

SITE-C PROJECT EIS REVIEW Interim Report

PREPARED FOR THE PRRD

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OVERVIEW

1. Impacts on Revenues, Services and Infrastructure
2. Impacts on Land and the Environment
3. Some General Observations and Questions
4. Identify some of the Key Regional Issues and Responses to EIS
5. Next Steps

EIS OVERVIEW

- 5 VOLUMES
- APPROXIMATELY 15,000 PAGES
- FOCUS ON 22 VALUED COMPONENTS
- NUMEROUS TECHNICAL STUDIES, APPENDICES AND TABLES
- MITIGATION STRATEGIES – V.5 TABLE 39.2
- 11 ENVIRONMENTAL MANAGEMENT PLANS YET TO BE PREPARED - V.5 Section 35

22 Valued Components

1. Fish and Fish Habitat
2. Vegetation and Ecological Communities
3. Wildlife Resources
4. Greenhouse Gases
5. Local Government Revenue
6. Labour Market
7. Regional Economic Development
8. Current Use of Lands and Resources for Traditional Purposes
9. Agriculture
10. Forestry
11. Oil, Gas and Energy
12. Minerals and Aggregate
13. Harvest of Fish and Wildlife Resources
14. Outdoor Recreation and Tourism
15. Navigation
16. Visual Resources
17. Population and Demographics
18. Housing
19. Community Infrastructure and Services
20. Transportation
21. Heritage Resources
22. Human Health

MITIGATION MEASURES

Two categories:

- 1) measures to be implemented as standard practice during Project construction and operations (V.5, S.35);
- 2) measures developed specifically to avoid or reduce the potential adverse effects of the Project on the VCs., (V.5, Table 39.1 and 39.2)

Significant Adverse Impacts (40.11)

According to BC Hydro, the Project is likely to result in some significant residual adverse effects on the following Valued Components:

1. Fish and Fish Habitat
2. Vegetation and Ecological Communities
3. Wildlife Resources
4. Current Use of Lands and Resources for Traditional Purposes

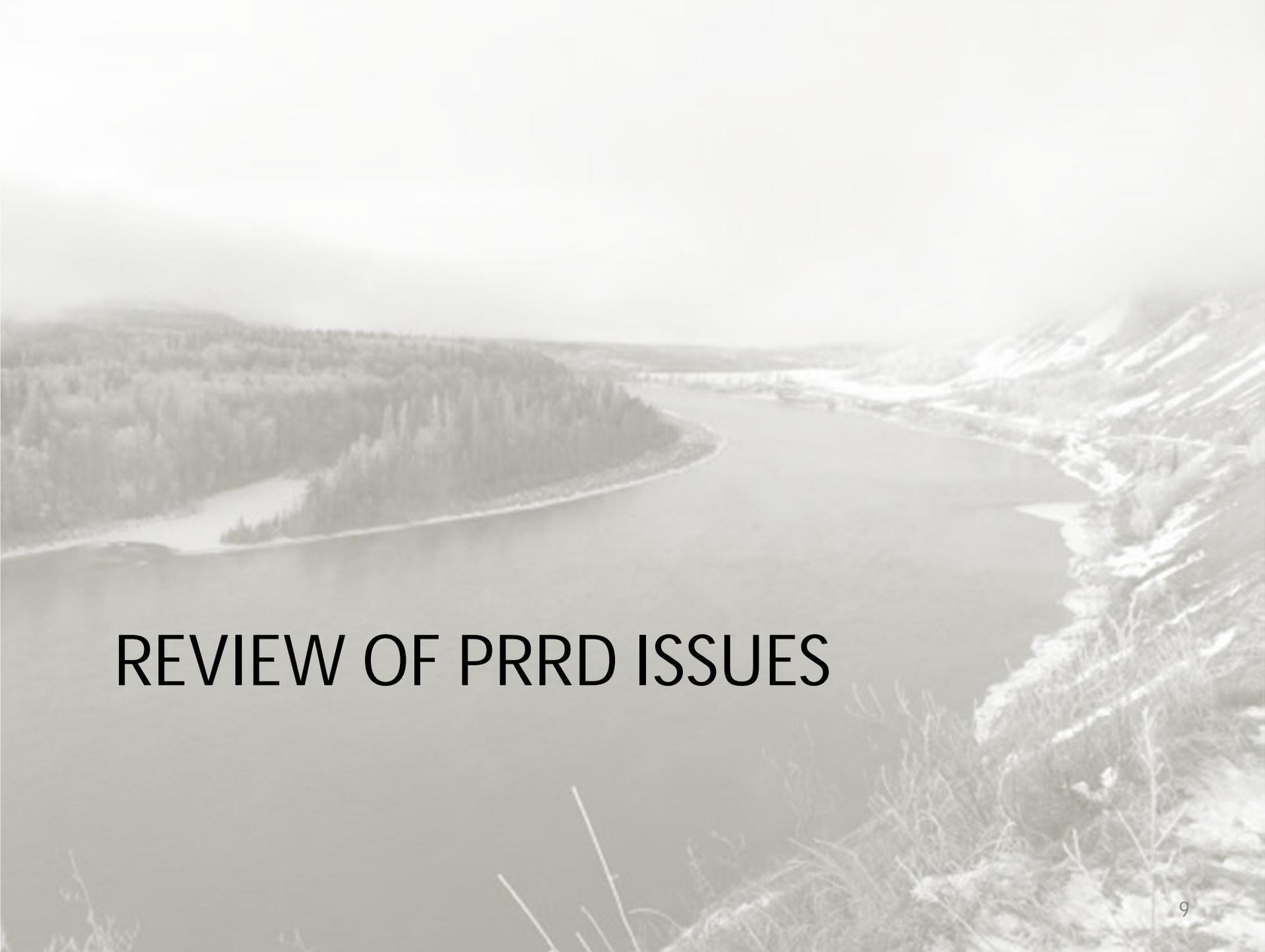
Cumulative Effects (40.11)

- A number of other major development projects and activities are proposed or planned for this region which may also result in residual adverse effects that are not yet reflected in the baseline status of the 22 Valued Components;
- *“...some of the effects of those projects or activities would likely overlap in time and space with the residual effects of the Project and combine to produce a cumulative effect.” (p.40.5)*

