

Preliminary Environmental Impacts Comparison: RBT2 & DP4



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solve and simplify

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1.0 INTRODUCTION

PGL Environmental Consultants (PGL) is an environmental consulting firm based in Vancouver, BC that specializes in environmental impact assessment. Since 2010, among other services, PGL has been providing expert third-party review services to help First Nations in BC, Alberta, and the Yukon evaluate projects proposed within their traditional or treaty territories. On the recommendation of the Tsawwassen First Nation (TFN), Global Container Terminals Inc. (GCT) retained PGL to undertake a high-level environmental comparison of the Vancouver Fraser Port Authority proposal to construct a new Terminal – Roberts Bank Terminal 2, or RBT2 – with GCT’s proposal to construct a 4th berth (DP4) at its current location.

2.0 BACKGROUND

The Vancouver Fraser Port Authority has submitted an Application to construct the T2 project to the Canadian Environmental Assessment Agency (the Agency). The Agency has referred the project for Panel Review and Panel hearings are expected to begin in 2017.

GCT believes that its DP4 project makes better economic and environmental sense. GCT is unwilling to proceed without early input from TFN. To that end, GCT approached TFN to discuss the viability of DPF as an alternative to T2 in the fall of 2017. TFN responded by asking for a preliminary comparison of the two projects so that it might better understand the options for waters within their territory.

For this purpose, PGL was retained to prepare a qualitative comparison of effects on a number of environmental topics and present this comparison to TFN’s Executive Council. This report is a companion document to the PowerPoint presentation given on February 8, 2017.

3.0 TOPICS FOR REVIEW

GCT requested that the following topics be the basis for the environmental comparison between RBT2 and DP4:

- Invasive species
- Marine habitats
- Impacts to “no float” zones
- Habitat compensation requirements
- Amount of dredging
- Impacts to crabs and crabbing
- Impacts to eelgrass
- Human health impacts

For ease of Presentation, these topics were grouped as follows:

Topic	Issues
Habitat	<ul style="list-style-type: none">• Area losses (infill; dredging)• Compensation requirements and options• Specific effects to eelgrass• Introduction of invasive species (focus: <i>Spartina</i> and hogweed)
Crab	<ul style="list-style-type: none">• Harvesting/no float areas
Human Health	<ul style="list-style-type: none">• Air quality effects• Ingestion of harvested crab• Nuisances: noise and night-time light

4.0 METHODOLOGY



GCT has not completed a full environmental assessment of the DP4 project. Therefore, PGL compared the content of the RBT2 Application¹ with a number of documents prepared for GCT. These included:

- *Executive Summary, Roberts Bank Container Terminal Capacity Enhancement Alternatives* (2014). Parsons Brinkerhoff, 11 pp;
- *Conceptual Fisheries Offsetting Plans for the Proposed Deltaport Expansion Project* (2015). AMEC Foster Wheeler, 94 pp; and
- *Assessment of Policy Options to Satisfy Canadian West Coast Container Port Capacity Needs* (2016). CPCS, 105 pp.

In the case of the air quality, noise, and light comparisons, PGL also requested information from GCT regarding expected vehicle (ship, train, truck, and light duty vehicle) numbers and terminal lighting requirements to help with comparisons.


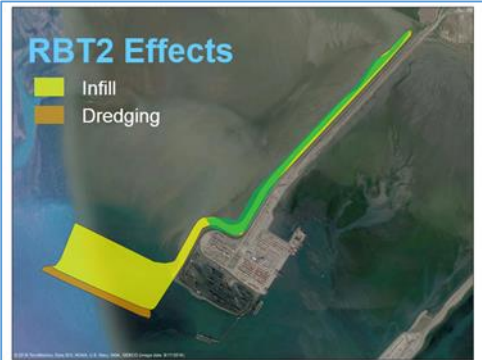



5.0 COMPARISON







This section is presented using a number of the PowerPoint slides for reference given the utility of many of the graphics in conveying large amounts of information in a succinct manner.





