Enbridge Northern Gateway Project
JRP Hearing Notes

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Order of Appearances

Northern Gateway Panel 2

Marine Emergency Preparedness & Response

Mr. John Carruthers	Mr. Randy Belore	Mr. Jeffrey Green
Dr. Alan Maki	Mr. Owen McHugh	Mr. Greg Milne

Mr. Jon Moore	Dr. Edward Owens	Dr. Walter Pearson
Dr. Jack Ruitenbeek	Dr. Malcolm Stephenson	Mr. John Thompson
Mr. Chris Wooley		

Examination by Mr. Chris Tollefson for BC Nature & Nature Canada (Continued) 1522

On the previous day, Mr. Tollefson had been seeking to understand the data which lay behind Table A.5 in Exhibit B83-17, "Recovery of the Biophysical and Human Environments from Oil Spills", Adobe 226. NGP had accepted an undertaking to update the table which it submitted this morning as Exhibit B191-1. Table A.5 is a summary of detail reported in Table B.1, "List of Oil Spills in Review of Recovery of the Biophysical Environment from Oil Spills", Adobe 231

Bird recoveries in the marine environment

Mr. Tollefson addressed Dr. Walter Pearson: "Dr. Pearson, I guess you had to know that my next line of questioning would probably be about birds, and so let's get right into that. In the 87 studies in the marine environment category that are reported on in Appendix B, how many of those studies address birds? Dr. Pearson said, "I don't know the exact number offhand," to which Mr. Tollefson replied, "Ccan I suggest to you, sir, that the number is seven? Would you agree with that? " Dr. Pearson: "Subject to check, yes."

Mr. Tollefson's next "questions" consisted mainly of him providing the answers to Dr. Pearson: A) The recovery statuses for the birds in that category? Two are recovered, two are recovering, two are not recovering, one has insufficient data. B) Of the two bird species reported as recovered, for one there is no information disclosing how long it took to recover, and that leaves only on for which there is data. C) The study was Esler and Iverson, 2010. D) For the one study, the time to recovery was ten years.

Taking one-liners out of context

Mr. Jon Moore interjected, beginning, "Can I just interject some other reasons why those statistics need to be taken in context? … There are a lot of studies that are missing from that report." Dr. Alan Maki joined in the defense of the reports, "The problem we're facing here is taking these one-liners out of context without a full feeling for the background behind it." 1549

The Chairperson supported Mr. Tollefson's appeal, and asked him to proceed with his next question. 1562

Mr. Tollefson noted that 10 years is quite different than the 5.1 average for Valued Ecosystem Components (VECs) in the marine environment shown in Table 5.1. Dr. Pearson replied that longer-live species such as birds, reptiles and mammals, will take longer to recover than short-lived species such as fish. 1572

No mammals, reptiles and only one bird in the recovery study

Mr. Tollefson asked how many marine mammals are in this component of the study. Dr. Pearson replied, "There's no marine mammals." He explained that the table lists the studies that had been looked at, researchers used the studies they could find in the time available, and "the table represents a sampling." 1582

This discussion is misleading

Mr. Tollefson asked Dr. Pearson to confirm that of the 47 studies reporting recovery (as reported in the updated Table A.5), none were of mammals or reptiles and only one was of birds. Dr. Pearson agreed. Mr. Green said that focussing on a table instead of the entire report is not a very scientific approach. "We can only review science that exists. So if scientists have not studied a species because they don't think there's a concern, we can't report on that. … These statistics, while we tried to use them as being helpful, I think are also quite misleading and I think this discussion is misleading." 1599

Table A.5 Recovery status by environment showing the mean time to recover post spill and the mean time to recover in years

Sample size for mean in parentheses

Environment	Recovery Status	VEC Count	Mean Study Duration (years)	Mean Time to Recovered (years)
Freshwater	None or none apparent	6	2.5 (6)	N/A
	Recovered	6	3.5 (4)	2.3 (3)
	Recovering	12	1.2 (11)	N/A
	Total	**24**		
Marine	None or none apparent	12	5.5 (11)	N/A
	Recovered	47	9 (29)	5.1[a] (45)
	Recovering	28	8.1[a] (27)	N/A
	Total	**87**		
Terrestrial	None or none apparent	7	14.7 (7)	N/A
	Recovered	2	2.3 (1)	2 (1)
	Recovering	6	25 (2)	N/A
	Total	**15**		
Terrestrial/Fresh-water	None or none apparent	0	N/A	N/A
	Recovered	1	1 (1)	1 (1)
	Recovering	2	8.5 (2)	N/A
	Total	**3**		

"a" Correction for minor computation error in spreadsheet.

