40 CONCLUSION AND CONDITIONS

BC Hydro is proposing to construct and operate the Site C Clean Energy Project (the Project), a third dam and generating station on the Peace River in northeast B.C. The Project, which is described in Volume 1 Section 4 of the EIS, would provide up to 1,100 megawatts (MW) of capacity and about 5,100 gigawatt hours (GWh) of energy each year to the Province's integrated electricity system. The Project would be a source of clean, reliable and cost-effective electricity for BC Hydro's customers in B.C. for more than 100 years.

40.1 The Proponent, BC Hydro

BC Hydro is a Crown corporation owned by the Province of British Columbia. BC Hydro's mandate is to generate, manufacture, conserve, purchase, and sell electricity to meet the needs of its customers. BC Hydro serves 95% of B.C.'s population, delivering electricity safely and reliably to approximately 1.9 million customers. BC Hydro operates an integrated system with 31 hydroelectric facilities and three thermal generating plants, totaling approximately 12,000 MW of installed generating capacity. BC Hydro's own generation is complemented by additional electricity purchased from Independent Power Producers in the province to meet customers' annual needs.

BC Hydro delivers electricity to its customers through a network of over 75,000 km of transmission and distribution lines, approximately 300 substations, 900,000 utility poles, and 325,000 individual transformers. The system is connected to other transmission systems in British Columbia, Alberta, and Washington State, which improves the overall reliability of the system and provides opportunities for trade.

BC Hydro carries out its mandate under the *Hydro and Power Authority Act*. The *BC Hydro Public Power Legacy and Heritage Contract Act* ensures public ownership of BC Hydro's transmission and distribution systems, all of BC Hydro's existing generation and storage assets, and any future increases to the capacity and energy capability of these facilities. The *Clean Energy Act*, S.B.C., 2010, c. 22, updated several elements included in the 2007 BC Energy Plan, and provides statutory guidance for how BC Hydro is to meet the Province's energy objectives.

40.2 The Project Components and Activities

The components and activities of the Project are:

- Dam, generating station, and spillways
- Reservoir
- Substation and transmission lines to Peace Canyon Dam
- Highway 29 realignment
- Quarried and Excavated Construction Materials
- Worker Accommodation

- Road and Rail Access
- Activities required to construct and operate the Project

40.3 The Assessment Process

The environmental assessment of the Project is being carried out in accordance with the the B.C./Canada Agreement. This EIS contains the information required by the EIS Guidelines, which were issued by the Minister of Environment of Canada and the Executive Director of the Environmental Assessment Office of British Columbia after being developed in accordance with the process required by the B.C./Canada Agreement. In meeting the requirements of the EIS Guidelines, the objectives of the three guiding principles set out the EIS Guidelines have been met:

- *Environmental Assessment*: The EIS demonstrates that comprehensive process to identify and evaluate the potential effects of the Project and ways to avoid or mitigate adverse effects has been conducted.
- *Public Participation*: The EIS demonstrates that the public has been provided with information which provides a clear understanding of the Project as early as possible in the review process and that the public has been provided with opportunities to participate in the environmental assessment process.
- *Aboriginal Consultation*: BC Hydro has engaged, and will continue to engage, with Aboriginal groups that may be affected by the Project, and that have asserted or established Aboriginal rights or treaty rights in the Project area, as early as possible in the project planning process.

Accordingly this EIS is, in accordance with the Terms of Reference of the Joint Review Panel, sufficient for the purposes of providing notice of, and holding, public hearings.

40.4 Need for the Project

Forecasts show that customer demand for electricity is expected to increase by about 40% over the next 20 years and that the Project, which would provide energy and dependable capacity for more than 100 years, is required to meet this projected demand.

BC Hydro must plan in advance to meet its customers' residential, business and industrial requirements and to ensure that the electricity resources required are available. The Project, like other large hydro projects, has a long lead time prior to the Project in-service date due to the lengthy construction period and the requirement for design work, stakeholder engagement, and regulatory review. As a result, BC Hydro considers its customers' long-term requirements in evaluating the need for the Project.

