

Issues Tracking Table - Tulsequah Chief Barge Transportation System - Project Certificate Amendment Application

ISSUE NUMBER	AUTHOR OF COMMENT	ISSUE RAISED BY PUBLIC	REDFERN RESPONSE	APPLICABLE REGULATORY PROCESS
1	Rivers Without Borders (1)	No data to support claim that ACB is safe for fish and fish habitat in shallow water at certain times of the year, with the potential impacts on substrate re-suspension, juvenile dislodgement and redd habitat deterioration	<p>Section 4.4.4.1 <i>Effects on Mainstem Spawning and Rearing</i> and Section 4.4.2 <i>Disturbance of Substrates</i>, Vol. 2, discuss issues related to mainstem spawning and the suspension of sediments. Section 4.4.4.3 <i>Entrainment Of Small Fish Under The ACB In The Air Cushion</i>, Vol. 2, addresses potential juvenile dislodgement as a result of ACB activity. Section 4.4.4.4, <i>Stranding of Juveniles</i>, Vol. 2, discusses issues related to wake and wave action from the ACB, which relate to potential juvenile dislodgement issues.</p> <p>Redfern is not aware of any air-cushion barge transportation system operating on a river that supports pacific salmon. As such, there is no data that explicitly quantifies the effect of this type of transportation system on a river similar to the Taku. Redfern is committed to:</p> <ol style="list-style-type: none"> 1) Defining an operational procedure that avoids shallow areas where possible. 2) a monitoring program that will monitor the predicted effects on fish where the barge transitions from land to water, including stranding from barge/tug wash pushing fish up onto shore. This monitoring will be carried out at the barge landing site. . 3) Adjusting operations based on the results obtained in the monitoring program. This could include: (a) altering the path taken by the barge, (b) altering the speed of the barge to modify the wake, (c) taking proactive measures to move fish from or keep fish out of areas of impact prior to the barge entering the area, and (d) using amphitrac rather than tug to draw less water. 	BCEA Amendment
2	Rivers Without Borders (1)	There is insufficient information related to effects on river structure in light of daily hover barge passage	This comment does not clearly define the information that is required from Redfern. The barge and tug will be slow moving and will not produce a large wake. As such, the barge is not expected to cause any significant change in river structure through bank erosion or channelization. No dredging or deliberate alteration of river morphology is proposed to support this operation. The Taku River is a very dynamic fluvial system that experiences flow ranging from 23 m ³ /s to over 3,000 m ³ /s with a mean annual discharge of approximately 388 m ³ /s. Wake size will be verified prior to operations commencing.	BCEA Amendment
3	Rivers Without Borders (1) Atlin resident (2)	Insufficient information on eulachon habitat, distribution and potential impacts	Eulachon spawning occurs in the State of Alaska. The State of Alaska permitting process is addressing this concern.	N/A
4	Rivers Without Borders (1)	The down blast from the hover barge fans is glossed over, with the mean footprint of 1 psi cited rather than addressing the actual impacts that could be expected from having a large vehicles of this sort pass over sensitive areas exerting the pressure over a large area simultaneously	Section 5.6.1.2 of Vol. 2 describes what is known about the effect of an ACB working in sensitive areas. Because water does not compress, we know the pressure on the surface of the water does not cause an increase pressure on sensitive habitat or sensitive life stages of fish under the water. Information provided in section 3.1.1.2 <i>Noise</i> of Vol. 1 indicates that underwater sound generated by hovercraft is considerably less than similar sized conventional vessels. On land the 1 psi over the entire area covered by the ACB is not likely to have any noticeable effect on the gravel cobble substrates it will travel over. Field trials during the commissioning phase will document the noise levels, and footprint of the ACB under maximum load, on varying types of substrate (mud, cobble, vegetation).	BCEA Amendment
5	Rivers Without Borders (1)	No attention given to impacts from increased predation flushing salmon juveniles out of gravel.	We assume the suggestion is that the ACB will force juvenile salmon to flee from the disturbance caused by the approaching air cushion barge, and by abandoning the protective shallows, will be subjected to increase predation in deeper water.	BCEA Amendment