Don't you trust the trustees?

In reply to Mr. Tollefson, Dr. Pearson said that his researchers were only told to use "Arctic and sub-Arctic temperate zone spills, not tropical spills." (which he corrected moments later to "a cold temperate zone or the sub-arctic, not tropical or sub-tropical.") Mr. Tollefson asked, "They didn't use any of the research done by the EVOS (Exxon Valdez Oil Spill) Trustees Council, was there a reason for that?" "Every several years …

the trustees put out a report … on the status of the various species. … Why didn't you use their data?" "You didn't tell them not to look at the Trustee Council material; did you?" Dr. Pearson replied, "Absolutely not." 1615

Mr. Tollefson: "And you have no reservations as to the reliability of that data from a scientific point of view. You'd be completely content to trust what the Trustees say about recovery?" Dr. Pearson replied, "That's a separate issue. … A study was commissioned and is part of the record here. … There's issues pointed to there. … That's a better document." Mr. Tollefson: "The fact that the Exxon Valdez Trustee's Council are not cited once in Appendix B, that their work is reflected nowhere in your table, you're not intending that to communicate to this Board that that is not useful information, that that's not reliable. You would -- you'd commend to them the Trustee's Council Report work? Dr. Pearson: "I would commend to them the document that I just discussed."

The document is Exhibit B137-3, "Effects of the Exxon Valdez Oil Spill on Marine Birds: A Literature Review."

Dr. Pearson's terms of reference: conduct a review of recovery

Mr. Tollefson reviewed the methods used in Exhibit B83-17, Adobe 219, one of which required that there be "recovery information in the document of some kind and … sufficient study to follow at least some aspect of recovery." He noted that 50 oil spills were selected from the original 114 studies. Dr. Pearson said, "Primarily those studies were ones that really didn't address recovery." 1659

Dr. Tollefson asked if Dr. Pearson was engaged by Mr. Green to address two concerns: "The first of those concerns was that a spill was inevitable and the second was that, if there was a spill, that the consequences would be permanent." Dr. Pearson replied that he understood it to be, "Given that a spill had happened, what was the time course of recovery and what were the kinds of mechanisms involved in recovery? Not to discuss the inevitability or probability of a spill." Mr. Green added, "He had a very specific task and that was to conduct a review of recovery based on the available scientific literature." 1695

From the Purpose and Scope section of the report (Adobe 3), Mr. Tollefson quoted, "It will be seen that although oil spills have adverse effects on biophysical and human environments, the scientific literature is clear that ecosystems and their components recover." From the Synopsis of Results (Adobe 5), he referred to the conclusion that, "of the total VEC's examined from all environments … 81 percent were recovered or recovering. Is that right?" Dr. Pearson replied, "Yes, sir." 1715

Of the spills selected for review, 19% do not report recovery.

Mr. Tollefson asked subsequent questions about the 19 percent which were not reported as recovering. "Sir, I mean, we're just dealing with the numbers that you've given us. You had a chance to do the studies and bring the evidence forward. And the best evidence that you have is that 19 or 20 percent of these species are showing no evidence of recovering or being recovered."

What about the spills not selected for review?

He continued, "We've already talked about birds and … marine mammals. Is it not important to put a pretty big caveat on your study when it comes to birds and marine mammals? When you said yesterday the numbers were robust, do you remember saying that, sir?" "The question, sir, is, do you say today that the numbers are "robust" in your study with respect to the recovery of birds and marine mammals in the marine environment?"

Examination by Mr. Chris Jones for the Province of BC 1815

Mr. Jones stated that his questions will be focussed primarily on emergency response and response to spills." He mentioned NGP's spill scenarios ranging from 10,000 m^3 up to 36,000 m^3, and put up Northern Gateway's response to federal Information Request 1.16 [Exhibit B41-4, Adobe 236 to 239], discovered that the information he was looking for was not there, and was directed to the Marine Shipping Quantitative Risk Analysis (QRA) written by Det Norske Veritas (DNV) [Exhibit B23-34].