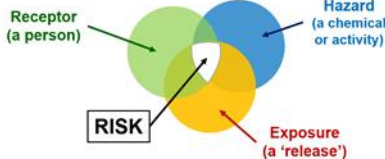
Slide	Comments
	<p>The current conditions at the site are represented by the Robert’s Bank facility comprising the coal port and all three berths (DP3) at DeltaPort.</p>
	<p>The RBT2 project is as identified in the Vancouver Fraser Port Authority Application, indicating new infrastructure, including three berths, container capacity, and rail extension) to the northwest of the existing facility.</p>




¹ Available at <http://www.ceaa-acee.gc.ca/050/document-eng.cfm?document=101482> (last accessed Feb. 21, 2017)



Slide	Comments
Habitat Issues	
	<p>The DP4 project (shown here with the RBT2 project) is designed to add a 4th berth and container capacity to the existing facility.</p>
	<p>The environmental comparison being undertaken assumes that either RBT2 or DP4 would proceed. It, therefore, attempts to answer the question “which project, in isolation, would have a greater or lesser adverse environmental effect.”</p> <p>In the event that both projects were to proceed, a cumulative effects assessment of both projects would be required.</p>
<p style="text-align: center;">Habitat Loss or Modification</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>RBT2 Effects</p>  <p>Infill = 164 ha Dredging = -20 ha Total = ~184 ha Eelgrass = 20% of total footprint (~40ha)</p> </div> <div style="width: 45%;"> <p>DP4 Effects</p>  <p>Infill = 54 ha Dredging = 14 ha Total = ~68 ha Eelgrass = 80% of total footprint (~55 ha)</p> </div> </div> <p style="text-align: right;"></p>	<p>The most significant habitat effect associated with either project is the loss (as a result of infilling to create land) or alteration (as a result of dredging to create deeper water to accommodate container vessels).</p> <p>This overview slide is discussed in greater detail below.</p>
<p>RBT2 Effects</p> 	<p>RBT2 would require that:</p> <ul style="list-style-type: none"> • 164ha of seabed be infilled; and • <u>20ha</u> of seabed to be dredged. <p>184ha of seabed habitat affected, in total.</p>

Slide	Comments
	<p>DP4 would require that:</p> <ul style="list-style-type: none"> • 54ha of seabed be infilled; and • <u>14</u>ha of seabed to be dredged. <p>68ha of seabed habitat affected, in total.</p>
	<p>Eelgrass is a shallow subtidal seagrass that is an important safe haven (“rearing area”) for young fish and is considered important fish habitat.</p> <p>Approximately 20% of the RBT2 project footprint (facility plus dredging) would result in eelgrass loss or modification.</p> <p>This amounts to approximately 40ha of eelgrass.</p>
	<p>Approximately 80% of the DP4 project footprint (facility plus dredging) would result in eelgrass loss or modification.</p> <p>This amounts to approximately 55ha of eelgrass</p>
<p>Habitat Compensation</p> <p><u>Agency focus on productivity</u></p> <ul style="list-style-type: none"> • DP3: <ul style="list-style-type: none"> – impacted 21.9ha, built 26.4 ha habitat • T2: <ul style="list-style-type: none"> – impacting 184ha, Offsetting Plan proposes 29ha (mix of 5 habitat types) • DP4: <ul style="list-style-type: none"> – impacting 68ha, Offsetting Plan not yet developed • Assessed range of offsetting options, including PMV habitat bank • Eelgrass replacement should be high priority • Want to consult broadly – TFN and others on what is needed  <p style="text-align: right;"></p>	<p>The federal Department of Fisheries and Oceans Canada is responsible for fish protection under the <i>Fisheries Act</i>.</p> <p>The focus in considering any project that may destroy or alter fish habitat is to “offset” this loss through the creation of habitat in other areas with similar “productivity”.</p> <p>In essence, project proponents must demonstrate the ability to create or improve habitat to allow for the same habitat function (ability to support fish) after a project’s construction as existed prior to construction.</p>

