Brunswick, Saint John, Science Advisor for the panel; and Douglas Lake, Principal and Vice-President Technical Operations, Natural Resources Group Inc., Minneapolis, MN, LNG advisor for the panel.

Approximately 60 people attended the public meeting which began at 7:00 p.m. The meeting was tape-recorded to enable the production of a verbatim transcript and simultaneous interpretation services were provided. Following the chair's opening remarks, the meeting began with presentations by individuals or groups who/which had pre-registered to present. The floor was then opened for comments from the audience in attendance. The independent EIA Panel members heard public comments on the EIS. The Panel also responded to various questions, particularly those relating to the nature and behaviour of liquid natural gas under a range of circumstances.

Prior to the adjournment of the meeting at 9:40 p.m., attendees were reminded that a further 15 days remained for the submission of any written comments on the project to the Minister of the Environment and Local Government. Comment sheets for this purpose were provided at the meeting. All written comments will be shared with the federal government. Attendees were also reminded throughout the evening to provide their names and addresses on a provided sign-up form, if they wished to subsequently receive a copy of the Summary of Public Participation and/or the verbatim transcript of the meeting.

Following the closing date for public comments on July 14, 2004, the Panel prepared and submitted a report of public input on the project, reflecting feedback gathered at the public meeting as well as via written comments submitted throughout the public comment period, to the Minister of the Environment and Local Government. This report was received on July 19, 2004. The report is included in its entirety as part of the Minister's Summary of Public Participation, and follows this page.

Independent EIA Panel Review

Irving Oil Limited Liquefied Natural Gas (LNG) Marine Terminal and Multi-Purpose Pier Project Saint John, NB

Report

July 19, 2004

INTRODUCTION

The present report pertains to the proposal by Irving Oil Limited to build a Liquefied Natural Gas (LNG) Marine Terminal and Multi-Purpose Pier near the Irving Canaport facility in Saint John, New Brunswick. The Irving Canaport facility is located off the Red Head Road in Saint John, on the banks of the Bay of Fundy.

On June 21, 2004, New Brunswick's Environment and Local Government Minister Brenda Fowlie announced the establishment of an independent expert panel to receive public comments and input on the Environmental Impact Assessment Report and the Comprehensive Study Report (EIA/CSR) that were prepared for Irving Oil Ltd.[1]

The three-person panel was chaired by Dr. Pierre-Marcel Desjardins, Associate Director of the Canadian Institute for Research on Regional Development, Université de Moncton. The other members were Dr. John Terhune, Associate Dean of Graduate Studies, University of New Brunswick, Saint John, Science Advisor for the panel; and Mr. Douglas Lake, Principal and Vice-President Technical Operations, Natural Resources Group Inc., Minneapolis, MN, LNG Advisor for the panel.

A public meeting was held June 29, 2004, at the Simons Lions Auditorium (Loch Lomond Villa) in Saint John, N.B. Furthermore, written submissions from the public were received for 15 days after the meeting (until July 14, 2004). The present document is the panel's report.

The methodology followed by the panel included:

- All information submitted, either at the public meeting or through written documents, was analysed by the panel.
- When required, panel members sought additional information from various sources.
- The report does not refer to every question received by the panel. Although the panel did analyse every question, in the present report, several issues have been grouped by topic or resource.
- If the panel could not get a satisfactory answer or felt that issues were not adequately covered, paths to achieving the desired objective were recommended.

[1] Note that in other provinces, the approach could be different since provincial regulations do vary.

GENERAL COMMENTS

Many participants had mixed feelings with respect to the project. Although most recognised that natural gas is a cleaner source of energy compared to several alternatives, they still had questions and concerns regarding the project that they wanted addressed. Several participants indicated that the formation of an independent panel represented an improvement over previous approaches which involved participation by the project proponents. At the public meeting, several questions from the public were answered by panel members to provide immediate clarification, when warranted. Furthermore, the message received by panel members, and this is reflected in the methodology, is that the issues discussed are often very complex and there was a wish expressed that panel members would analyse all questions raised to see if they were valid points of concern. If they were, the panel members would take the necessary steps to have them answered and/or bring them to the attention of the Minister.

GENERAL CONCERN

FURTHER STUDIES LEFT UNTIL AFTER APPROVAL

Several comments were raised regarding the formulation and development of further studies and reports (*e.g.*, Environmental Protection Plan, Marine Terminal Manual, Emergency Response Plan, Spill Prevention and Cleanup Plan) that are to be completed after the decision process for approval or denial of the Irving Marine Terminal/Multi-purpose Pier Project was completed. The commentors felt that these studies and plans should be completed prior to the decision regarding approval of the project and the information provided in each study factored into the decision process. In general, they felt that too many decisions were being left until after the project approval decision process was completed. For example, Mr. G. Dalzell's written statement (page 76) states "The Minister(s) should not approve this Project unless all these cited plans are prepared and studied by Responsible Authorities and the Public." He also calls for more broad-based information to be gathered before a decision is reached, specifically the conference on the Future of the Bay of Fundy which will be held in September

2004 (page 69). Other examples of incomplete plans include the final (versus "preferred" page 45 EIS) decision on the LNG tank structure or the sizes of the exclusion zone and related ship movement policies that are to be determined in consultation with the Saint John Port Authority, Saint John Harbour Pilots, Canadian Coast Guard and Transport Canada (page 729 EIS).

Response – The regulatory review and approval process for large industrial facilities often utilizes a phased or conditional approach, with additional studies, reviews and decisions being made subsequent to the initial decision to approve the project. This can results in conditions and stipulations being added to the initial certificate or license to proceed with development of the project. In general, a project approval is granted based on review of the material required by the reviewing agency in its application requirements, which is used to evaluate various aspects of the project, including purpose and need, economics, environmental assessments, public safety and other aspects of the project. In large, complex projects some technical aspects of construction and operations are delayed (generally by necessity) until predecessor details necessary to determine those aspects have been developed. As long as the type of information that is delayed is not necessary or critical in determining acceptability or feasibility of the project, then it is acceptable for this information to be delayed until the necessary details required to produce that level of information can be developed. If the information being delayed is important to constructing or operating the facility, but does not affect the overall decision regarding whether or not the project is acceptable or feasible, then this information can be provided at a later date, considered by the regulatory bodies and other stakeholders, and stipulations or conditions can be added to the approval documents, if needed, to ensure that any decisions made from consideration of the additional information are incorporated into the project requirements.

This process allows the regulatory review and approval process to move ahead in a timely and practical fashion, while at the same time allowing the proponent's capital investments required for the different stages of project development to proceed in a stepwise fashion.

A commenter questioned whether the review process in the United States by the Federal Energy Regulatory Commission (FERC) also included a process that allowed further studies and plans to be developed after the approval process.

Response – The regulatory review process in the United States by the FERC for the review of LNG and natural gas pipeline facilities proceeds in a similar fashion as described above. For example, relative to review and approval of an LNG import facility, the FERC requires a certain level of detailed information relative to cryogenic and LNG process design to be completed and submitted with the proponents application, but many details required in the final design of the facility are finalized and included in various reports that are submitted for further review and approval after the initial project approval process, but prior to initiation of construction of the project. The U.S. Coast Guard also may not complete its LNG Vessel Management and Emergency Plan (a document similar to the proposed Marine Terminal Manual) until after the FERC has issued preliminary approval of the project. In this case, however, the FERC approval would generally be conditioned on the successful completion by the Coast Guard of the LNG Vessel Management and Emergency Plan.

