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Order of Appearances

Northern Gateway Panel 1

Marine, Environmental & Socio-Economic Assessment

Mr. John Carruthers	Ms. Andrea Ahrens	Mr. David Fissel
Mr. Jeffrey Green	Mr. David Hannay	Mr. John Thompson
Dr. Tom Watson	Mr. Paul Anderson	Mr. Peter Reid

Examination by Ms. Maria Morellato for the Coastal First Nations (continued) 11131

Mr. Carruthers confirmed that Northern Gateway Pipelines (NGP) would fund the Fisheries Liaison Committee (FLC) for the operational costs for the duration of the project.

Halibut fishers in the gulley

Ms. Morellato asked whether NGP had considered specifically the impact its project might have on longline halibut fishing in a deep part of Hecate Sound, near Triple Island, known locally as the gulley, and on the proposed tanker route. 1138

Mr. Carruthers put up Figure 13-5, "Commercial Fisheries Potentially Affected by Transiting Vessels" in Exhibit B3-36 which shows groundfishing in the gulley area. Dr. Watson discussed some features of the map[1]. Mr. Green said that the route past Triple Island, a pilot station, is an established shipping lane and NGP's tankers represent 2%-3% of the vessel traffic. 11163

Ms. Morellato said that her "instructions" are that NGP tankers are the only vessels traversing the gulley on the outside of Triple Island. She was referred to the Shipping and Navigation Panel for routing questions. Her primary concern is that NGP can provide no evidence of having spoken to First Nation halibut fishers about this area. 11193

Coral and sponge reefs near Caamano Sound

Ms. Morellato asked Mr. Green about the benefits of integrated marine use planning, its use in PNCIMA, and the PNCIMA atlas. Mr. Green said "We've been using it." This is an entry to a discussion about coral and sponge reefs near Caamano Sound as illustrated on Figure 9-1, Summary of Human Use in the Open Water Area in Exhibit B3-41 11212, 11271

Mr. Green said, "It's important to point out that these are in deep water and we're talking about routine marine transportation which can be occurring 100 or more metres above … these reefs. … The ships are on the surface, these are on the bottom of the ocean, so there's substantial spatial separation between the routine activities of these vessels and these reefs that you're referring to."

Ms. Morellato said, "As part of routine tanker traffic there are oil spills and oil leaks and we know that oil sinks." Mr. Green interjects: "No, I would like to correct your statement. That's not correct and that I do not want that on the record, is that as we discussed at some length on Monday, chronic discharges of oil, as you're referring to, is not a part of routine operations. And legal discharges of water effluent containing small amounts of hydrocarbons are permitted under the Shipping Act, they are not permitted within 50 nautical miles of land. In some of the areas you're referring to, particularly Caamano Sound, even authorized discharges of effluent would not be permitted. So that is not a correct statement." 11274

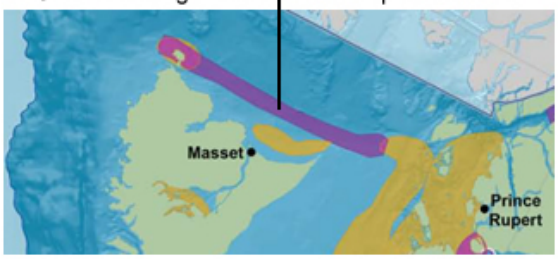
[1] Dr. Watson explained the "three party rule" which is intended to maintain confidentiality for fishers where there are three or fewer working an area. In this case, they are grouped and assigned to another area.

Eulachon and herring areas

Ms. Morellato put up PNCIMA's Herring and Eulachon Important Areas map (link) as an as an aid to questioning (AQ). Focusing on the eulachon important area along Dixon Entrance, she asked where the eulachon are on Figure 8-2, "Summary of Biological Important Areas" in Exhibit B3-39. Mr. Green explained the colour coding used on Figure 8-2 to indicate overlapping important habitats, and pointed to the same polygon as appears on the PNCIMA map. He said that they used exactly the same DFO database as did PNCIMA 11286

NGP: Fig. 8-2, Biological Important Areas, B3-39

PNCIMA: Herring and Eulachon Important Areas



Ms. Ahrens confirmed that marine mammals - porpoise, finback whales, killer whales, sea lions - are known to follow the eulachon migration from open water into rivers and coastal areas. She agreed with Ms. Morellato that the eulachon and the mammals travel on an overlapping route with the tankers. 11394

Introduction by Ms. Laura Estep of Mr. Peter Reid 11439

Ms. Estep introduced Mr. Reid and referred to his portion of Exhibit B136-2, his direct evidence & resume (Exhibit B176-1 & B176-2). He is qualified as an expert on air quality.

