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January 15, 2020

Mr. Patrick Wruck  
Commission Secretary and Manager  
Regulatory Support  
British Columbia Utilities Commission  
Suite 410, 900 Howe Street  
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

**RE: British Columbia Utilities Commission (BCUC or Commission)  
British Columbia Hydro and Power Authority (BC Hydro)  
Site C Clean Energy Project  
PUBLIC Quarterly Progress Report No. 17 – July to September 2019 (Report)**

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BC Hydro writes to provide its public Report.

Commercially sensitive and contractor-specific information has been redacted.

A confidential version of the Report is being filed with the BCUC only under separate cover.

For further information, please contact Geoff Higgins at 604-623-4121 or by email at [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com).

Yours sincerely,



(for) Fred James  
Chief Regulatory Officer

st/ma

Enclosure (1)

**Site C Clean Energy Project**

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**Quarterly Progress Report No. 17**

**F2020 Second Quarter**

**July 2019 to September 2019**

**PUBLIC**

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# 1 **Project Status – July to September 2019**

2 This Quarterly Progress Report No. 17 (**Report No. 17**) provides information  
3 concerning the Site C Clean Energy Project (**Project**) covering the period from  
4 July 1, 2019 to September 30, 2019.

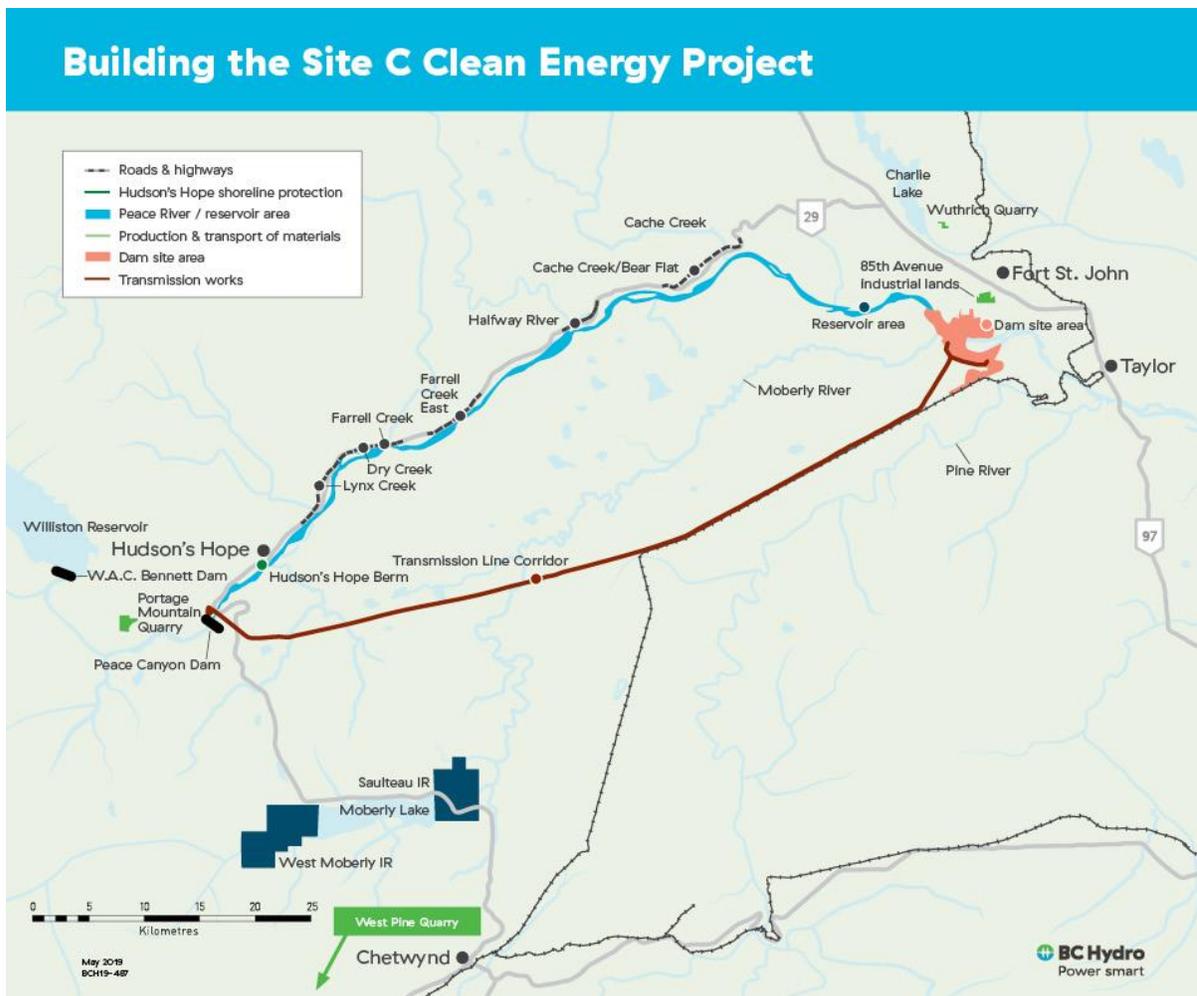
## 5 **1.1 Overview and General Project Status**

6 Construction began on July 27, 2015 and is ongoing. Since the commencement of  
7 construction, the following work has been completed:

- 8 • Site preparation, including on-site access roads;
- 9 • Clearing of the left and right banks at the dam site is substantially complete and  
10 clearing of the lower reservoir area is complete;
- 11 • Left bank cofferdams;
- 12 • Construction of the original worker accommodation lodge and Peace River  
13 construction bridge;
- 14 • Powerhouse excavation, and placement of 414,000 cubic metres of  
15 roller-compacted concrete in the powerhouse buttress;
- 16 • Construction of dam site access public road;
- 17 • Construction of the Site C viewpoint;
- 18 • Excavation of the diversion tunnel inlet (upstream) and outlet (downstream)  
19 portals, allowing for the commencement of diversion tunnel excavations;
- 20 • Excavation of the right bank drainage tunnel, which will be used to monitor and  
21 drain the remaining excavations for the spillway and dam buttresses and will  
22 eventually be connected to services within the powerhouse;

- 1 • Breakthrough on the excavation of the two river diversion tunnels, which will be
- 2 used to temporarily reroute a short section of the Peace River to allow for the
- 3 construction of the earthfill dam;
- 4 • Clearing activities in the lower reservoir; and
- 5 • Completion of the Peace Canyon 500 kV gas-insulated switchgear expansion to
- 6 enable connection of Site C to the BC Hydro electrical system.

**Figure 1 Site C Project Components**



1 Significant Project updates that occurred from July 1, 2019 to September 30, 2019,  
2 include the following. These, and other, project updates are detailed in  
3 Report No 17:

- 4 • In July 2019, the Project completed the successful breakthrough of the  
5 second river diversion tunnel. Refer to section [1.2.1.1](#) for further information;
- 6 • In July 2019, the transmission subproject reached a significant milestone by  
7 energizing the new gas-insulated switchgear at the indoor substation at Peace  
8 Canyon, making it the first official Site C asset placed into service. The  
9 switchgear is required to enable connection of the two new 500 kV transmission  
10 lines from Site C into BC Hydro's 500 kV transmission network. Refer to  
11 section [1.2.1.3](#) for further information;
- 12 • The phase 1 camp expansion of 150 rooms was completed on schedule on  
13 July 18, 2019, increasing the camp capacity to 1,750 beds;
- 14 • In August 2019, the Northern Development Initiative Trust started accepting  
15 applications for the first round of funding from the \$20 million Peace Agricultural  
16 Compensation Fund launched by BC Hydro in 2018. For more information, refer  
17 to section [1.2.1.1](#);
- 18 • Record employment for the fifth consecutive month saw 4,870 workers involved  
19 in the Project in August 2019. While remaining high, the total workforce  
20 decreased to 4,790 in September 2019, including 401 Indigenous people and  
21 517 women. Seventy six per cent of the total workforce are residents of British  
22 Columbia. For more information, refer to section [1.8.2](#);
- 23 • In September 2019, testing of the five-kilometre-long till conveyor system for  
24 Site C began. The conveyor, which runs from the 85<sup>th</sup> Avenue Industrial Lands  
25 to the dam site, will carry glacial till, an impervious clay-like material that will  
26 form the core of the Site C dam. Refer to section [1.2.1.3](#) for further information;

- 1 • Site preparation began for the construction of the Highway 29 realignment east  
2 of Cache Creek in September 2019. Refer to section [1.2.1.3](#) for further  
3 information; and
- 4 • In September 2019, another local non-profit organization received a grant from  
5 the Generate Opportunities (**GO**) Fund. The grant went towards a Student  
6 Support Program, providing school supplies to children in need and helping  
7 local families provide healthy snacks for their school-aged children. To date, we  
8 have distributed \$391,091 (of the \$800,000 fund) to 44 projects.

9 A dashboard based on the Project's status as of September 30, 2019 is provided in  
10 [Table 1](#) below. BC Hydro continues to manage the Project within the approved  
11 budget of \$10.7 billion. The Project team, with direction from the Project Assurance  
12 Board, will deliver the Project on the basis of not compromising on safety, scope,  
13 and quality.

14 Some areas of the Project have experienced significant cost pressures and/or  
15 budget increases since the Project budget was approved in February 2018 and the  
16 revised budget did not contemplate certain unforeseen financial impacts, for  
17 example:

- 18 • The Project is experiencing material cost pressures in the areas of contractor  
19 delay and other claims, additional labour resource requirements, worker  
20 accommodation expansion and increased utilization, as well as estimated site  
21 reclamation costs;
- 22 • First Nations treaty infringement claims and an injunction application had an  
23 impact on the planned sequencing of certain construction; and
- 24 • Costs associated with reservoir clearing, transmission line construction and  
25 highway re-alignment work are higher due to changes in scope, updated designs  
26 and delays associated with the First Nation injunction application.

1 As at September 30, 2019, BC Hydro has drawn approximately 63 per cent of  
2 project contingency and continues to monitor and mitigate cost pressures. In  
3 September 2019, a cost risk analysis was completed that shows that BC Hydro's  
4 budget is under pressure. The cost risk analysis incorporates probabilistic analyses  
5 and is based on assumptions and assessments of risks that may or may not be  
6 realized. BC Hydro expects to request a draw on the project Reserve, as and when  
7 needed to make future contractual commitments.

8 **Table 1 Project Status Dashboard**

9 ● On Target ● Moderate Issues ● At Risk

Status as of:		September 2019
<b>Overall Project Health</b>	●	Overall project health remains amber. At September 30, 2019, the Project remains on schedule. Safety issues and cost pressures continue to be assessed and monitored. The overall environmental status has improved over the last quarter.
<b>Scope</b>	●	Scope changes have been minimal and the changes are expected to be managed within contingency.
<b>Schedule</b>	●	The Project continues to be on track for river diversion (September 2020) and for the overall in-service date of 2024.
<b>Cost</b>	●	BC Hydro continues to manage the Project within the total approved Site C budget of \$10.7 billion, which includes future draws on the Treasury Board Reserve. Cost pressures continue to be identified, assessed, monitored and managed to the extent possible.
<b>Quality</b>	●	Overall, quality continues to track well across the Project. BC Hydro continues to work with each contractor to identify and resolve nonconformities and quality issues as they arise. Attention to the generating station and spillways civil works contractor's curing and thermal control of concrete processes have resulted in quality performance improvements. BC Hydro continues its ongoing monitoring program to assure that process improvements are maintained.
<b>Regulatory, Permits and Tenures</b>	●	Permits are on track and are meeting schedule requirements. To date, the Project has obtained 72 per cent of its major required authorizations and the remaining authorizations are anticipated to be received as required to meet the overall project schedule needs. Environmental assessment certificate amendment approvals are progressing, with all requested amendments approved to date.
<b>Environment</b>	●	BC Hydro and contractors have substantially completed the main care-of-water features within the dam site and are further developing the care-of-water features along the till conveyor corridor as well as within Highway 29 works. Installation continues of habitat mitigations for fishers, bats, snakes, and eagles. Noise, dust, smoke and light monitoring also continues.

Status as of:		September 2019
<b>Procurement</b>	●	Subsequent to the reporting period, the Halfway River Grading, Paving and Bridge Construction Contract was awarded in early October 2019 through the Ministry of Transportation and Infrastructure.
<b>Indigenous Relations</b>	●	Six of ten agreements are fully executed and in implementation. Confidential discussions between the Province of British Columbia, BC Hydro, West Moberly First Nations and Prophet River First Nation to seek alternatives to litigation related to the Site C Project started in February 2019. West Moberly First Nations withdrew from the discussions in August 2019 and filed an amended Notice of Civil Claim in September 2019.
<b>Litigation</b>	●	The treaty infringement claims filed by West Moberly First Nations and Prophet River First Nation in January 2018 remain active. The trial of these claims is expected to occur sometime in 2022. In February 2019, the Province of British Columbia, BC Hydro, West Moberly First Nations and Prophet River First Nation agreed to enter into confidential discussions to seek alternatives to litigation related to Site C. West Moberly First Nations withdrew from the discussions in August 2019 and filed an amended Notice of Civil Claim in September 2019. Discussions with Prophet River First Nation remain open.
<b>Safety</b>	●	This reporting period covers the height of an intense summer construction work period with almost 5,000 workers engaged on the Project and a 68 per cent increase in work hours compared to the same reporting period last year. As a result, the Project continued to see higher reporting of both serious and non-serious safety incidents and injuries, as well as regulatory inspections and orders. However, all three key safety frequency metrics decreased significantly this reporting period compared to the same reporting period last year suggesting a strong site-wide safety focus by all employers and contractors.
<b>Stakeholder Engagement</b>	●	BC Hydro continues to work with the communities, regional district and stakeholder groups on the implementation of various community agreements.

1 **1.2 Major Accomplishments, Work Completed, Key Decisions and**  
2 **Key Issues**

3 **1.2.1 Construction**

4 Refer to [Appendix F](#) for the high level construction schedule.

5 **1.2.1.1 Main Civil Works**

6 The scope of the main civil works contract includes the construction of the following  
7 major components:

- 8 • Diversion works, including two concrete-lined, 10.8 metre diameter tunnels.
- 9 Tunnel No. 1 is 700 metres in length and Tunnel No. 2 is 790 metres in length;

- 1 • Inlet and outlet portals;
- 2 • Excavation and bank stabilization (approximately 26 million cubic metres of
- 3 overburden and rock excavation);
- 4 • Relocation of surplus excavated material (including management of
- 5 discharges);
- 6 • Dams and cofferdams (including a zoned earth embankment dam 1,050 metres
- 7 long and 60 metres above the present riverbed, and stage 1 and 2 cofferdams);
- 8 • Roller-compacted concrete (including a buttress approximately 800 metres long
- 9 made up of approximately 1.7 million cubic metres of concrete); and
- 10 • Haul roads.