Based on the load resource balance analysis, new resources are required to meet the energy and dependable capacity needs of BC Hydro customers within the next 10 to 15 years, even when taking into account BC Hydro's Demand Side Management (DSM) Target and Revelstoke Unit 6, and excluding load from LNG facilities. The addition of non-compression LNG load served by BC Hydro, lower than expected DSM results, or higher than expected attrition of IPP contracts would accelerate the need for new resources.

40.5 Alternatives to the Project

In order to evaluate the Project compared to other resource options, BC Hydro developed several portfolios of resources, one of which includes the Project and was referred to in the analysis as the "Site C portfolio." Each of the portfolios would provide comparable energy and capacity to the Site C portfolio and each took into account the relevant policy context, including the legislative requirements of the *Clean Energy Act*. A comparison of the financial, technical, environmental and economic development attributes of the portfolios demonstrates that the Project provides the best combination of financial, technical, environmental, and economic development attributes and is therefore the preferred option to meet the need for energy and capacity within BC Hydro's planning horizon.

40.6 Purpose of the Project

The Project is being proposed to meet three purposes: (1) to cost-effectively meet BC Hydro's forecast need for energy and capacity, (2) to meet the provincial policy objectives of the *Clean Energy Act*, and relevant B.C. Government policy statements, and (3) to cost-effectively maximize the development of the hydroelectric potential of the Site C Flood Reserve which was established in 1957.

40.7 Alternative Means of Carrying out the Project

BC Hydro has conducted a number of evaluations of alternate means to develop the hydroelectric potential of the Site C Flood Reserve. This work is consolidated in a comprehensive study, Review of Alternate Sites on the Peace River, which reviews previously identified alternates and any new alternates and compares them to the Project using a consistent evaluation process. The evaluation framework considered multiple project attributes including technical, financial, environmental and social attributes for each alternative and compared them with the Project's attributes. The conclusion of the alternates study is that the Project is the preferred means of cost-effectively maximizing the development of the hydroelectric potential of the Site C Flood Reserve.

40.8 Information Distribution and Consultation

BC Hydro began consulting with Aboriginal groups in late 2007, well before a decision was made to advance the Project to the environmental assessment process. While consultations are ongoing, BC Hydro has a comprehensive record of issues and interests raised by Aboriginal groups. These issues and interests have been taken into account in the assessment. BC Hydro also began consulting with communities in late 2007, and has led or participated in more than 500 public consultation meetings, presentations, local government meetings, community events and open houses. Input from these consultations informed project planning and design, as well as the proposed mitigation measures. The EIS also demonstrates the consultation with federal and provincial government agencies and includes a summary of issues, concerns and interests raised.

40.9 Technical Studies

BC Hydro conducted a comprehensive study of baseline conditions and background information to prepare for the effects assessment of the Project. Multi-year planning and technical studies were conducted. The findings are included in a large number of technical data reports that are appended to the EIS. This work was completed as a preliminary step in the effects assessment process. With this information, it was possible to identify and assess the potential effects of the Project on valued components (VCs).

The technical investigation of the potential changes to the physical environment, land, water and air, is described in the environmental background section of the EIS and supported by an extensive volume of technical data reports.

40.10 The Valued Components

Using the methodology set out in Section 8.3 of the EIS Guidelines, 22 VCs have been identified, and the potential residual effects of the Project on those VC have been assessed. The VCs are:

- Fish and Fish Habitat
- Vegetation and Ecological Communities
- Wildlife Resources
- Greenhouse Gases
- Local Government Revenue
- Labour Market
- Regional Economic Development
- Current Use of Lands and Resources for Traditional Purposes
- Agriculture
- Forestry
- Oil, Gas and Energy
- Minerals and Aggregate
- Harvest of Fish and Wildlife Resources
- Outdoor Recreation and Tourism
- Navigation
- Visual Resources
- Population and Demographics
- Housing
- Community Infrastructure and Services
- Transportation

- Heritage Resources
- Human Health

40.11 Assessment of the Potential Effects and Cumulative Effects of the Project

Using the methodology set out in Sections 8.4 and 8.5 of the EIS Guidelines, the potential effects and potential cumulative effects of the Project on the VCs have been assessed. The results of the assessment are contained in Sections 12 through 33 in the EIS.