LNG

Existing LNG Facilities in U.S.

One commenter indicated that most of the facilities in the U.S. were constructed between 1965 and 1975 and wondered why none have been constructed in the U.S. during the past 29 years and why there were only four LNG import facilities. The commenter speculated as to fear of the technology, worry of problems, etc. as a reason for no new facilities.

Response – The import of LNG into the United States during the 1960's and 1970's began as a result of favorable economic conditions regarding the price of imported natural gas and the availability of LNG. Beginning around the mid-1970's, the economics of imported natural gas (as LNG) turned downward, and subsequent construction of new facilities stopped after the construction of four LNG import facilities in the United States. One relatively new facility at the time (Cove Point) was mothballed

relative to further shipments of LNG. Recently the economics of natural gas imports has drastically improved together with a more robust need for natural gas supplies; hence the increased activity and planning of new import facilities in North America.

Alternative LNG Regasification Technologies

> One commenter questioned if there were alternative methods of vaporizing LNG back into natural gas, other than the submerged combustion vaporizer (SCV) described on page 51 of the EIS report and if any of the other methods were more appropriate for this location.

Response – Section 2.3.3.4.6 of the EIS report clearly presents six alternative vaporizer techniques and evaluates the appropriateness of each technique for the proposed site location. The evaluation was well presented and conclusive, both from a site location (environmental conditions such as colder ambient water temperatures) as well as an economic perspective. The SCV technique is widely used throughout the world and consists of proven technologies. It is currently the only method used in the U.S. at import facilities, although other methods, such as ambient water technologies and waste heat from non-associated industries are currently being considered on new LNG terminals, where appropriate (*i.e.*, Gulf of Mexico).

LNG Regulations and Code

> A commenter questioned how the Canadian Code for LNG was developed and adopted, since there are no LNG facilities currently located in Canada, and whether they are similar to those used in the United States.

Response – Although there are no LNG import facilities currently located in Canada, the LNG industry in Canada has been active for many years. The Canadian Standards Association (CSA) developed its first edition of engineering standards for LNG (CSA Z276-01) in 1972, and these standards have been revised six times since then, ending with the most recent and current edition (2003). The standards pertain to the safe design, location, construction, operation, and maintenance of LNG facilities, including LNG import and storage facilities. The standards were developed by a panel of LNG

engineering and regulatory experts from North America, and are similar, but not identical, in detail and content to that used in the United States.

> A commenter questioned whether classification of LNG tankers by the International Association of Classification Societies indicated that these tankers were the best and if the classification system was the most stringent in the world.

Response – "The International Association and Classification Societies (IACS) are organizations that establish and apply technical standards in relation to the design, construction and survey of marine related facilities, including ships and offshore facilities. A vessel that has been built to appropriate rules of the society may apply for a certificate of classification from that society. Such a certificate does not imply, nor should it be construed as an express warranty of safety, fitness for purpose or seaworthiness of a ship. It is an attestation only that the vessel is in compliance with the standards that have been developed and published by the society issuing the classification certificate." Ten of the 50 organizations worldwide that provide marine classifications form the IACS. These ten organizations collectively classify 94 percent of all commercial marine tonnage in the world [from www.iacs.org.uk]. Consequently, the commenter can be assured that the LNG tankers that are classified by the IACS would comply with all international standards that pertain to safe LNG transport.

LNG Tanker Design

> A commenter questioned whether, in light of the new LNG import projects being proposed around the world, whether there was a worldwide shortage of LNG tankers.

Response – As indicated in the EIS (page 33) there are 136 LNG tankers in existence (as of the end of 2002) and 57 new tankers on order or under construction. The order of new tankers is in direct response to the increasing activity around the world concerning the sale and transport of LNG, and a need to develop newer, larger capacity ship designs. Because of the lag time needed to site, design, meet regulatory approval requirements and construct new LNG import facilities (estimated at least six years per

facility), new tankers should be available in time to meet the needs of the LNG shipping industry.

> The same commenter asked, of the two major designs described in the EIS, is one superior to the other in terms of risk of fire, explosion.

Response – Two ship designs make up approximately the entire worldwide fleet of LNG tankers. Each design represents almost 50 percent of the total number of ships. Both types incorporate double hulled design and are considered to be safe with respect to risk of fire and prevention of explosion (from accumulated natural gas vapors). Both designs are recognized and classified by the IACS.

LNG Storage Tank Safety

> One commenter questioned whether there are requirements in Canada for an aviation (flying) restriction zone over LNG storage facilities to prevent aircraft from flying over LNG tanks. The commenter also suggested the need to partially construct the LNG tanks underground to lower the profile of the tank.

Response – The panel is not aware of any aviation restriction zones required in North America specifically regulating the flight of airplanes over LNG storage facilities. The United States LNG siting codes do regulate the siting of LNG storage tanks within 20,000 feet of an airport serving large aircraft (*e.g.,* 12,500 pounds or greater maximum certified take off weight). The EIS report clearly and adequately describes the safety and integrity of the different types of LNG storage tanks (Section 2.3.3 and table 2.3). There are no code requirements for single walled LNG tanks with secondary containment to be located partially or fully underground and most LNG storage tanks in North America are constructed above ground and consist of the single walled tanks design. Some LNG tanks, however, are constructed underground (*i.e.,* in Japan).

Fire Safety

> A commenter questioned what the role of the existing Saint John Fire Department would have in fighting a major fire at the LNG facility, should a major release event occur accompanied by ignition.

Response – Preparation of an Emergency Response Plan that addresses procedures for responding to controllable and uncontrollable emergencies and procedures for coordinating with the appropriate local officials in the preparation of an emergency evacuation plan are discussed in the EIS in Section 2.9.3 (page 183). Also thoroughly discussed is the planning process and topics of discussions that will take place with the Saint John Fire Department, the NB EMO, the Saint John EMO, and the provincial Fire Marshall's office relative to preparation and implementation of an effective Emergency Response Plan.

The role of the local fire department and the expected ability of that department to address the severe fire conditions that could be associated with a major spill event or associated evacuation have not been discussed in the document. To adequately assess the ability of the facility and the public to be protected from a fire event, additional information should be provided that assesses the size and ability of the local fire fighting service, together with the fire prevention and fighting capabilities of the facility. The EIS report only addresses the proposed fire extinguishing capabilities at the facility and the proposed future planning that would be undertaken to plan for emergency events.

Recommendation - Additional information should be developed and provided to the **Department of Environment and Local Government** relative to the probable need for outside fire fighting support in both a controllable and uncontrollable event, the current ability of the local fire departments to provide that capability, and what entity would be responsible for meeting the required cost (*e.g.*, the facility proponent, the local tax base) of providing additional equipment and training to the local fire fighting department.

<u>Construction Safety</u>

> A commenter questioned whether because there were no existing LNG storage facilities in Canada, whether the workers who would construct the facility would

have the expertise or experience to adequately construct the necessary components.