BENEFITS (AS SEEN BY BC HYDRO)

Section 7:

- Maintain competitive hydro rates and in BC
- Clean energy
- Increased revenues to all levels of government (S.16)
- Economic Development
- Increased employment during construction
- Education opportunities
- Benefits to Aboriginal Groups
- Social benefits (i.e. Affordable Housing & Daycare)
- Environmental Benefits
- Recreational Benefits
- Improvements to road networks and infrastructure



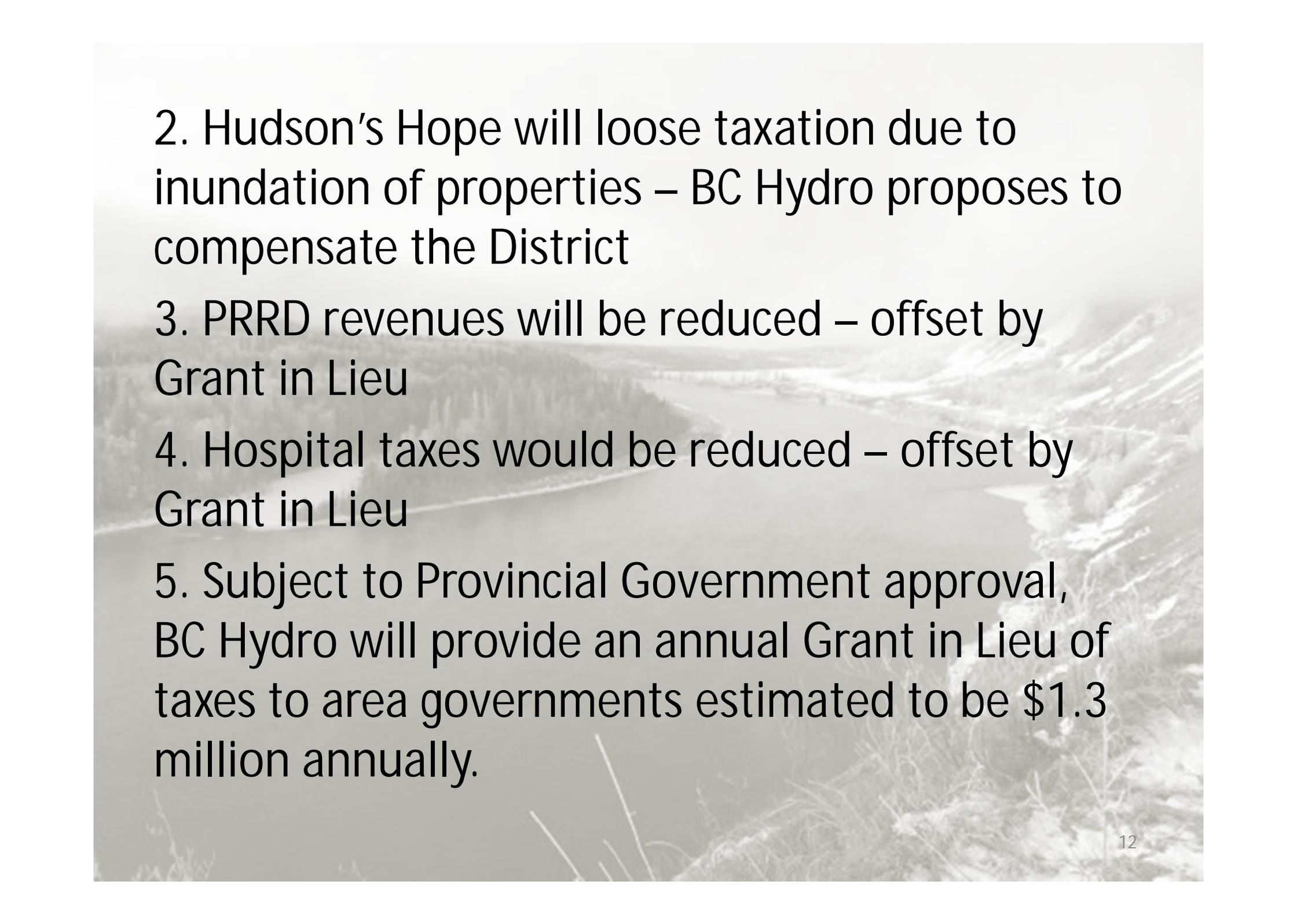
REVIEW OF PRRD ISSUES

REVENUES, SERVICES, INFRASTRUCTURE AND ACTIVITIES

- Government Revenues
- Local Services
- Roads, Water, Sewer and Airport
- Recreation, Trapping & Guiding
- Noise