Examination by Ms. Maria Morellato (continued) 11476

Air emissions in the Kitimat watershed

Northern Gateway defines the boundaries of the project effects assessment area (PEAA) as a 300 square kilometre area that contains the Kitimat Terminal and lands on both sides of the Kitimat Arm extending north and south of the terminal. 11476

It also estimates the maximum predicted ground level concentrations of criteria air contaminants within the PEAA, focused on the area around the marine terminal primarily.

Ms. Morellato said, "To estimate the criteria air contaminant concentration within the PEAA, you use a dispersion model with four scenarios that include the base case, the project case, the application case, and the future case." Mr. Reid replied, "We use those cases to characterize what is existing, how the project effects the environment on its own if it were alone, and then we add those two together to yield the application case, which is the project, in addition to what's already existing, and then the future case is considering

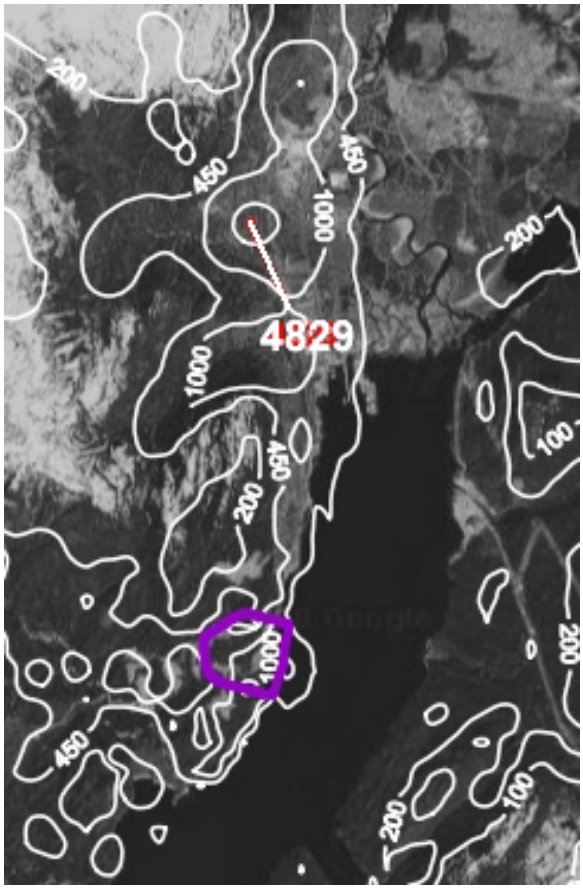
projects that are announced or approved at the time that we are able to include them in the dispersion modelling." 11478

Maximum Predicted Ground-Level Concentrations of Criteria Air Contaminants

Ms. Morellato turned to Section 4.4.3.5, Cumulative Effects Implications, in Exhibit B3-1 and then to Table 4-15. "Maximum Predicted Ground-Level Concentrations of Criteria Air Contaminants from Emissions from the Project and Other Industrial Facilities within the PEAA". The table shows levels well above provincial and Canadian standards for the criteria air contaminants (CAC). 11482

Mr. Reid explained aspects of the table and the model. They modelled five years of actual meteorological data, and the model predicts a concentration for every year modelled, at thousands of receptors which are densest at the emission source and more disbursed at greater distances. Table 4-15 is the highest concentration at the most affected receptor. In the project case, that is immediately adjacent to the vessel right next to the jetty since the tankers are the main source of sulphur emissions for the project; and in the base case, it's at the Rio Tinto Alcan smelter.

Ms. Morellato asked how many other monitoring points or receptor points are above the provincial and Canadian standards. Mr. Reid took her to Figure A-41, "Application Case - Maximum Predicted One-Hour Average Ground-level SO_2 Concentrations (µg/m³)" in Exhibit B10-4. It is an isopleth representation of SO_2 levels in the PEAA with the highest concentration of 4829 µg/m³ on the hillside adjacent to the smelter and an isopleth of 1000 at the terminal site. The isopleth labelled 450 is the BC air quality objective. (see clip at right). 11551



Ms. Morellato referred back to Table 4-15 and noted that the annual average SO_2 concentration of 40.4 µg/m³ for the project alone exceeds the BC air quality objective of 25 µg/m³. Mr. Reid said that since they did this modelling, IMO and national regulations are being adopted that impose a 96% reduction in sulphur in marine fuels so the emission levels will be reduced well below the BC threshold. 11582

Mr. Reid also said that their modelling is intended to err on the conservative side, so that "I don't want the mistaken impression to go on the record that the values that we have in

our table for predictions could in fact be measured if we were at that location measuring all the time." 11692

Ms. Morellato said "We can only go with the evidence that you've put on the record." She said she would like to know what the health impacts of high SO_2 concentrations. Mr. Roth objected. The Panel ruled that it is not a useful exercise. Ms. Morellato wished to note an objection on the record.