He next put up Coastal First Nations IR 1.19a [Exhibit B38-2, Adobe 78] in which CFN had asked for a number of worst-case scenarios to be developed, and NGP had replied that the scenarios were not credible. Mr. Jones asked, "Perhaps you could let me know on what basis Northern Gateway thought it was not a credible scenario." Mr. McHugh said is was the combination of factors – total loss of a VLCC, severe weather, multiple spills around North America. He also noted that the usual meaning of "total loss" is "damage that exceeds the insurance against the tanker" and it is "very unlikely to have a total cargo spill." 1832

NGP will exceed international best practices … but there is no standard

Referring to BC IR 2.34c [Exhibit B40-6], Mr. Jones quoted NGP, "...manpower and equipment levels for a planned response that will exceed international best practices," and asked what that means. Mr. McHugh replied, "It's a difficult concept," and "It becomes very challenging," and "To look at your project in detail, to assess the risk, to evaluate what is the appropriate style of response." Dr. Edward Owens added, "There is no standard. … International best practices are a combination of a number of things, not just equipment, not just how much boom you have, how many pumps you have, but how do you design the overall system. … In that respect, this project exceeds." 1844

Discussion continued in a non-specific way about what Mr. McHugh characterised as a "world-class system:" reduced ship speeds, geographic response plans, NGP to participate in a unified command for tanker spill, beacons, buoys, tugs, personnel. Dr. Owens repeated the proposal to be able to cover a response within the Confined Channel Assessment Area (CCAA) within six to 12 hours.

Response Organizations … but it's the people that count

Mr. Jones quoted from Exhibit B3-37, Adobe 44, "Collectively, the recovery capacity envisioned for the ROs (response organizations) will provide a level of response that places it within the top terminal-port operations for oil preparedness worldwide." He asked if there was a comparative analysis of terminal port operations in evidence that

would support that assertion. Dr. Owens said, "We have not presented a lot of the data and information," and said they looked at Sullom Voe in Scotland and Prince William Sound (PWS) in Alaska. He said "It's not relevant to compare" with PWS. "The thing that sets one operation apart from others is the personal element; both the management and the people that are involved." 1879

Mr. Jones wanted to know more about Dr. Owens' "people" statement. Mr. McHugh put up Exhibit164-13, Adobe 9, Figure 1-1, "Framework for Marine Oil Spill Preparedness." [appended to these notes] He described it as "a very high-level framework for the next five years." He mentioned that "Western Canada and Marine Response Corporation is doing a base lining study ... looking at [how] they compare to international best practice across the globe." 1908

Not as stringent at Prince William Sound or San Juan Islands

Mr. Jones put up BC IR 2 [Exhibit B47-28, Adobe 101] and the quote, "The Project's adopted response standards do not reach the stringency of those applicable to Prince William Sound, Alaska or the San Juan Islands in Washington State waters; however, both of the latter two jurisdictions have additional special legislation that drives planning requirements above international best practice." He asked, what is the legislation? Dr. Owens replied, the US Oil Pollution Act of 1990, and Washington State waters are regulations by the Department of Ecology. 1960

Mr. Jones: "In what way is Northern Gateway saying it doesn't meet the stringency?" Mr. McHugh replied, "They set very prescriptive regulations … towards volume associated with recovery. … That's expressed as an affective daily recovery capacity." "The technology was quite a bit different than it is today." Dr. Owens, "There have been some very major changes in … the equipment side. One was Open 90 which altered the management systems … and introduced ICS (Instant Command System) and unified command into the oil spill response world." 1977

More efficient skimmers have changed the response paradigm

"The second paradigm shift is … a move away from … big is best. ... After Exxon Valdez, there was a strategic move in response organizations to acquire very large skimming, pumping systems and many miles of boom and very high capacity pumps and, as Mr. McHugh's just said, a lot of these systems involve high-volume water as well as oil and so they needed large storage capacities in order to recover and pump and contain these large oil volumes."

"Different skimmers have been developed." Dr. Owens mentioned a million dollar competition called the X Challenge. The winner had a five-time better recovery rate. These new skimmers remove a much higher oil to water ration, requiring less storage capacity. [http://www.youtube.com/watch?v=oEoDGzBcxoI#!] He described another skimmer called "an octopus" [http://www.youtube.com/watch?v=JsrvCkBQDcs]

Mr. McHugh said, "What's in B.C. right now is a 10,000 tonne requirement for specific areas within its 72-hour delivery window. What we're talking about is having, in region,

a 36,000 cubic metre response capacity. … Alaska … may set a higher amount of storage [because of] those volumes of oil and water recovered." 1998

47,700 m^3 in 72 hours vs 36,000 m^3 in 10 days: apples to apples?