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<p>Habitat Compensation</p> <p><u>Agency focus on productivity</u></p> <ul style="list-style-type: none"> • DP3: <ul style="list-style-type: none"> – impacted 21.9ha, built 26.4 ha habitat • T2: <ul style="list-style-type: none"> – impacting 184ha, Offsetting Plan proposes 29ha (mix of 5 habitat types) • DP4: <ul style="list-style-type: none"> – impacting 68ha, Offsetting Plan not yet developed • Assessed range of offsetting options, including PMV habitat bank • Eelgrass replacement should be high priority • Want to consult broadly – TFN and others on what is needed  	<p>...continued:</p> <p>RBT2 proposed to offset the loss of 184ha of seabed habitat with 29ha of a mix of marine habitats.</p> <p>DP4 has not yet identified offsetting options, but if RBT2 does not proceed, the locations proposed for RBT2 offsetting would be available to DP4.</p> <p>Offsetting eelgrass losses should be a focus. Agencies may also be open to other regional projects</p>
<p><i>The meaning of the findings in the foregoing slides is discussed in Section 6.0.</i></p>	
Invasive Species	
<p>Invasive Vegetation</p> <p>Hogweed <i>Spartina</i></p>  <ul style="list-style-type: none"> • noxious terrestrial plant • Burns, rashes on contact • invasive intertidal plant • Alters intertidal to marsh habitat over time 	<p>Invasive species are those that are not native to the region, do not have local predators, and therefore spread in an uncontrolled manner, harming local species.</p> <p>Hogweed is a noxious terrestrial plant that can be spread by land-based construction equipment; <i>spartina</i> is a marine grass spread by contaminated marine equipment and disturbance of sediment already associated with <i>spartina</i> which can convert open water to marshes.</p> <p>Both species are present in the vicinity of the current facility; RBT2 and DP4 may cause the spread of these species.</p> <p>GCT is aware that TFN actively monitors these and other invasive species and would be engaged to help identify and implement mitigation efforts.</p>
<p><i>The meaning of the findings in the foregoing slides is discussed in Section 6.0.</i></p>	
Crab Issues	
<p>“No Float” areas</p>  	<p>Current DeltaPort infrastructure is surrounded by a commercial crab fishery closure to prevent interactions between fishing gear and ships calling at the Port. The current closure area, identified on the adjacent slide, is 718ha.</p> <p>The aboriginal crab fishery is permitted to occur within this closure zone provided that crab traps are not set with floats to identify their location that could snag on vessels calling at the Port.</p>

Slide	Comments
<p style="text-align: center;">RBT2 added "No Float" areas</p>  <p style="text-align: right;"></p>	<p>The 116ha footprint of the RBT2 terminal would be lost as habitat and therefore unavailable for any crab harvest.</p> <p>For navigation safety, an additional 232ha commercial crab closure area would be designated around the RBT2 project.</p> <p>A further 120ha would be closed to the fishery over a five-year period during RBT2 construction.</p> <p>It is assumed no-float aboriginal crab fishing would be permitted in the new closure area.</p> <p>The total area affected by temporary or permanent closures to the commercial crab fishery is 468ha.</p>
<p style="text-align: center;">DP4 added "No Float" areas</p>  <p style="text-align: right;"></p>	<p>The 68ha footprint of the proposed DP4 terminal would be lost as habitat and therefore unavailable for any crab harvest.</p> <p>For navigation safety, it could be expected than an additional commercial crab closure area of approximately 130ha would be designated around the DP4 project. Additional closures during construction are not expected to be needed for DP4.</p> <p>It is assumed no-float aboriginal crab fishing would be permitted in the new closure area.</p> <p>A total of approximately 200ha may be closed to commercial crab harvests as a result of the DP4 project.</p>
<p><i>The meaning of the findings in the foregoing slides is discussed in Section 6.0.</i></p>	
<p>Human Health</p>	
<p style="text-align: center;">Human Health</p> 	<p>Risks to human health are estimated based on the presence of three things: a receptor, a hazard, and an exposure. If any one of these components is absent, there is no risk to human health.</p> <p>The key hazards associated with both RBT2 and DP4 are air quality contaminants from internal combustion engines, and ingestion of crab harvested from dredged areas.</p> <p>Nuisances from both projects that affect humans but are not considered health "risks" include additional vehicle noise and additional night-time light.</p>