BC Hydro has made changes to the historic project design to avoid or reduce potential adverse effects. In addition, the assessment of the potential effects of the Project took into account a comprehensive set of technically and economically feasible mitigation measures proposed by BC Hydro to further avoid, reduce, or, in some cases, compensate for, potential adverse effects. A framework for environmental and safety management has been developed to protect the health and safety of the public and workers, and to ensure that measures recommended to mitigate the potential adverse effects of the Project are implemented.

While the Project is likely to result in some significant residual adverse effects, most would not be significant. However, some potential residual adverse effects of the Project on following VCs, as they are found today, would be significant:

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

To conduct the cumulative effects assessment, a number of projects and activities that may not yet have commenced but are as likely as, or more likely than, the Project to proceed have been identified. Those projects and activities may also result in residual adverse effects that are not yet reflected in the baseline status of the VCs. The cumulative effects assessment has determined that 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.

The residual effects of the Project on two of the VCs listed above, Vegetation and Ecological Communities and Wildlife Resources are expected to be significant and, accordingly, those effects are also significant when considered in combination with the effects of other projects or activities. However, the effects on those VCs resulting from other projects and activities that have been or will be carried out are considered significant, even without the Project.

The residual effects of the Project on Fish and Fish Habitat, on the Current Use of Lands and Resources for Traditional Purposes, and on other VCs are not predicted to combine with the residual effects of the other projects and activities.

Increasing GHG emissions from the many sources globally and the resulting increase in GHG concentrations in the atmosphere, and the consequent changes to the global

climate, are currently believed to be a significant cumulative environmental effect, even without the Project. While the Project's contribution to a net change in global GHG emissions is relatively small and the environmental effect of the Project related GHG emissions (on its own) on global climate is not measurable, the cumulative effect is considered significant.

40.12 Impact to the Exercise of Treaty Rights

BC Hydro's understanding of the asserted or established Aboriginal rights and treaty rights of each Aboriginal group, and how the exercise of those rights may be impacted by the Project, is presented in the EIS. BC Hydro is continuing to consult with Aboriginal groups and to seek accommodations where appropriate.

40.13 Follow up Program

BC Hydro proposes to implement a follow up program with a number of measures. Specific measures have been identified to address specific areas of uncertainty regarding the nature or extent of predicted adverse residual effects on a VC. Follow-up measures are also proposed to address uncertainty about certain mitigation measures. Volume 5 Section 39, Table 39.2, identifies the objectives of each follow-up measure and briefly describes follow-up methods (e.g., type of information to be collected, monitoring frequency and duration, reporting requirements).

40.14 Environmental, Economic, Social, and Sustainability Benefits

The Project would provide a wide range of benefits to British Columbians and Canada. Businesses and workers who are involved with the construction and with the operation of the Project would receive benefits through employment, and regional economic development. The Project would be a clean, renewable and reliable power resource that would provide cost-effective long-term energy and dependable capacity to BC Hydro customers with a low risk of future increases in the Project's cost of energy. All British Columbians and Canadians would receive benefits through increased government revenues during the construction and the operation the Project. Finally, the Project would contribute to sustainable development through its optimization of existing BC Hydro hydroelectric facilities on the Peace River and through its delivery of electricity with low GHG emissions intensity.

BC Hydro is committed to continuing to negotiate benefits agreements with Peace region communities and impact benefits agreements with some Aboriginal groups.