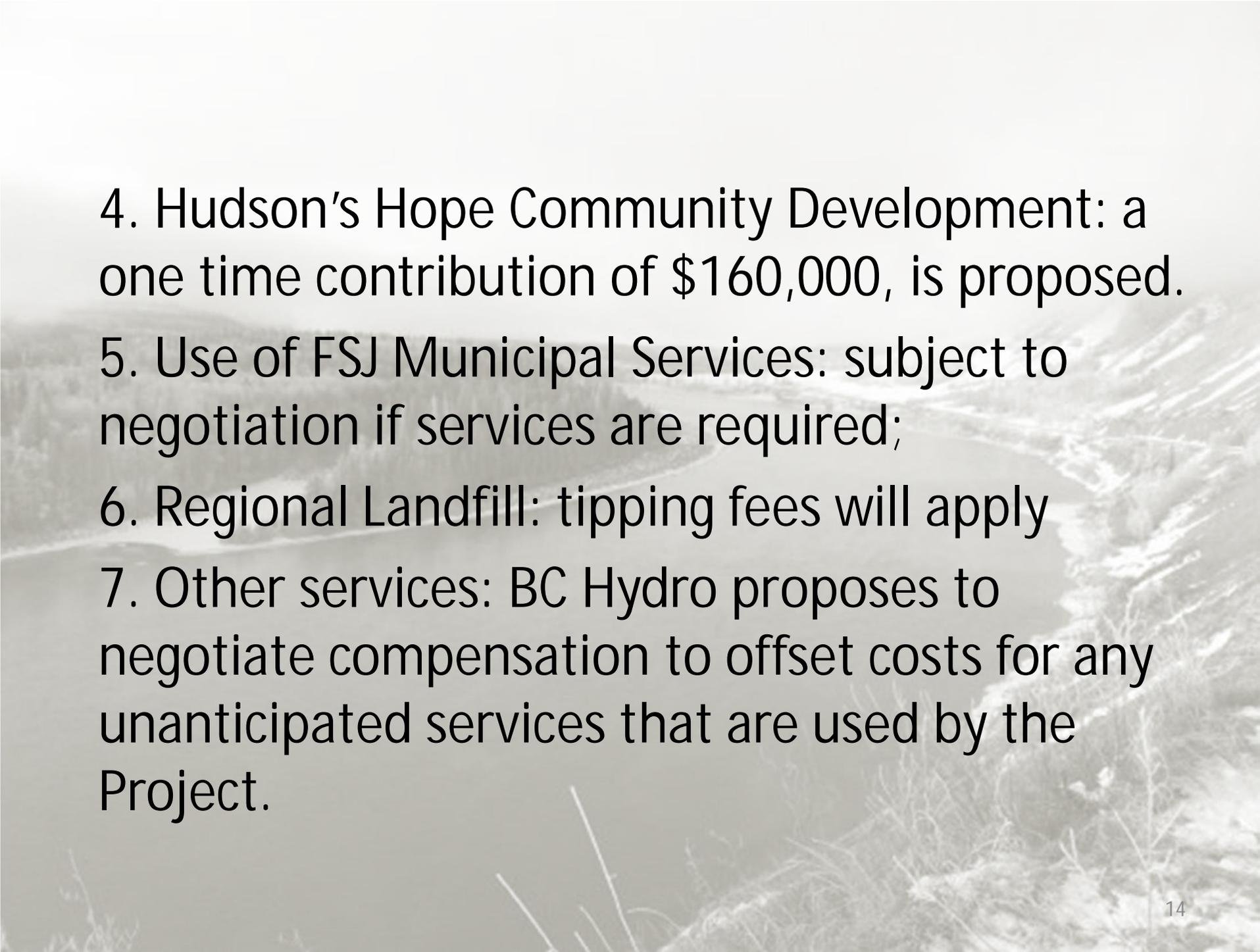
REVENUES: TAXES, GRANTS & FEES

1. BC Hydro projects that local and regional governments revenues will benefit from increases in area populations that will pay more property taxes, business licences and fees for services used and that these increased revenues will off-set costs for the provision of additional or new services:
 - This has potential for a boom & bust economy whereby increased services may need to be reduced after construction if other projections are not realized.

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2. Hudson's Hope will lose taxation due to inundation of properties – BC Hydro proposes to compensate the District
 3. PRRD revenues will be reduced – offset by Grant in Lieu
 4. Hospital taxes would be reduced – offset by Grant in Lieu
 5. Subject to Provincial Government approval, BC Hydro will provide an annual Grant in Lieu of taxes to area governments estimated to be \$1.3 million annually.

SERVICES

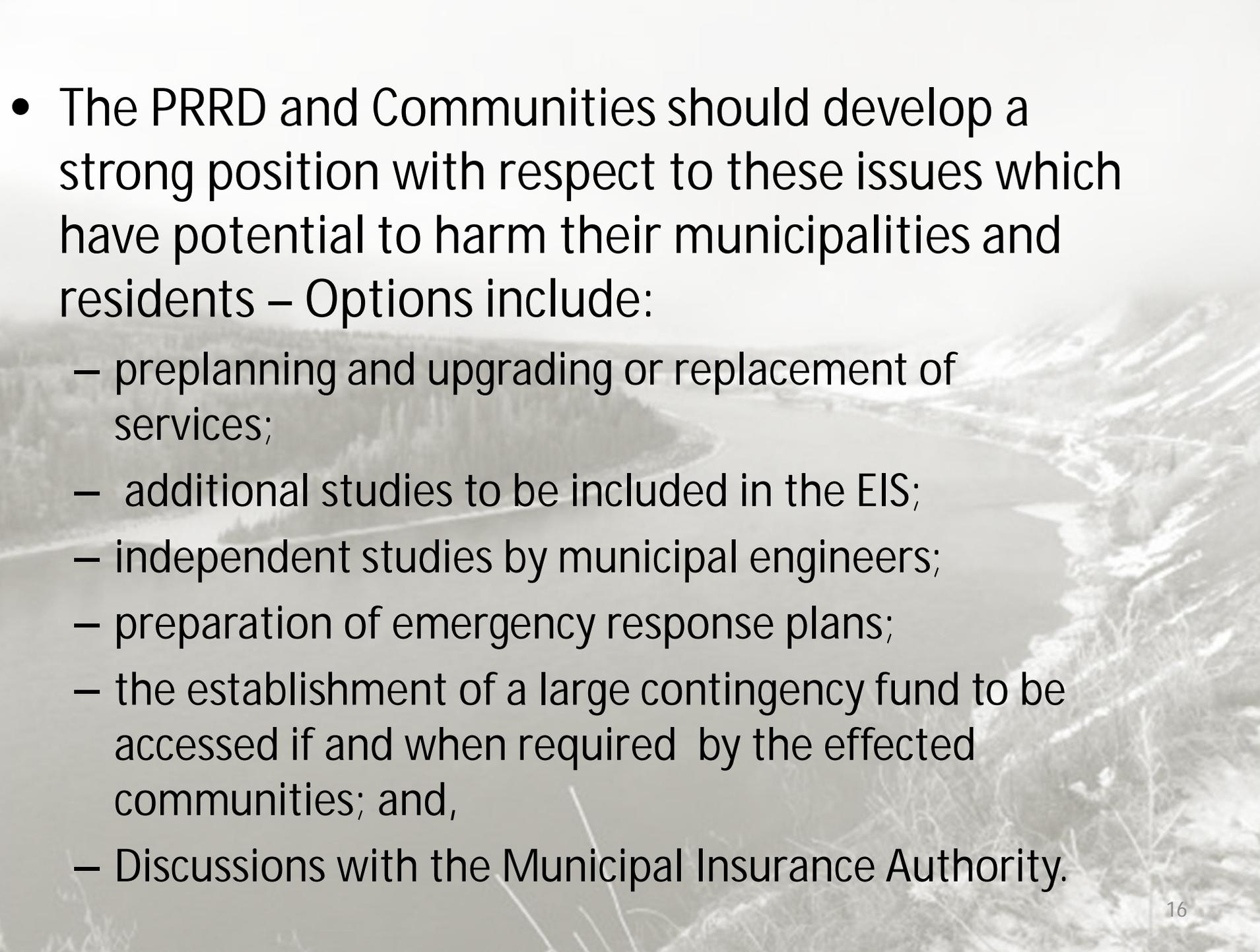
1. Regional Airport: BC Hydro believes that increased use of the Regional Airport will generate additional fees that will offset the costs of any improvements or services increases required;
2. Recreation – Fort St. John: BC Hydro proposes to negotiate a subsidy with FSJ to offset increased costs of usage by worker camp residents
3. Provincial Policing: BC Hydro proposes a subsidy to compensate the RCMP/Province for increased policing costs