Response – The components that comprise LNG storage and regasification facilities and the methods used to construct them are similar to industrial petrochemical processing and storage facilities located throughout the world, including in Canada. These include the fabrication and welding of pipe sections, construction and welding of large steel storage tanks (*i.e.,* crude oil tanks), electrical conduits and systems, civil construction techniques, and the installation of monitoring equipment. This includes materials that are used to interface with the cryogenic liquids (*e.g.*, LNG, liquid oxygen, and liquid nitrogen), including 9 percent nickel steel alloy. The fabrication and/or installation of these materials is strictly regulated by established codes and standards.

Although many of the construction techniques and design components are similar, and many of the craftsmen will be local, it is doubtful that all construction will be conducted with local craftsman and experts. The construction of LNG storage and regasification facilities will typically require expertise from outside the local area and even outside the country. Beginning with Design and Engineering, through construction, outside experts will most certainly be required.

Pipeline Safety

A commenter noted that the EIS indicated that Mercaptan, a commonly used natural gas odor additive to assist in leak detection (pure natural gas is odorless), would not be introduced to the revaporized natural gas as it leaves the vaporizer and travels through the sendout pipeline and wondered why it would not be added.

Response - Adding Mercaptan to natural gas supplies is generally done only at the local distribution level, such as when natural gas is delivered from larger transportation pipelines to local gas distribution companies that deliver natural gas locally, including to residences and businesses. Because natural gas transportation pipelines (such as the sendout pipeline) are typically large diameter pipelines located within well marked rights-of-way and with few fittings, and with little or no contact with people as compared to local

distribution systems (such as small diameter pipes in houses or other buildings), the need for odorants is not warranted. Leaks from transportation pipelines are generally detected through pressure sensors or by way of pipeline right-of-way inspections. This practice is an industry standard.

> A commenter expressed concern regarding the presence of external, above-ground facilities (*e.g.*, valves, meter stations, compressor stations) associated with the pipeline and the ability of the company to protect these structures from vandals and accidents.

Response – The sendout pipeline from the regasification facilities to the refinery will be located underground. All compression will be done to the LNG before it is vaporized, so additional compression to achieve delivery pressures will not be required (page 80). With the exception of block valves to protect against sudden loss of pressure due to a leak, all other valves, metering and other types of fittings will be located within fenced areas either within the LNG terminal or within the refinery. Block valves located along the pipeline right-of-way are standard safety equipment for all natural gas transportation pipeline systems.

> A commenter questioned whether the pipeline to the refinery would contain LNG or natural gas. He also commented that the EIS indicated that the gas put into the sendout pipeline at the regasification facility was listed at a pressure of 8,273 kPa and wanted to know what that pressure was when converted to pounds per square inch gage (psig), and if that pressure was reasonable for moving gas from the regasification facility, through the proposed pipeline to the refinery.

Response – The 9.0 km sendout pipeline located between the LNG terminal and the refinery will carry only natural gas from the vaporizer. It will not carry LNG. 8,273 kPa converts to about 1,200 psig, which is fairly typical for natural gas transmission systems. The sendout (discharge) pressure is determined by the design delivery pressure requirements and the expected pressure loss through the pipeline (pages 78 and 79). Pipeline pressure in natural gas transportation pipelines located throughout North America can vary from 900 to 1,740, although it is typically closer to the lower end.

LNG Tank Design

A commenter asked about tank designs, and which design (single, double walled, or full containment) was superior, and when will the final tank design be selected.

Response – The EIS report thoroughly describes the various available LNG storage tank designs and the design aspects associated with each (section 2.3.3.3). All three designs are capable of adequately storing LNG when properly sited, designed and constructed, although the double wall design may be more difficult to maintain for stated reasons. Single walled tanks are commonly used throughout the world and in North America. An important factor in tank selection is the available space at the terminal site. Single walled tanks utilize containment berms for secondary containment of spilled LNG in the case of an accident. In order to contain the necessary volume of spilled LNG to meet the secondary containment standards set in CSA Z276-01, the containment berms around the tanks would have a large containment surface area which would result in a large pool of LNG when contained from a major spill, and a much larger thermal exclusion and vapor dispersion zone if an accidental spill with ignition were to occur. Conversely, a double walled or full containment tank design utilizes a concrete wall of similar height as the storage tank as a form of secondary containment. Since the containment surface area in these designs are much smaller (the concrete wall is only slightly larger in diameter than the inner storage tank), the resulting exclusion and dispersion zones are also much smaller. These tank designs are often used on storage sites that are limited in size. Another selection criterion is material and construction costs, with the single walled tank being least expensive to build. The preferred tank design was clearly stated as the single walled design, which the proposed site is capable of supporting. If the proponent decided to change its design to a double-walled or full containment design at a later date, the safety margins inherent with a concrete outer walled tank would be greater, and the exclusion and dispersion zones smaller than those currently described.

A commenter questioned whether or not the construction of the LNG storage tanks required extremely specialized skills, which might not be available in Canada.

Response – Construction of a single-walled LNG storage tank requires expertise similar to that found in the construction of large petrochemical storage tanks that are commonly used to store crude oil and other hydrocarbon materials. Engineering design will specify foundation parameters and materials to be met, and welding of the nickel steel alloy and carbon steel used in the inner and outer tank walls, respectively, will follow accepted guidelines and standards commonly used in storage tank construction throughout the world.

> A commenter questioned which LNG storage design was safer, one that incorporated steel walls or one that incorporated concrete walls.

Response – A general question such as this is difficult to answer without specific tank designs to be evaluated. In general, as long as the specific federal codes and standards are being met and good engineering design is incorporated, both designs can be very safe. The reader is referred to Section 2.3.3.3 and specifically table 2.3 for a discussion of the merits and design comparisons of both, particularly with regard to capacities to withstand external events such as projectiles, and small and large aircraft collisions. Regarding projectiles and small aircraft collisions, concrete walled tanks can be designed to provide greater protection than steel tanks.

<u>Hydrostatic Testing of Storage Tanks and Piping</u>

> A commenter questioned whether the LNG storage tanks could be hydrostatically tested using seawater as opposed to freshwater, if this was commonly done, and whether it would result in any problems.

Response – Many LNG storage tanks, especially those constructed along the coast and in areas with a low availability of fresh water, use seawater to hydrostatically test the inner tank of the LNG storage tank. This process is covered thoroughly in section 2.5.5.3.3 of the EIS.

> A commenter wanted to know to what regulatory standards the cryogenic pipeline would be tested.

Response – The cryogenic pipeline will be hydrostatically tested using freshwater at pressures above maximum allowable operating pressure (as determined by CSA standards for high pressure pipeline testing) to ensure the integrity of the pipeline. This is a common test required for all natural gas transmission and LNG pipelines in North America.

LNG Properties

> Many comments were received pertaining to the explosive nature of LNG and asking under what conditions LNG or its vapor would explode.

Response - This has been addressed in earlier responses by the panel during the public meeting[2] and is thoroughly covered in the EIS under section 2.8.3.

> A comment was received questioning the O rings, seals, flanges and other gaskets used in association with LNG and how they were protected against the cryogenic temperatures associated with the storage and transport of LNG.

Response – All material associated with LNG facilities that have the potential to be exposed to with cryogenic temperatures are fabricated of materials known and developed to withstand extremely cold conditions without experiencing reduced ductility. For example, the inner storage tank and the pipelines used for storage and transport of LNG are fabricated from a 9% nickel and steel alloy. Gaskets and O-rings often contain materials such as Teflon to protect against cold temperature failure.