Mr. Jones continued to examine NGP's recovery plans. He said that Alaska legislation requires a capacity to recover 47,700 m^3 within 72 hours. Dr. Owens said, "we're looking at basically the same capability in the same timeframe." Mr. McHugh said, "We've stated a 36,000 m^3 capacity … response planning standard within a 10 operational day period. Dr. Maki said, "Although those numbers are different, the 36 versus 47,000, we may be more efficient in collecting more oil at the 36,000 with the enhanced skimmer technology." Mr. Jones acknowledged being confused. 2012

Dr. Maki replied, "When oil enters into the marine system, it very rapidly forms what we call a mousse. It's an actual emulsion of sea oil and water and it has the consistency of chocolate frosting, chocolate mousse, depending on how much oil and water are in this emulsion. So actually, we're not directly picking up raw black spilled oil. … This happens within a day or two of once oil has mixed into seawater. … That earlier standard did take into account the fact that mousse and water were mixed together and we weren't as efficient." Dr. Owens added that the term used is "derated", so where pumping capacity is derated to 20% it is because "it's actually recovering five times more volume than the actual amount of oil." "We're looking at systems that are derated to only perhaps 80 percent."

Mr. Jones asked for clarity with respect to the 47,700 m^3 in 72 hours. Is that oil recovery? Or mousse? Dr. Maki: "It would have to include some level of mousse." "We just don't have the technology to accurately separate them." Mr. Jones: "The 36,000 cubic metres, is that some mousse and some oil?" Mr. McHugh said, "The content of that [emulsion] can be almost 75 percent water to 25 percent oil." "If you're running a large Weir-style skimmer, You're recovering approximately -- typically the rating is 20 percent of that oil and water emulsion and then the other 80 percent is free water. …Current technologies … tend to bring in the emulsion … and a very small amount of free water. And that's where you're getting this difference in the storage capacity." 2052

Mr. Jones said he'd finish off here, but asked again if the 47,700 vs 36,000 is applies to apples. Mr. McHugh said, "You're getting closer to apples to apples."

Alaska vs BC – are the areas so different?

Mr. Jones read, in part, "It is difficult to compare response planning standards across different jurisdictions. All port and waterways are different and … have individual requirements." [Exhibit B47-28, Adobe 97]. He asked why you couldn't take into account the different conditions and perform a reasonable comparison between responses. Mr. McHugh said you couldn't do that and he doesn't see a value in comparing with other jurisdictions. "We've stated continuously that we've made a risk-based decision for this project. We've set a response planning standard that's appropriate for this project and we've been very conservative in the way we've set that standard." 2102

We have capability, commitment, plans – but we still do it seat-of-the-pants

Mr. Jones: "Northern Gateway that was inviting a comparison with other standards around the worlds by asserting a world-class capability." Dr. Owens: "I've been involved in oil spills for 40 years now and we used to do it by the seat of our pants -- actually we still do it from time to time. … How do we define success? Success is having the capability to achieve the goals that we're setting. … One of the most important things … is to have a commitment. … We have a single project-wide general oil spill response plan." 2109

Discussion continues for some time about NGP's commitments and plans, and comparing response plans from different jurisdictions. Start at paragraph 2109.

International Best Practice for spill response and planning

Dr. Owens said there is an International Best Practice for spill response and spill planning developed for the International Maritime Organization (IMO) by him and Dr. Taylor who is on one of the other NGP panels. "We've used this to audit operations." Mr. Jones asked, "Are there international audit standards now for spill response?"Dr. Owens: "There are, in the sense of auditing the capability and looking for gaps in response capability; both management and equipment of, you know, the whole gambit, and information. 2174

Comparison of spill equipment: Valdez vs Kitimat

Mr. Jones put up Table 5.2, Comparison of response equipment for Kitimat and Valdez terminals, from the NUKA report, [Exhibit D80-27-09, Adobe 96]. He asked, "Maybe you can help us understand why the figures look so significantly different for the different pieces of equipment there?" Mr. McHugh said it was a "very preliminary" table and "maybe it's easier if I just describe what our preliminary design was." His description followed. 2201

Table 5.2. Comparison of response equipment planned for Kitimat Marine Terminal with that on-site at the Valdez Marine Terminal (Source: Alyeska Fact Book 2009)

	Proposed for Kitimat Marine Terminal	On-site at Valdez Marine Terminal
Vessels	• 2 Escort tugs • 2 Harbor tugs • 2 Oil Spill Response vessels • 2 Terminal Line boats • 2 Response Operations booming boats • 4 Booming boats • 2 log Mini-tugs	• 11 Tugs • 10 Work boats • 8 Barges for recovered oil (143,088 m^3) • 1 Flat deck barge
Containment & Recovery	• 5,400 m of boom • 7 Skimmers	• 79,984 m of boom • 33 Skimmers • 4 Self propelled skimmers • Sensitive area protection boom (positioned on flat deck barge) • 3 Vacuum trucks

Concept of extended responsibility

Mr. Jones quoted from Exhibit B38-9 Adobe 43, "Northern Gateway has committed to 'maintain or contract a response organization capable, under the planning standards, of containing and recovering within 10 days or earlier, up to 32,000 tonnes of on-water oil".