11 Construction progress is currently split between work on the left bank and right bank.  
12 Main civil works is on track to meet river diversion in September 2020 and first  
13 power in-service milestone in December 2023.

#### 14 ***Left Bank***

15 In preparation for river diversion and construction of the earthfill dam, the significant  
16 work activities on the left bank are to stabilize the slope with a mass excavation  
17 associated with construction of the dam, stabilize the diversion inlet and outlet  
18 portals, excavate two diversion tunnels, construct concrete diversion tunnel linings,  
19 and construct inlet and outlet structures at the ends of the diversion tunnels to house  
20 the hydraulic gates.

21 The activities currently underway or completed on the left bank during this reporting  
22 period include:

- 23 • Excavation of the diversion tunnels began in August 2018. Breakthrough on the  
24 upper portion (heading) of diversion Tunnel No. 1 occurred in June 2019, and  
25 on the longer diversion Tunnel No. 2 in early July 2019. Beginning in July 2019,

- 1 access to continue excavation of the tunnels was restricted due to a shotcrete  
2 delamination in Tunnel No. 1 that resulted in schedule delays in the tunnel  
3 excavation and lining. BC Hydro has worked with the contractor and  
4 WorkSafeBC to resolve safety concerns and as of October 2019 the excavation  
5 has recommenced. BC Hydro continues to target achievement of the key  
6 construction diversion milestones to achieve river diversion in fall 2020;
- 7 • The lining of Tunnels Nos. 1 and 2 are underway with more than 20 per cent of  
8 the concrete placements completed. Progress on the concrete lining  
9 placements was temporarily halted so that the bottom excavation of the tunnels  
10 could be completed ahead of the lining work. The concrete lining was restarted  
11 in October 2019 in Tunnel No. 1 and expected to restart in mid-November 2019  
12 for Tunnel No. 2;
  - 13 • Excavation for the left bank dam core was started, but continues to track behind  
14 schedule. The contractor had some concerns regarding the safety of the  
15 excavated slopes which resulted in lower production in September 2019.  
16 BC Hydro worked with the contractor to confirm that the stability of the slope  
17 was safe, and work has recommenced. The contractor has constructed  
18 additional infrastructure on site to facilitate more efficient material hauling  
19 routes, and it is expected that this will increase efficiency in the future.  
20 Foundation grout trials were completed and production grouting is underway;  
21 and
  - 22 • The till conveyor system construction and commissioning is complete. The  
23 conveyor, which runs from the 85<sup>th</sup> Avenue Industrial Lands to the dam site, will  
24 carry the glacial till that will form the core of the Site C dam. Till material trials  
25 are in progress. As of October 2019, the contractor is completing trials of  
26 material transportation.

1 ***Right Bank***

2 The right bank scope of work includes the excavation of the powerhouse, spillways  
3 and dam, and placing roller-compacted concrete for the foundations to support the  
4 powerhouse, dam and spillway structures.

5 The activities currently underway or completed on the right bank during this reporting  
6 period include:

- 7 • As of September 25, 2019, approximately 495,000 cubic metres of  
8 roller-compacted concrete had been placed for the spillway buttress.  
9 Subsequent to the reporting period, the contractor continued to place  
10 roller-compacted concrete and achieved their 2019 season milestone in  
11 October 2019. The contractor then continued to place material and has now  
12 completed all roller-compacted concrete placements for the spillways seven  
13 months ahead of schedule. The total volume of roller-compacted concrete  
14 placed in 2019 was 585,516 cubic metres;
- 15 • The right bank dam core trench and dam buttress excavations continued during  
16 the reporting period and are expected to be completed in 2019.  
17 Roller-compacted concrete for the dam buttress will commence placements in  
18 spring 2020 and is expected to be complete in fall 2020; and
- 19 • All of the aggregates required for the 2019 roller-compacted concrete  
20 placements have been produced. Aggregate supply is currently in full  
21 production and the contractor is on track to produce the planned stockpile in  
22 advance of the 2020 construction season.

23 ***In-River Work***

24 When the river is diverted in 2020, upstream and downstream cofferdams will be  
25 constructed in the Peace River to provide safe access for the main dam  
26 construction. The current in-river work includes dredging in support of the stage 1  
27 cofferdams.

1 ***Earthfill Dam***

2 Work on the earthfill dam commenced in October 2018 and initial material  
3 placements for the earthfill dam will continue through November 2019 and will  
4 recommence in 2020. Foundation preparation has commenced with core trench  
5 excavation underway and grout trials completed. While the left bank core trench  
6 excavation is behind schedule, BC Hydro expects to meet the key earthfill dam  
7 construction milestone of July 2023 for reservoir filling.

8 ***1.2.1.2 Generating Station and Spillways***

9 The generating station and spillways scope of work includes the construction of the  
10 following major components:

- 11 • Generating station and spillways civil work includes:
- 12 ▶ Powerhouse: Concrete placements, installation of structural steel, and  
13 installing hydraulic gates;
  - 14 ▶ Inlet headworks: Concrete placements, construction of the penstocks, and  
15 installing hydraulic gates; and
  - 16 ▶ Spillways: Concrete placements and installing hydraulic gates;
- 17 • Cranes which includes the supply and commissioning of the powerhouse  
18 cranes, tailrace gantry crane, and headworks gantry crane; and
- 19 • Hydromechanical equipment, including the supply of all gates.

20 ***Generating Station and Spillways Civil Work***

21 As of September 25, 2019, the generating station and spillways contractor had  
22 placed a cumulative total of 67,000 cubic metres of concrete for the powerhouse  
23 compared to a plan of 60,000 cubic metres.

24 Concrete placements for the powerhouse are being completed on Units 1, 2, 3, 4,  
25 and 5. Concrete and structural steel in the main service bay are complete.

1 The generating station and spillways contractor had placed a cumulative total of  
2 12,000 cubic metres of concrete for the intake headworks to September 25, 2019,  
3 compared to a plan of 14,100 cubic metres.

4 Concrete placements for the intake headworks are being completed on  
5 Units 1, 3 and 6.

6 The generating station and spillways contractor had fabricated a cumulative total of  
7 292,000 kg of steel for the penstocks as of September 25, 2019, compared to a plan  
8 of 668,000 kg. BC Hydro is working with the generating station and spillways  
9 contractor to provide a plan to recover the penstock schedule.

#### 10 ***Cranes***

11 Design work on the Intake Headworks crane continues. The powerhouse bridge  
12 cranes are scheduled to be commissioned and operational by spring 2020.

#### 13 ***Hydromechanical Equipment***

14 Gate guides for the draft tube maintenance gates are proceeding on schedule. The  
15 first guides will be on site in November 2019.

#### 16 **1.2.1.3 *Balance of Plant***

17 The formal procurement process for the generating station and spillways balance of  
18 plant contract was launched in June 2018. The request for proposals for the balance  
19 of plant contract was issued to three shortlisted proponents on April 30, 2019. Since  
20 that time, the proponent teams visited the site and participated in collaborative  
21 meetings to facilitate development of their competitive proposals. Proposals will be  
22 received in 2020 with a target contract award date of June 2020 and mobilization set  
23 for September 2020. Between July and September 2019, the generator step up  
24 transformer, powerhouse cooling water and dewatering large valve, the DC station  
25 service, the high voltage equipment, and the compressed air receiver supply

1 contracts were awarded. The final supply contract, for the diesel back-up generators,  
2 is scheduled to be awarded in fall 2019.

#### 3 **1.2.1.4 Turbines and Generators**

4 The scope of the turbines and generators work includes the complete design,  
5 supply, installation, testing and commissioning of six turbines, generators, governors  
6 and exciters. The design, procurement and manufacturing for the turbines and  
7 generators are on schedule.

8 The contractor continues the assembly and welding of embedded turbine  
9 components in its temporary manufacturing facility on the right bank at site. The  
10 contractor's São Paulo Brazil factory will supply the majority of the turbine generator  
11 components, and has produced all cast steel parts for approximately five of the  
12 six turbines. Initial meetings for the various other turbine and generator components  
13 in the São Paulo factory have been held concurrently with visits to most of the  
14 contractor's subcontractors in the São Paulo area. Based on the powerhouse  
15 construction schedule, the contractor will commence turbine installation in the  
16 powerhouse by July 2020, and was recently provided with notice to this effect.  
17 Current areas of focus include ensuring the quality of the manufactured components  
18 and that contract specifications and schedule are met.

19 Pre-production stator bars for the generators were tested in BC Hydro's subsidiary,  
20 Powertech Labs, and the test results confirmed the design will meet contractual  
21 requirements.

#### 22 **1.2.1.5 Transmission and Substation**

23 The transmission subproject will connect the Site C Project to the BC Hydro  
24 transmission system. The scope of work includes the following major components:

- 25 • A new 500 kV Site C substation;

- 
- 1 • Two 75-kilometre long, 500 kV transmission lines from the Site C substation to  
2 the Peace Canyon generating station;
- 3 • Three, one-kilometre long, 500 kV transmission lines from the Site C generating  
4 Station to the Site C substation; and
- 5 • Expansion of the existing Peace Canyon 500 kV gas-insulated switchgear to  
6 incorporate the two new 500 kV transmission line terminals.

### 7 ***Transmission***

8 The transmission line contractor continued to install helical pile tower foundations  
9 and assemble lattice towers in an effort to recover schedule. At the end of  
10 September 2019, 100 of 120 foundations were completed on the eastern half of the  
11 transmission line. The remaining 20 foundations are expected to be placed by the  
12 end of November 2019.

13 Construction of access roads on the western half of the transmission right-of-way  
14 was significantly impacted by unseasonable wet weather in July, August and  
15 September 2019 and is forecast to be completed behind schedule. BC Hydro is  
16 working with the transmission line contractor to mitigate this delay.

### 17 ***Substation***

18 Substation construction continued between July and September 2019 with the  
19 contractor substantially completing all concrete work, and meeting two contract  
20 milestones for the installation of telecom equipment and the assembly of the 500 kV  
21 shunt reactor. The contractor also made significant progress on the installation of  
22 500 kV electrical equipment and the installation of cable trenches and protection and  
23 control cabling, which enabled the testing and commissioning of electrical equipment  
24 to start. Delivery of insulating crushed rock began in August 2019 and was  
25 90 per cent complete by the end of September 2019.

1 The upgrade of telecommunication sites to enable remote operation of the  
2 substation started with the telecommunication contractor mobilizing to site in  
3 July 2019.

4 Substation construction remains on schedule.

5 ***Peace Canyon Gas-Insulated Switchgear Expansion***

6 The 500 kV gas-insulated switchgear at Peace Canyon was energized in July 2019,  
7 becoming the first in-service Site C asset. The remaining activities include correcting  
8 minor deficiencies, receiving final drawings and documentation and closing out the  
9 contract.

10 ***1.2.1.6 Highway 29 and Hudson's Hope Shoreline Protection Berm***

11 The creation of the Site C reservoir requires realignment of segments of Highway 29  
12 totalling approximately 30 kilometres. The scope of the highway realignment  
13 subproject also entails relocation of existing 25 kV distribution lines along the  
14 existing highway and construction of a slope protection berm at the District of  
15 Hudson's Hope to protect against bank erosion due to reservoir wind waves and  
16 water table rise. The permanent realignment is planned to be completed by  
17 spring 2023 in order for the highway to remain accessible once the reservoir is  
18 created and the dam is operational.

19 The Highway 29 realignment and Hudson's Hope Shoreline Protection Berm is  
20 divided into the following main areas:

- 21 • Cache Creek (Cache Creek East and Cache Creek West);
- 22 • Halfway River;
- 23 • Western segments (Farrell Creek East, Farrell Creek, Dry Creek, Lynx Creek);  
24 and
- 25 • Portage Mountain Quarry and Hudson's Hope shoreline protection.

1 **Cache Creek**

2 **Cache Creek East**

3 A tender for the construction of the Cache Creek East embankment fill (early works)  
4 was issued by Ministry of Transportation and Infrastructure in August 2019 and  
5 closed in September 2019. The contract is scheduled to be awarded in  
6 October 2019. Site preparations started in September 2019.

7 **Cache Creek West**

8 Construction of the four kilometre highway realignment at Cache Creek West  
9 continued through the reporting period and is expected to be completed on schedule  
10 in summer 2020.

11 **Halfway River**

12 The tender for the Halfway River bridge construction issued by the Ministry of  
13 Transportation and Infrastructure closed in September 2019. Subsequent to the  
14 reporting period, the contract was awarded in October 2019.

15 A contract for the construction supervision of the Halfway River bridge construction  
16 was awarded by the Ministry of Transportation and Infrastructure.

17 The stripping and recovery of archeological site materials was completed in  
18 August 2019.

19 **Western Segments**

20 A First Nations direct award procurement was initiated for an embankment fill at  
21 Lynx Creek East, with the contract award expected by December 2019.

22 Farrell Creek, Farrell Creek East and Dry Creek Functional designs were completed.  
23 The 50 per cent detailed design was completed for Farrell Creek.

1 ***Portage Mountain Quarry and Hudson's Hope shoreline protection berm***

2 Material from Portage Mountain will supply rip rap materials for sections of  
3 Highway 29 realignment and construction of the shoreline protection berm for the  
4 District of Hudson's Hope. Development of the quarry continued, with haul road  
5 construction completed in August 2019. The mine production permit for the Portage  
6 Mountain quarry was received in August 2019, and production blasting occurred in  
7 August and September 2019 to begin producing rip rap materials.

8 Engineering design of the Hudson's Hope Berm was completed to the 90 per cent  
9 level and is expected to be completed by November 2019.

10 ***1.2.1.7 Reservoir Clearing***

11 The remaining reservoir clearing scope of work is divided into two main areas:

- 12 • Lower reservoir, Moberly River drainage and eastern reservoir including Cache  
13 Creek drainage; and
- 14 • Middle reservoir including Halfway River drainage and western reservoir.