> A commenter indicated that he would like to know what would happen if there was a large spill of LNG onto the surface of water. What happens to the LNG in the water? Does LNG sink? If it does, what would happen to the marine life in the area?

Response – The consequences of a spill of LNG on water are thoroughly covered in the EIS report on pages 163 – 165 and in the supplemental report titled ‘Preliminary Siting

[2] Please see transcript of public meeting for details.

Study for Irving Oil LNG Import Terminal', February 4, 2004. Because LNG has roughly half the specific gravity of sea water, the LNG would float and not mix with the water. Because its temperature (-160°C) is so much lower than the ambient seawater temperature (even in the coldest part of winter), the LNG would rapidly boil and vaporize. Some minor freezing of seawater (1 to a couple of centimeters) at the interface of the seawater and LNG may occur, but this would be slight and very temporary and not to the extent it would significantly harm marine life that live continuously below the surface (*e.g.,* fish, lobsters). If the LNG pool that formed came into contact with marine life on the surface of the water (*e.g*., birds or marine mammals), then the cryogenic nature of the super cold liquid would immediately freeze and probably kill the animals.

Should the vapor generated from the boiling LNG not be ignited, a cloud of natural gas (methane) would form over the pool of boiling LNG and would immediately begin to disperse in the direction of the wind movement. In general, a higher wind level would cause the vapor cloud to disperse faster. Because natural gas is an asphyxiate, if the vapor cloud engulfed surface dwelling marine life on the surface, it could cause asphyxiation and death. If a portion of the vapor cloud with flammable concentration of methane (5 – 15%) were to come in contact with an ignition source, then the vapor cloud would burn back to the source of the natural gas vapor. The EIS reviews the size of the pool that could be formed from various size spills and how long they would persist before boiling away. The supplemental report describes the distance flammable concentrations of vapor could travel over water.

Multi-Use Pier Design

> A commenter questioned whether the multi-purpose design of the proposed pier (*i.e*., for both LNG and Orimulsion) is commonly seen on other LNG offloading piers, or would the pier generally be constructed for dedicated use by LNG facilities.

Response – This panel is not aware of any other LNG offloading pier that is built with multi-purpose offloading capabilities. However, it should be noted that this panel is most familiar with LNG import facilities in the United States and is not familiar with all import facilities in the world. From a technical nature, LNG offloading equipment located on the

pier is extremely specific to LNG cargo and can not be used for other non-cryogenic liquid cargos. That does not preclude the possibility, however, of other non-LNG cargo offloading equipment being available on the pier to offload other cargos, such as Orimulsion.

> Several commentors expressed concern regarding the future use of the multi-purpose pier for uses other than those stated (*i.e.*, to offload LNG and Orimulsion) and that other uses could extend the use of the proposed facilities to the import or export of other materials (*e.g.*, crude or refined oil, aggregates, including sand and gravel) that would change the nature of the project beyond that proposed, potentially leading to impacts not evaluated.

Response – The DELG has made it expressly clear to this panel that the proposed project and associated uses under review for approval consists only of the import of LNG and Orimulsion. Should the proponent seek additional uses of the facility in the future, the proponent would be required to file for review and approval with the appropriate agencies, including the **Minister of Department of Environment and Local Government**. At that time a review process similar to the current review process, including a thorough environmental review of the potential impacts, would be conducted prior to approval or denial of the new proposed use for the terminal.

Thermal Exclusion and Vapor Dispersion Zone Modeling

> One commenter questioned whether the type of accident scenario analysis and exclusion zone modeling used for this project was also required in the United States regulatory review process.

Response – Yes, a very similar process, utilizing the same or similar predictive models, are required for determining thermal exclusion and vapor dispersion zones and siting LNG import facilities in the United States. It is required by the U.S. Department of Transportation, contained in the National Fire Protection Association (NFPA) standard 59(a) and is reviewed in the environmental impact statement produced by the Federal Energy Regulatory Commission (FERC).

A commenter question whether there are any set of events [at an LNG facility] in which a fire, then an explosion could occur.

Response – Should an accidental spill of LNG occur it would be directed to and contained within a specified and required containment area, where it would begin to vaporize and the resulting natural gas vapor would begin to disperse. If a flammable concentration of natural gas encountered an ignition source, and it was not in a confined space, then the natural gas would ignite and burn back to the source (vaporizing LNG) and continue to burn until the LNG source fuel was expended or the fire was extinguished. An explosion would not occur unless natural gas (in vapor form) collected in a confined area prior to ignition. Although this event could happen as a result of a leak of natural gas in a confined area, the design and placement of containment areas for storage facilities utilizing single-walled tanks are generally in open areas and not susceptible to confinement of gases.

A commenter questioned whether the panel agrees with the technical analysis associated with the spill scenarios and the modeled exclusion zones.

Response – Based on the review of the presentation of the results in section 2.8.2.1 of the EIS (page 138) and not a technical review of the actual data input and calculations used in the model, the modeling efforts appear to have addressed and met the requirements of CSA Z276-01.

A commenter asked if a vapor cloud of LNG (resulting from an accidental release of LNG) could travel to populated areas and then if ignited burn or explode? How far could it travel?

Response – This question is addressed in the EIS in sections 2.8.2.1 – 2.8.2.4, with results of modeling presented in table 2.22. At the proposed site, and under the worst possible scenario, if a catastrophic failure of a full LNG tank occurred and resulted in the spill of its entire contents (160,000 m^3), the lower flammable limit of the vapor cloud (the lowest concentration of natural gas that could ignite – about 5% methane) could travel for a distance of 2,223 m from the center of the containment area. The distance to the nearest residential area (Red Head Road) from the center storage tank is approximately

650 m. If the vapor cloud encountered a source of ignition, it could ignite and burn back to the source of the vapor cloud at the spill containment site. An explosion would not occur unless natural gas vapors became concentrated in an confined area prior to ignition. It should be noted that the modeling of this scenario (catastrophic failure of a full tank) for vapor dispersion is not required by CSA Z276-01. Vapor dispersion distances for spills that are required to be modeled ranged between 213 m and 225 m from the center of the containment area (see table 2.22).

> Commentors expressed concern regarding the explosive nature of LNG and under what conditions it would explode.

Response – This subject is covered thoroughly in sections 2.8.2.1 and 2.8.3. Explosions that have occurred in the past at LNG facilities have been the result of natural gas becoming concentrated within an uncontrolled confined area.

> Comments were received relative to the nature of the explosion at a LNG liquefaction facility in Algeria in January 2004 and how this might be related to the proposed LNG facilities in Saint John.

Response – The accident that resulted in an explosion at the LNG facility in Algeria is still under investigation and it would be speculation to provide further comment on that accident until the final studies to determine the cause are released. The facility was an LNG liquefaction facility (produces and exports LNG) and in that regard, it is a much more complicated facility than that proposed for Saint John.

> A commenter, who lives near Connelly Head across the bay from the proposed site, questioned how far LNG vapor could travel over water.