He asked, “Is that what extended responsibility is?” Mr. McHugh said, “[It] is a much larger concept than that.” This was part of extended responsibility because it is not a requirement under Canadian law. Mr. John Carruthers then described some other features of the concept, as did Mr. Chris Wooley. 2222

Mr. McHugh said the commitment is to respond to any tanker calling at or leaving the terminal. The extended area of response is the 200-nautical mile limit. 2300

Mr. Jones said “the one comparator I could think of … is Alyeska.” Mr. McHugh replied, ‘They are regulated to have that capacity and the tankers, essentially, own the SERVS (Ship Escort Response Vessel System) component of the Project. They own the tanker plan. What we’re calling our “Marine Oil Spill Response Plan”, in Alaska, for the SERVS project is the “Tanker Oil Spill Response Plan.”’ 2309

Extended responsibility: no compensation for loss, and may not be enforceable

Mr. Jones asked if extended responsibility includes “any commitment to compensation for loss in the event of a tanker spill?” Mr. McHugh said, “That’s correct.”

Mr. Jones: “Some of these commitments are similar to what were in Alaska pursuant to a regulated environment. I’m assuming that the kind of commitments that you’ve been describing as enhanced responsibility wouldn’t attract legal enforcement? That is, these are not legally imposed requirements upon Northern Gateway? Mr. Carruthers: “They’re certainly commitments that were made very publicly and I expect there could be conditions with respect to project approvals that would enforce those commitments.”

Mr. Jones asked if tanker owners would sign on to the plan. Mr. McHugh replied that, “they would be required to comply with … the Marine Oil Spill Response Plan through the terminal regulations.” The terminal regulations are not developed yet. 2327

Mr. Jones, Mr. McHugh, and Mr. Carruthers discussed NGP’s concept of an “independent response organization” and it’s as-yet undefined relationship to or through the “Western Canada and Marine Response Corporation.” Mr. Carruthers said it would have to be certified by Transport Canada, and that he did not see Northern Gateway as being legally exposed if the response capability is not available or functional. He expected the costs of the response organization would be borne by the shippers, and recovered through the pipeline tariff or the port charge. 2363

Coast guard and unified command

Mr. Jones quoted from Volume 7C: Risk Assessment and Management of Spills – Kitimat Terminal [Exhibit B3-22, Adobe 32], “As the lead federal agency for all ship-source spills or pollution incidents in waters under Canadian jurisdiction, the CCG (Canadian Coast Guard) will advise the Responsible Party (RP) regarding emergency response. In turn, Northern Gateway will be advised of its responsibilities.” He asked what that means. Mr. McHugh pointed out that this volume “is for terminal-related spills,” and that the CCG is “the federal monitoring officer sitting outside of the unified command.”

Mr. Jones asked how this works with a tanker spill, in which the tanker owner is the responsible party. Mr. McHugh said it would be similar, with CCG sitting to the sidde. Dr. Owens said the proposed management scheme is unified command using the incident command system."The federal monitoring officer will only intervene in the event that that person believes that those best interests [of Canada] are not being looked after."

Mr. Jones: "I understand that the Coast Guard is not yet at this time in agreement with that approach. Is that correct?" Dr. Owens: "I can't speak to their current status … but they are required in Canada's Shipping Act to be outside of the unified command." 2415

Captain of the ship with unified command

Mr. Jones asked for more detail about unified command. Dr. Owens explained that unified command for oil spills is used extensively in the United States where it is regulated who participates in the unified command and embeds 51% of the vote to the US Coast Guard or the EPA. 2463

Incident command passes through a couple of phases. At the time of the incident, the ship's master is the incident commander. At approximately the same time, for a marine accident, the response organization, the Canadian Coast Guard response certified organization, would be immediately mobilized and they would have an incident commander in the first instance. So you start off with two people. Within a few hours, "that transitions into a unified command as we envisage it. The ship's captain's role would probably be transferred to the responsible party representative. The BC government would establish their incident commander. First Nations would be involved. "And we anticipate that the Project would also have an incident commander as a representative. So you would have four entities in the unified command as we see it."

Mr. Jones: "Is there a captain to the ship in that unified command?" Dr. Owens said that has not been resolved. "Unified command is …a consensus-based approach. … The federal monitoring officer potentially has a role to decide … the best course of action."