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			The company's experience from operating a conventional barge during 2007 is that the shallowest section of water within Canada is that near the proposed barge landing area. The company commits to working closely with Fisheries and Oceans Canada to define the potential impacts within this area.	
6	Rivers Without Borders (1)	Sediment suspension during incubation period.	<p>The barging is not expected to cause any noticeable sediment suspension above background levels in the fall to spring incubation period. When travelling on the ice there will be no increase in sediment levels. The report has addressed the issue of sedimentation during the open water period, early fall, and late spring when the air cushion barge is operating on the water. The wake produced by the slow moving air cushion barge and tug is not expected to cause any significant erosion or re-suspension of sediment.</p> <p>While there is only limited data available, Table 3-5, <i>Total Suspended Sediments and Turbidity Data for the Taku River</i>, Vol. 2 reported that the total suspended sediment recorded in the Taku River during the fall open water period the natural sediment load in the Taku River is ranges from 24 to 73 mg/L while the spring levels ranged from 19 to 280 mg/L. During commissioning, field tests to measure wave height under a range of vessel speeds will be conducted. The results of these tests will be used to develop or modify operational procedures to minimize wake in sensitive areas along the river.</p>	BCEA Amendment
7	Rivers Without Borders (1)	No information is provided about salmon egg/embryo disturbance in general.	<p>General disturbance to salmon egg/embryos as a result of the air cushion barge operation is not predicted. Section 3.3.1.3 <i>Pacific Salmon</i> and Section 4.4.4.1 <i>Effects on Mainstem Spawning and Rearing</i>, Vol. 2, includes information on salmon spawning areas. Maps showing fish habitat along the Taku River, based on current knowledge of habitat types, are attached.</p> <p>Studies cited in the environmental assessment indicate that spawners using the mainstem of the Taku River tend to select habitats such as side-channels, back channels, sloughs and upwelling basins. The air cushion barge route will generally avoid these areas causing little to no disturbance to eggs and embryos. There may be disruption of some fish habitat in the shallow area near the barge landing facility. The company will work closely with Fisheries and Oceans Canada to define that potential effect.</p>	BCEA Amendment
8	Rivers Without Borders (1)	Insufficient mapping of salmon habitat along and adjacent to the barge route; specifically juvenile habitat	The environmental assessment report relied on the salmon spawning locations provided in Eiler, J.H., B.D. Nelson, and R.F. Bradshaw, 1992, as cited in Vol. 2. No specific habitat mapping was prepared for this environmental assessment. Juvenile salmon tend to stay in shallow, edge of river habitats or back-channels and sloughs which are located 10's to 100s of meters away from the proposed route of the air cushion barge, as illustrated in Appendix C, <i>Route Atlas</i> , Vol. 1, except for the barge landing area. However, because there is no air cushion barge operating in areas similar to the Taku River, Redfern is committed to setting up monitoring program to confirm whether juvenile fish are being negatively impacted at the barge landing facility. Corrective action, in consultation with Fisheries and Oceans Canada at the barge landing operations will be made if notable adverse effects are identified.	BCEA Amendment