Response – A vapor dispersion model scenario to predict the distance a vapor cloud could travel over water as a result of a spill from a tanker, although not required by the CSA standards, was conducted by Irving Oil at the request of DELG. The results of this analysis are presented in a supplemental report that was produced by Quest Consultants Inc. for Irving Oil (Preliminary Siting Study for Irving Oil LNG Import Terminal, February 4, 2004). Modeling results indicated that a 1-minute spill of LNG

onto water from an unloading arm on the pier could travel up to 623 m before dispersing to concentrations below the flammable limit. A larger, rapid, catastrophic spill of up to 25,000 m3 of LNG from a storage compartment on an LNG tanker could travel between 3,716 m and 4,142 m before dispersing to concentrations below the flammable limit. Based on information contained in the Quest Report, vapors from a design spill at the pier would not likely reach any residential areas. However, a large spill from a tanker, depending on the location at the time of the accident and other factors (*e.g.*, wind direction and speed), could result in the formation of a vapor cloud that could reach residential areas.

ATMOSPHERIC ENVIRONMENT

Air emissions

> Two commentors expressed concerns about the increase in air emissions, particularly nitrogen oxides and carbon dioxide and the related problems of health and global warming. A question was raised as to whether or not the brush clearing operations would involve burning stumps or brush. Also, a commenter raised the possibility of installing Emission Control Technologies to remove nitrogen oxides (Dalzell page 48) from the regasification emissions.

Response - Although the carbon dioxide and nitrous oxide production will be higher in the Saint John area (page 123 EIS), the proponents indicate that there will be an overall reduction in these gases assuming that natural gas replaces existing fuel oil and coal usage in eastern North America (page 350 EIS). To some extent, the prevailing wind patterns (pages 256-266 EIS) will often disperse the emissions to the east and south of Saint John. The proponents expect that “the emissions will be sufficiently dispersed and the applicable air quality standards are not expected to be exceeded” (page 332 EIS). The proponent mentions minimizing greenhouse gas emissions through an adaptive management approach (page 271 EIS) but no details of the strategies or methods to be used are provided. There is no mention of brush burning in the EIS and it is assumed that this would not occur.

One commenter questioned the following statement which appeared in the General Review Statement by the Department of Environment and Local Government (page 4, May 2004): “The Technical Review Committee required the proponent to focus the EIS on identifying best available and economically viable technologies to minimize greenhouse gas emissions”. The question raised was what other technologies would potentially be available and if it would later be up to the proponent to decide what was economically viable?

Response – Five regasification options are presented (page 47 EIS). Enough is known about these technologies that they could be evaluated with respect to feasibility, cost, and air emissions. The development of a new method for regasification would have the disadvantage of being an untried technology and the construction and operating costs would not be known.

Dust

Dust suppression during the construction phase was a concern to one commenter (Dalzell page 31).

Response – The proponents plan to apply water and lime to the dust generating areas (page 110 EIS). Various dust generating activities are expected to occur during construction. It is expected that most of the dust will be generated on site and disperse over a distance of 300 m (page 308 EIS). The roadways on the site are to be paved, presumably near the end of construction (page 308 EIS).

Noise

Concern was expressed about the equipment noises associated with the project (Dalzell page 33).

Response – Tables 2.14 and 2.18 in the EIS present noise levels of typical construction and operation equipment at specific distances. The dB(A) scale is a standard adjustment of the sound level to human hearing abilities. Given these source levels it is

possible to estimate the sound levels at different distances from the site. Background sound levels typically decrease at night (page 299 EIS) and the annoyance of noises increases because people are trying to sleep. The irregular nature of impact sounds, such as pile driving, also tends to generate higher levels of reaction than constant level noises. The proponents indicate that "Pile driving will occur at night only if work progress is slowed due to weather or unfavorable geotechnical conditions" (page 324 EIS). It is later noted (page 353 EIS) that noise monitoring may be required during construction activities such as pile driving.

Recommendation – To reduce the potential for nighttime noise impacts to the surrounding residents, this panel recommends that Irving develop steps that would be taken to reduce noise should agreed upon nighttime noise levels be exceeded during the night.

> One commenter asked about safe sound levels, particularly with respect to the levels presented in Table 2.14 (Dalzell page 33).

Response – There are health and safety regulations limiting noise levels and exposures that workers would receive while operating equipment. These would only apply in the immediate vicinity of the source, typically within 100 m.

MARINE ENVIRONMENT

Right whales

> Two commentors raised questions concerning the potential of increased mortality of North Atlantic right whales associated with increased ship traffic in the mouth of the Bay of Fundy. Currently, ship strikes result in mortalities of large whales and because of their endangered status, are particularly important for the right whales. Reducing ship speeds, adjusting shipping routes and alerting whales to the presence of ships were suggested mitigations.

Response – This problem has been recognized by the shipping industry, a number of actions have been taken and the situation is still under study. On July 1, 2003, the

shipping lanes in the Bay of Fundy were moved to avoid areas where right whales are concentrated during the summer and early fall. A number of related studies are currently underway, including developing methods to locate the whales in real time to enhance ship avoidance possibilities. The background information on the right whale is presented on pages 411-413 in the EIS. The slight increase in the ship traffic is not expected to result in an increased mortality in right whales. The proponents indicate that should problems be identified (*i.e.,* a project-related collision with a North Atlantic right whale) that mitigation measures would be improved (page 436 EIS). Given the intensive study associated with this species and because other ship strike studies are underway in the Bay of Fundy, the impact of the additional LNG shipping is unlikely to be significant.

Introduced species in ballast water

> Concern was expressed about the possibility of introduced species via ballast water discharges in the Mispec area.

Response – It is unlikely that ballast water would be discharged because the LNG tanker would be arriving full, off-load its cargo, and would take on ballast water before leaving. The appropriate treatment of ballast water is to recycle it during the return trip across the ocean so that the potential for introducing species from one port to another is significantly reduced. There are also regulations concerning the discharge of bilge water which should reduce the risk of introduced species. An environmental impact assessment would be required if the pier were to be used to load cargos, and thus require the discharge of ballast water.

Atlantic Salmon

> Concern was expressed about the effects of the project on Atlantic salmon (Dalzell page 63). Increased predation on salmon has been reported when fish ladders, spillways and bridges are illuminated at night and salmon are migrating through them.

Response – It is unlikely that this project would impact Atlantic salmon (page 433 EIS). The pier lighting would not be a significant problem because, unlike the three examples

above, the salmon are not entering a confined channel during migration. Nocturnal foraging by piscivorous birds associated with lighting on the pier is not likely to be significant because of the small area illuminated.

Underwater Noise

> One commenter noted that propeller noises could potentially disturb fish and marine mammals and result in changed distributions or behavioral patterns (Dalzell page 65).

Response – Right whales do not seem to react to ship noises. The low frequency noise components may mask some of the underwater calls of the large whales. The LNG ships would result in slightly greater noise production in the Bay of Fundy, but any possible impact cannot be assessed at this time.

Wastewater discharge

> A concern was expressed that process wastewater would be discharged to the marine environment.