15 Clearing in the lower reservoir, Moberly River drainage, eastern reservoir and middle  
16 reservoir is required to support river diversion in fall 2020. All other clearing is  
17 scheduled for completion by spring 2023 (prior to reservoir inundation).

18 ***Lower Reservoir, Moberly River Drainage, Eastern Reservoir including Cache***  
19 ***Creek Drainage***

20 Clearing occurred in the lower reservoir, Moberly River drainage, north bank of the  
21 eastern reservoir and Cache Creek area over the winter 2018/2019. All clearing was  
22 completed in these areas except for some floodplain debris removal and some trees  
23 temporarily retained for environmental or accessibility reasons. These trees are  
24 being removed during the 2019/2020 clearing season, from August 2019 to  
25 March 2020. Any remaining wood waste will also be disposed of during this period.

1 Procurement for the clearing of the right bank portion of the eastern reservoir began  
2 in May 2019 with road work starting in July 2019. Clearing activities were advanced  
3 over the summer months and are anticipated to continue through to March 2020.

#### 4 ***Middle Reservoir including Halfway River Drainage and Western Reservoir***

5 Designs for the middle reservoir including Halfway River drainage and western  
6 reservoir are ongoing. Procurement on the first contract package for the middle  
7 reservoir was initiated in May 2019 and a contract was awarded in August 2019. The  
8 final two procurements for this season's clearing work are being completed between  
9 October and December 2019. Clearing of the reservoir is scheduled to be complete  
10 up to the Halfway River by March 2020 with work occurring in the Halfway River  
11 drainage and further westward in subsequent clearing seasons.

### 12 **1.2.2 Engineering**

13 The Engineering team provides technical support across the Site C project, with  
14 substantial focus this reporting period on supporting the achievement of the Project  
15 and contractors' schedule for both the main civil works contract and the generating  
16 station and spillways civil works contract.

#### 17 ***Main Civil Works***

18 For the main civil works contract, the main focus areas for the engineering team  
19 during the reporting period were optimization of the river diversion schedule and  
20 completion of engineering designs and proposed contractors' changes for the left  
21 bank excavation permanent drainage, spillway buttress roller-compacted concrete,  
22 right bank dam buttress slope protection, the left bank dam core trench excavation  
23 and slope protection sequencing, and the consolidation and curtain grouting mix  
24 design and the till trial and filter preparations. Engineering also provides ongoing  
25 support to construction through constructability, schedule and engineering reviews  
26 for the sequencing of the remaining works and assessment of the permanent  
27 drainage and grouting works on the right bank.

1 ***Large Cranes, Hydromechanical, Turbines and Generators***

2 Engineering support to construction and vendor integration has been ongoing  
3 throughout the reporting period for the large cranes, hydromechanical equipment  
4 and turbines contracts. The two powerhouse bridge cranes have been successfully  
5 erected onto the crane rails in the powerhouse. The crane contractor has also  
6 commenced detailed design and material procurement activities for the headworks  
7 gantry crane. Design of the hydromechanical equipment continues, with upcoming  
8 activities focussed on the gate hoists and heating systems. Manufacturing of the  
9 gates and embedded parts are underway. Design of the turbines and generators is  
10 well advanced, with focus now on integration design with the balance of plant  
11 equipment. Turbine and generator manufacturing activities continue to advance.

12 ***Generating Station and Spillways, Balance of Plant and Equipment Supply***

13 Several batches of construction drawings for the generating station and spillways  
14 civil works contract were completed through the reporting period, in support of, and  
15 in accordance with, the revised contractors schedule for the release of remaining  
16 construction drawings. Engineering also provides ongoing support to construction  
17 through extensive reviews and approvals of contractor submittals to support the  
18 construction program.

19 The implementation design for the spillway, balance of plant and equipment supply  
20 packages for the generating station and spillways continues to advance including  
21 specifications, drawings and three dimensional modelling work. Nine of the  
22 ten equipment supply contracts have been awarded. The request for proposals  
23 drawings and approximately 140 specifications for the balance of plant contract are  
24 on track to be issued to the proponents in early December 2019 as scheduled.

25 Design work continued to advance on the protection and control systems and is on  
26 schedule.

1 ***Transmission and Substation***

2 Detailed design of the final transmission towers for the 500 kV powerhouse  
3 transmission lines is in progress.

4 ***Highway 29***

5 Advancement of the implementation design for Highway 29 and associated bridge  
6 structures continues in accordance with the Project schedule requirements.  
7 Procurement was completed for Halfway River by the Ministry and Transportation  
8 and Infrastructure in September 2019. Design packages are completed to support  
9 construction at Cache Creek and Lynx Creek, which is expected to start in fall 2019.

10 ***Technical Advisory Board***

11 The Technical Advisory Board visited the dam site from September 12, 2019 to  
12 September 13, 2019. The Technical Advisory Board viewed the ongoing  
13 construction works at key areas, was provided with a general project update and  
14 discussed a variety of technical issues.

15 The next formal Technical Advisory Board meeting will be held from January 7, 2020  
16 to January 10, 2020 in Vancouver.

17 **1.2.3 Quality Management**

18 The Project has a quality management plan that outlines activities to ensure  
19 materials, equipment and the constructed works meet contract quality requirements.  
20 The plan, and its supporting plans, describes roles and responsibilities and the  
21 procedures necessary to achieving the Project quality objectives. Updates were  
22 made to the plan during fiscal 2020 to reflect the increased complexity of the Project  
23 and to reflect the fiscal 2019 changes to the Project team's organizational structure.

24 Implementation and monitoring of quality control and quality assurance plans are a  
25 requirement for all contractors. The Project tracks and manages quality  
26 nonconformities, defined as an occurrence that does not conform to the quality

1 requirements of the contract. [Table 2](#) identifies quality management nonconformity  
 2 instances occurring during the reporting period.

3 **Table 2** **Quality Management Nonconformity**  
 4 **Report Metrics Reporting Period – July**  
 5 **2019 to September 2019**

Contract	July 1, 2019 to September 30, 2019		Cumulative to Date		Open as of September 30, 2019
	Reported	Closed	Reported	Closed	
Main Civil Works	71	45	1,252	1,179	73
Turbines and Generators	35	25	89	48	41
Generating Station and Spillways Civil Works	72	86	254	191	63
Large Cranes	1	1	11	11	0
Hydromechanical Equipment	2	1	3	1	2
Transmission	15	14	88	76	12

6 The overall quality performance of the main civil works contractor was assessed as  
 7 good for the reporting period. The spillway buttress roller-compacted concrete  
 8 continues to be placed in conformance with the drawings and specifications. While  
 9 there have been some challenges in the diversion tunnels with the surface finish of  
 10 the tunnel liner concrete, the quality of the placed concrete has been good and a  
 11 repair program for the surface defects is expected to commence in fiscal 2020.  
 12 BC Hydro and the contractor continue to meet on a weekly basis to discuss and  
 13 resolve quality issues and quality steering committee meetings continue to be held  
 14 monthly to discuss broader topics related to the contractor’s quality performance.  
 15 The main civil works contractor continues to maintain its staffing targets for quality  
 16 control personnel at the site to support the multiple work fronts in the 2019  
 17 construction season.

18 The overall quality performance of the turbines and generators contractor was  
 19 assessed as good for the reporting period. While the quality of the fabricated  
 20 components continues to be good, there have been instances of resistance from the  
 21 contractor to provide BC Hydro’s local inspectors access to its São Paulo

1 manufacturing facility for surveillance inspections. BC Hydro has met with the  
2 contractor on this issue and as part of the resolution, bi-weekly meetings are now  
3 taking place to specifically discuss and resolve any issues related to access and  
4 communication protocols around surveillance inspections. There have been no  
5 issues with BC Hydro's local inspectors gaining access for regularly scheduled  
6 witness and hold points. The increase in nonconformities reported is attributed to an  
7 increase in casting and water passage fabrication activities, and based upon both  
8 the contractor's and BC Hydro's past experiences, this is not unusual.

9 The quality performance of the generating station and spillways civil works  
10 contractor was assessed as good for the reporting period. The performance of the  
11 contractor, as it relates to curing and thermal control of concrete, has significantly  
12 improved since the prior reporting period and BC Hydro and the contractor continue  
13 to close out the nonconformity report dispositions. Offsite manufacturing of  
14 penstocks and trashracks is generally proceeding without any major quality issues.

15 The quality performance of the transmission contractors was assessed as good for  
16 the reporting period. BC Hydro continues to perform quality surveillance audits of the  
17 transmission contractors to verify that their quality management systems are being  
18 adhered to.

19 BC Hydro continues to perform quality audits of the main civil works and generating  
20 station and spillways civil works contractors. The audits are performed  
21 approximately every six weeks and are focused on the contractor's construction  
22 operations and supporting processes. Audits during this reporting period include:  
23 concrete curing and thermal control; diversion tunnel lining concrete operations and  
24 penstock fabrication; and installation processes.

1     **1.3           Safety and Security**

2     This reporting period covers the height of an intense summer construction period for  
3     the Project. All of the subprojects, and all contractors, saw increased work activity.  
4     Accordingly, the Project has seen an increase in the number of reported serious and  
5     non-serious safety incidents as well as an increase in the number of WorkSafeBC  
6     regulatory inspections and orders. However, when adjusted for the volume of work  
7     hours in key safety frequency performance measures, the Project saw a significant  
8     improvement in safety outcomes compared to the same quarter last year (see  
9     [Table 4](#)).

10    The main safety trend continues to be muscular-skeletal incidents, which account for  
11    approximately 65 per cent of all injuries. Other trends identified during this  
12    construction period were shotcrete/concrete contacts, crane impacts, rebar-related  
13    injuries, and environmental exposure. Understanding the trends enabled employers  
14    to mitigate the hazards more effectively. As one example, a major contractor  
15    installed six feet of mesh on top of rebar mat slabs, which is expected to reduce  
16    rebar-related injuries by up to 50 per cent.

17    WorkSafeBC's focus this reporting period has been on serious near misses involving  
18    a large tower crane contact and two separate shotcrete falls that occurred in July  
19    and August 2019. BC Hydro worked with WorkSafeBC, and the main civil works and  
20    generating station and spillways contractor to resolve these orders and get  
21    contractors back to work safely.

22    BC Hydro is continuing a proactive 'Technical Safety Assurance' program for the  
23    Project. This program focuses on having technical specialists with safety expertise  
24    review higher risk equipment, plant and processes involved in the Project. BC Hydro  
25    completed technical safety reviews of the new till conveyor system, and Lock  
26    Out/Tag Out procedures implemented by major employers. The focus for next  
27    quarter will be technical safety reviews on winter preparedness, construction cable  
28    management (electricity contact) and fire safety (hoarding) inspections.

1 In support of winter preparedness, a new winter chain on/off area has been  
2 completed at the top of Old Fort Road, above the steep hill approaching Gate B. The  
3 space provides a safe area for large truck operators to put tire chains on and off their  
4 trucks on snowy or icy days reducing risk to both residents and workers.

5 ***Summary of Safety and Regulatory Performance Metrics***

6 With the ongoing increase of work fronts and workers on the Project, there has been  
7 a significant increase in work hours and a 16 per cent increase in the number of  
8 safety incidents and injuries this reporting period, compared to the prior reporting  
9 period.

10 [Table 3](#) below reflects safety and regulatory performance results for the Project,  
11 including all contractors. The table summarizes results in a tabular format, with  
12 incident details provided below the table.

1  
2

**Table 3      Summary of Site C Safety and Regulatory Metrics**

	Reported July 1, 2019 to September 30, 2019 <sup>1</sup>	Reported Since Inception (July 27, 2015 to September 30, 2019) <sup>1</sup>
Fatality <sup>2</sup>	0	0
Permanently Disabling Injury <sup>3</sup>	0	1 <sup>4</sup>
Serious Incidents <sup>5</sup>	3	44
Lost Time Injuries <sup>6</sup>	1	23
All-Injury Incidents <sup>7</sup> (Lost Time Injuries <sup>6</sup> and Medical Attention requiring Treatment <sup>8</sup> )	28	123
Regulatory Inspections	32	125
Regulatory Orders	53	220

3 During the reporting period, the Project experienced three serious safety incidents,  
 4 and 28 all-injury incidents that included one lost time injury and 27 medical attention  
 5 requiring treatment incidents.

6 The Project to date has experienced 44 serious incidents, which include 28 near  
 7 misses and 16 injuries with the potential to be serious.

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1 Numbers are subject to change due to timing of when data is retrieved and when injury is categorized.  
 2 Excludes health events unrelated to work standards.  
 3 A permanently disabling injury is one in which someone suffers a probable permanent disability.  
 4 In June 2018, an injured worker received a permanent partial disability award from WorkSafeBC due to a lost time injury incident in August 2017. The worker was attempting to unload a light plant (tower) from a flatbed truck. The worker stepped on the light plant (tower) outrigger to gain enough height to reach the lifting attachment when the worker lost balance and fell approximately 7.5 feet to the ground. BC Hydro reclassified this incident as a permanent disabling injury after receiving an update on the WorkSafeBC award in June 2018. The incident is identified as a serious injury in the BC Hydro Incident Management System.  
 5 Serious incidents are any injury or near miss with a potential for a fatality or serious injury.  
 6 Lost time injuries are those where a worker (employee or contractor) misses their next shift (or any subsequent shift) due to a work-related injury / illness. If a worker only misses work on the day of the injury, it is not considered a lost time injury.  
 7 All Injury incidents is a count of all work-related fatalities, lost time injuries and medical attention requiring treatment.  
 8 Medical attention requiring treatment is where a medical practitioner has rendered services beyond the level defined as “diagnostic or first aid” and the worker (employee or contractor) was not absent from work after the day of the injury. Services beyond diagnostic/first aid include (but are not limited to) receiving stitches, a prescription, or any treatment plan such as physiotherapy or chiropractic.

1 ***Serious Safety Incidents***

2 The three serious incidents that occurred during the reporting period include:

- 3 1. A rock truck operator started the vehicle while the fuel and lube attendant was  
4 still positioned under the truck. This was a near miss as there were no injuries.
- 5 2. A worker wearing their personal protective equipment was chipping shotcrete at  
6 the entrance to diversion Tunnel No. 1 when a metal hook weighing between 15  
7 and 20 pounds disengaged from one of the steel sets approximately five to  
8 six feet above and struck the worker's head and shoulder. The worker was  
9 assessed by a medical professional and returned to work with no injuries.
- 10 3. A worker tripped over a wooden plank while they were walking backwards and  
11 sustained fractures to major bones.