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4. Hudson's Hope Community Development: a one time contribution of \$160,000, is proposed.
 5. Use of FSJ Municipal Services: subject to negotiation if services are required;
 6. Regional Landfill: tipping fees will apply
 7. Other services: BC Hydro proposes to negotiate compensation to offset costs for any unanticipated services that are used by the Project.

CRITICAL INFRASTRUCTURES

The EIS identifies several potential impacts to the community and private water and sewer infrastructure in Hudson's Hope, the PRRD, Fort St. John and Taylor. They have chosen to adopt a wait and see approach to dealing with these issues and to respond if and when they are effected by the Project:

- Hudson's Hope STP
- PRRD Charlie Lake Outfall
- Fort St. John Water Supply
- Taylor Water Supply
- Private wells and septic systems.

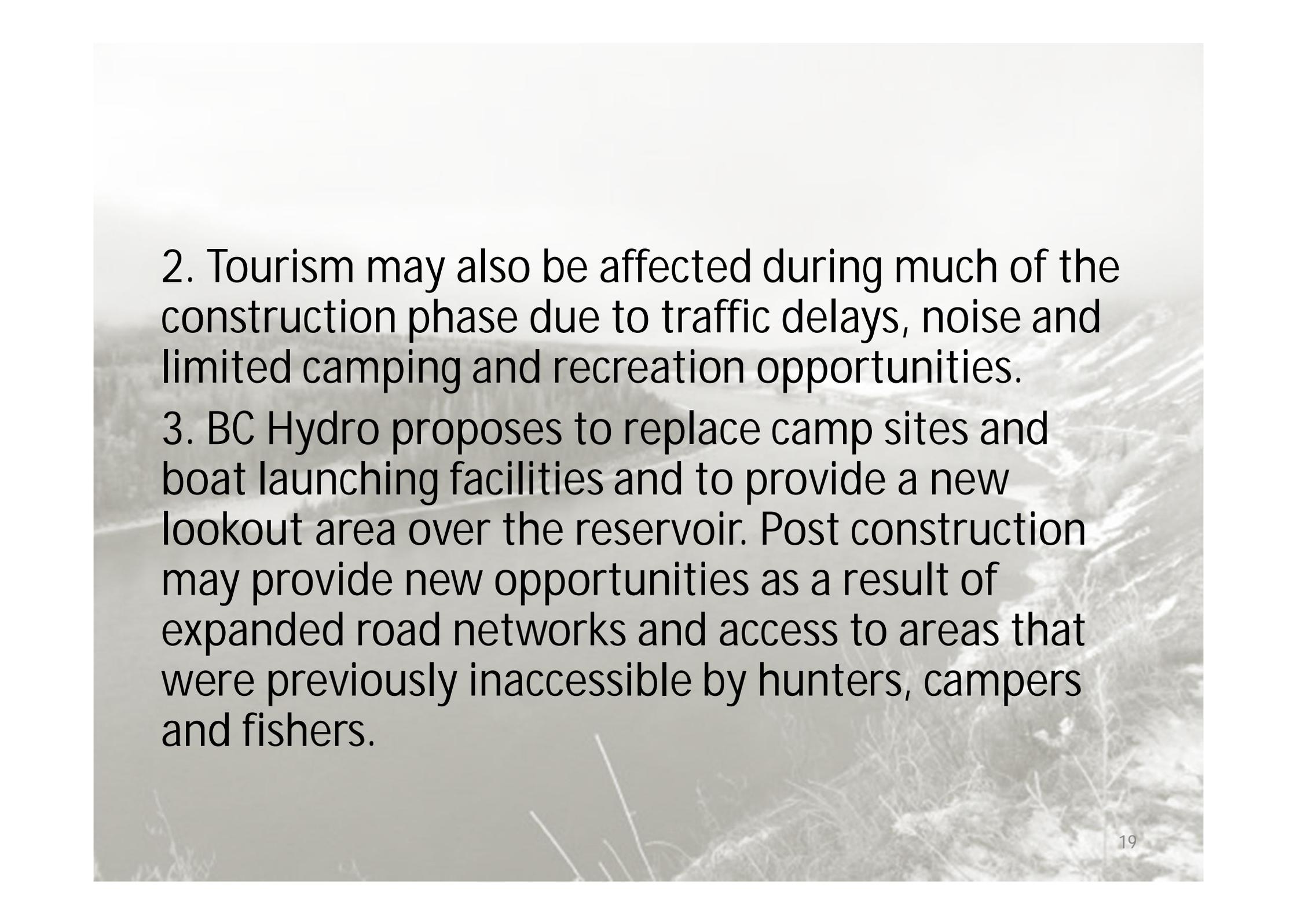
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- The PRRD and Communities should develop a strong position with respect to these issues which have potential to harm their municipalities and residents – Options include:
 - preplanning and upgrading or replacement of services;
 - additional studies to be included in the EIS;
 - independent studies by municipal engineers;
 - preparation of emergency response plans;
 - the establishment of a large contingency fund to be accessed if and when required by the effected communities; and,
 - Discussions with the Municipal Insurance Authority.

Regional Airport

- The EIS includes several references to the Regional Airport in Fort St. John all of which conclude that there will be no significant impacts on the airport as a result of either increased use, microclimate changes – wind & fog, or other factors.
- The PRRD should challenge these findings and require that at a minimum the EIS require BC Hydro to prepare and include a management plan to monitor and immediately respond to any adverse effects identified during and after construction of the Project.