Response – Oily wastewater will be collected and removed to an appropriate facility via truck and sanitary wastewater will be routed to a septic tank field (page 127 EIS). The regasification process will produce a substantial amount of water as a byproduct of the natural gas combustion. This acidic water would be neutralized and briefly stored in a holding pond (to come to ambient temperature) before being released to the ocean (page 127 EIS). Neutralization of acidic process water generated as a result of the vaporization process (use of submerged combustion units) is a common practice that effectively treats the water. This effluent would be similar to rainwater and would be readily mixed with seawater in the Bay of Fundy. It would not contain any chemicals aside from sufficient caustic soda to bring the pH near 7 (neutrality).

TERRESTRIAL AND WETLAND ENVIRONMENT

ATV usage of Right of Way

> A commenter has raised land and stream impact and security/liability questions concerning potential increased use of the expanded right of way by all terrain vehicles and skidoos (Dalzell pages 10, 18, 20, 30, 31, 70, and 81). The commenter asked who is responsible for protecting the right of way? Will landowners be liable for accidents on their property? What steps will be taken to see that various habitats are not going to be disturbed?

Response – The proponents believe that simply widening the right of way will not result in an increase of ATV traffic (page 103 EIS). Currently, the small fen is crossed by ATVs during dry conditions and trails are used to bypass cliffs (page 509 EIS). While the increased width of the right of way may exacerbate use of a broader piece of land covered by the new right of way by ATV use, especially during the revegetation of the new right-of-way following construction, the proposed action will not initiate such use and will likely not result in a higher number of ATV users in the area. Fencing off areas would be a decision to be made by individual landowners and may not be practical in some portions of the right of way.

MIGRATORY BIRDS

Harlequin ducks

> Three commentors expressed concerns of possible impacts on birds, in particular endangered harlequin ducks, which have been sighted in the Mispec area. Potential disturbances of foraging marine birds near the LNG facility and of nesting birds by ATVs in the right of way were considerations. Questions were raised as to whether or not there would be follow-up studies in the area and if sighting information from local bird watchers would be utilized.

Response – Information on terrestrial birds, harlequin ducks and other marine species is presented in pages 518-523 in the EIS. The mitigation actions presented in the Evaluation of Significance section (pages 544-545) and the Residual Environmental effects ratings are appropriate.

Site and pier lighting

> The nature and extent of the site and pier lighting was a concern with respect to migrating birds and "light pollution" related to public viewing of the coastline from Mispec Beach and adjacent areas (Dalzell page 51, 82).

Response – The proponents intend to use down-shielded lighting wherever possible (page 532 EIS). The lighting of the pier will be determined by navigation regulations and operational requirements. There is also provision for external reports from the Point Lepreau Bird Observatory and on-site monitoring of migration to monitor migration times. During rough weather or fog when construction work would be suspended, the lighting would be reduced (page 532 EIS).

The LNG tanks will be visible from Mispec Beach. They are painted a light colour to help reflect solar radiant heat. If a buffer of mature trees between the LNG facility and the shoreline are not removed during site preparation or operation, they may help shield the tanks from offshore or across water viewing points.

COMMERCIAL FISHERIES

Compensation for fishers

> Commercial fishers currently operating in the Canaport/LNG area will have their fishing area and times reduced because of exclusion zones and will have longer sailing times when traveling along the coastline because of the need to sail around the exclusion area (rather than through it when no ships are present). The question of financial compensation for the fishers was raised.

Response – The existing situation concerning commercial fishers is presented on pages 552-555 in the EIS. During offloading operations at the LNG facility, fishers will be excluded from areas between the end of the shipping lane to the pier, including vessel turning basins (page 567 EIS). The exclusion of fishers from fishing grounds around the Canaport facility is of an incremental nature (page 572 EIS) but with 2-3 ships per week,

their offloading times and tidal or weather concerns, available fishing times will often be too short to deploy and retrieve gear before the next ship arrives.

Recommendation - The Panel recommends that the commercial fishers and the Irving Oil Corporation meet to discuss the issue of financial compensation. The Department of Fisheries and Oceans should mediate the issue and formally approve the agreements.

HEALTH AND SAFETY

Adequate Emergency Response Access

1. A commenter indicated that he was concerned that the Red Head Road may not be able to provide adequate emergency response access if a large accident occurred and that perhaps a new road should be considered for suitable fire equipment access to the site and for emergency evacuation.

Response – The use of Red Head Road as an adequate means to provide emergency access to the LNG facility in the event of a major accident, and one that may also require evacuation of local residents was not thoroughly covered in the EIS report.

Recommendation - This panel respectively recommends that, because Red Head Road is the only means of access to the site and that there has been considerable concern regarding its condition and stability relative to erosion processes associated with shoreline conditions, it be more thoroughly assessed for its ability to provide both emergency access to the site and emergency evacuation from the surrounding area, should it be needed. Different means of site assess and egress (*i.e.*, construction of a new different road) should be considered if warranted as part of the review process. [Please see page 33 for further discussion of this issue]

Munitions disposal

There is a possibility that munitions and bomb ordinances from World War II were dumped in this area (Dalzell page 12).

Response – The side casting of seabed materials could potentially interact with such explosive materials if they do exist here.

Recommendation – The possibility of munitions being in the Canaport area should be investigated by checking with Mr. Dalzell's source and other sources.

LAND USE

Tourism concerns

One commenter stated the need to preserve the Bay of Fundy for tourism.

Response – Although the LNG import facility would affect an area of coastline not currently developed, thus resulting in an incremental (and cumulative) effect on the viewshed of Mispec Bay, it would be immediately adjacent to a similar industrial use (the Canaport facility) and would result in the expansion of an existing land use in the area, rather than the creation of a new use or separated industrial facility. It is unlikely that tourism operations would be impacted by the increased shipping activity at Mispec. Cruise ships would pass the various tankers in the anchorages or the shipping lanes. The Canaport facility is farther up the bay than the Port of Saint John. The restricted access to the Canaport facility would be slightly increased but not otherwise substantially changed.

Pipeline concerns

Concerns were raised with respect to the request to the Public Utilities Board for the installation of the pipeline(s). An initial request for the Orimulsion project has been suspended. A commenter argued that the environmental impact on individual's property need to be assessed and taken into account.

Response – A request to the Public Utilities Board will have to be made, a process which considers environmental impacts.

Zoning

One commenter regretted the fact that his rural bedroom community is becoming an industrial community.

Response – This is a zoning issue which falls outside the scope of the present review.

Other projects

Both at the meeting and through written contributions (ex: Dalzell pages 78, 79), it was argued that other projects linked to the present one were being considered and should be included in the present review. A petrochemical plant was presented as an example.

Response – The present review is self inclusive. Other utilization or new projects would have to receive the approvals required based on their own characteristics.

Property Value

A commenter raised the issue of property value, which may decrease as a result of the project.

Response: This issue is discussed on pages 623 and 624 of the EIS. It is correctly stated that "residential housing prices are a reflection of a number of factors and attributes that include market conditions, social values and perceptions, the quality of housing, and location." The EIS' conclusion that "it is unlikely that property value would be adversely affected and the effects of the Project on property values are rated as not significant" is reasonable.