Slide	Comments																																							
<p style="color: red; font-weight: bold;">Air Quality Hazards</p> <table border="1"> <thead> <tr> <th>Hazard</th> <th>RBT2</th> <th>DP4</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Construction</td> </tr> <tr> <td>Duration</td> <td>5.5 – 6 yrs</td> <td>3 yrs</td> </tr> <tr> <td>Construction equipment (average)</td> <td>x</td> <td>2/3 x</td> </tr> <tr> <td>Construction equipment (peak)</td> <td>x</td> <td>1/2 x</td> </tr> <tr> <td colspan="3" style="text-align: center;">Operations</td> </tr> <tr> <td>Vessel Calls</td> <td>+260</td> <td>+95</td> </tr> <tr> <td>Duration in Port</td> <td>14 hrs</td> <td>52 hrs</td> </tr> <tr> <td>Port Power (assumes regulated requirement)</td> <td>electric ~even</td> <td>electric</td> </tr> <tr> <td>Cargo Handling Equivalents</td> <td>150</td> <td>~even 167</td> </tr> <tr> <td>Rail trips</td> <td>1460</td> <td>~even 1508</td> </tr> <tr> <td>Container truck trips</td> <td>720,000</td> <td>302,000</td> </tr> <tr> <td>Light duty vehicles</td> <td>313,000</td> <td>594,000</td> </tr> </tbody> </table> <p style="text-align: right;"></p>	Hazard	RBT2	DP4	Construction			Duration	5.5 – 6 yrs	3 yrs	Construction equipment (average)	x	2/3 x	Construction equipment (peak)	x	1/2 x	Operations			Vessel Calls	+260	+95	Duration in Port	14 hrs	52 hrs	Port Power (assumes regulated requirement)	electric ~even	electric	Cargo Handling Equivalents	150	~even 167	Rail trips	1460	~even 1508	Container truck trips	720,000	302,000	Light duty vehicles	313,000	594,000	<p>To compare RBT2 and DP4, PGL assumed that the receptors (humans) and the types of hazards (air contaminants) are identical. PGL therefore used RBT2 information provided in the Application and requested information on relative number of hazard sources from GCT to compare the potential release volumes. This allowed an estimate of relative exposure from each sources.</p> <p>In general, RBT2 would require smaller numbers of vehicles throughout the life of the project (see Section 6.0 for additional information).</p>
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<p style="color: red; font-weight: bold;">Light</p>  <p style="text-align: right;"></p>	<p>Despite the smaller “light print”, the DP4 project would be located closer to TFN residences.</p>																																							

Slide	Comments
<p data-bbox="277 310 337 338">Light</p>  <p data-bbox="651 621 724 646">PGL</p>	<p data-bbox="764 384 1354 562">Light from the RBT2 project would be partially blocked by existing DeltaPort infrastructure. The same light, however, would be closer to important bird areas near the mouth of the Fraser River that are currently relatively dark compared to the region's urban light profile.</p>
<p data-bbox="277 695 337 722">Light</p>  <p data-bbox="651 1003 724 1029">PGL</p>	<p data-bbox="764 827 1354 884">Important Bird areas would be much less affected by additional light associated with the DP4 project.</p>

6.0 DISCUSSION

Based on the comparisons made in Section 5.0, a number of preliminary statements regarding the comparative environmental effects of the RBT2 and DP4 projects may be made. These are discussed below by topic area.

6.1 Habitat Effects

This section summarizes habitat effects and identifies additional issues to consider.

6.1.1 Losses, Compensation, and Invasive Species

In general, both projects will:

- Result in habitat losses on Roberts Bank;
- Require both infilling to create new land and dredging to provide turning basins for vessels calling at new berths; and
- Result in serious harm to fish pursuant to the *Fisheries Act* and therefore would require a DFO Authorization pursuant to section 35 of the Act.

RBT2 would result in a larger habitat loss overall and would therefore require greater offsetting (habitat function replacement).

- The RBT2 project is likely to result in the loss of approximately **184ha** of total habitat.
- The DP4 project is likely to result in the loss of approximately **68ha** of total habitat.

DP4 would result in a smaller overall habitat loss but would have a greater impact on eelgrass than RBT2. Specifically,

- The RBT2 project is likely to result in the loss of approximately **40ha** of eelgrass.
- The DP4 project is likely to result in the loss of approximately **55ha** of eelgrass.

