

## NATIONAL ENERGY BOARD

IN THE MATTER OF the *National Energy Board Act*, R.S.C. 1985, c. N-7, as amended, and the Regulations made thereunder;

AND IN THE MATTER OF an Application by WesPac Midstream – Vancouver LLC for a licence pursuant to section 117 of the *National Energy Board Act* authorizing the export of natural gas.

To: Secretary  
National Energy Board  
517 Tenth Avenue SW  
Calgary, Alberta T2R 0A8

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### RESPONSE OF WESPAC MIDSTREAM – VANCOUVER LLC TO NATIONAL ENERGY BOARD INFORMATION REQUEST NO. 3

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#### **3.1 Use of a Long-Term Licence for Exports to the United States, follow-up to IR No. 1.4**

- Reference:**
- i) WPMV Application to the NEB, PDF pages 3 (“Export Point”) and 5 (paras. 8 and 9) of 12, A3Y4Q6
  - ii) WPMV Response to the NEB’s Information Request No.1.4, Clarify the Export Point(s) Applied For, PDF pages 4 and 5 of 5, A4A9L9

- Preamble:**
- References i) and ii) imply:
- LNG loaded from the hose connector of the pump at the truck rack at the Tilbury LNG Plant in Delta, B.C. will be exported by either truck, ship, or barge; and
  - Some of the exported LNG is destined for the United States.

The Board notes the following:

- Currently, nearly all natural gas, including LNG, is exported to the United States under short-term export orders not long-term export licences<sup>1</sup>; and

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<sup>1</sup> To reference export statistics, including natural gas exports by term, see the National Energy Board website – Energy Information – Statistics and Analysis – Natural Gas link entitled [Natural Gas Import, Exports and Liquefied Natural Gas Statistics](#).

- Export licences may have specified export points while short-term export orders do not.

**Request:** Please explain WPMV's rationale for seeking a 25-year export licence for proposed natural gas exports to the United States.

**Response:** The primary reason why WPMV is seeking a 25-year export licence for proposed natural gas exports, including to the United States, is that WPMV contemplates entering into long term commercial contracts (i.e., greater than two years' duration) in relation to the proposed exports to the United States. As is the case with its exports to regions other than the United States, WPMV requires long term authorization to export natural gas to provide WPMV and its commercial counterparties with the certainty they require to enter into such long term commercial contracts and to finance capital investments to support them. WPMV has been and is currently in negotiations with a number of third parties respecting commercial arrangements (for example, new LNG-powered ship fuel supply, or power generation fuel switching) that would involve exports to the United States for periods substantially longer than two years.

In addition, WPMV noted in its Application that the markets for natural gas exported under the applied-for licence could include Asia, Central America, South America and the United States and its territories. Over the term of the licence, WPMV anticipates that the volumes of gas exported under the licence to any particular region will vary over time. In other words, a greater or lesser portion of the applied-for volume of gas exported over a particular time period during the term of the licence may be destined for the United States versus other markets. By including exports to the United States under the umbrella of the volumes authorized for export, the licence will provide WPMV and its commercial counterparties with flexibility to respond to changes in market demand by providing certainty that the full volume of gas authorized for export under the licence will be available to meet their commercial requirements and opportunities.

Finally, WPMV notes that the Board has recently approved two natural gas export licences for a term of 25 years which involve exports to the United States (Jordan Cove LNG L.P. (A58981) and Oregon LNG Marketing Company LLC (A59998)).

### **3.2 Factors Limiting LNG Exports from Canada, follow-up to IR No. 2.1**

- Reference:**
- i) Navigant, Supply and Demand Market Assessment, Table 3: Gas Resource Life (to supply domestic demand plus pipeline exports), PDF page 18 of 48, A3Y4Q7
  - ii) Navigant, Supply and Demand Market Assessment, Table 4: Gas Resource Life (to supply domestic demand only), PDF page 19 of 48, A3Y4Q7
  - iii) Navigant, Supply and Demand Market Assessment, 3.8 Supply-Demand Balance, PDF pages 40-42 of 48, A3Y4Q7
  - iv) WPMV, Response of WesPac Midstream – Vancouver LLC to National Energy Board Information Request No. 2.1 a), PDF page 2 of 3, A4C3H4
  - v) Navigant, Supply and Demand Market Assessment, 3.8 Supply-Demand Balance, PDF page 43 of 48, A3Y4Q7
  - vi) Navigant, Supply and Demand Market Assessment, 3.7 Risks to the Supply and Demand Forecasts, PDF pages 38-40 of 48, A3Y4Q7

**Preamble:** References i) and ii) show Canada and Western Canada recoverable resource calculations to supply Canadian demand levels with and without net pipeline exports. In illustrating the resource life calculations, Navigant included 23.76 Bcf/d of approved and applied-for Canadian LNG export licence volumes (as of April 2014), including WesPac’s.