Ms. Morellato's questions continued about SO_2 and World Health Organization (WHO) recommended levels. Mr. Reid said that it is BC and Canadian regulations that apply in this jurisdiction. He pointed her to Table 5.2, "Maximum Predicted Ground-level Concentrations of Sulphur Dioxide Associated with Anticipated Reductions of Sulphur in Marine Residual Fuel Oil" in Exhibit B10-3 where the reduced sulphur standards have been applied. 11736

Substance	Averaging Period	Maximum Predicted Ground-level Concentration ($\mu g/m^3$)				British Columbia AAQO ($\mu g/m^3$)		
		Base Case	Project Case	Application Case	Future Case	Level A	Level B	Level C
SO_2	1-hour	4,829	4,627	4,829	4,829	450	900	900-1,300
	3-hour	2,557	3,063	3,063	3,063	375	665	-
	24-hour	755	839	839	839	160	260	360
	Annual	82.0	40.4	82.1	82.1	25	50	80

Particulate matter

Ms. Morellato turned to Table 4-15 again and asked about particulate matter, noting that the application and future cases predicted levels for PM_{10} of 82.1 µg/m³ exceed the provincial guideline of 50 µg/m³. She asked Mr. Reid if the project will follow WHO guidelines. He said as before, that they would follow regulations for this jurisdiction. There is more discussion of PM in the transcript. 11803

Cumulative impacts & major projects

Ms. Morellato noted that CEAA required an environmental assessment to include cumulative effects, but that NGP had included only one project in their cumulative impact assessment. She then turned to BC's 2009 Major Projects Inventory (as an AQ) and asked about each of the seven projects listed that might have an impact in the Kitimat PEAA but which were not included in NGP's study. 11877

Details are in the transcript, but the reasons for not including them included being outside the PEAA, the impacts would be temporary construction effects only, with the Alcan expansion they did not know if the effects would go up or down from the existing smelter, with the Pacific Trails Pipeline that there was no temporal overlap with NGP, and for others that they were at best hypothetical.

Proposed LNG & pipeline projects & NGP

Shell LNG was listed in the 2012 Major Projects Inventory, long after the NGP application had been submitted. Mr. Reid said Shell would have to include NGP in its cumulative effects study rather than the other way around. 12020
The Coastal GasLink Pipeline Project would transport gas for Shell LNG, also surfaced long after the NGP application.
Douglas Channel LNG, previously known as BC LNG and the Merrill Lynch TeeKay LNG project was also not included because of timing.
Pembina Kitimat to Summit Lake Condensate pipeline withdrew from environmental assessment.
Kinder Morgan's TMX – North pipeline is on hold.

Kitimat LNG – devil in the details

Kitimat LNG was included in the NGP air quality study, and the PTP Pipeline. Talking about the number of vessels, Ms. Morellato quoted from a project description, an AQ, that the number of shipments will be five to seven per month and the project has an export permit for up to 10 MMTPA (million metric tonnes per year) of LNG[2]. She asked, Would doubling the export capacity of the Kitimat LNG increase air pollution emissions? Mr. Reid replied, "That doesn't exactly follow. … The devil's in the details. … The facility has relatively small emissions because they're just using electricity mainly to liquefy natural gas…, so it's a relatively innocuous facility." 12165
[*Editorial interjection: Mr. Reid is only correct if the electricity itself is from a renewable source. If KLNG uses gas at the LNG train to generate the electricity needed for its liquefaction process, then there will be substantial emissions generated within the PEAA.*]

Vessels within the CCAA

Ms. Morellato returned briefly to an earlier discussion about vessels in the confined channel assessment area. Mr Reid said that in his modelling he assumed that there was a vessel at each jetty at all times, the condensate vessels run their auxiliary systems fairly hard while they're at the jetty pumping whereas the VLCCs are receiving cargo. 12047

Ms. Morellato, noting that a number of new projects have firmed up, that regulations have changed with low sulphur marine fuels, that the Eurocan project has shut down, that as Mr. Reid said, "a lot of information changed on us at the last minute," asked, "will Northern Gateway agree to complete a revised air quality analysis that includes these additional projects?" Mr. Carruthers replied, "A lot of analysis [is] being done by others in this air shed, and so that information would be available to us in the future. … Should we be directed by the Board to do such further analysis, we would." 12219

Examination by Ms. Jennifer Griffith for the Haisla Nation 12264

[2] Natural gas is typically measured in cubic feet – thousand cf (mcf) or billion cf (Bcf). That's the input to an LNG export facility. The output is typically measured in tonnes – million metric tonnes is MMT. MMTPA is MMT per annum. 1 Bcf of natural gas = 0.021 MMT. The PTP was approved to transport 1 Bcf/day, or 7.665 MMTPA.