RECREATION

1. For many people recreation is directly related to quality of life. The EIS makes it clear that opportunities to a hunt, fish, boat, camp and use the river area between Fort St John and Hudson's Hope will be significantly impacted during construction and for several years after the reservoir is filled to enable monitoring of the banks. Use of the reservoir will also be impacted by slides or sloughing that will contribute debris and sediment in the water.



2. Tourism may also be affected during much of the construction phase due to traffic delays, noise and limited camping and recreation opportunities.

3. BC Hydro proposes to replace camp sites and boat launching facilities and to provide a new lookout area over the reservoir. Post construction may provide new opportunities as a result of expanded road networks and access to areas that were previously inaccessible by hunters, campers and fishers.

TRAPPING & GUIDING

- Project construction activities would interact with the use of and the access to fishing, hunting, trapping, and guide outfitting harvesting activities, as well as with the habitat supporting harvested species.
- The use of public fishing and hunting areas could also be affected by population change forecast during construction.
- Construction noise will displace birds and ungulates temporarily or permanently.
- At the end of the construction period, the filling of the Site C reservoir would permanently change the areas available for fishing, trapping, and guide outfitting. In particular, fishing use and access would change from a river setting to reservoir setting.
- BC Hydro proposes that project activities would be mitigated through discussions and, where appropriate, agreements with the affected tenure holders

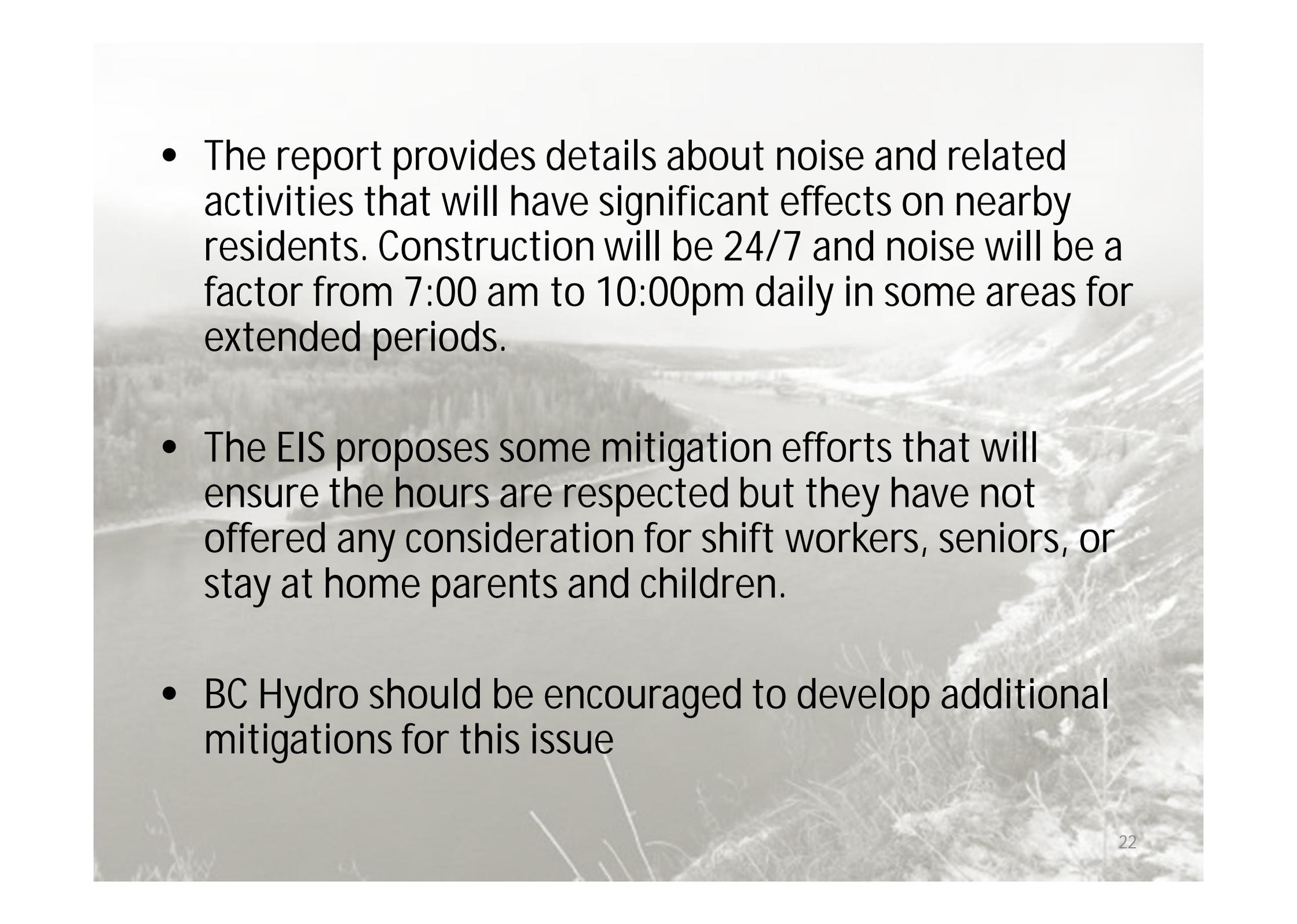
NOISE

- *According to Health Canada:*

“ Noise is more than just a nuisance since it constitutes a real and present danger to people’s health. Day and night, at work and at play, noise can produce serious physical and psychological stress. No one is immune to this stress. People appear to adjust to noise by ignoring it but the ear, in fact, never closes. The body at times still responds with extreme tension, such as to a strange sound in the night (Health and Welfare Canada, 1989).

The most common outward symptom of stress building up in humans, when faced with noise, is annoyance (Health and Welfare Canada, 1989).

Exposure to excessive noise can also induce or aggravate stress-related health outcomes, including those on the cardiovascular system, immune system, sleep, task performance, behaviour, and mental health.”