DP4 and RBT2 are likely to have equivalent effects on the spread of hogweed and *spartina*, two invasive plant species of particular concern in the region.

6.1.2 Other Considerations:

DP4 would result in fewer additional vessel calls on an annual basis. This may:

- Reduce the odds of alien species carried on hull/in bilge water, as compared to the RBT2 project;
- Lead to smaller adverse effects associated with vessel noise on marine mammals in the Straits of Georgia and Juan de Fuca, as compared to the RBT2 project; and
- Lead to fewer potential marine mammal injuries/deaths associated with vessel strikes in the Straits of Georgia and Juan de Fuca, as compared to the RBT2 project.

6.2 Crab and Crabbing Effects

This section summarizes crab effects.

6.2.1 Closures and “No Float” Zones

Both projects would result in a loss of subtidal habitat suitable for crabs through infill.

- The RBT2 loss associated with infill would be **116ha**.
- The DP4 habitat loss associated with infill would be **68ha**, or 58% of the RBT2 loss.

Both projects would also result in the increase in the area of Roberts Bank that is closed to commercial harvesting and to which the no float rule applies for aboriginal harvesting.

- The closure/no-float area associated with RBT2 is **232ha**.
- The closure no/float area associated with DP4 is **130ha** or 56% of the RBT2 closure.

RBT2 would also result in a temporary additional closure of 120ha during the five-year construction period.

Overall, RBT2 would increase the closure area on Roberts Bank by 50%; the DP4 project would increase the closure area by 25 to 30%.

6.3 Health

This section summarizes the comparison of air quality and crab consumption effects on health as well as the nuisance effects of noise and night-time light.

6.3.1 Air Quality Comparison

Based on a comparison of numbers of vehicles, RBT2 may result in higher adverse effects to air quality than DP4 based on the fact that RBT2 would result in:

- A larger number of construction vehicles for a longer period of time during construction;
- Approximately half the number of container trucks during operations; and
- Approximately the same number of train trips.

It is not possible to make a clear determination regarding the health effects resulting from this comparison because emissions from the DP4 project may be somewhat closer to important receptors in the TFN community. On balance, however, a worst-case scenario suggests that lower emissions from DP4 that are spatially closer could result in equivalent health effects to those associated with RBT2.

6.3.2 Crab Consumption

Both projects are likely to mobilize sediment through dredging and, in the event that the sediment is contaminated due to past activities on Roberts Bank, some of these contaminants may bioaccumulate through prey species, be eaten by crab, and affect humans eating contaminated crab.

For this comparison, it was assumed that receptors (consumers of crab meat) were the same.

In general, it is therefore reasonable to assume the effects of the two projects will generally be the same. The only caveat may be that the location of harvest (vicinity of RBT2 vs. vicinity of DP4) could influence overall health risk.

7.0 CONCLUSIONS

Based on the foregoing discussion and associated limitations, a preliminary comparison of a specific set of potential environmental effects from the RBT2 and DP4 projects suggests that the DP4 project may have a smaller adverse environmental effect than the RBT2 project. Broken down by topic:

Table 1 – Summary of DP 4 Effects, Compared to RBT2

Metrics for Comparison	Lower	Equivalent	Higher
Habitat			
Total habitat loss	✓		
Eelgrass loss			✓
Introduction of invasive species		✓	
Crab Closures			
Closure area	✓		
Health and Annoyance			
Air Quality	✓		
Contaminants in Crab		✓	
Train Noise		✓	
Vehicle Noise	✓		
Night-time Light	✓		

DP4 may have a smaller adverse effect than RBT2 on the following:

- Overall habitat loss
- Closure/no float zones
- Air Quality
- Vehicle noise
- Night-time light

DP4 may have a larger adverse effect on RBT2 on the following:

- Eelgrass

DP4 and RBT2 are likely to have equivalent effects on the following:

- Introduction of invasive species
- Contaminants in crab
- Train noise

8.0 LIMITATIONS

This high-level comparison has been done without detailed quantitative data and is intended to provide an initial indication, based on overall project design. It should not be considered to be a definitive assessment nor a comprehensive high-level comparison of a complete set of potential project effects.