Questions about excavation at the terminal

Ms. Griffith asked if excess material from dredging and blasting at the marine terminal will be disposed of in an area called "the excess cut disposal area on land." She asked if about 30,000 m^3 is to be dredged and about 25,000 m^3 will be removed by blasting. And she asked whether some of the dredged material will escape the dredge buckets, and whether about 40% of the blasted material will end up on the bottom. Mr. Green and Mr. Fissel said all of that is correct. 12318

Ms. Griffith asked, So about 45,000 m^3 will be deposited in the disposal area? Mr. Fissel never did get the arithmetic sorted out. Referencing Exhibit B3-12, Ms. Griffith noted that approx 3 million m^3 will be generated from site grading for the tank lot. "[Do you] know what the total area of land is that is expected to be covered by the excess cut material?" Mr. Roth accepted an undertaking to find the answer.

Acid rock drainage

Ms. Griffith asked if the excess cut material will cover existing vegetation. Mr. Green said that is correct. She asked if there is potential for acid rock drainage and how the excess cut area will be managed so that it does not have adverse effects on the area's hydrology. From Exhibit B3-12, Mr. Green read, "Geochemical testing of the shoreline near the marine terminal has shown there is little risk of acid rock drainage and metal leaching from soils or rick disturbed during terminal construction. For these reasons, acid rock drainage is not expected to result in changes in water or sediment quality ..." Mr. Anderson answered the second question: "With respect to the hydrology of the area for the disposal site, a reclamation plan would be developed, … a component of which will be ensuring that the hydrology is not negatively affected. Re-contouring and re-vegetation would be included as part of that reclamation plan." 12368

Marine terminal construction

Ms. Griffith established through her questions that the construction of the terminal will result in disruption of 1000 metres of marine riparian vegetation, along 1 km of shoreline. The associated habitat loss is estimated to be 18,339 square metres. 12401

She said, "A number of CMTs, both pre and post-1846 have been identified on the lands [to be used] for the tank terminal. Is it possible that this marine riparian vegetation also includes CMTs?" Mr. Green said, "CMTs could occur within that marine riparian zone. There's CMTs throughout the site." 12410

In Exhibit B3-12, page 196, "we see that the prediction confidence for marine riparian vegetation is moderate because not much is known about current availability and status of marine vegetation in the region." Mr. Green agreed: "Yes, we know less about marine riparian vegetation -- abundance and structure." 12414

Field surveys could have been done

Ms. Griffith asked, "Couldn't the absence of information about currently availability and status of marine riparian vegetation have been easily cured through field investigations and surveys? Mr. Green: "The simple answer is: Yes, field surveys could have been done. The area that is encompassed within the Regional Effects Assessment Area would

include, for example, the area from Elmslea Cove through along to our site, the Rio Tinto area, the working waterfront of Kitimat, and then around to Kitamaat Village and slightly beyond that." 12421

Mr. Green said it would have improved the prediction confidence if the field surveys had been done. Part of the problem was the marine terminal itself which was moving away from a "robust structure" to "more of a trellis-like facility that's above the water." 12442

"The context is important in that land use planning sets what may or may not be an acceptable change. When an area is zoned as industrial, the tolerance for change is much higher than in an area that might be designated as protected. It does influence how one might determine whether something may be significant -- it's what's referred to as "context" in the guidance documents under the CEA Act. 12459

Fish surveys at the terminal site

From Exhibit B9-25, page 32, Ms. Griffith determined that a fish survey at the terminal site was done in August and September 2005. Mr. Green said that no fish surveys had been done since then. Ms. Griffith asked about a number of fish species, and obtains answers from either Mr. Green or Dr. Watson that some are present in the terminal area in spring, some from June on, herring in February-March. 12478

Ms. Griffith: "Thank-you, Dr. Watson. … I've been dying to say that."
Dr. Watson: "Don't pick on me." 12495

Ms. Griffith said, in effect, other than late summer, you have no local site-specific information for the remainder of the year. Mr. Green replied, "We don't have actual field data, but there is literature, there is the traditional use information that has been filed by the Haisla." 12511

A discussion follows about fish surveys, and NGP's preference for habitat surveys over species surveys.