12 ***All Injury Incidents***

13 The 28 injury incidents that occurred during this reporting period include one lost  
14 time injury and 27 medical attention injuries:

15 **Lost Time injury**

- 16 1. A worker tripped over a wooden plank while they were walking backwards and  
17 sustained fractures to major bones.

18 **Medical Attention requiring Treatment**

- 19 1. A worker inhaled fire retardant fumes in an enclosed space while extinguishing  
20 a fire in the manifold of the rock truck. Worker was seen by a first aid attendant  
21 and a medical professional and returned to work.
- 22 2. A worker pinched their finger causing a laceration, while adjusting scaffolding.
- 23 3. A worker went to retrieve a tool underneath the horizontal shaft impactor when  
24 they slipped on some loose gravel and fell forward hitting their left shoulder  
25 against a steel beam. Worker was seen by a medical professional.

- 1 4. A worker lost their footing, slipped, and strained their back while unloading the  
2 vacuum hoses from the back of a light duty vehicle.
- 3 5. A worker stepped into fresh concrete during a mud slab pour, causing it to  
4 overflow the workers boots and resulting in concrete burns to both legs.  
5 Components of concrete are caustic, which can cause a chemical burn to  
6 organic, living tissue, such as skin and muscle.
- 7 6. A worker felt discomfort in both eyes after welding work.
- 8 7. A worker was adjusting a hydraulic jack when a space plate dislodged and  
9 caused a laceration in their upper lip.
- 10 8. A worker lost their footing, fell forward and received a laceration in their hand.
- 11 9. A worker stepped on an unmarked pin flag and strained their hip and lower  
12 back.
- 13 10. A worker slipped on uneven ground and strained their lower back.
- 14 11. A worker stepped on a power cable and strained their knee.
- 15 12. A worker stepped on a rock which caused their ankle to roll over.
- 16 13. A worker felt discomfort in both eyes after grinding work.
- 17 14. A worker stepped into a hole which caused their ankle to roll over.
- 18 15. A worker strained their shoulder while lifting a cutlery holder.
- 19 16. A worker received concrete burns while raking concrete. Components of  
20 concrete are caustic, which can cause a chemical burn to organic, living tissue,  
21 such as skin and muscle.
- 22 17. A worker pinched their finger causing a laceration, while working on formwork.
- 23 18. A worker stepped backwards on a rebar mat and their foot went through the  
24 mat; worker fell onto the vertical form savers causing a laceration on their back.
- 25 19. A worker sustained a laceration to their lip and earlobe while installing stayform.

- 1 20. A worker installing bracing disturbed some metal debris which caused  
2 discomfort in their eye.
- 3 21. A worker drilled through formwork and punctured another worker’s hand.
- 4 22. A worker cut their hand on the inner perimeter flange of an electrical panel.
- 5 23. A worker caught their finger between the ball and hitch of their equipment,  
6 causing a laceration.
- 7 24. A worker pinched their finger between two plates which caused a laceration.
- 8 25. A worker stumbled on the steps of a crew bus and their arm got stuck between  
9 the handrail and bulkhead which caused a shoulder injury.
- 10 26. A worker injured their knee while using a pry bar.
- 11 27. A worker climbing through rebar had a tie wire poke the worker.

12 **Safety Performance Frequency Metrics**

13 To assess safety performance over time, the Project considers key safety metrics in  
14 context of the total amount of hours worked (frequency), correcting for the volume of  
15 work. [Table 4](#) summarizes the key safety metrics for this reporting period.

16 **Table 4 Summary of Safety Performance**  
17 **Frequency Metrics**

	Fiscal 2019 (Rolling 12-Month Average)				Fiscal 2020 (Rolling 12-Month Average)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Serious Incident Frequency	0.95	0.56	0.44	0.36	0.43	0.39	n/a	n/a
Lost Time Injury Frequency	0.48	0.43	0.40	0.29	0.20	0.16	n/a	n/a
All Injury Frequency	1.67	1.47	1.25	1.01	1.00	1.40	n/a	n/a

18 Fiscal 2020 Q3 and Q4 will be updated when information is available.

19 All three key safety frequency metrics have decreased compared to the same  
20 quarter last fiscal year. Serious incident frequency for this reporting period is 0.39, a  
21 30 per cent decrease from 0.56 in the same reporting period in fiscal 2019. Lost time

1 injury frequency is 0.16, down 63 per cent from 0.43 in the same quarter last year.  
2 Finally, all-injury frequency is 1.40, down slightly compared to 1.47 the same quarter  
3 last year. These results suggest a strong site-wide safety focus by all employers  
4 during the height of this construction season.

### 5 ***Non-Serious Incidents***

6 During this reporting period, the Project reported 305 non-serious safety incidents  
7 which included ten good catches, 97 near misses and 198 minor injuries that may  
8 have required first aid and/or medical treatment. A “near miss” is defined as an  
9 incident that could have resulted in an injury, but did not because of effective hazard  
10 barriers or the person was out of harm’s way/missed. BC Hydro considers near miss  
11 reporting as indicative of a stronger and improving safety culture, and is strongly  
12 encouraging all Site C contractors and employees to report near misses.

13 BC Hydro’s Site C safety team has developed several data analytics tools to provide  
14 improved safety dashboard reporting and support more detailed analyses to identify  
15 safety trends across the site and by contractor.

### 16 ***Safety Regulatory Inspections and Orders***

17 WorkSafeBC, under the authority of the *Worker’s Compensation Act*, is the primary  
18 regulator with jurisdiction over safety for the Project. WorkSafeBC oversees all  
19 worker safety (employee and contractor) for the Project, both on the dam site and off  
20 the dam site. The Ministry of Energy, Mines and Petroleum Resources has been  
21 involved in some aspects of safety for the Project, specifically, West Pine Quarry,  
22 Portage Mountain Quarry, and Wuthrich Quarry.

23 From July through September 2019, WorkSafeBC issued 31 inspection reports and  
24 51 orders. The Ministry of Energy, Mines and Petroleum Resources conducted one  
25 regulatory inspection and issued two orders.

26 WorkSafeBC’s primary focus this reporting period was the tower crane incidents in  
27 the right bank cofferdam area, as well as shotcrete falls in the left bank diversion

1 tunnel and right bank drainage tunnel and areas. These situations are described in  
2 more detail as follows:

- 3 • During the installation of the final jib section for tower crane no. 3, an incident  
4 occurred resulting in a piece of the crane trolley falling to the ground within the  
5 limits of the control zone. Following this incident, during installation of the cable  
6 on tower crane no. 3, a wire rope grip failed causing the cable to fall to the  
7 control zone below. No workers were in the control zone at the time of this  
8 incident.
- 9 • The left bank diversion tunnel and the right bank drainage tunnel both  
10 experienced shotcrete falls. Sections of concrete, 18m x 3m and 10m x 3m, fell  
11 from the temporary tunnel linings. No workers were in the vicinity of the tunnels  
12 at the time of the incidents.

13 Special investigations by geotechnical and engineering experts have been  
14 completed that reaffirm engineering design of the tunnels' remains safe for the rock  
15 conditions. As a precautionary measure to ensure the safety and confidence of  
16 workers, BC Hydro has authorized addition installation of rock pins and bolts in the  
17 portals of the diversion tunnels.

18 Others topics referenced in the WorkSafeBC and Ministry of Energy, Mines and  
19 Petroleum Resources inspections and orders included coordination of safety in  
20 multi-employer worksites, crew supervisor responsibilities, appropriate use of  
21 equipment, using equipment according to the manufacturer's instructions, having  
22 signed and sealed design instructions available at the work site, and exposure  
23 control plans.

24 Of the 32 regulatory inspection reports issued this reporting period, 12 resulted in no  
25 orders or a 'clean sheet'. As of September 2019, the Project's rolling 12-month  
26 'clean sheet' result was 34 per cent which is lower than overall BC Hydro and  
27 WorkSafeBC industry averages. To more fully assess regulatory compliance

1 performance, the Project monitors an additional metric – average number of orders  
2 per regulatory inspection – which helps account for the higher volume of regulatory  
3 inspections expected at a large construction project like this Project. The average  
4 number of orders per regulatory inspection this reporting period is 1.7, up from 1.6 in  
5 the same period in fiscal 2019.

6 Refer to [Appendix B, Table B-1](#) for the details of the safety regulatory inspections  
7 and orders that occurred during the reporting period.

#### 8 **1.4 First Nations Consultation**

9 Pursuant to the Environmental Assessment Certificate and Federal Decision  
10 Statement, BC Hydro is required to consult with 13 Indigenous groups with respect  
11 to the construction stage of the Project. This consultation includes provision of  
12 information on construction activities, support for the permit review process, and  
13 review and implementation of mitigation, monitoring and management plans, and  
14 permit conditions.

15 Accommodation offers were originally extended to ten First Nations communities.  
16 Six agreements have been fully executed and are in various stages of  
17 implementation. In February 2019, the Province of British Columbia, BC Hydro, West  
18 Moberly First Nations and Prophet River First Nation agreed to enter into confidential  
19 discussions to seek alternatives to litigation related to the Site C Project. West  
20 Moberly First Nations withdrew from the discussions in August 2019 and filed an  
21 amended Notice of Civil Claim in September 2019. Discussions with Prophet River  
22 First Nation remain open. To date, Impact Benefits Agreements with Doig River First  
23 Nation, Halfway River First Nation, Saulteau First Nation and McLeod Lake Indian  
24 Band, and a Project Agreement with Dene Tha' First Nation have been publicly  
25 announced, while a Project Agreement with Duncan's First Nation has also been  
26 reached.

1 Consultation and engagement with Indigenous groups is ongoing through the  
2 Cultural and Heritage Resources Committee, Environment Forum and Permitting  
3 Forum. Engagement through these forums and directly with Indigenous groups to  
4 prepare them for river diversion and reservoir inundation is ongoing and includes  
5 numerous boat, highway and site tours.

## 6 **1.5 Litigation**

7 A number of legal challenges of the Project have been filed by First Nations and  
8 other interests. In all cases where the courts have issued rulings, the legal  
9 challenges have been dismissed.

10 The treaty infringement claims filed by West Moberly First Nations and Prophet River  
11 First Nation in January 2018 remains active. West Moberly First Nations had  
12 concurrently filed an injunction application in January 2018 to stop construction of  
13 the Project, but the injunction was denied by the B.C Supreme Court. The trial of the  
14 treaty infringement claims is expected to occur sometime in 2022.

15 In February 2019, the Province of British Columbia, BC Hydro, West Moberly First  
16 Nations and Prophet River First Nation agreed to enter into confidential discussions  
17 to seek alternatives to litigation related to Site C. West Moberly First Nations  
18 withdrew from the discussions in August 2019 and filed an amended Notice of Civil  
19 Claim in September 2019. Discussions with Prophet River First Nation remain open.

20 The details of all open proceedings as of September 30, 2019 are summarized in  
21 [Table 5](#) below. Other than the treaty infringement claims, the litigation listed in  
22 [Table 5](#) are either inactive, meaning no steps have been taken in litigation that  
23 require a response from BC Hydro, or do not present a material financial risk to  
24 BC Hydro.

1 **Table 5 Litigation Status Summary**

Description		Date
<b>B.C. Supreme Court: Treaty Infringement Claims</b>		
West Moberly First Nations	Civil claim filed Injunction application filed Injunction hearing date  Injunction denied (no appeal filed) Amended civil claim filed	January 15, 2018 January 31, 2018 July 23 to August 3, 2018 and September 4 to 7, 2018 October 24, 2018 September 25, 2019
Prophet River First Nation	Civil claim filed	January 15, 2018
<b>B.C. Supreme Court Civil Claims</b>		
Building Trades v. BC Hydro	Civil claim filed Response to claim filed	March 2, 2015 April 10, 2015
Aggregate Mining Process LLC and Reynolds Shipping LLC	Civil claim filed Response to claim filed Order granting security for BC Hydro's costs Application to dismiss filed after plaintiff failed to post security as ordered (later adjourned after plaintiff belatedly posted security)	November 16, 2018 December 6, 2018 June 17, 2019  July 31, 2019
<b>Office of the Information and Privacy Commissioner (OIPC)</b>		
Applicant requested review of Freedom of Information response	Request for review filed OIPC Order issued Application for judicial review of Order filed Hearing date	August 17, 2017 December 11, 2018 January 18, 2019  September 17, 2019 and October 4, 2019

2 **1.6 Permits and Government Agency Approvals**

3 **1.6.1 Background**

4 Before the Site C Project could start construction, an extensive environmental  
 5 assessment process was undertaken that resulted in the issuance of the Provincial  
 6 Environmental Assessment Certificate and the Federal Decision Statement in  
 7 support of the Project. In addition, the Project is required to apply for multiple  
 8 provincial permits, water licences, leaves to commence construction and federal  
 9 authorizations. Timing of the application for these permits and authorizations is

1 staged and aligned with the construction schedule, availability of detailed design  
2 information, and by project component. Permitting approaches and requirements are  
3 also determined through regular meetings with regulatory agencies, and are subject  
4 to change throughout the Project. As at September 30, 2019, BC Hydro estimates  
5 that approximately 444 permits will be required throughout the life of the Project. Of  
6 these permits, 311 have been received and are actively being managed.

7 Multiple conditions are attached to each permit or authorization, which cover  
8 subjects such as air quality, water quality, fish and aquatics, wildlife, heritage, health  
9 and safety, construction environmental management and First Nations consultation.  
10 Each of the conditions must be implemented, audited and tracked to prove  
11 compliance or identify issues for follow-up with corrective actions. BC Hydro has  
12 developed a comprehensive Construction Environmental Management Plan which  
13 outlines how we will comply with the Project Environmental Assessment Certificate,  
14 Federal Decision Statement, and provincial and federal permits and authorizations.  
15 As of September 30, 2019, all required conditions and submissions have been met  
16 in accordance with the schedule and requirements of the conditions.

### 17 **1.6.2 Federal Authorizations**

18 Federal authorizations are required under the *Fisheries Act* (Fisheries and Oceans  
19 Canada) and the *Navigation Protection Act* (Transport Canada). All major federal  
20 authorizations for construction and operation of the Site C dam and reservoir were  
21 received in July 2016. At this time, no further *Fisheries Act* authorizations are  
22 anticipated. Additional *Navigation Protection Act* approvals for discrete works in the  
23 reservoir (e.g., shoreline works, debris booms and Highway 29 bridges) are  
24 anticipated to be issued at the regional level. As of September 30, 2019, a total of  
25 44 federal approvals have been received and are actively being managed.  
26 Eight approvals are pending, and 17 future approvals are planned.