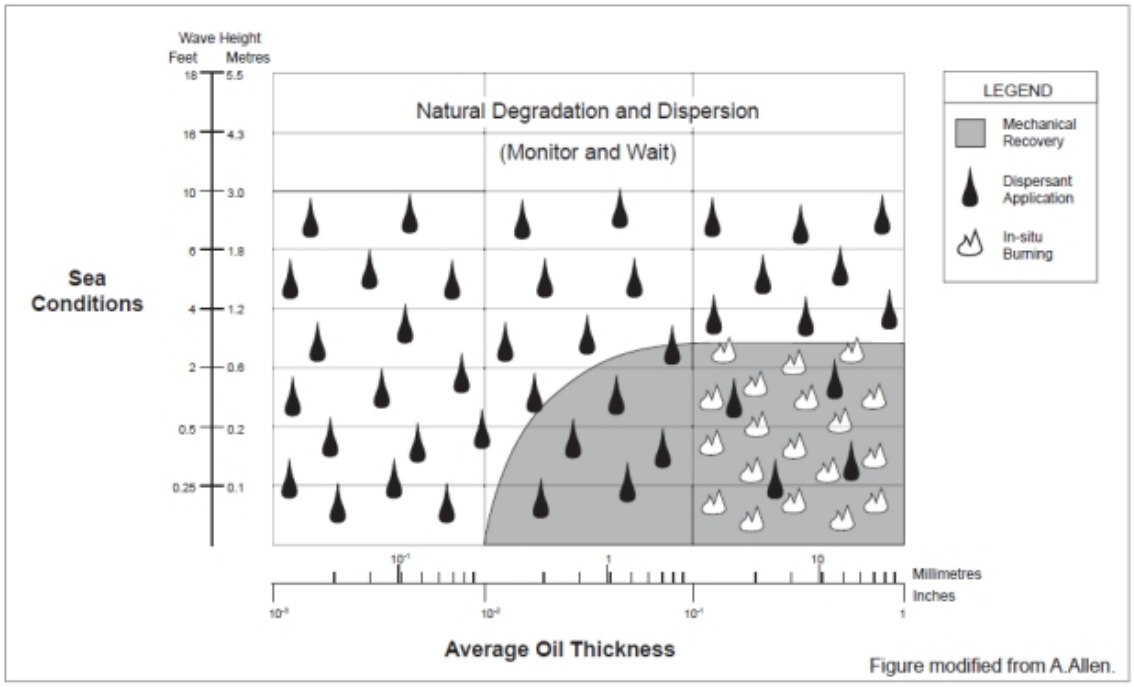
Response time of 6 to 12 hours

Mr. Jones asked about the commitment NGP has made to respond to an incident within 6 to 12 hours. "Is that first arrival on scene or is that first activity?" Mr. McHugh said that laden tankers will be escorted by two tugs, one tethered and the other nearby. Both tugs are available on site for immediate response to the incident. "The first arrival of a larger form of response in terms of containment and recovery pieces, that would be within that six to twelve-hour window." 2483

Mr. McHugh said 6 to 12 hours is primarily based on travel time, and could be met within the CCAA under most conditions - distance, visibility, sea-state - though safety is the number one priority. "We've looked at this" and less than 2% of the time will wind or wave conditions disallow an effective containment operation CCAA. 2530

Arising out of Mr. Jones's concern about sea conditions interfering or preventing response timing and effectiveness, Dr. Owens reviewed Figure 8.2, "Spill Countermeasures and Windows of Opportunity" [Exhibit 21-2, Adobe 79]. He said that a

wave height of 2 metres is the limit of effectiveness for mechanical recovery, "but at that point, we start to get into natural degradation and dispersion. … Just as our equipment starts to reach some of the safety and other operational limits, the natural dispersion as a result of wave action -- wind and wave action is starting to break the oil down and it's starting to accelerate the natural degradation of that oil." [*The figure actually shows the limit of mechanical recovery when waves reach just 1 metre, and the natural degradation and dispersion not becoming significant until the waves reach 3 metres.*] 2573



NOTE: This figure is applicable to spills in the open ocean. As the sea conditions increase, natural degradation and dispersion typically increase. During this period, the spill would be monitored.

Figure 8-2 Spill Countermeasures and Windows of Opportunity

Shoreline oiling and cleanup targets

Mr. Jones asked about the amount of oil that could end up on shorelines under various hypothetical conditions. Mr. McHugh said, "There's multiple things that can go on during a spill" both in terms of conditions and response options that could influence this – exposure of the shoreline, whether the wind is blowing offshore or onshore, booming, dispersants, burning.