Reference iii) discusses the Canadian supply/demand balance forecast which indicates that net pipeline exports to the United States diminish as Canadian LNG exports ramp up but then stabilize over the last 20 years of the forecast. Navigant forecasts 4.3 Bcf/d of net pipeline exports and shows approximately 1.3 Bcf/day of LNG exports from Canada in 2045, for an approximate total surplus quantity of 5.6 Bcf/d in net gas exports.

In Reference iv), Navigant states that it expects the 5.6 Bcf/d net gas export figure in 2050 to remain at about 4.3 Bcf/d for net gas pipeline exports and 1.3 Bcf/d for net LNG exports net Canadian LNG exports.

Reference v) states “It is important to recognize that North American LNG exports will occur within a global marketplace, with a supply-demand balance that accounts for international competition. Consequently, it should be expected that only some portion of incremental international LNG liquefaction capacity will be built in North America, and relatedly that only some portion of proposed North American facilities will be built.”

In reference vi), Navigant stated that the assumptions used in its forecast could be impacted by certain resource development and market risks to Canadian supply and demand. However, Navigant's report does not provide the Board with a specific rationale for limiting its forecasted net LNG exports from Canada to 1.3 Bcf/d.

The Board notes that Navigant forecasts a total of 5.6 Bcf/d of net gas exports which comprises of 4.3 Bcf/d for net gas pipeline exports and 1.3 Bcf/d for net LNG exports. The Board recognizes that within the total forecast of 5.6 Bcf/d that the level of net gas pipeline exports and net LNG exports could vary depending on several factors, including market conditions.

The Board notes Navigant's conclusion that only some portion of the proposed "North American" LNG facilities will be built. Although Navigant referenced 23.76 Bcf/d of applied-for and approved LNG export volumes proposed from Canada, Navigant's actual net LNG exports forecast is limited to 1.3 Bcf/d. Based on this forecast, the Board infers that Navigant does not believe that all proposed "Canadian" LNG facilities will be built.

**Request:** Please provide an extensive discussion of the factors that Navigant believes will limit the volume of exports from Canadian LNG facilities.

**Response:** Navigant responds as follows:

As noted in Navigant's Supply and Demand Market Assessment prepared for WesPac Midstream and referenced by the Board in Information Request 3.2 (Preamble paragraph four), Navigant believes that only some portion of incremental international LNG liquefaction capacity will be built in North America, and that therefore only a portion of proposed North American facilities will be built. As the Board further referenced in Information Request 3.2 (Preamble paragraph 7), Navigant's forecast that is incorporated into its Assessment included only 1.3 Bcfd of net LNG exports (2.0 Bcfd of gross LNG exports) from Canada.<sup>2</sup> The Board's inference that Navigant does not believe all proposed Canadian LNG facilities will be built is correct, although Navigant believes that the magnitude of the Canadian natural gas resource is sufficient to support a much larger level of exports should they develop. The remainder of this response will further explain Navigant's view.

Navigant's Assessment included global LNG forecast information based on 2012 data from BP and the Canadian Energy Research Institute (CERI), specifically an estimated global LNG demand in 2030 of 70 billion cubic feet per day (Bcfd) versus estimated 2030 liquefaction capacity of then-

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<sup>2</sup> Navigant's Fall 2013 Outlook figure of 1.3 Bcfd of net LNG exports actually reflects gross LNG exports of 2.0 Bcfd, less LNG imports of 0.7 Bcfd.

existing and currently-under-construction facilities of 50 Bcfd. Grossing up the 70 Bcfd for an assumed 90-percent utilization gives a requirement of 78 Bcfd of capacity, a shortfall of 28 Bcfd versus the estimated 50 Bcfd of future existing global capacity. Comparing this 28 Bcfd capacity shortfall to the 56 Bcfd of proposed North American liquefaction projects at the time of the Assessment clearly indicated that the expected capacity shortfall, even assuming the construction of only North American projects, could amount to only half of the proposed North American capacity, leaving many North American projects likely unbuilt.