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### 1 1.6.3 Provincial Permits

2 Site C requires provincial permits primarily under the *Land Act*, *Water Sustainability*  
3 *Act*, *Forest Act*, *Wildlife Act*, *Heritage Conservation Act*, and *Mines Act*. These  
4 permits include investigative permits, licences to occupy land, water licence  
5 approvals, leaves to commence construction and leaves to construct, and licences  
6 to cut vegetation, among others. Permit applications are sequenced with the overall  
7 schedule of the Project to ensure the most current and factual information is  
8 included in the submissions.

9 Approximately 375 provincial permits and approvals will be required throughout the  
10 life of the Project. As of September 30, 2019, 267 permits have been obtained and  
11 are actively being managed. These include permits for the dam site area (site  
12 preparation and clearing, as well as works for the main civil works and generating  
13 station and spillways, such as construction of cofferdams, excavation and  
14 construction of roller-compacted concrete buttress), worker accommodation (land  
15 tenure and water withdrawal), Highway 29 geotechnical investigations, transmission  
16 line clearing and construction of access roads, and lower/eastern reservoir and  
17 Moberly River clearing. Future provincial permits are planned for the construction of  
18 the Highway 29 realignment, Hudson's Hope Berm, and middle and western  
19 reservoir clearing and filling. All future permits are anticipated to be issued in  
20 accordance with the Project construction schedule.

21 The majority of the provincial permits are administered by the Ministry of Forests,  
22 Lands, Natural Resource Operations and Rural Development and the Ministry of  
23 Energy, Mines and Petroleum Resources. In addition, BC Hydro has developed a  
24 coordinated First Nations consultation process with the Ministry of Forest, Lands,  
25 Natural Resource Operations and Rural Development to assist with the government  
26 permit workload. This coordinated consultation process was implemented in  
27 January 2018.

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1 **1.6.4 Environmental Assessment Certificate**

2 Compliance with the Project conditions in the Environmental Assessment Certificate  
3 is regularly monitored, and evidence is collected by various federal and provincial  
4 regulatory agencies, the Independent Environmental Monitor, BC Hydro and  
5 contractors.

6 To date, the Environmental Assessment Office has issued four amendments to the  
7 Project's Environmental Assessment Certificate. These are:

- 8 • Amendment No. 1 – Changes to Environmental Assessment Certificate  
9 Schedule A, project description regarding design changes to the generating  
10 station and spillways (issued June 22, 2018);
- 11 • Amendment No. 2 – Changes to Environmental Assessment Certificate  
12 Schedule A, project description regarding design changes to the Halfway River  
13 Bridge within the Halfway River Highway 29 realignment (issued  
14 October 26, 2018);
- 15 • Amendment No. 3 – Changes to Environmental Assessment Certificate  
16 Schedule A, project description regarding the use of West Pine Quarry, in  
17 addition to the already approved Portage Mountain Quarry, as a source of  
18 quarry and excavated material for the construction of the Highway 29  
19 realignment, Hudson's Hope shoreline protection, and areas along the reservoir  
20 requiring protection during reservoir filling (issued November 14, 2018); and
- 21 • Amendment No. 4 – Changes to Environmental Assessment Certificate  
22 Schedule B, Condition Nos. 4 and 13 to permit the selective use of mechanical  
23 clearing in riparian zones during reservoir clearing when it is unsafe to  
24 undertake manual clearing (issued February 12, 2019).

25 All amendments and amendment requests are posted on the Environmental  
26 Assessment Office website at

27 <https://projects.eao.gov.bc.ca/p/site-c-clean-energy/docs>.

1 As with any large construction project, refinements to the design are expected.  
2 There are no material impacts to the cost of the Project as a result of the proposed  
3 amendment requests.

#### 4 **1.6.5 Permitting Improvement**

5 In order to efficiently and effectively manage the large volume of permits required for  
6 the Project, BC Hydro continues to engage with regulators, First Nations  
7 communities and contractors to share information, seek feedback, and identify  
8 process improvements. Process improvements implemented include the following:

- 9 • BC Hydro continues to facilitate meetings with the Ministry of Forests, Lands,  
10 Natural Resource Operations and Rural Development, the Comptroller of Water  
11 Rights, the Department of Fisheries and Oceans and contractors to ensure  
12 permit applications are coordinated, timely and sufficient;
- 13 • Regular permitting forums are being held with Indigenous groups to share  
14 information on upcoming permit applications and to seek feedback before  
15 applications are submitted to regulators;
- 16 • BC Hydro has implemented a coordinated Indigenous groups consultation  
17 process with the Ministry of Forest, Lands, Natural Resource Operations and  
18 Rural Development to assist with the government permit workload; and
- 19 • Permitting Forum No. 13 was held on July 17, 2019, covering eight permits for  
20 works related to Highway 29 realignment at Lynx Creek East, middle reservoir  
21 clearing, Portage Mountain quarry, and transmission line stringing. Permitting  
22 Forum No. 14 was held on September 11, 2019, covering six permits and  
23 authorizations for debris boom facilities on the Moberly and Peace Rivers,  
24 groundwater use for Highway 29 construction, and construction of the  
25 realignment of Highway 29 at Cache Creek.

1 **1.7 Environment**

2 **1.7.1 Mitigation, Monitoring and Management Plans**

3 The Environmental Assessment Certificate and Federal Decision Statement  
4 conditions require the development of draft and final environmental management,  
5 mitigation and monitoring plans, as well as the submission of annual reports on  
6 some of these plans.

7 Focus remains on minimizing sediment and erosion across the dam site, care of  
8 water, hydrocarbon management, invasive weed control and wildlife identification  
9 and avoidance.

10 On the left bank, construction of the sediment control features located at L3 (a gully  
11 on the left bank which contains a stream that flows for a portion of the year) is  
12 substantially complete and the control features effectively conveyed water during the  
13 spring rain events. Care of water systems are substantially complete within the till  
14 conveyor area and include directional ditching, sediment control devices and ponds.

15 On the right bank, management of water that has contacted naturally occurring  
16 acidic rock has been substantially implemented. Works are substantially complete  
17 for the right bank downstream side channel fish enhancement project. This project  
18 has created shallow, still backwaters that provide valuable habitat for fish within the  
19 Peace River.

20 Wildlife mitigation programs are progressing with further installations of summer bat  
21 boxes, fisher maternity boxes, eagle nest platforms and snake dens necessary in  
22 advance of reservoir clearing. Wildlife sweeps of the area for any potential project  
23 interactions continue regularly and appropriate mitigation or avoidance practices  
24 established; such as snake fencing and warning signs, no work zones, and limiting  
25 hours or days of work.

1 Wildlife and fisheries studies and monitoring continue to collect baseline usage data  
2 for comparison post dam construction.

3 Air quality, water, noise and light monitoring continue at various locations throughout  
4 the project with only localized or sporadic elevated readings noted and appropriate  
5 mitigation taken.

### 6 **1.7.2 Environmental Compliance Inspections and Enforcement**

7 During the reporting period, the Site C Project was inspected by provincial regulators  
8 from the Canadian Environmental Assessment Agency and the B.C. Environmental  
9 Assessment Office who performed more than 120 hours of inspections. No warning  
10 letters or orders were issued as a result of these inspections.

11 Throughout the course of the on-site inspections, environmental compliance was  
12 focused on the following areas:

- 13 • Spill prevention and response plans.
- 14 • Waste management plans in regards to bear-proofing.
- 15 • Enhancing erosion and sediment control measures along the dam site area and  
16 Portage Mountain Quarry.

17 BC Hydro had 13,480 environmental inspection results over the reporting period,  
18 with a compliant or partial compliant result of 99 per cent across all contractors and  
19 works areas.

20 During the reporting period, the independent environmental monitor continued  
21 weekly inspections with a focus on hydrocarbon management, waste disposal,  
22 erosion and sediment control, dust management, and wildlife management. Overall,  
23 the weekly inspections indicated general environmental compliance.

1 Site C Project staff met bi-weekly with provincial regulators to ensure ongoing focus  
2 and attention to the areas of most importance and concern for the regulators, and to  
3 proactively address any environmental or regulatory issues that could arise.

4 Additionally, the Site C Project has engaged both an Independent Environmental  
5 Monitor and an Independent Engineer that report directly to provincial regulators.  
6 The Independent Environmental Monitor provides weekly reports that have  
7 demonstrated substantial compliance across the Project while continuing to identify  
8 areas of focus for sediment and erosion control, water management, and spill  
9 prevention. The Independent Engineer works directly with site staff to proactively  
10 identify design issues that may impact the environment and develop mitigation plans  
11 to avoid or minimize impacts.

### 12 **1.7.3 Heritage**

13 In accordance with Environmental Assessment Certificate and Federal Decision  
14 Statement conditions, the Site C Heritage Resources Management Plan addresses  
15 the measures that will be used to mitigate the adverse effects of the Project on  
16 heritage resources.

17 The 2019 heritage field program is focused on field work that will meet regulatory  
18 requirements for pre-construction archaeological impact assessments, and  
19 systematic data recovery at selected archaeological sites. This year's field season  
20 was initiated in May 2019, and is anticipated to be completed in October 2019.

21 During the reporting period, BC Hydro's heritage specialists submitted one  
22 archaeological interim report to the BC Archaeology Branch and Indigenous Groups  
23 per the *Heritage Conservation Act* permit terms and conditions.

24 Heritage reviews of contract documents, contractor environmental plans and  
25 construction readiness plans were performed on an ongoing basis to ensure  
26 compliance. Additionally, in this reporting period, three new *Heritage Conservation*

1 Act permits and two amendments were received, and three heritage chance finds  
2 were reported.

3 **1.7.4 Agricultural Mitigation and Compensation Plan Framework**

4 As part of the Site C Agricultural Mitigation and Compensation Plan, BC Hydro has  
5 established a \$20 million BC Hydro Peace Agricultural Compensation Fund to  
6 support agricultural production and related economic activity in the Peace Region.  
7 The fund is governed by a regional decision-making board made up of  
8 representatives from five regional agricultural organizations, the Peace River  
9 Regional District, three agricultural producer members-at-large and one Peace River  
10 Valley agricultural producer. Northern Development Initiative Trust was selected as  
11 the fund administrator and is managing the investment account which had a balance  
12 of \$22.2 million as of August 31, 2019. The first grant intake of \$250,000 for the fund  
13 was held from August 1 to September 30, 2019. The Board will review applications  
14 in November 2019.

1 **1.8 Labour, Employment and Training Initiatives and Building**  
2 **Capacity Initiatives**

3 **1.8.1 Labour**

4 To date, unions that have participated in the construction of Site C are listed in  
5 [Table 6](#) below.

6 **Table 6 Participating Unions**

Union
Construction Maintenance and Allied Workers ( <b>CMAW</b> )
Christian Labour Association of Canada ( <b>CLAC</b> ), local 68
Canada West Construction Union ( <b>CWU</b> )
Construction and Specialized workers Union ( <b>CSWU</b> ), local 1611
International Union of Operating Engineers ( <b>IUOE</b> ), local 115
Ironworkers, local 97
International Brotherhood of Electrical Workers ( <b>IBEW</b> )
MoveUP, local 378
Pile Drivers 2402
The Boilermakers, lodge 359
The United Association of Journeymen & Apprentices of the Plumbing & Pipefitting Industry of the U.S. & Canada, local 170
Teamsters, local 213

7 In addition, ten unions affiliated with the BC Building Trades will be working on the  
8 installation of the turbines and generators.

9 The generating station and spillways contractor has signed a labour agreement for  
10 the generating station and spillways civil works with the IUOE Local 115, the CSWU  
11 Local 1611 and CMAW.

12 Further, the substation contractor has negotiated labour agreements with the IBEW  
13 for the electrical work on the Site C substation, and their civil subcontractor has been  
14 certified to the CMAW. The transmission contractor is performing transmission line  
15 work on the Project and is signatory to a labour agreement with the IBEW. The

1 Teamsters have collective agreements with both Saulteau Securiguard and ATCO  
2 Two Rivers Lodge Group.

3 **1.8.2 Employment**

4 Contractors submit monthly workforce data electronically to BC Hydro. [Table 7](#)  
5 presents the monthly number of construction contractors, non-construction  
6 contractors, engineers, and project team workers for this period. As with any  
7 construction project, the number of workers – and the proportion from any particular  
8 location – will vary month-to-month and also reflects the seasonal nature of  
9 construction work.

10 **Table 7 Site C Jobs Snapshot Reporting Period –**  
11 **July 2019 to September 2019**

Month	Number of B.C. Primary Residents <sup>9</sup>	Number of Total Workers <sup>10</sup>
July 2019	3,596	4,797
August 2019	3,710	4,870
September 2019	3,634	4,790

12 In September 2019, 76 per cent (3,634 workers) of the workforce was made up of  
13 residents of British Columbia, while 21 per cent (869 workers) of the workforce lived  
14 in the Peace River Regional District. The on site contractor workforce number also  
15 includes 13 per cent women (517 workers) and 185 workers who are working for  
16 various contractors as apprentice carpenters, welders, electricians, millwrights,  
17 ironworkers, mechanics, boilermakers and heavy equipment operators.

<sup>9</sup> Employment numbers provided by Site C contractors and consultants are subject to revision. Data not received by the Project's deadlines may not be included in the above numbers. Employment numbers are direct only and do not capture indirect or induced employment.

<sup>10</sup> Total workers include:

- Construction and non-construction contractors performing work on Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services;
- Engineers and project team that is comprised of both on-site and off-site workers; and
- The Project team, which includes, BC Hydro construction management and other offsite Site C project staff. An estimate is provided where possible if primary residence is not given.

### 1.8.3 Training and Capacity Building Initiatives

In September 2017, the Contractors Labour Committee agreed to establish an Indigenous labour subcommittee. The purpose of the subcommittee is to support Indigenous training, labour and employment on Site C through communication, consultation, coordination and cooperation among contractors on the Project.

The committee meets quarterly, or on an as-needed basis. All major Site C construction contractors currently attend this meeting.