Mr. Jones understood there is a requirement to be able to clean up 500 m of shoreline per day. He asked where that requirement comes from. Dr. Owens chuckled. Mr. Jones asked, "Did you make it up?" Dr. Owens, "Yes, I'm afraid so." He said that the reasonable quota should be a function of various factors. "We would certainly be meeting that requirement," but a better answer comes out of the Shoreline Cleanup and Assessment Technique (SCAT). 2600

Expect multiple activities here, just like Deepwater Horizon

Mr. Jones asked, "That [extended responsibility] commitment includes all the personnel and equipment necessary to undertake the response?" Mr. McHugh agreed. Dr. Owens added, "Deepwater Horizon is a great example of where there was source control, there was dispersant, there was burning, there was booming, there was shoreline protection and there was shoreline clean-up, all going on at the same time; all literally in a matter of days." 2640

"And I think it's reasonable to expect the same here. You have multiple activities all driven towards mitigating and reducing the impact of that spilled oil. And they're all -- as soon as you get passed that initial response, they all become part and parcel of the overall strategy."

Shoreline cleanup

Mr. Jones asked, "You're telling me that … the question really is what can we do best to help nature. [But can you] indicate what kind of resources might have to be marshalled and how long that might take in a shoreline spill [of a large magnitude]?" Dr. Owens replied"The standard answer to this, unfortunately, is that all spills are unique and I won't go there." 2706

Dr. Owens described the cleanup of the Selendang Ayu near Dutch Harbor in the Aleutians in December 2004. It is similar in terms of access, remoteness, and shoreline types. After a SCAT assessment, equipment and personnel were all brought in, and there may have been 200 workers for up to three months to complete the cleanup. 2710

Existing response standard and NGP's proposal

Mr. Jones asked Mr. McHugh to explain the existing standard for rescue capability. Mr. McHugh said that the standard is based on designated ports. Kitimat is not presently a designated port and Transport Canada would have to make that designation for NGP's commitment to be approvable.

The existing standard specifies four tiers. Tier 1 requires the response organization (RO) to have the capacity at the port to respond to a 150 tonne spill within 6 hours; a Tier 2 spill of 1000 tonnes within 12 hours, Tier 3 - 2500 tonnes in "the primary area of response or the enhanced area of response" in 18 hr, and Tier 4 -10,000 tonnes within the the primary area of response or the enhanced area of response, in 24 hr.

NGP's plan describes the primary area of response or the enhanced area of response as the confined channel assessment area. NGP is proposing to have 10,000 tonne capacity "spread around a whole bunch of different sites": 10,000 tonnes for Prince Rupert area, 10,000 for Kitimat area, and 10,000 for Shearwater area. Each of those areas would have 10,000 tonnes in 6 to 12 hours. Combined, at least 20,000 tonnes in 24 hours, and "almost all" the resources in "just over" 24 hours. 2740

When Mr. McHugh was finished, Mr. Jones asked whether this commitment applies just within the CCAA, or extends to the OWA. Mr. McHugh put up Exhibit B47-28, Adobe 100, an IR reply to the Province of BC at which there is a table that describes the existing

standard. In reply to the question, he said that outside the primary area of response, travel time would be additional to the commitment. 2766

Gap analysis

Mr. Jones asked if NGP had done a "gap analysis" which looked at "which periods of the year spill responses were not likely to be possible and the necessary resources to address spills." Mr. McHugh said they had filed one by ASL Environmental, which he described as "a summary of the conditions that exist and the duration of which an exceedance occurs of a certain type of condition. ... Subsequently, we have looked at a preliminary gap analysis for what we would overall consider from an actual operations standpoint for emergency response" Later, he said "operational assessment" might be a better term.

Mr. Jones asked why the analysis cannot be completed now, and Mr. McHugh said it is part of the detailed planning process scheduled in the next four years, post-approval. "We feel we've taken it far enough." Readers wishing to continue with this discussion should follow in the transcript from paragraph 2775.

Limits to safe operation

Mr. Jones asked whether NGP had done any evaluation as to when certain safety limitations will make it difficult or impossible to respond to a spill. He cited deck icing, thick fog, cold temperatures, high winds or waves. Mr. McHugh said these things may limit the windows of work, but many can be mitigated by technology: floater suits, heated deck systems, infrared radar which can detect oil, appropriate deck lighting. The RO Western Canada's operations are based on a 24-hour period. 2842

Aircraft in the response plan

Mr. Jones asked "Will Northern Gateway be utilizing aircraft for movement of personnel and for locating spills?" Mr. McHugh said "That's part of the standard spill response techniques, yes." Mr.Jones "What fleet of aircraft? Mr. McHugh: "I wouldn't use the term "fleet of aircraft." He said these would be contracted to be in place within a certain amount of time. Also, Transport Canada has an offshore tracking vessel which is very often used as part of the response system for aiding in mapping and detecting oil. 2879

Mr. Jones asked where these aircraft are located. Mr. McHugh said a "substantial and very high tech aircraft" is in Vancouver and others are in Alaska. 2888

Mr. Jones asked whether NGP was including Western Canada's existing capacity in its planning? Mr. McHugh replied, "To date, that has not been the plan. We're talking about an additional capacity. Western Canada … current capacity is in the order of over 20,000 tonnes … based on their current equipment spread across the coast."