With respect to the proposed Canadian liquefaction capacity, Navigant's Assessment did not specifically address the roughly 20 Bcfd of proposed Canadian capacity versus the estimated global capacity need of 28 Bcfd, instead highlighting the overall North American balance. The response herein will detail the current state of proposed global liquefaction capacity to support Navigant's view that ultimate Canadian liquefaction capacity will be far less than that currently proposed, based on updated forecasts of the global LNG market.

BP's latest update of its global energy forecast is in its Energy Outlook 2035, issued in February 2015.<sup>3</sup> That forecast reflects a forecasted global demand for traded LNG of about 78 Bcfd in 2035.<sup>4</sup> Grossing that 78 Bcfd of demand up by an assumed 90-percent utilization, as in our Assessment, gives an estimated total liquefaction capacity requirement of 87 Bcfd. With respect to the estimated capacity of currently existing and under-construction liquefaction facilities, Navigant's data indicates about 57 Bcfd of expected capacity<sup>5</sup> from such facilities, which implies the need for 30 Bcfd of additional liquefaction capacity to fully serve estimated LNG demand in 2035.

Against this need for 30 Bcfd of liquefaction capacity, Navigant has reviewed the inventory of proposed, applied-for, and approved LNG facilities worldwide that are not yet under construction. Navigant has identified about 111 Bcfd of potential incremental liquefaction capacity, of which the 30 Bcfd of estimated required incremental capacity constitutes only about 27 percent. In total, there is about 46 Bcfd of Canadian projects, and 65 Bcfd of other projects globally. The 65 Bcfd of potential non-Canadian incremental capacity is spread across the globe in a variety of locales positioned to compete in the global market. Assuming a uniform chance of success for all potential projects would mean a 27 percent success rate, which would lead to Canadian liquefaction capacity

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<sup>3</sup> [http://www.bp.com/content/dam/bp/pdf/Energy-economics/energy-outlook-2015/Energy\\_Outlook\\_2035\\_booklet.pdf](http://www.bp.com/content/dam/bp/pdf/Energy-economics/energy-outlook-2015/Energy_Outlook_2035_booklet.pdf)

<sup>4</sup> BP Energy Outlook 2035 (February 2015), slides 51 and 58. Estimated gas consumption in 2035 at 490 Bcfd, with LNG share of gas consumption at about 16% in 2035, yielding estimated LNG demand in 2035 of about 78 Bcfd.

<sup>5</sup> Based on 306.65 mtpa of existing capacity and 129.42 mtpa of under-construction capacity, using an assumed conversion of 7.6 mtpa per Bcfd.

of about 12.5 Bcfd (11 Bcfd on the West Coast and 1.5 Bcfd on the East Coast), versus identified potential capacity of 46 Bcfd. Table 1 provides a more detailed breakdown of global potential incremental liquefaction capacity.

Table 1

Potential Incremental Liquefaction Capacity Beyond Current Existing and Under-Construction Capacity		
	<u>Bcfd</u>	<u>30 Bcfd, pro-rata</u>
Canada West Coast	41	11.1
U.S Gulf/East Coast	29	7.8
East/South Africa	7	1.8
West Africa	6	1.7
Eastern Europe/FSU	6	1.7
Canada East Coast	5	1.4
U.S. West Coast	5	1.2
Middle East	4	1.2
Oceania	3	0.8
Medit./South Europe	2	0.5
Central/Latin America	2	0.5
Southeast Asia	<u>1</u>	<u>0.3</u>
Total	111	30

Source: Navigant

While it is useful to put into context the relative magnitude of potential liquefaction project capacity versus the much smaller likely need for new capacity, a discussion of the specific factors facing Canadian projects is in order. Despite there being no real dispute about the sheer magnitude of Canada’s natural gas resource, other factors exist which create obstacles to the construction of Canadian liquefaction facilities. These factors relate to the various risks that are inherent in major project development and that have resulted in no major Canadian project having yet made a Final Investment Decision (FID).<sup>6</sup>

From a cost perspective, developers of projects on the B.C. coast will generally be faced with the prospect of building or funding long and expensive pipelines to bring feedgas from sources or interconnections over coastal mountains – some of the world’s most difficult natural terrain – to the project sites. These are costs that some other global competitors may

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<sup>6</sup> In fact, in October 2014, BG Group announced a delay in their FID for the Prince Rupert LNG project, due to gas market uncertainties. In December 2014, Petronas, lead partner of the Pacific Northwest LNG project, announced a delay in making their FID as a result of construction cost increases. Also in December, Apache Corporation announced the sale of its interest in the Kitimat LNG project.

not face.<sup>7</sup> These pipelines represent hundreds of millions of dollars in additional commitments, adding to project costs. For example, the proposed 650-km Coastal GasLink Pipeline to serve LNG Canada at Kitimat is estimated to cost \$4 billion; the proposed 900-km Prince Rupert Gas Transmission pipeline to serve Pacific Northwest LNG at Prince Rupert is estimated to cost \$5 billion. These pipeline costs are unique at least in North America, and in fact in most all other global supply basins.