The committee has developed a number of initiatives, such as:

- Established a protocol for distribution of Indigenous candidate resumes;
- Developed and implemented the Indigenous Employment and Information Day;
- Participated in the development of the BC Hydro and Northern Lights College pre-carpentry skills pilot program on the Site C Project;
- Reviewed and assisted contractors in contract reporting requirements;
- Discussed communication of site-wide policies;
- Shared regional cultural events with project contractors;
- Shared BC Hydro's Indigenous Employment and Business Development employment and training initiatives;
- Reviewed contractors' best practices;
- Shared success stories to assist in generating opportunities; and
- Reviewed project status and upcoming labour requirements for contractors and how to meet labour demands.

BC Hydro has included apprentice targets in the generating station and spillways civil works contract, the transmission lines and the substation contracts, and the Highway 29 work to be procured by BC Hydro.

1 As of September 30, 2019, the generating station and spillways contractor employed  
2 approximately 183 journeyperson carpenters on the generating station and spillways  
3 civil works contract and 44 apprentices. This amounts to 24 per cent of all these  
4 workers being apprentices. Further, 15 per cent of this workforce self-identify  
5 themselves as Indigenous. Of the self-identified Indigenous carpenters, nearly  
6 44 per cent are apprentices.

7 In August 2013, Northern Lights College Foundation started distributing the  
8 BC Hydro Trades and Skilled Training Bursary Awards. As of September 30, 2019, a  
9 total of 259 students had received bursaries, including 112 Indigenous students who  
10 have benefitted from the bursary in programs such as electrical, welding, millwright,  
11 cooking, social work, and many others. The bursary ended in October 2018, with  
12 remaining amounts still available. However, BC Hydro has worked with the Northern  
13 Lights College Foundation to extend the bursary and reserve the remaining bursary  
14 amounts for trades programs directly needed for project work. Part of this agreement  
15 was to set aside funds for the BC Hydro and Northern Lights College pre-carpentry  
16 skills pilot program for Site C. BC Hydro is working with Northern Lights College  
17 Foundation to extend this program until December 2020.

18 BC Hydro continues to work with local employment agencies to ensure that as job  
19 opportunities become available, they are posted on the WorkBC website as well as  
20 on the Fort St. John Employment Connections website. With the announcement of  
21 the Louisiana Pacific Peace Valley Oriented Strand Board (**OSB**) mill permanent  
22 curtailment, BC Hydro is working with Ministry of Forests, Lands, Natural Resource  
23 Operations and Rural Development and their worker transition initiative to assist the  
24 local community in responding to this closure. On July 30, 2019, WorkBC hosted a  
25 job fair at the Peace Valley Oriented Strand Board mill to support the impacted  
26 workers. There were approximately 110 employees who attended the job fair.  
27 BC Hydro and six Site C contractors attended the job fair. Site C's main civil works  
28 contractor hired approximately 30 people at the job fair. The generating station and

1 spillways contractor has hired approximately six employees, including three  
2 Indigenous workers. BC Hydro has also hired one employee from the mill since the  
3 announcement of the curtailment. BC Hydro's contractors continue to work with the  
4 local community to access available skilled and qualified workers impacted by the  
5 downturn in the forestry sector, including participating in local job fairs. BC Hydro is  
6 planning an employment and training information session on site for local  
7 employment agencies and training institution representatives to meet with Site C  
8 contractors. This session will be an opportunity for these organizations to connect  
9 with Site C contractors on their current and future employment and training needs.

10 In September 2019, Site C contractors reported 869 workers on-site from the Peace  
11 River Regional District.

12 Site C contractors have noted that certain trades will be in high demand over the  
13 next two to three years during peak project construction periods. As such, major  
14 on-site contractors are exploring opportunities for apprentice and other training to  
15 take place on-site. BC Hydro worked with Northern Lights College and Site C  
16 contractors to develop the BC Hydro and Northern Lights College on-site  
17 pre-carpentry skills pilot program. This program was successfully delivered in  
18 April 2019 and BC Hydro and Northern Lights College are currently planning on  
19 delivering the program again in spring 2020. The intent of this program is to provide  
20 an overview of the skills required for the carpentry trade (essential skills training),  
21 general employment knowledge (employment readiness), overview of job  
22 requirements for carpenters, knowledge of B.C.'s apprenticeship system, and Site C  
23 Project-specific knowledge.

24 This is a 14-day program designed for local new workers or workers new to the trade  
25 with preference given to local Indigenous candidates. The course was partly run at  
26 the worker accommodation camp and the 14 days were intended to reflect a typical  
27 Site C schedule. Seven Indigenous students from this program were hired for project

1 work by contractors on the Project, with one student entering an apprentice program  
2 to become journey-person carpenter.

3 The main civil works contractor has reported apprentices in the heavy equipment  
4 operator and labourer trades through a new training program in partnership with  
5 Christian Labour Association of Canada (**CLAC**) and the Industry Training Authority.

6 BC Hydro facilitated the fourth Site C Project Indigenous Employment and Training  
7 Information Session in Fort St. John in July 2019. The purpose of these meetings is  
8 to assist in building relationships between employment and training professionals  
9 from the Indigenous communities and key Site C contractors.

## 10 **1.9 Community Engagement and Communication**

### 11 **1.9.1 Local Government Liaison**

12 There are a number of Environmental Assessment Certificate conditions that are  
13 relevant to local communities in the vicinity of the Project. BC Hydro is implementing  
14 some of these conditions through community agreements offered to five local  
15 governments. Through these discussions BC Hydro has, in some instances, agreed  
16 to additional measures to address concerns about local community impacts from  
17 construction and operation of the Project.

18 BC Hydro has concluded four community agreements with respect to the Project: the  
19 District of Taylor (2013), the District of Chetwynd (2013), the City of  
20 Fort St. John (2016) and the District of Hudson's Hope (2017). BC Hydro and the  
21 City of Fort St. John established a Community Agreement Monitoring Committee to  
22 jointly oversee implementation of the community agreement. BC Hydro continues to  
23 work cooperatively with the City of Fort St. John, District of Hudson's Hope,  
24 District of Taylor and the District of Chetwynd to ensure implementation of their  
25 respective agreements.

1 During this reporting period, the Regional Community Liaison Committee, which is  
2 comprised of local elected officials and local First Nations communities, met once  
3 (September 18, 2019). Eight local governments and four local First Nations  
4 communities (McLeod Lake, Doig River, Saulteau and Blueberry River) as well as  
5 the two MLAs for Peace River North and Peace River South, are invited to  
6 participate as committee members. Representatives from the Project's major  
7 contractors may also attend the meetings as invited guests.

## 8 **1.9.2 Business Liaison and Outreach**

9 BC Hydro continued to implement its business construction liaison and outreach by  
10 attending local chamber of commerce meetings in Fort St. John and Chetwynd.  
11 During this reporting period, the project team sent five notifications to the Site C  
12 business directory.

### 13 **1.9.2.1 Community Relations and Construction Communications**

14 BC Hydro continued to implement its construction communications program  
15 throughout the reporting period. The program includes updating and maintaining the  
16 Project website ([www.sitecproject.com](http://www.sitecproject.com)) with current information, photos and videos  
17 of construction activities, and providing information to local and regional  
18 stakeholders as required.

19 Between July 1, 2019 and September 30, 2019, the Site C community relations team  
20 hosted 23 external site tours showing key stakeholders, local government officials  
21 and Indigenous groups how the Project is progressing.

### 22 **Construction Bulletins**

23 There were seven bi-weekly construction bulletins and one quarterly construction  
24 notification letter issued throughout this reporting period. These bulletins are posted  
25 on the Project website and sent by email to the web-subscriber list.

1 **Public Enquiries**

2 In total, BC Hydro received 482 public enquiries between July 1, 2019 and  
3 September 30, 2019, compared to 580 in the previous quarter. The majority of these  
4 enquiries continued to reference business and job opportunities, with limited  
5 construction impact concerns from local residents. [Table 8](#) below shows the  
6 breakdown of some of the most common enquiry types.

7 In total, BC Hydro has received more than 10,689 enquiries since August 2015.

8 **Table 8 Public Enquiries Breakdown**

Enquiry Type <sup>11</sup>	July 2019	August 2019	September 2019
Job Opportunities	102	112	98
Business Opportunities	27	31	26
General Information	10	14	11
Construction Impacts <sup>12</sup>	5	5	4
Other <sup>13</sup>	7	15	15
<b>Total</b>	<b>151</b>	<b>177</b>	<b>154</b>

9 **1.9.2.2 Communications Activities**

10 Based on a search using the media database Infomart, there were 100 stories  
11 referencing the Site C Project in B.C. news media from July 1, 2019 to  
12 September 30, 2019, compared to 98 media stories in the previous quarter.

13 **1.9.3 Housing Plan and Housing Monitoring and Follow-Up Program**

14 BC Hydro and BC Housing Management Commission (**BC Housing**) signed a  
15 contribution agreement on July 19, 2016 related to the development, construction  
16 and operation of a building in Fort St. John comprised of 50 residential rental units.  
17 The agreement structured the financial contribution from BC Hydro to enable viable

<sup>11</sup> This table is a sample of enquiry types and does not include all enquiry types received.

<sup>12</sup> The nature of the construction impact inquiries is primarily air quality, noise and traffic conditions.

<sup>13</sup> "Other" accounts for enquiries related to a variety of other topics, such as recreation access near construction sites, property owner correspondence, or requests for site tours.

1 financial operation of the affordable housing units by BC Housing in the near-term  
2 and viable financial operation of all 50 units of affordable housing in the longer term.

3 BC Hydro completed a head lease with BC Housing in May 2019 for 20 units in the  
4 building. Any suites not utilized by BC Hydro are available to BC Housing to offer for  
5 public rental. The grand opening of the building is expected to be held jointly by  
6 BC Housing, BC Hydro and the City of Fort St. John in November 2019.

### 7 **1.9.4 Labour and Training Plan**

8 In accordance with an Environmental Assessment Certificate condition, a Labour  
9 and Training Plan was developed and submitted to the Environmental Assessment  
10 Office on June 5, 2015. This plan, as well as Environmental Assessment Certificate  
11 Condition 45, includes reporting requirements to support educational institutions in  
12 planning their training programs to support potential workers in obtaining project jobs  
13 in the future. This report was issued to the appropriate training institutions in the  
14 northeast region of B.C. in July 2016, July 2017, July 2018 and July 2019.

### 15 **1.9.5 Human Health**

#### 16 ***1.9.5.1 Health Care Services Plan and Emergency Service Plan***

17 The Project health clinic is contracted by BC Hydro with Halfway River International  
18 SOS Medical Ltd., a partnership between Halfway River First Nation and  
19 International SOS. The clinic continues to operate in its permanent location within  
20 the Two Rivers Lodge, and based on camp occupancy, was staffed 24/7 during this  
21 period with a nurse practitioner and advanced care paramedics. BC Hydro and the  
22 clinic operator continue to liaise with the local health care community.

23 The clinic provides workers with access to primary and preventative health care and  
24 work related injury evaluation and treatment services and is currently open seven  
25 days a week, 24 hours a day. Since opening the health clinic, there have been a  
26 total of 11,853 patient interactions. During the reporting period, there were

1 1,229 patient interactions, of which 248 were occupational and 981 were  
2 non-occupational. Several preventive health themes were promoted to workers  
3 including: hepatitis, overdose awareness and foot health.

#### 4 **1.9.6 Property Acquisitions**

5 During this quarter, BC Hydro continued to access private properties to inform  
6 design and mitigation options for the Project. BC Hydro also completed the  
7 acquisition of rights over three private properties impacted by Hudson's Hope  
8 shoreline protection project. An additional four property rights acquisitions have been  
9 negotiated and are expected to be completed next quarter. All property acquisition  
10 plans are now complete and land surveys are underway at Cache Creek and  
11 Halfway River.

#### 12 **1.10 Key Procurement and Contract Developments**

##### 13 **1.10.1 Key Procurement**

14 The procurement approach was approved by the board of directors in June 2012 for  
15 the construction of the Project. The procurement approach defined the scope of the  
16 major contracts and their delivery models, as summarized in [Table 9](#) below.

1  
2

**Table 9 Major Project Contracts and Delivery Models**

Component	Contract	Procurement Model	Anticipated Timing
Worker Accommodation	Worker accommodation and site services contract	Design-Build-Finance-Operate-Maintain	Completed
Earthworks	Site preparation contracts	Predominantly Design-Bid-Build	Completed
	Main Civil Works contract	Design-Bid-Build	Completed
Reservoir/Transmission Clearing	Multiple reservoir clearing contracts to be awarded over seven to eight years	Design-Bid-Build	Seven contracts completed (2 transmission line, 5 reservoir)  5-9 contract packages remain to be procured; final number will depend on the scope of each package.
Generating Station and Spillways	Turbines and Generators contract	Design-Build	Completed
	Generating Station and Spillways Civil Works contract	Design-Bid-Build	Completed
	Hydromechanical Equipment contract	Supply Contract	Completed
	Balance of Plant Equipment Supply	Supply Contracts	Nine contracts completed (generator terminal equipment, protection and control panels, generator circuit breakers, AC station service equipment, DC station service equipment, large valves, motor-operated disconnect switches, compressed air receivers, generator step-up transformers) and one more contract to be awarded in November 2019
	Balance of Plant Contract	Design-Build/Design-Bid-Build	Collaborative meetings with the three shortlisted proponents were held on July 17-19, 2019. Second draft contract was sent to shortlisted proponents in September 2019.
Electrical and Transmission Infrastructure	Transmission Lines Construction contract	Design-Bid-Build	Completed
	Site C substation contract	Design-Bid-Build	Completed

Component	Contract	Procurement Model	Anticipated Timing
	Peace Canyon Substation upgrade contract	Design-Build	Completed
Highway 29 Realignment	Cache Creek West 2018 and 2020 scope of work	Design-bid-Build	Completed
	Halfway River Bridge, Grade and Paving	Design-Bid-Build	October 2019
	Cache Creek East Embankment	Design-Bid-Build	October 2019
	Design-Bid-Build in coordination with B.C. Ministry of Transportation and Infrastructure with anticipated contracts being awarded from 2019 to 2022		

1 **1.10.2 Major Construction Contracts Exceeding \$50 Million**

2 Since inception of the Project, seven major construction contracts have been  
 3 awarded that exceed \$50 million in value, as shown in [Table 10](#).