Eulachon

Ms. Griffith put up Exhibit B3-13, p37. Mr. Anderson said, "There is quite a wealth of information on eulachon in this area. The problem … is that the numbers have gone down so dramatically that it's difficult to get a good understanding of this species given those population numbers." "It's our understanding that [eulachon] travel through in deep water in the March to mid-April timeframe through this area." 12532

Ms. Griffith: "What if the field surveys had been conducted at different times of the year?" Mr. Anderson: "This is a very difficult species because the numbers are so low and there's years where there's basically no adults coming in." 12543

In Exhibit E9-21-12, DFO has set out some very specific information which it thinks would be beneficial, said Ms. Griffith. She asked if NGP has taken any steps to obtain the information. Mr. Anderson said that no further information has been collected because NGP does not "see an obvious pathway of effect of our project on eulachon." 12551

He continued, “We do have a good understanding of the habitat that is present. I wouldn’t agree with you that there is a gap of information. Historical information is good in this area. And our understanding of the habitat that’s present in this area is excellent.”

Marine environmental effects monitoring program

Ms. Griffith put up a discussion about the marine environmental effects monitoring program in Exhibit B46-2, page 29. Mr. Anderson said that the purpose of the marine environmental effects monitoring program is to help refine our project in respect of mitigation, timing for least risk periods and for obtaining pre-construction baseline information for the purposes of a follow-up program under CEAA. It reflects the moderate level of certainty that we had in terms of our predictions and it will help us to determine the effectiveness of our mitigation. That’s the intent of this program. It isn’t an intent to provide more information to inform the environmental assessment. 12569

Ms. Griffith said, “for the marine terminal ESA, Northern Gateway has identified the following key indicators for fish: eulachon, Pacific herring, rockfish and chum salmon.” She noted that “the basis on which chum salmon have been selected as a KI, is because it's commercially and recreationally valuable; it's culturally important; it's sensitive to disturbance; and it is an important food source for marine biota; and it is abundantly or widely distributed in the area.” “None of these characteristics tell us how chum salmon is similar or dissimilar to other salmon species” 12589

Ms. Griffith asked about a mitigation measure for habitat disturbance which is to adjust work windows for in-water activities, such as dredging and blasting. Mr. Anderson said using work windows is, “to mitigate the pathways of effect that we've identified and try to minimize the impacts associated with the project.” 12609

Ms. Griffith asked, “Do you actually know whether there is a clear work window for this area?” Mr. Anderson replied, “I'm told that the general work window is November 30th to February 15th.” Ms. Griffith continued with questions about the seasonal behaviour of herring and eu1achon. Mr. Anderson said, “The entire period of in-water activity is estimated to be approximately 18 weeks.” 12619

Ms. Griffith said that the marine terminal ESA says the prediction confidence for various impacts to marine fish and habitat is moderate, not high. “The reason for a moderate prediction confidence is … that is the exact spatial and temporal distribution of each KI species in the PEAA relative to impacts is unknown.” Considerable discussion follows. 12649

Ms. Griffith said, “I think I heard you say a couple of questions ago that you would have no better understanding if habitat -- or migratory fish data had been collected at different times of year over a number of years than you do now.” Why are you saying that additional monitoring or studies post-certificate would give you a clearer understanding? Mr. Anderson said: Two reasons. The first is we’ll be getting the most recent information in the years prior to construction, and then we would be monitoring during that year of

construction to ensure that the timing window is working efficiently with respect to the movements of the fish during that year. 12664

Bubble curtains and silt curtains

Mr. Green described bubble curtains. You surround the area in which you're working with pipes that are on the bottom, perforated pipes, and you pump compressed air through the pipes and they create bubbles that rise to the surface. It contains the sound much more effectively, and it also essentially provides a visual barrier to fish that are moving through the area. Ms. Griffith suggested that "Northern Gateway's familiarity with this mitigation measure is based strictly on literature." Mr. Anderson agreed. 12673

Mr. Hannay said, "I'm the acoustics expert. … Bubble curtains are used quite extensively for other sources, like pile driving, where the high pressure pulses that are produced by that activity can cause injury to fish … The use of air curtains has been tested quite extensively with blasts and the tests in the literature show that it is quite effective. [In one test we've done] they showed that the peak pressure could be reduced by up to 60% and the energy density reduced by 40%. This could have a significant effect on reducing the distance at which sound pressures would exceed the injurious thresholds for fish." 12690