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- The report provides details about noise and related activities that will have significant effects on nearby residents. Construction will be 24/7 and noise will be a factor from 7:00 am to 10:00pm daily in some areas for extended periods.
 - The EIS proposes some mitigation efforts that will ensure the hours are respected but they have not offered any consideration for shift workers, seniors, or stay at home parents and children.
 - BC Hydro should be encouraged to develop additional mitigations for this issue

Heritage

- Within the heritage resources LAA, 173 positive palaeontologically sensitive areas, 251 archaeological sites, and 42 historical sites have been recorded;
- For heritage sites in the proposed reservoir area, “opportunities for scientific study” and “public appreciation” may be considered foreclosed for the planned operational life of the Project....100 years.





ENVIRONMENTAL IMPACTS

Natural Capital

- Natural Capital comprises Earth's natural assets (soil, air, water, flora and fauna), and the ecosystem services resulting from them, which make human life possible
- Ecosystem goods and services from Natural Capital are worth trillions of US dollars per year and constitute food, fiber, water, health, energy, climate security and other essential services for everyone.
- Natural Capital is critical to understanding and accounting for the true cost of economic growth and sustaining human wellbeing today and into the future.
 - www.naturalcapitaldeclaration.org

Natural Capital

“You cannot manage what you cannot measure”

- Pavand Sukhdev
lead author
- 2010 The Economics of
Ecosystems and Biodiversity

1. Has BC Hydro attempted to quantify the Natural Capital of the Peace River Valley?
2. If so, how did they calculate the natural assets?
3. Considering natural capital, what is the true economic growth?

PRRD Concerns

BC Hydro Significant Adverse Impacts

- Current Use of Lands and Resources
- Vegetation and Ecological Communities
- Fish and Fish Habitat
- Wildlife Resources



Wildlife Resources

Y2Y Migration Corridor

- Yellowstone to Yukon Conservation Initiative or Y2Y is a joint Canada-US charitable organization that seeks to preserve and maintain the wildlife, native plants, wilderness and natural process of the mountain ecosystem from Yellowstone National Park to the Yukon.
- BC Hydro concluded that residual effects on wildlife resources would be local and not significantly affect populations with the application of effective mitigation measures. Exceptions to this are migratory birds that are considered species at risk: Canada Cape May & Bay-breasted Warblers, and Yellow Rail & Nelson's Sparrow
- Did BC Hydro consult with the Yellowstone to Yukon Conservation Initiative (Y2Y) or their partners when assessing impacts on wildlife resources through the Peace River Valley?

Wildlife Resources

Winter habitats and birthing sites

- Residual effects for ungulates are reflective of the effect on winter habitats. Loss of winter range has been characterized as moderate for moose and elk, and high for mule deer, reflecting the amount of loss. This loss is considered permanent, as recovery during the life of the Project is not expected.
- Of the 19 birthing sites identified in the Peace River valley, 3 sites (2 moose and 1 mule deer) were identified on islands in the Peace River completely surrounded by flowing water. In general, moose sites were mostly on the plateau, elk favoured valley slopes, and mule deer used the plateau, slopes, and riparian habitats equally.
- Will the wildlife management plan address the following:
 1. Winter feeding programs?
 2. Loss of birthing sites on Peace River Island?
- Will equally suitable land be accessible for birthing given the shelter and remote nature inherent in island sites?

Wildlife Resources

Cumulative Effects

Table 14.24 Characterization of Residual Cumulative Effect – Habitat Alteration and Fragmentation

Effects Criteria	Project Case
Direction	Negative
Magnitude	High
Geographic Extent	Regional
Duration	Permanent
Frequency	Continuous
Reversibility	Irreversible
Context	Low and High resilience
Level of Confidence	High
Probability	High

- A collective, broad-based high level commitment from all industries is required to reduce pending impacts. How will BC Hydro work with current and future industrial developments to reduce cumulative effects?

Groundwater

Quality and mitigation

- 6 of the 55 identified wells are expected to be inundated
 - 5 properties of contaminated sites that may be impacted with increasing water table
 - Groundwater and surface water quality may be impacted with pesticides, herbicides, and fertilizer runoff and seepage
- The EIS identifies these potential problems and proposes to monitor impacts as the reservoir is filled. If problems occur, the impacts will be immediate.
 1. Is BC Hydro prepared to be proactive in dealing with these issues which could affect health?
 2. Can a contingency fund be accessed by the PRRD and local governments on an emergency basis?

Land

Private Properties

Flooded Land = 5,550 ha

81% Crown Land

12% BC Hydro

7% Private
(companies, individuals, gov't agencies)

- BC Hydro interviewed 22 of the 34 identified farm operations determined to be affected by the project
1. What defines a farm operation? Does this list include hobby or part-time farming?
 2. How many private properties will be impacted?
 3. Can a list of land titles affected and the extent/nature of impacts be disclosed to the PRRD?

Land

Statutory Right of Ways

- Maximum normal reservoir line (MNRL)
 - elevation 461.8 m to impact lines
 - 9,648 ha