4 All of the construction contracts have been procured and awarded through the  
 5 competitive public procurement process within the budget established for each  
 6 contract.

7 **Table 10 Major Contracts Exceeding \$50 Million**

Work Package	Contract Value <sup>14</sup> (\$ million)	Contract Execution Date
Site Preparation: North (Left) Bank	60	July 2015
Worker Accommodation	489	September 2015
Main Civil Works	2,150	December 2015
Turbines and Generators	464	March 2016
4 Evergreen Transmission & Clearing Blanket	73	October 2016
Generating Station and Spillways Civil Works	1,633	March 2018
Hydromechanical Equipment	69	April 2018
Transmission Line Construction	114	May 2018

<sup>14</sup> Contract value reflects the current value including executed change orders to the end of the reporting period.

1 **1.10.3 Contracts Exceeding \$10 Million**

2 For open contracts procured and awarded in excess of \$10 million, refer to

3 [Appendix C](#).

4 **1.10.4 Contract Management**

5 **1.10.4.1 Material Changes to the Major Contracts**

6 The main civil works contract is a unit price contract and as such variations in  
7 quantities and design are expected over the term of the contract. Since contract  
8 award in December 2015, the main civil works contract value has increased by  
9 \$402 million to reflect approved changes to date. To September 30, 2019, the  
10 changes have been managed within project contingency.

11 **1.10.4.2 Contingency and Project Reserve Draws**

12 As a result of the change in timing for river diversion and other factors including an  
13 increase in direct and indirect costs, BC Hydro revised the Project budget to  
14 \$10.7 billion, which was approved by the provincial Treasury Board in January 2018  
15 and the BC Hydro board of directors in February 2018. This revised budget includes  
16 an \$858.1 million contingency allowance and a \$708.0 million reserve that is subject  
17 to Treasury Board's discretion.

18 The Project has a risk management plan that establishes the risk management  
19 framework for the Project and describes specific processes, procedures,  
20 organization, tools and systems that guide and support effective risk management.  
21 Utilizing this plan, risks are identified, assessed and managed on a continuous  
22 basis. The output of the risk management process is documented in the risk register.  
23 The risk register is utilized as an input into project forecasts and cost risk analysis is  
24 conducted periodically to inform contingency requirements. Subsequent to the  
25 reporting period, work commenced on the next cost risk analysis and that  
26 information will be used to inform the next quarterly progress report.

1 Refer to [Appendix E](#) for more detailed information regarding contingency and project  
 2 reserve draws.

3 **1.11 Plans During Next Six Months**

4 [Table 11](#) below presents the key milestones for activities planned during the next  
 5 six months.

6 **Table 11 Key Milestones for Activities Planned**  
 7 **during the Next Six Months**  
 8 **(October 2019 to March 2020)**

Milestone	Performance Measurement Baseline	Plan Date (Control Date <sup>15</sup> )	Forecast <sup>16</sup>	Status (Measured by Month)
<b>Generating Station and Spillways</b>				
Main service bay and building exterior complete	October 2019	September 2019	September 2019	Complete
Work area W3 access to generating station and spillways	November 2019	November 2019	November 2019	On track
Powerhouse bridge cranes commissioned and ready for travel load tests	December 2019	December 2019	December 2019	On track
<b>Highways</b>				
Halfway River grading, paving and bridge contract award complete	July 2019	October 2019	October 2019	On track
<b>Main Civil Works</b>				
Cast-in-place concrete & roller-compacted concrete of spillway (apron boundary around roller-compacted-concrete walls) complete	October 2019	October 2019	October 2019	On track
Diversion tunnel inlet structure complete	January 2020	January 2020	January 2020	On track
Diversion tunnel outlet structure complete	February 2020	February 2020	January 2020	On track
Diversion Tunnel Nos. 1 and no. 2 construction complete	November 2019	November 2019	February 2020 <sup>17</sup>	At risk

<sup>15</sup> Control date reflects plan, adjusted for approved changes to milestone dates.

<sup>16</sup> As of September 30, 2019.

<sup>17</sup> In response to some delays with the excavation of the diversion tunnels, the construction activities required to complete the diversion tunnels have been re-sequenced, by advancing some activities and delaying others, to optimize the schedule. This optimized schedule still achieves the key schedule milestones associated with river diversion in fall 2020.

Milestone	Performance Measurement Baseline	Plan Date (Control Date <sup>15</sup> )	Forecast <sup>16</sup>	Status (Measured by Month)
(M3.1) Diversion works stage 2 works complete, excluding portions to be completed in M3.2	March 2020	March 2020	March 2020	On track
Diversion inlet portal & channel Complete	March 2020	March 2020	March 2020	On track
Spillway roller-compacted concrete buttress (excluding drainage gallery) and install access to gallery W4 (access to generating station and spillways) complete	May 2020	May 2020	October 2019	Complete
<b>Reservoir Clearing</b>				
Reservoir prepared for diversion	March 2020	March 2020	March 2020	On track
<b>Transmission</b>				
Peace Canyon GIS in-service date	October 2019	October 2019	July 2019	Complete

1 **1.12 Impacts on Other BC Hydro Operations**

2 In the reporting period, GM Shrum and Peace Canyon dams were operated as  
 3 expected during this phase of the Site C construction, with no material impacts on  
 4 generation or water management relative to plan. BC Hydro continues to plan the  
 5 operation of Williston Reservoir to reduce the risks to the Project during the Site C  
 6 river diversion.

7 **1.13 Site Photographs**

8 Refer to [Appendix A](#) for Site Construction photographs.

1     **2           Project Schedule**

2     **2.1          Project In-Service Dates**

3     As filed with the British Columbia Utilities Commission Inquiry respecting Site C on  
 4     October 4, 2017, BC Hydro identified that the river diversion milestone will move  
 5     from 2019 to 2020. This did not impact the overall in-service dates, as shown in  
 6     [Table 12](#) below.

7                             **Table 12           In-Service Dates**

Description	Final Investment Decision In-Service	Status
5L5 500 kV Transmission Line	October 2020	On Track
Site C substation	November 2020	On Track
5L6 500 kV transmission line	July 2023	On Track
Unit 1 (first power)	December 2023	On Track
Unit 2	February 2024	On Track
Unit 3	May 2024	On Track
Unit 4	July 2024	On Track
Unit 5	September 2024	On Track
Unit 6	November 2024	On Track

8     **2.2          Project Governance, Costs and Financing, and Risk**

9     **2.2.1        Project Governance**

10    In December 2017, the provincial government announced their approval to continue  
 11    with construction of the Site C project. The approval to proceed included increased  
 12    external and internal oversight of project performance. Measures to improve project  
 13    governance implemented this quarter include:

- 14    • EY Canada continued to provide independent oversight for the Project including  
 15    budget oversight, schedule evaluation and risk assessment analysis. BC Hydro  
 16    and EY Canada are working collaboratively on enhancements to risk analysis  
 17    and reporting;

- 1 • BC Hydro completed a cost risk analysis and schedule risk analysis during the  
 2 reporting period. During these analyses BC Hydro worked collaboratively with EY  
 3 Canada and implemented identified enhancements. EY Canada agreed with the  
 4 results from the analyses;
- 5 • An Independent Construction Advisor was retained during the quarter to provide  
 6 advice and opinions on construction planning by major contractors at the Dam  
 7 Site; and
- 8 • A Technical Advisory Board workshop was held in September 2019 when a  
 9 variety of technical and other issues were discussed. The two-day workshop took  
 10 place in Fort St. John.

### 11 2.2.2 Project Budget Summary

12 As a result of the change in timing for river diversion and other factors including an  
 13 increase in direct and indirect costs, BC Hydro presented a revised cost estimate of  
 14 \$10.7 billion to the board of directors in December 2017.

15 [Table 13](#) below presents the overall project budget, based on the project budget  
 16 approved in February 2018, represented in nominal dollars.

17 **Table 13 Project Budget**

Description	(Nominal \$ million)
Dam, Power Facilities, and Associated Structures	4,548
Offsite Works, Management and Services	1,845
<b>Total Direct Construction Cost</b>	<b>6,393</b>
Indirect Costs	1,456
<b>Total Construction and Development Cost</b>	<b>7,849</b>
Contingency	858
Interest During Construction	1,285
<b>Project Budget, before Treasury Board Reserve</b>	<b>9,992</b>
Treasury Board Reserve	708
<b>Total Project Budget</b>	<b>10,700</b>

## 2.3 Project Expenditure Summary

[Table 14](#) provides a summary of the budget for the *total* Project, the current forecast *total* Project cost and the variance between the two. It also presents the cumulative updated budget amount planned to September 30, 2019 compared to the cumulative actual costs incurred to September 30, 2019 and the variance between the two.

**Table 14 Total Project Expenditures Budget Compared to Forecast and Life to Date – Budget Compared to Actual Expenditures to September 30, 2019 (\$ million Nominal)**

Description	Total Project			Life to Date, to September 30, 2019		
	Budget	Forecast	Variance	Budget	Actual Expenditures	Variance
Project	9,992	9,992	0	4,107	4,270	(163)
Treasury Board Reserve	708	708	0	0	0	0
<b>Total Project</b>	<b>10,700</b>	<b>10,700</b>	<b>0</b>	<b>4,107</b>	<b>4,270</b>	<b>(163)</b>

[Table 15](#) below provides a summary of the 2019/20 to 2021/22 Service Plan Project expenditures for Fiscal 2020 to September 30, 2019, the actual Project expenditures for Fiscal 2020 to September 30, 2019 and the related variance.

**Table 15 Actual Fiscal 2020 Project Expenditures Compared to 2019/20 to 2021/22 Service Plan (\$ million Nominal)**

Description	2019/20 to 2021/22 Service Plan September 2019 YTD	Actual Expenditures September 2019 YTD	Variance
Project	811	779	32
Treasury Board Reserve	-	-	-
<b>Total Project</b>	<b>811</b>	<b>779</b>	<b>32</b>

Details of the variances between actual and plan are in [Appendix E](#).

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## 1 **2.4 Internal Project Financing versus External Borrowings to Date**

2 To date, all project funding has been from internal borrowings and there has been no  
3 Site C Project-specific debt issued. As part of BC Hydro's debt management  
4 strategy, BC Hydro's exposure to variable debt is managed within a board-approved  
5 range of 5 per cent to 25 per cent and a target of 15 per cent. In addition, since  
6 fiscal 2017, BC Hydro has hedged \$10.0 billion of its future forecast long-term debt  
7 issuances through the use of derivative contracts to lock in interest rates. As at  
8 September 30, 2019, \$5.4 billion of hedges remained outstanding to hedge future  
9 debt issuances, hedging approximately 75 per cent of BC Hydro's forecast total  
10 borrowing requirements out to and including fiscal 2025.

## 11 **2.5 Material Project Risks**

12 Material project risks are identified and reviewed on an ongoing basis. As the Project  
13 progresses through implementation phase, the material project risks will evolve to  
14 reflect the current risks facing the Project. The following list of material project risks  
15 does not include risks that are subject to confidentiality obligations or solicitor client  
16 privilege, or that disclose commercially sensitive information relating to matters that  
17 are currently outstanding, including procurements and negotiations that are in  
18 progress at the time of this report, the disclosure of which would be harmful to  
19 BC Hydro's commercial interests.

20 Refer to [Table 16](#) below for a list of the material project risks.

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**Table 16 Material Project Risks**

Risk Description	Impact and Response Plan Summary
Risk of river diversion system delay if contractor productivity does not meet plan and/or differing geotechnical conditions	<p><b>Impact:</b> Diversion delay could cause the schedule to slip by a year and increase costs.</p> <p><b>Response:</b> BC Hydro closely monitors the development of design and construction plans, and labour and equipment productivity for critical construction activities (tunnel excavation/linings, inlet/outlet portals, and gates and cofferdam); provision of additional incentives through settlement agreement with contractor.</p>
Risk that BC Hydro's borrowing costs for project are higher than budgeted	<p><b>Impact:</b> Rising interest rates increase the Project's interest costs above the amount budgeted.</p> <p><b>Response:</b> BC Hydro has hedged interest rates on approximately 75 per cent of future debt placements through fiscal 2025 to reduce the potential impact of rising interest rates.</p>
Risk of contractor labour rate increases in excess of budgeted amount	<p><b>Impact:</b> BC Hydro has included provisions in major contracts that allow for labour escalation to a prescribed amount, as well as a cost/savings sharing formula based on general industry rates above or below the prescribed amount. Increased pressure on the labour market would likely drive labour wage rates higher, potentially resulting in general industry increases beyond the prescribed amounts.</p> <p><b>Response:</b> BC Hydro has defined contract labour escalation formulas in all major contracts.</p>
Risk of a safety incident resulting in fatality or disabling injury	<p><b>Impact:</b> Serious worker injury or fatality; project delays and associated costs.</p> <p><b>Response:</b> Continue with BC Hydro and contractor safety steering committee to address shared safety issues and opportunities; BC Hydro and contractors have implemented safety cultural leadership training; increase BC Hydro executive involvement and engagement with site safety leadership; regularly hold on-site safety conferences; contractor to bring in senior safety manager to prepare safety improvement plan for BC Hydro review; continue to include safety in BC Hydro and contractor on-boarding orientations; and continue to promote a strong safety culture.</p>
Risk of geotechnical issues on work fronts other than left bank diversion tunnel	<p><b>Impact:</b> Potential schedule delay and increased cost.</p> <p><b>Response:</b> Completed detailed geotechnical investigations prior to construction; close monitoring and quick intervention to manage construction risk if geotechnical issues arise.</p>
Risk of additional expenditures required for engineering support for the project	<p><b>Impact:</b> Exceed budget due to work required for as found site conditions, complete design, and support schedule and construction activities; Insufficient resources to complete, manage and/or oversee engineering work.</p> <p><b>Response:</b> Optimize BC Hydro resources; optimize work front team structure and minimize duplication of activities. Work with contractors to increase their quality control staffing.</p>