ARCHAEOLOGICAL AND HERITAGE RESOURCES

A concern was expressed that the federal department responsible for these issues was not consulted (Dalzell page 4). A specific concern pertained to the World War II bunkers (Dalzell page 85)

Response – Representatives of the New Brunswick Archaeological Services (Culture and Sport Secretariat) were consulted and will continue to be active. The New Brunswick Archaeological Service is responsible for the comprehensive cultural resource management of the Province's archaeological heritage. This responsibility includes protecting, preserving and interpreting New Brunswick's non-renewable archaeological resources. It's functions include overall coordination, licensing, collection management, heritage resource impact assessment, salvage, product development, research and liaison with First Nations on heritage issues. They provide professional and technical expertise to work with industry, municipal, provincial and federal agencies, with First Nations, communities, non-profit groups, and individuals.

ABORIGINAL LAND AND RESOURCE USE

> Questions were raised with respect to First Nations consultation and their input (Dalzell page 86)

Response – On pages 661 and 662 of the EIS, we can see that attempts have been made to obtain the input of First Nations' representatives, as well as to obtain pertinent information. It is further indicated that "Irving is prepared to continue consultation with the Union of New Brunswick Indians and other First Nations." (page 662 EIS).

Road Transportation Network

Aggregate supply

> The supply source and transport of aggregate needed for construction was questioned.

Response – The proponents are planning to use an on-site construction batch plant and the rock will be obtained on site using a balanced cut and fill method (page 96 EIS). Additional aggregate will be obtained from existing quarries. Materials delivery will average up to 107 heavy truck trips per month during the construction phase (page 106 EIS).

Road traffic

Concern was expressed that the increased vehicle traffic, large trucks in particular, would present a safety hazard on the Red Head Road. The situation is made more difficult by the narrowness of the road and the absence of sidewalks.

Response – The proponents list a number of mitigative actions associated with the increased road traffic which assume that the roadway will not be altered (Table 5.12.11 and page 690 EIS). Periodic monitoring of traffic flow and liaison with the City of Saint John with respect to traffic light timing at the Bayside Drive – Red Head Road intersection are appropriate. Strict adherence to the posted speed limit by all users of the road will be an important aspect of road safety. This would likely be enhanced by increased traffic police surveillance, especially during the construction phase.

LABOR AND ECONOMY

Comments pertaining to this section were generally very positive. Indeed, energy has been identified as a priority sector in Enterprise Saint John's "Growth Strategy". One commenter indicated that it was felt that future investments in the sector could total well over $3 billion dollars. This commenter considered the present project to be central to the growth of the region's energy sector, generating numerous positive socio-economic spin-offs for the region.

Increased supply of natural gas is generally perceived as very positive. Questions were raised as to what extend this would be the case, especially its impact on prices. A caveat also expressed is the wish of a commenter that the natural gas generated will be available for the New Brunswick market.

Response – An LNG terminal will increase the supply of natural gas, both on a local and regional basis. Market forces will ultimately dictate the impact on prices, although increased supply, everything else being equal, will put downward pressure on prices. Market forces will also influence the location of final consumption of the natural gas.

VESSEL NAVIGATION

Shipping corridors

> A question was raised concerning the shipping corridors associated with alternative facility site locations and the effects the use of these sites might have on the cruise ship industry (Dalzell page 9). Will other types of ships be required to drop anchor in the Bay to wait for a LNG tanker to go by? (Dalzell page 16).

Response – The three alternative locations, Courtney Bay, Saint John Harbour and Lorneville presented various navigation difficulties and were not advantageous locations for other reasons (pages 25-26 EIS). The cruise ship industry would be less impacted by having the LNG facility well outside of the Saint John Harbour. The existing rules and procedures for ship traffic in the Bay of Fundy, Saint John Harbour and at the various anchorages would apply to all vessels and it is likely that priority of movement would be based on established protocols. With only a slight increase in the number of vessels per year in the area, the traffic control operations in the shipping lanes and anchorage sites would not likely have to be changed significantly to accommodate the LNG tankers. Route details, turning and exclusion zones etc. will have to be determined after further consultation with the Atlantic Pilotage Authority (APA), Saint John Harbour Pilots, Canaport, the Canada Coast Guard, and the Saint John Port Authority (page 54 EIS).

LNG Tanker Exclusion Zones

> A commenter questioned whether safety exclusion zones around LNG tankers, if determined to be necessary, would negatively impact marine traffic in the Bay and local area by restricting other uses in the marine environment. The commenter also strongly felt that the issue of whether or not safety exclusion zones would be required and the affects of those zones on existing marine uses should be determined prior to project approval.

Response – Section 5.14.5.1.2 (page 726) of the EIS fully and thoroughly discusses LNG and Orimulsion tanker traffic and expected movements during operation of the

facility. This section also describes the potential need for moving safety exclusion zones around transiting tankers and the process for how these zones will be established. The stakeholders involved in determining exclusion zone establishment will include the Saint John Port Authority, APA/Saint John Harbor Pilot Association, the Canadian Coast Guard, Transport Canada, Irving Oil, and local fishers. To date, representatives of the Saint John Harbor Pilots Association have participated on the TRC and have indicated that, in general, movement of the tankers in the approach to and docking at the proposed pier location will be acceptable. Knowing that a workable situation exists, it is acceptable (and commonly done elsewhere, such as by the U.S. Coast Guard relative to preparation of LNG import terminal vessel management plans in the United States) for the establishment of safety zones and operational details involved in the approach, docking and cargo unloading procedures to be finalized after conditional approval of the project, but prior to operation.

Risk Analysis of Shipping

> A commenter indicated that there should be a risk analysis performed on not just LNG tankers, but also the potential for LNG tankers and crude oil tankers colliding due to the increased overall number of ships in the area.

Response – The risks of LNG or Orimulsion ships associated with proposed project operations is thoroughly covered in Section 5.14 of the EIS.

> A commenter during the public meeting (a member of the Saint John Harbor Pilots Association) commented that Irving Oil indicated early on in the process that it would meet with the Saint John Harbor Pilots Association as a group and that to date it has not done this, although Irving Oil has met with two of the pilots on an individual basis.

Response – This panel recognizes that the Saint John Harbor Pilots Association are represented on the TRC by two individuals, both who have met with representatives of Irving Oil to discuss various aspects of marine navigation associated with this project. Further, this panel understands that Irving Oil has also met with a number of other local captains at different times to discuss navigational issues associated with the operation of

this project. At a meeting on November 28, 2003 to discuss marine issues with Irving Oil, the APA proposed a meeting between Irving Oil and the entire group of local pilots to discuss the pier design and orientation. It would seem prudent, since marine navigation is a central issue associated with development of this project, that Irving Oil meets collectively with the Saint John Harbor Pilots Association and the APA as a group to consider input by this group regarding future operations relative to marine traffic associated with this project.

> A commenter during the public meeting (a Saint John Harbor Pilot) commented that the Harbor pilots have reviewed the proposed location of the Multi-purpose pier and indicated that the proposed location would work, although it is not the pilots preferred location for docking tankers. The preferred location is Tiners Point, near Coleson Cove.

Response – The analysis of alternative sites for the proposed import facility, including analysis of the Lorneville area where Tiners Point is located, is included in the EIS on pages 25 through 27. The panel recognizes that although the proposed pier site may not be preferred in terms of nautical aspects, it is acceptable and that many other factors have to be considered in the overall selection of a preferred site, as discussed in the EIS.

EFFECTS OF ENVIRONMENT ON PROJECT

Climate change

> One commenter identified possible climate change impacts on the viability of the pier via more intense weather conditions. Can the pier withstand the 100 year wave and 100 year wind despite the best engineering designs?