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9	Rivers Without Borders (1)	No information on thermal weakening of river ice prior to break-up	The assumption is not clear. What mechanism would cause thermal weakening of ice prior to break-up in Canadian waters?	BCEA Amendment
10	Rivers Without Borders (1) Atlin resident (3)	Potential impact to wildlife using river ice as a travel corridor	Section 4.5.5 <i>Terrestrial Mammals</i> in Volume 2 of the EA provides a summary of the potential effects on wildlife that may use river ice as a travel corridor. A detailed assessment on the potential effects and the proposed monitoring and mitigation measures to reduce those effects is provided in <i>Tulsequah Chief Mine ACB Transportation System - Detailed Wildlife Effects Assessments and Mitigation Measures</i> are available by mid-January 2008. The detailed effects assessment provides supplementary information and detailed effects assessments on moose and wolf use of the area during the winter and the predicted effects. Monitoring plans and mitigation measures to reduce the predicted effects are also provided in this report.	BCEA Amendment
11	Rivers Without Borders (1) Atlin resident (2)	Information on ice formation and thickness	Ice breaking is not desirable for operations on the Taku River. When shelf ice is less than 3 inches thick, aquatic operations will be maintained in open mainstem channel and thin ice shelves forming along sides of channel or near gravel bars will be avoided. When shelf ice thickens, when it is greater than 3 inches thick, the route will traverse solid shelf ice and avoiding open leads in mainstem as much as possible to minimize ice breaking and maintain efficient operations. There may be periods of time when the company suspends operations in order to facilitate natural ice formation.	BCEA Amendment
12	Rivers Without Borders (1)	Little specific detail about ice formation, schedules, thickness and importance of ice cover to juveniles/eggs	Section 4.4.2.3 <i>Effects on Ice Formation and Break Up</i> , Vol. 2., discusses issues related to ice formation and ACB effect on ice thickness. Section 4.3.2, <i>Winter Operations-Early November to Early April</i> , Vol. 1, discusses ACB activities on the Taku River during the winter. Ice formation along the Taku River begins along the edges, slow moving shallows and gravel bars; the thalweg is the last area to freeze over. A few sections of the Taku River remain open year round due to groundwater upwelling; the ACB will avoid these areas where possible. It is important to note that there will be no attempt to create an ice road on the Taku; ice road activities, such as flooding the surface of the ice, will not be conducted. Given that spawning does not appear to occur near the barging route, effect on juveniles/eggs under ice would not be a significant concern, except perhaps in the area near the barge landing facility. With respect to the importance of ice cover to juveniles/eggs, trials in the spring of 2008 will be used to determine how best to operate the ACB during the period around spring break-up. One of the criteria for determining the optimal operational plan will include causing minimal disruption to the ice regime on the Taku River.	
13	Rivers Without Borders (1)	No bathymetric data to back up channel depth assumptions on tidal flats	Please refer to Appendix A <i>Channel Depth Analysis of the Lower Taku River</i> of Volume 1 for detailed bathymetry collected in June 2007. Note also that the results of this 2007 bathymetric study agreed well with the results of a similar study by Sandwell in 1995. However, this is a potential effect in the State of Alaska and will be addressed through that permitting jurisdiction.	N/A
14	Rivers Without Borders (1)	No proven track record of using this technology	We recognize that this is an issue and have outlined ways in which we will address the uncertainties of the EA in earlier responses. Field trials during the commissioning phase will provide additional specific data on several aspects of this technology, including footprint, wake; noise; and related data.	BCEA Amendment