Another cost factor is the fact that many of the Canadian project sites are “greenfield”, as opposed to being “brownfield” sites that exist for many projects in the U.S. A greenfield site has little to no existing infrastructure, thus requiring greater investment to complete the development, adding to costs and decreasing competitiveness. For example, necessary utilities such as water and electricity services have to be specially developed, and even things like roads and other supporting infrastructure do not exist currently and need to be built. Certain projects that involve the addition of liquefaction facilities at existing LNG import terminals, such as many of the U.S. Gulf Coast projects, therefore have a natural cost advantage due to existing infrastructure including pipeline capacity that may only need to be reversed or existing right of ways that can be used.<sup>8</sup> Higher costs impair the competitive nature of the export project, making investment less attractive and therefore the project more difficult to develop. Whatever the infrastructure status, liquefaction facilities are some of the most expensive projects undertaken and consequently present natural financing challenges; for example, estimated project costs for a large project like LNG Canada are from C\$25 billion to C\$40 billion.

In addition to cost considerations are completion risks that ordinarily accompany such endeavors. Permitting hurdles that could result in additional development time will need to be accommodated, such as First Nations requirements that affect not only the development of liquefaction project sites, but of pipeline projects, as well. Other risk elements relate to both regional and international market changes affecting natural gas prices delivered to a facility, technical challenges facing these large LNG projects, or even the uncertainty of the ultimate actual costs of construction. Other risk factors not even directly related to the gas industry, such as changes in the price of oil, as we have seen recently, and other market cycles that could again occur over the long term life of these projects, could result in a lowered competitive outlook for LNG in the global market, and more risk facing these large projects in finding financing.

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<sup>7</sup> Similarly, WesPac itself will not face these cost issues as its project will be located adjacent to an existing coastal liquefaction facility.

<sup>8</sup> Similarly, WesPac’s project is proposed for a brownfield site adjacent to an existing (and expanding) liquefaction facility.

All of these risks and uncertainties represent impediments to a positive FID to all LNG projects, including projects in Canada, which is one reason why of all the major potential Canadian liquefaction projects, there has not been a positive FID yet, nor more than a few publicly announced LNG off-take contracts as there have been with U.S. projects. A somewhat later start date compared to LNG projects in the U.S. is obviously another factor facing the Canadian LNG export industry. This to some degree also enters into what may in fact be a 'window' of market opportunity facing all LNG projects around the globe that could close at some point for a wide variety of reasons.

In deciding to incorporate 2.0 Bcfd of assumed Canadian liquefaction capacity into its current modeling, Navigant has reflected its risk-based view of likely development given the current state of the markets with a view to the future--actually a market view that Navigant has espoused for several years now and sees no reason to change at the moment. Navigant's outlook for LNG exports reflects a conservative approach consistent with Navigant's outlook on supply or infrastructure development, where changes are modeled based on actual physical changes such as new production or signs of actual or at least tangible progress regarding the development of pipeline construction. It should also be mentioned that Navigant's view on Canadian LNG liquefaction capacity and exports, like other aspects of our market outlook, could change if future changes occur or if we see indications that more LNG export potential exists.

This being said, it should be noted that the evidence we have seen and support is that the sheer magnitude of the Canadian natural gas resource will support a much larger volume of LNG exports than is currently in our forecast; for example, the resource life estimates presented in Navigant's Assessment include scenarios of 23.76 Bcfd of LNG exports with gas resource lives of over 100 years (118 years based on Canadian domestic demand, and 102 years based on Canadian domestic demand plus pipe exports to the U.S.).<sup>9</sup> We continue to believe that the abundant and robust Canadian and U.S. supply base and the interconnected pipeline grid between Canada and the U.S. are the key factors supporting Canadian exports today.

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<sup>9</sup> See Navigant Supply and Demand Market Assessment for WesPac, May 28, 2014, at Tables 3 and 4 (A3Y4Q7).