Response – The proponents reference two climate change reports and note that the project-related facilities will be designed to withstand the 100-year return rainfall event (page 745 EIS). The construction codes and regulations to be followed are outlined on pages 60-61 in the EIS.

> Concern was raised about the possible climate changes resulting in right whales changing their movement patterns closer to the shipping lanes (Dalzell page 65).

Response – This possibility is not addressed in the EIS. It is, however, a very complex system that would be difficult to predict with any certainty. The endangered status of the North Atlantic right whale is such that if such a displacement occurred, mitigative steps may be required by various authorities.

Red Head Road Stability

The instability of sections of the Red Head Road has been an ongoing concern for a number of years. Should a section of the Red Head Bluffs collapse, the eastern portion of Red Head Road would be isolated.

Response – This problem has been identified by the City of Saint John but construction of a bypass road has not been approved. The main problem appears to be wave erosion at the toe of the slopes and the slumping of the soil as a consequence (page 669 EIS). The construction of the LNG facility is not expected to exacerbate the problem (page 689 EIS). The **potential** failure of the road, especially during a hurricane, would present significant safety and economic problems to the residents, Canaport and the LNG facility.

Recommendation – Irving Oil should study alternative means of transportation to its site. Furthermore, the City of Saint John should undertake the planning for a bypass road around the Red Head Bluffs area as soon as possible.

FACILITY SECURITY

> Several comments were received that questioned the planned security at the facility, particularly regarding terrorist attacks and the need for an independent review of proposed security systems at the site (ex: Dalzell, pp 4, 13, 23, 29, 31, 49).

Response – Security measures mentioned in the report are briefly covered in section 2.8.11. The measures outlined appear to be developed to reduce the likelihood of trespass onto the Canaport facility site property. This panel recognizes that development of more detailed security plans will proceed with development of the project and respectively recommends that once a complete and detailed security plan for the LNG Terminal facility is developed, it be reviewed by an independent source (*e.g.*, appropriate provincial and federal agencies or authorities or their designees) prior to initiation of facility operation to provide an independent determination of the adequacy of such an important aspect of the project.

Recommendation – Once a complete and detailed security plan for the LNG Terminal facility is developed, New Brunswick's Environment and Local Government Minister should ask a security expert to analyze it and make appropriate recommendations if warranted.

TRACKING COMPLIANCE OF PROJECT CONDITIONS AND COMMITMENTS

During the course of this panel's review, it became apparent that the development stage and regulatory review period for a project of this size and complexity will result in many commitments being made by Irving Oil to various stakeholders and agencies during negotiations, meetings and in environmental permit applications and reports. It is also very likely that with the outstanding studies, plans and reports still to be completed, regulatory conditions would inevitably be applied to permits that are issued for the project. From a regulatory perspective, ensuring and documenting compliance with environmental commitments and conditions is an important part of the regulator's role during construction and operation of the project.

Recommendation – To help track and ensure and document compliance with the assorted environmental conditions and commitments made during the regulatory review process, this panel respectively recommends that Irving Oil develop a tracking database (table) that can be used to track and document compliance with all permit conditions and commitments made by Irving during the regulatory

review process and project design phase. Each condition or commitment should be tracked and the database searchable by the following fields, at a minimum:

- **facility associated with the commitment or condition (*e.g.*, pier, LNG terminal, sendout pipeline)**
- **the project stage when the condition or commitment is required to be addressed (*e.g.,* permitting, pre-construction, construction, operation)**
- **the party responsible for implementation**
- **the document (*e.g.*, EIS, permit, authorization, letter) in which the commitment or condition resides, and**
- **the date implementation is achieved**

Once this database is developed and prior to initiation of construction, we recommend that Irving Oil update the database on a monthly basis throughout construction and submit a printout of the tracking table to the Department of Environment and Local Government as a means of tracking and documenting compliance throughout construction and, as necessary, during operation.

LIAISON COMMITTEE

Concerns were raised that representation on the liaison committee was limited and some potential members excluded.

Response – With projects such as this one, having access to information is very valuable for all stakeholders. Limiting access to information and to the forum where this information can be distributed may fuel suspicion. While membership may indeed be limited to allow efficient deliberations, key stakeholders should be able to contribute when possible.

Recommendation – Membership to the liaison committee should be revised to include, as possible, all key stakeholders.

Appendix 1: Presentations at public meeting and/or submissions of written documents:

- Artiss, William – Enterprise Saint John and Town of Rothesay
- Barton, Dianna – Enterprise Saint John
- Dalzell, Gordon – Saint John Clean Air Coalition
- Ediger, Nick – Sentinel Associates Limited
- Goyetche, Darryl – Saint John Board of Trade
- Griffin, Dennis – Red Head Road Resident
- Griffin, Glenn – Red Head Road Resident
- Hunter, Jim
- Hunter, Roger – Commercial Fishermen from Mispec
- Macintosh, Andrew – Connelly Head Resident
- McAfee, Mr.
- Moore, Charlene – Concerned Citizen
- Peacock, Daniel
- Quinn, Captain Kevin – Bay Pilots & Marine Consultants Inc.
- Quinn, Captain Pat – Saint John Harbour Pilots
- Thompson, David – Conservation Council
- Thompson, David W. – Fisher, Mispec
- Thompson, Greg – Fundy North Fishermen's Association
- Thompson, E. Jean – Concerned Citizen

FINAL STEPS IN EIA PROCESS

The submission of the Independent EIA Review Panel's report and preparation and release of the Minister's Summary of Public Participation completes the public participation component of the provincial Environmental Impact Assessment process. The Minister of the Environment and Local Government will take into account the public input received as summarized in the Panel's report and any findings noted, as well as information provided by the Technical Review Committee, including the General Review Statement, and prepare a recommendation to be brought forward to Cabinet for consideration and decision. This recommendation may include a series of operational conditions to be considered.

Once a Cabinet decision is made, the Minister of the Environment and Local Government issues a media release announcing the Government's determination or decision regarding the project, including any conditions of determination, as applicable.

This information will be available by contacting any office of the Department of the Environment and Local Government or via the Department's web site at http://www.gnb.ca/0009/0377/0002/0008-e.asp .

Similarly, the federal Minister of the Environment makes his determination on next steps and will advise the federal Responsible Authorities. Best efforts will be made to ensure coordination of the announcement of decisions. Information made available as part of the *Canadian Environmental Assessment Act* (CEAA) process on this project is available on the Environment Canada web site at: http://www.ceaa-acee.gc.ca/010/0003/0012/report_e.htm.

STEPS FOLLOWING THE EIA PROCESS

The EIA process is the first component of a larger environmental management system. Detailed design considerations and operational issues are examined subsequently as part of the Approval and Permitting component of the environmental management system. This would be followed by a Monitoring and Follow-up component to ensure compliance. There would be various construction and operation approvals to be sought and commitments made would have to be tracked in order to ensure compliance. Several examples of requirements would be a Public Utilities Board Approval for the natural gas pipeline and right of way which is an open, public process; the development of a marine vessel simulation model; compliance with federal covenants (to be established) as a large final emitter of CO_2; development of emergency response plans and environmental protection plans to the satisfaction of various expert authorities.