- Flood impact line (FIL)
 - 648 ha

- Erosion impact line (EIL)
 - 1,464 ha

- Stability Impact Line (SIL)
 - 9,190 ha

- Total Impacted Area
 - 20,950 ha

Table 11.3.2 Estimated Permanent Statutory Rights-of-way Required

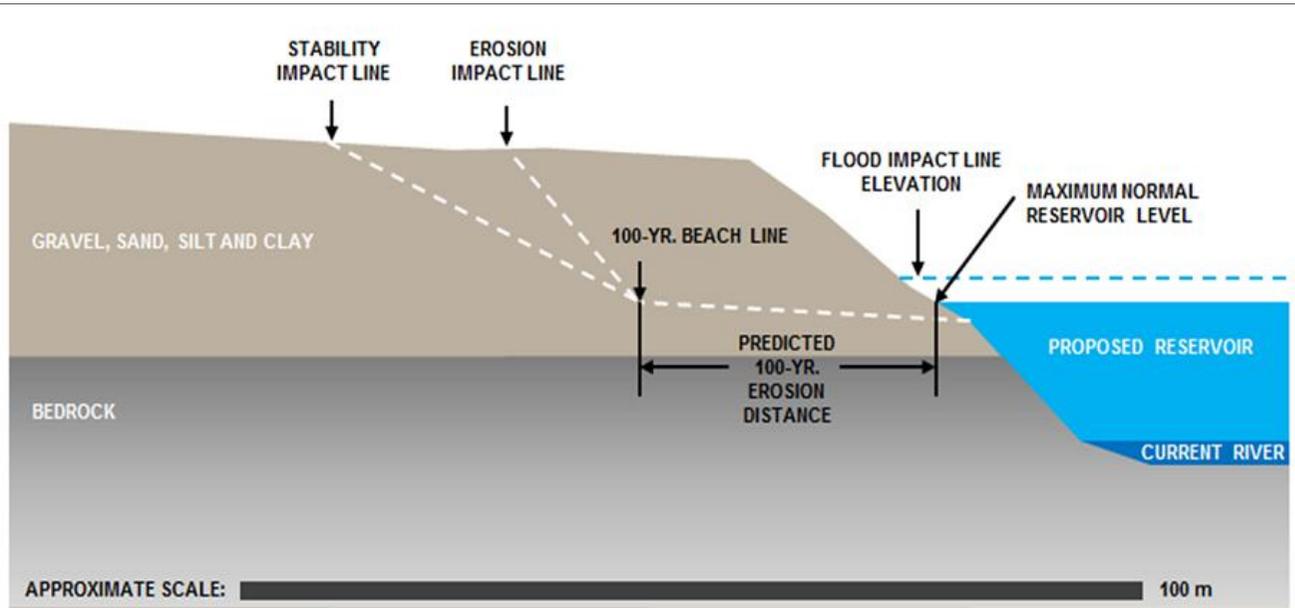
Project Component/Activities	Area of Private Land (ha)	Area of BC Hydro Land (ha)	Area of Crown Land (ha)	Total (ha)
Impact lines: flood, erosion, and landslide-generated wave impact lines	190	322	1,377	1,889
Stability impact line	940	398	6,268	7,606
Existing transmission line (118 m)	0	0	0	0
Project access road	12	0	99	111
North and south bank dam site connecting roads	0	3	10	12
Transmission line tie-in at Peace Canyon Dam site	0	12	20	32
Transmission line tie-in at Site C dam site	0	0	51	51
Proposed transmission line widening (34 m)	29	0	222	251
Hudson's Hope shoreline protection	4	1	7	12

NOTES:

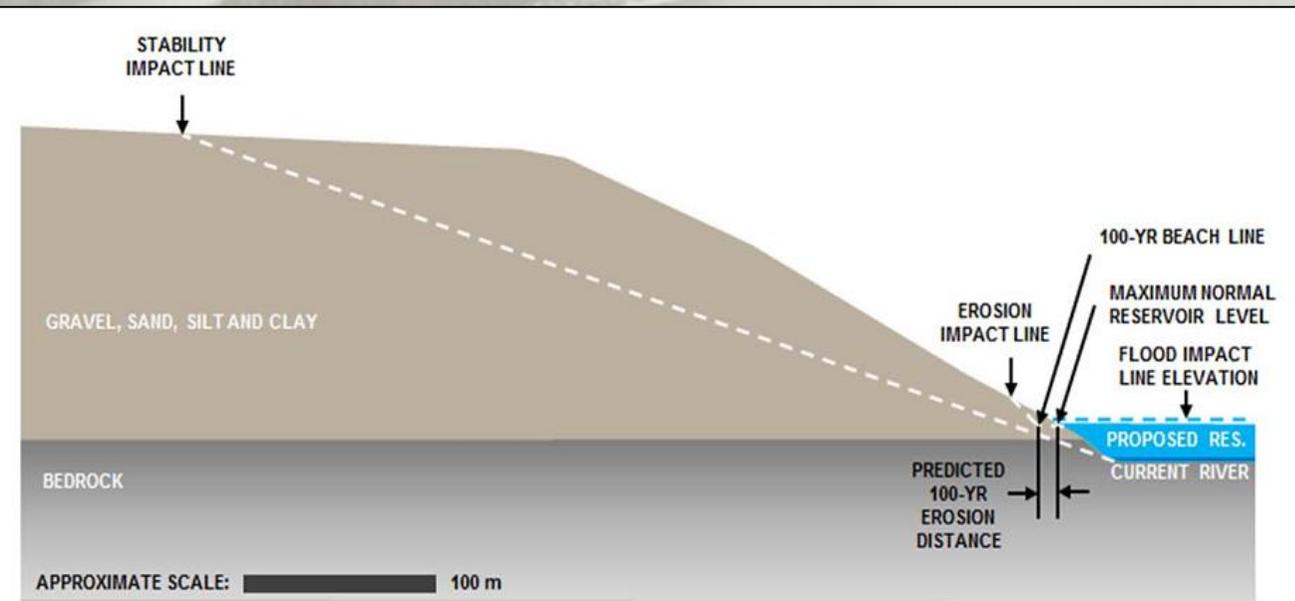
The project access road would be 21 m wide and would be partially included within the existing transmission line statutory right-of-way and proposed transmission line widening; therefore, there is some duplication in areas.

Due to rounding of the individual areas, the individual areas may not add up to the total area shown; however, the total area is correct.

This table reflects information as of November 15, 2012, and is subject to change due to changes in property ownership.



SCHMATIC ILLUSTRATION OF THE FLOOD, EROSION AND STABILITY IMPACT LINES FOR A TYPICAL LOW BANK SLOPE (< 75 M HIGH)



SCHMATIC ILLUSTRATION OF THE FLOOD, EROSION AND STABILITY IMPACT LINES FOR A TYPICAL HIGH BANK SLOPE (> 75 M HIGH)

Land

Requests for Information

1. Statutory right-of-way

- a) How close can residential or other structures be built on the landward side of the stability impact line?
- b) Were property values within the statutory right-of ways assessed at current or prospective value?
- c) If applicable, does BC Hydro plan to compensate for loss of property value for land located within the statutory right-of-ways?

2. Downstream properties

- a) Did BC Hydro consult with downstream landowners?
- b) Does BC Hydro have an interest in acquiring land downstream or compensating landowners for any loss in property value incurred by the project?