He continued, "We're proposing a different model. We're not talking about large, cascading of 10,000 tons in 72 hours. We're talking about a much shorter period of time in a much more confined Project-based space. We're proposing a Project-based capacity and it's fundamentally different than what exists on the coast right now."2926

The oil may sink, but not through the weathering process

Mr. Jones said the potential for diluted bitumen to sink was covered in Prince George, but he wanted to return to because he doesn't entirely understand NGP's views. He put up Exhibit B3-42, Adobe 47, and read, under the heading "Sinking of the surface oil": "As the hydrocarbons in the surface oil weather, its density increases. If the density of the surface oil exceeds that of seawater, the surface oil is assumed to form globules that would sink to the subtidal sediment." In Prince George, Dr. Horn said the oil would not sink simply due to weathering. 2935

Dr. Malcolm Stephenson said the quote is taken from a mathematical model and was dealing with a denser type of oil, such as Bunker C, than will be transported by NGP. Mr. Randy Belore put up JRP IR 10 [Exhibit B74-2, Adobe 23], which contains NGP's views on the ability of the oils to be transported by NGP, to sink. "We don't feel that it will sink through weathering processes," and he described the testing they performed. Essentially, they are shipping only oils which are lighter than water, and which, through weathering, may lose their lighter fractions and will approach the density of water, but will not exceed it. The other factor, according to Mr. Belore, is that this weathering causes the oil to emulsify to some extent, and also to become less viscous, which increases its persistence, but also decreases its ability to lose whatever light ends remain through weathering. 2943

This weathering process happens offshore. If the weathered oil approaches a shoreline, where the water contains sediments, the oil passes through a surf zone where it can be broken up into smaller particles. These smaller particles may pick up the heavier sediments which can then cause it to sink. Mr. Belore said, "That is different than an outright sinking through a density issue." 2973

Figure 1-1

Attachment 1 JPR IR 14.4

Northern Gateway: Framework for Marine Oil Spill Preparedness

Project Milestone

OSR Planning Output

ERP Elements

OSR Management Team & Personnel

- Assemble OSR Management Team
- OSR Management Team Coordinates Ongoing Work
- Northern Gateway Spill Management Team
- ERP Program Design
- Enbridge Emergency Response Team Integration
- Response Team Training & Exercises
- Ongoing OSR Training & Exercises, Ongoing Field-testing of GRPs

Resources Tier I

- Development of Tier 1 Response Contractor arrangements
- OSR Equipment Maintenance, Repair, and Inventory Control

Resources Tier II and III

- Cost Estimate
- OSR Equipment Procurement
- Equipment and Cache Review Tiers 1-3
- OSR Training & Exercises
- Ongoing OSR Training & Exercises, Ongoing Field-testing of GRPs (Tiers 1-3)
- Capacity Review Tier 2 and 3 Assessment and Agreements
- Development of Tier 2 & 3 Agreements

Plan Development

- Incorporate Conditions of Approval
- General Oil Spill Response Plan (GOSRP) Review and Update
- Logistics Planning, Coordination with Construction and Operations
- Geographic Response Plans (GRPs) Development
- Marine Oil Spill Response Plan (MOSRP), Terminal Oil Spill Response Plan (TOSRP) and Sub-plans
- Review & Update

Scientific Advisory Committee

- Framework Development
- Initiation
- Scope Development
- Research Implementation

Consultation & Local Input

- Liaison with Regulators, Emergency Responders, Appropriate Organizations, First Nations, and Members of the Public Adjacent to Marine Terminal and Shipping Routes
- Public Awareness Program Development
- Program Implementation
- Ongoing Public Awareness Program

Assessment

- Internal OSR Review & Assessment
- Third Party Selection
- Third Party Readiness Assessment
- Third Party OSR Review

Project Phase

- JRP Hearings & Review Process
- Cost Estimation
- Detailed Design, Construction, Detailed Planning, Commissioning (subject to regulatory approval)
- Marine Operations

Recommendation by JRP

Project approval and certificate issued by NEB

Ready for first oil

2012 2013 2014 2015 2016 2017 2018

Dates are subject to refinement and assume a mid 2018 operational date

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