40.15 Justification of the Potential Significant Adverse Effects

The assessment of the potential effects of the Project on 22 valued components indicates that the effects of the Project can largely be mitigated through careful project planning, comprehensive mitigation programs. However, the Project is likely to result in significant adverse effects on four VCs. In view of the following, those effects would be justified in the circumstances:

- BC Hydro serves more than 1.9 million residential, commercial, and industrial customers, which represent 95% of the electricity users in the Province. Over the next 10 to 15 years, demand for electricity is expected to grow by up to 40%, and BC Hydro has a legislated obligation to ensure a secure supply of power to meet this need. Based on BC Hydro's long-term planning process and analysis of alternative resources to meet need, the Site C Project has been identified as the preferred resource option to meet both long-term energy and capacity requirements. As hydroelectric projects are complex, they require a long lead time to plan, design, and to complete the rigorous environmental assessment process. In addition, they take many years to construct. For these reasons, BC Hydro believes the Project should proceed to ensure that the energy and dependable capacity from the Project is available to meet forecasted customer demand.
- The Project would provide employment, economic development, ratepayer, taxpayer, and community benefits. The construction of the Project would create approximately 10,000 direct construction jobs and approximately 33,000 total jobs through all stages of development. It would also provide substantial economic benefits including a contribution of $3.2 billion to the provincial GDP during construction. BC Hydro is committed to providing lasting benefits and opportunities to Aboriginal groups and communities through the construction and operation of the Project. Examples of regional benefits would include employment and contracting opportunities, improvements to infrastructure, road upgrades, new outdoor recreation opportunities and additional affordable housing units.
- As a clean, renewable resource, the Project would deliver electricity with low GHG emissions per unit of energy produced. Emissions would be comparable to other renewable sources such as wind and run-of-river hydro. As such, the Project will support both provincial and federal GHG reduction strategies. In addition, the dependable capacity provided by the Project will facilitate the integration of additional renewables into BC Hydro's system, supporting the Province's clean energy strategy.
- The Project would take advantage of water already stored in the upstream reservoirs to generate over 35% of the energy generated by BC Hydro's largest facility with only 5% of the reservoir area

In summary, while the Project has the potential to result in some significant residual effects, they are justified by (1) the public interest served by delivering long term, reliable electricity to meet growing demand (2) the employment, economic development, ratepayer, taxpayer, and community benefits that would result (3) the ability of the Project to meet this need for electricity with lower GHG impact than other resource options and (4) because the Project would also take advantage of water already stored in the upstream reservoirs to generate over 35% of the energy generated by BC Hydro's largest facility with only 5% of the reservoir area. Further, BC Hydro is continuing to consult with Aboriginal groups and to seek accommodations where appropriate.

40.16 Issuance of a Decision Statement and Environmental Assessment Certificate, with Conditions

The EIS demonstrates that under Sections 53 and 54 of CEAA 2012, a Decision Statement should be issued stating the Project is likely the result in significant adverse effects that can be justified in the circumstances and that BC Hydro must comply with following conditions:

- Implement Environmental Management Plans which provide for measures to mitigate the environmental effects referred to in Sections 5(1) and 5(2) of CEAA 2012; those EMPs are:
    - Fisheries and Aquatic Habitat Management Plan
    - Air Quality Management Plan
    - Erosion Prevention and Sediment Control Plan
    - Surface Water Quality Management Plan
    - Blasting Management Plan
    - Fuel Handling and Storage Management Plan
    - Vegetation and Invasive Plant Management Plan
    - Soil Management, Site Restoration and Revegetation Plan
    - Wildlife Management Plan
    - Human-Bear Conflict Management Plan
    - Public Safety Management Plan (marine navigation provisions)
    - Heritage Resources Management Plan
- Implement the follow-up programs identified in Table 39.2 of Volume 5 Section 39, of the EIS.

The EIS also demonstrates that under Section 17(3)(c)(i) of BCEAA, an Environmental Assessment Certificate should be issued for the Project subject to the following conditions:

- Implement the Environmental Management Plans described in Volume 5 Section 35 of the EIS
- Implement the follow-up programs identified in Table 39.2 of Volume 5 Section 39, of the EIS.