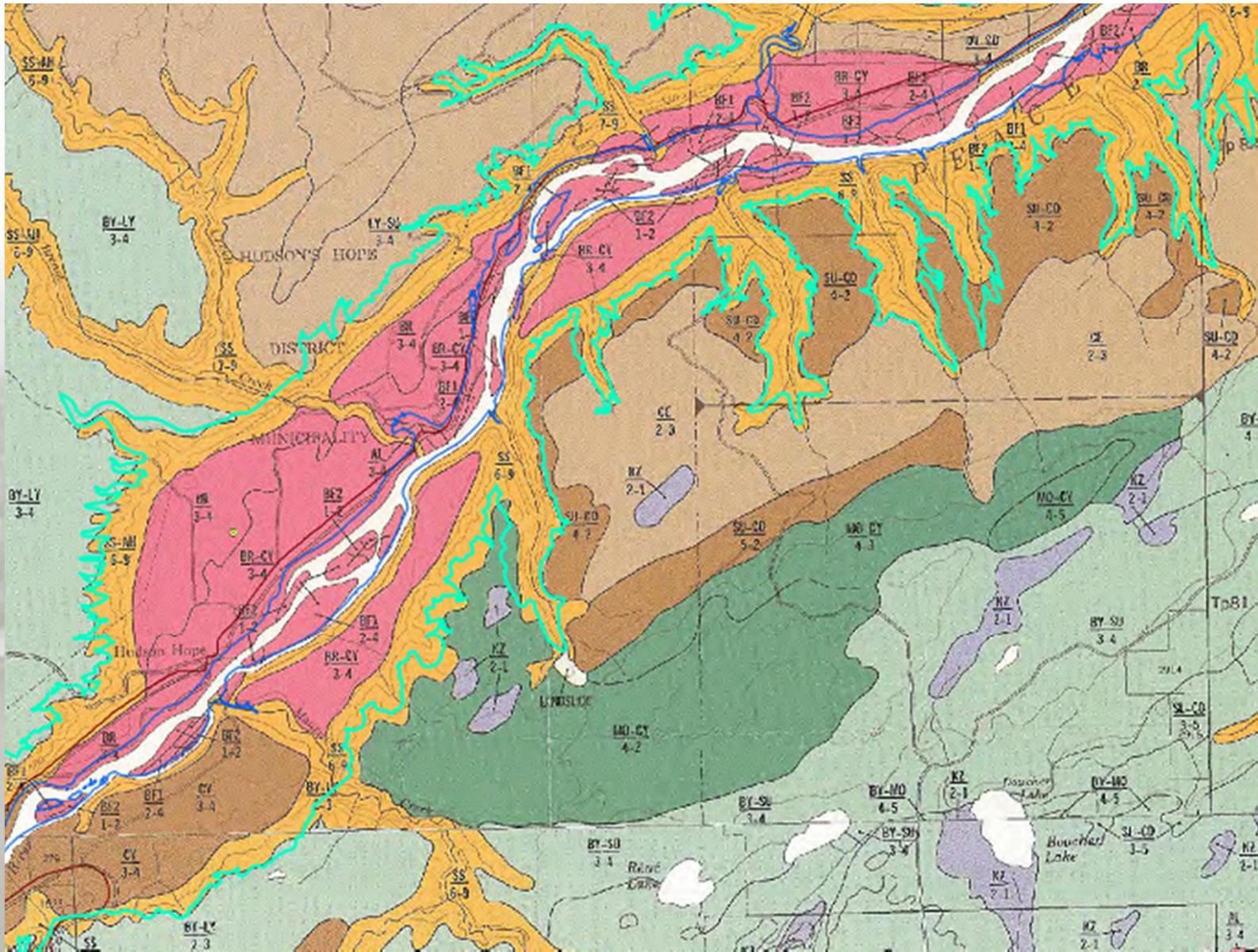
Land Soil Capability Classification

- 2,601 ha of unimproved Class 1 and Class 2 lost

Table 20.16 Permanently Lost Agricultural Land (ha) Within the Project Activity Zone, by Unimproved Capability

Project Component or Activity	Class 1	Class 2	Class 3	Class 4	Class 5	Subtotal Class 1–5	Subtotal Class 6&7	Total
Reservoir	0	2,290	685	182	68	3,225	1,298	4,523
Highway	0	149	32	66	1	248	82	330
Erosion	0	87	34	25	15	161	1,212	1,373
Dam site	0	75	29	0	0	104	61	165
Access roads	0	0	52	7	19	78	0	78
Total	0	2,601	832	280	103	3,816	2,653	6,469

- 24.8 % Peace River Valley
- 2.1% of Peace Agricultural Region
- 1% of Provincial Total



Soil Capability Map – Volume 3, Appendix D

Golder Associates, Site C Clean Energy Project – Agricultural Assessment

Land Soil Capability Classification

1. How many hectares of unimproved Class 1 capability soils will be flooded based on the maps provided in the Golder Associates technical report?
2. If it's a question of unimproved versus improved soil, how many hectares of currently improved Class 1 soil will be flooded?

Fish and Fish Habitat Population

- 3- fold increase in total biomass of harvestable fish in the Site C reservoir relative to what currently exists in the Peace River, though with a very different species composition.
 - Existing fish populations that are specifically adapted to river habitats would be affected.
 - Arctic grayling
 - Mountain whitefish
 - Sculpin species
 - Bull trout
1. How will a change in water temperatures affect fish populations and structure?
 2. What are long term impacts associated with a loss of riverine species?

Vegetation and Ecological Communities

- Loss of riparian forests
 - 44% of the blue - listed 07/SH – White spruce/Red swamp currant/Horsetails
 - 42% of the blue - listed 09/Fm02 – Balsam poplar – White spruce/Mountain alder – red - osier dogwood in the LAA
- Loss of rare and sensitive ecosystems such as tufa seeps – 5/7 and marl fens
- Loss of 675 ha of wetlands
- Loss of 122 rare plant occurrences

Next Steps

1. Receive Comments & Complete the Review of the EIS
2. Prepare Submissions on Specific Issues by April 4th
3. Review BC Hydro Responses to Submissions from the PRRD and other Stakeholders
4. Prepare a submission to the Joint review Panel
5. Make a Presentation to the Joint Review Panel
6. Negotiate written commitments with BC Hydro
7. If the Site C Project proceeds, participate as a member of a Joint Stakeholders Monitoring Committee