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15	Rivers Without Borders (1)	Cumulative effects of Big Bull and Polaris mine	There are no plans to develop / operate either Big Bull or Polaris exploration properties during the timeframe that Tulsequah Chief mine is planned to operate. As there is no temporal overlap, no cumulative effect is predicted.	BCEA Amendment
16	Atlin resident (2)	Impact on salmon habitat due to significant river water contamination that is likely to occur	The source of significant river water contamination or its presumed likelihood is not identified in the question. No significant river contamination is predicted to occur. A Spill Prevention and Response Plan will be implemented to prevent and respond effectively to any spills.	BCEA Amendment
17	Atlin resident (2)	Where else has ACB been used successfully	Yukon River; England (Norfolk coastal tidal flats); Suriname; Abu Dhabi; Dead Sea.	BCEA Amendment
18	Atlin resident (2)	Icebreaking - how will ice cover be maintained	Ice breaking is not desirable for operations on the Taku River. Route will follow ice / snow cover on shelf ice, over gravel bars, shallow stretches of river. Avoid, to extent possible, thin ice cover in mainstem, allowing it to freeze and remain frozen. Where open leads cannot be avoided, amphitrac will cross ahead of ACB, then winch ACB across lead and up onto thicker, or landfast ice.	BCEA Amendment
19	Atlin resident (2)	Daily passage of ACB will scatter salmon due to pressure exerted on water and river bottom	The air cushion barge will displace water, similar to any other object in water. The displacement is related to the mass of the vessel, and is approximately 1240m ³ when fully loaded. The draught of the ACB when fully loaded on hover is 0.73m (2.4 feet). No additional pressure would be exerted on the river bottom as water cannot be compressed, and the barge hovers above the surface of the water that is not displaced. In channel depths less than about 0.73m (2.4 feet), the bottom of the flexible skirts will touch the river bottom; however, the route in Canada will follow the deepest part of the river channel during the aquatic season, avoiding areas that are shallow, other than where it comes ashore at the barge landing site. Some water spray will escape the spray skirt, but that is the extent of the effect of the air pressure exerted on the surface of the water. Spray only occurs at the skirt where the pressure differential exists. Air under the barge is relatively calm. Daily transit of the ACB may cause short term, temporary disturbance to migrating salmon, however this effect is unlikely to have any significant (long-term, permanent, widespread) effect on upstream or downstream migration.	BCEA Amendment
20	Atlin resident (2)	Unclear on how accidents will be dealt with, clarify any landing sites in event of an accident	Volume 2, Section 4.8 describes potential accidents and malfunction scenarios, and how these will be dealt with. In the unlikely event of a malfunction, the ACB would be taken off hover, and gradually set down and secured. If difficulties occur in Canadian waters every effort will be made to return the vessel to the barge landing area, depending on the specific circumstances of the situation.	CEAA screening BCEA Amendment

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21	Atlin resident (2) Atlin resident (3)	Spill prevention and planning for project, including haul road	Redfern is developing Spill Prevention and Response Plan for all aspects of the transportation system, including the haul road, barge landing area, and river/marine transportation components of the system. This plan will be implemented prior to commencement of operations. Spill Prevention and Response Planning is a normal part of most if not all industrial operations.	CEAA screening BCEA Amendment
22	Atlin resident (3)	What impacts documented in an equivalent river system related to: -wake -icebreaking -salmon populations	Studies have been carried out to determine effects of <i>hovercraft</i> in terms of wake, noise, and effects on fish stranding, as referenced in Volume 2, Section 4.4.3. The design of the ACB is such that the speed, noise levels, and wake are much reduced from a hovercraft or conventional tugs. As such, the potential effects of the ACB are predicted to be insignificant, based on professional advice.	BCEA Amendment
23	Atlin resident (3)	Outburst floods on river - what precautions will be taken to ensure safe transport	Increase in flow from either the annual freshet or outburst floods cause water levels in the river to rise gradually over several days and are not catastrophic events. Volume 2, Figure 3-5, illustrates the effect of outburst flood events on the Taku River hydrograph over a 3 to 4 day period. These floods are obvious on the Tulsequah River and will be monitored by staff at the mine. These staff will communicate any flood activity to transportation staff when it occurs. The company will regularly monitor the USGS water gauge operated at Canyon Island.	BCEA Amendment
24	Atlin resident (3) Atlin resident (4)	Request for extension to public comment period	This is not a schedule that is controlled by the company and therefore will not comment on this request.	BCEA Amendment

Respondents:

1. David McKinnon, Rivers Without Borders. October 17, 2007.
2. Don Weir, Atlin resident. October 12, 2007.
3. Nan Love, Atlin resident. October 12, 2007.
4. Wayne Merry, Atlin resident. October 14, 2007. Taku River hoverbarge proposal.

Comments attached.