Risk Description	Impact and Response Plan Summary
Risk of Highway 29 costs exceeding the approved budget	<p><b>Impact:</b> As designs are finalized and procurement is conducted, costs could exceed the approved budget.</p> <p><b>Response:</b> Conduct value engineering during design phase to find cost savings and/or reduce cost increases; conduct independent reviews of cost estimates and optimize the number of contracts using the Ministry of Transportation and Infrastructure’s competitive public tender process.</p>
Risk that spillway costs increase materially due to design changes	<p><b>Impact:</b> Increased quantities result in higher construction costs.</p> <p><b>Response:</b> Issue revised drawings to the contractor. Meet with the contractor to plan work so that construction cost increases are minimized.</p>
Risk that Indigenous groups do not support the Project	<p><b>Impact:</b> Indigenous groups file legal challenges (e.g. injunction applications) or engage in protest actions that could delay or stop the project work and/or increase costs.</p> <p><b>Response:</b> Project team to continue to engage and consult with First Nations and ensure commitments to First Nations are met or exceeded; fully support the development of legal response documents; follow court order requirements, if applicable; continue to negotiate Impact Benefit Agreements.</p>
Risk that reservoir clearing costs are higher than budget	<p><b>Impact:</b> Increased cost.</p> <p><b>Response:</b> Review scope, modify approach, negotiate pricing, provide sufficient time to negotiate, work with Indigenous Relations on procurement of clearing services; develop alternative procurement options if planned procurements are not feasible.</p>
Risk of dam construction delay	<p><b>Impact:</b> Contractor misses milestone(s) and BC Hydro incurs schedule related delay costs.</p> <p><b>Response:</b> On-site physical progression captured and reported on a weekly basis for key work fronts. BC Hydro monitors key interface milestones and reviews with contractor on regular basis.</p>
Risk that productivity for roller-compacted concrete is lower than planned	<p><b>Impact:</b> Lower productivity may result in delays to project schedule; potential interface issues may arise with other contractors.</p> <p><b>Response:</b> Detailed planning completed in advance of work starting. Physical progress is captured and reported on a weekly basis for key work fronts. Key interface milestones are monitored and discussed on a regular basis. Meetings are held with the contractor on a regular basis.</p>

Risk Description	Impact and Response Plan Summary
Risk that the Project cannot attract and retain sufficient skilled workers	<p><b>Impact:</b> Contractors may not be able to adequately source, supply, attract, and retain sufficient project labour due to workforce demographics, increased competition for labour from other major projects, and the requirement for specialized workers. This may result in potential impacts to schedule, safety, productivity and cost.</p> <p><b>Response:</b> Contractors provide labour sourcing and supply plans, provide advance notice of foreign workers, and participate in local job fairs. BC Hydro encourages and facilitates capacity-building initiatives, and monitors employee turnover rates and labour conditions on other projects.</p>
Risk of additional work for the Main Civil Works contractor to meet powerhouse, dam & spillway roller-compacted concrete buttress requirements	<p><b>Impact:</b> Increased costs for investigation; potential for scope change</p> <p><b>Response:</b> Investigate (drill, sample, test, and monitor) and conduct engineering analysis and review. Update design basis as required and identify and scope measures that may be needed.</p>
Risk of the stage 2 cofferdam overtopping or erosion	<p><b>Impact:</b> Damage to upstream and downstream cofferdams; uncontrolled river flow; flooding and damage to dam and powerhouse while under construction.</p> <p><b>Response:</b> Clear reservoir area before river diversion and install debris booms; utilize Williston reservoir to provide water storage; complete river flow forecasting and manage water.</p>
Risk of insufficient aggregate supply to meet demand on dam site	<p><b>Impact:</b> Decreased productivity, schedule delays and increased cost that could impact multiple contracts. Aggregate supply required for concrete production (roller-compacted concrete, cast-in-place concrete/conventional vibrated concrete and shotcrete) and dam (general fill, filter materials, drain material, and riprap).</p> <p><b>Response:</b> Increase aggregate stockpiles; work with contractors to minimize waste and maximize aggregate production; release BC Hydro on-site contingency aggregate excavation sites and seek out additional aggregate on-site sources; procure off-site and haul in additional aggregate.</p>
Risk that the river has been diverted but the Stage 2 Cofferdam is not completed on time	<p><b>Impact:</b> Unable to release restrictions upstream; overtopping of the cofferdam; construction delays; BC Hydro system (GM Shrum generation, etc.) impacts.</p> <p><b>Response:</b> Contractor financial incentives in place to meet diversion date; contractor increases work force; BC Hydro and contractor evaluate schedule and optimize activities.</p>

## **Site C Clean Energy Project**

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### **Quarterly Progress Report No. 17**

#### **Appendix A**

#### **Site Photographs**

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**Figure A-1**    **Diversion Tunnel No. 2 Breakthrough**  
**(July 2019)**



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**Figure A-2**    **Construction Continues on the**  
**Powerhouse (July 2019)**



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**Figure A-3** View of Inside Unit 1 Draft Tube in the Powerhouse. Once Site C is Operational, Water will Enter the Penstocks, Move through the Turbines and Generators and then be Released into the Draft Tubes prior to Exiting through the Tail Race (July 2019)



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**Figure A-4** Assembly of a Multi-plate Culvert that will Provide Drainage under a Realigned Segment of Highway 29 in the Cache Creek Area. A variety of Culverts are being Installed as Part of the Highway 29 Realignment (July 2019)



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**Figure A-5 A Worker Conducts Archaeological Excavations near Farrell Creek, in Support of the Highway 29 Realignment Work (July 2019)**



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**Figure A-6 The Site C Substation will be the Largest in BC Hydro's System. The Substation is 80 per cent Complete and Scheduled to go into Service in October 2020 (August 2019)**



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**Figure A-7 Installing Rebar at the Powerhouse (August 2019)**



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**Figure A-8 To Compensate for the loss of Wetland Habitat resulting from the Project, we are Working with Ducks Unlimited to Construct and Restore over 500 hectares of Wetlands. The First of these is at a 50-acre Wetland Project at Golata Creek, a Complex System of 15 Ponds Retained with a Dam and Berms. These Wetlands provide Important Habitat for a Wide Range of Plants and Animals, including Fish, Invertebrates, Bats, Birds, and Rare Plants (September 2019)**



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**Figure A-9** The 5km Conveyor System, which Runs from the 85<sup>th</sup> Avenue Industrial Lands to the Dam Site, will Carry Glacial Till, an Impervious Clay-like Material that will Form the Core of the Dam. The Conveyor System was Chosen as the Primary Form of Transport because it will Reduce Traffic on Local Roads, Create Fewer Greenhouse Gas Emissions, and Result in Less Noise and Dust (September 2019)



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**Figure A-10** Construction Started on a Temporary Bridge to an Island in the Peace River near Halfway River, as Part of Clearing Activities for the Project. The Bridge allows Workers to Remove Vegetation from the Island and Prepare for the Creation of the New Reservoir (September 2019)



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## **Site C Clean Energy Project**

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### **Quarterly Progress Report No. 17**

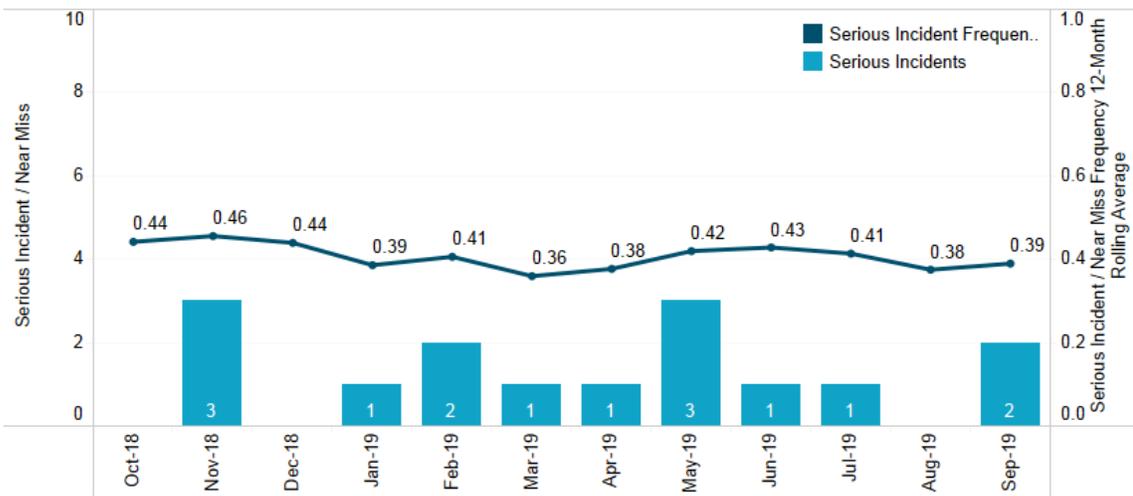
#### **Appendix B**

#### **Safety and Security**

1 [Figure B-1](#) below provides information on employee and contractor serious  
2 incidents/near miss frequency, lost time injury frequency and all-injury frequency  
3 from July 1, 2018 to September 30, 2019.

4 **Figure B-1 Employee and Contractor Serious**  
5 **Incidents/Near Miss Frequency, Lost Time**  
6 **Injury Frequency and All-injury Frequency**

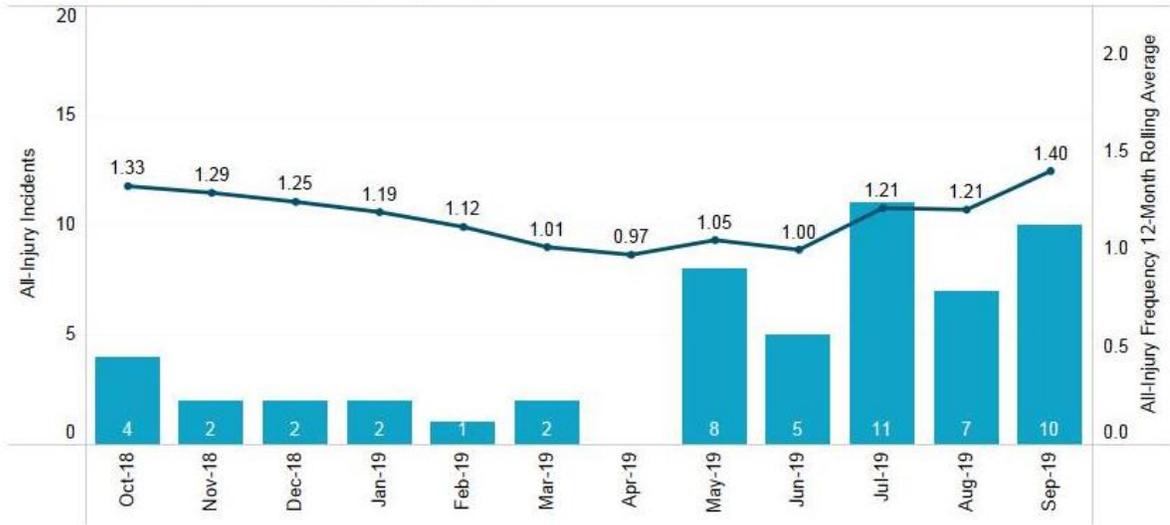
**Employee & Contractor Serious Incident / Near Miss Frequency**



**Employee & Contractor Lost Time Injury Frequency**



Employee & Contractor All-Injury Frequency



1 [Table B-1](#) lists the safety regulatory inspections and orders received from July 2019  
2 to September 2019.

3 **Table B-1 Safety Regulatory Inspections and**  
4 **Orders**

5 **WorkSafeBC**

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #1:</b> WorkSafeBC conducted an inspection at the generating station &amp; spillways powerhouse construction worksite due to a crane misadventure while the contractor was in the process of erecting the tower crane. Items discussed and areas of inspections included, but were not limited to the following: crane misadventure, manufacturer's erection instructions, and incident investigation.</p> <p>Crane misadventure - "misadventure" means a contact with a high voltage electrical source, a shock load, a loss of a load, a brake failure, a collision or upset, or any other circumstance that may impair the safe operation of the crane or hoist.</p>			
High Risk	Certification following misadventure	<p><b>Order #1 – OHS14.16.1(2):</b> The tower crane was subject to a misadventure and due to the impact between the jib end, hoist cable and the jib boom, there may have been unknown damage to the tower crane. The contractor failed to remove the tower crane from service until a professional engineer has:</p> <ul style="list-style-type: none"> <li>a) supervised an inspection of, and supervised any necessary repairs to, the equipment; and</li> <li>b) certified the equipment as safe for use at the manufacturer's rated capacity for the equipment or as provided by section 14.16 if the manufacturer's rated capacity is not available.</li> </ul>	July 2, 2019
Low Risk	Tower crane erection	<p><b>Order #2 – OHS 14.73(2):</b> The tower crane erection was not done in accordance with the instructions of the crane manufacturer or professional engineer</p>	

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<b>Inspection #2:</b> WorkSafeBC conducted an inspection at the generating station and spillways powerhouse construction worksite due to a crane misadventure while the contractor was in the process of erecting the tower crane. Items discussed and areas of inspections included, but were not limited to the following: system to ensure compliance			
Low Risk	Tower crane erection	<b>Order #1 – WCA118 (2)(b):</b> The prime contractor of a multiple-employer workplace must do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the <i>Workers Compensation Act</i> Part 3 and the regulations in respect of the workplace.	July 2, 2019
Low Risk	Safety documentation	<b>Order #2 – OSH20.3(4)(c):</b> BC Hydro failed to have a set of construction procedures designed to protect the health and safety of workers at the workplace.	
<b>Inspection #3:</b> WorkSafeBC conducted an inspection at the generating station and spillways powerhouse construction worksite due to a crane misadventure while the contractor was in the process of erecting the tower crane 3. Crane misadventure - "misadventure" means a contact with a high voltage electrical source, a shock load, a loss of a load, a brake failure, a collision or upset, or any other circumstance that may impair the safe operation of the crane or hoist.			
High Risk	Certification following misadventure	<b>Order #1 – OHS14.16.1(2):</b> The tower crane was subject to a misadventure and due to the impact between the jib end, hoist cable and the jib boom, there may have been unknown damage to the tower crane. The contractor failed to remove the tower crane from service until a professional engineer has a) supervised an inspection of, and supervised any necessary repairs to, the equipment; and b) certified the equipment as safe for use at the manufacturer's rated capacity for the equipment or as provided by section 14.16 if the manufacturer's rated capacity is not available.	July 2, 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #4:</b> WorkSafeBC conducted an inspection at the generating station and spillways powerhouse construction worksite due to a crane misadventure while the contractor was in the process of erecting the tower crane 3. Items discussed and areas of inspections included, but were not limited to the following: system to ensure compliance</p>			
		<b>No Orders</b>	July 2, 2019
<p><b>Inspection #5:</b> WorkSafeBC conducted an inspection at the generating station and spillways powerhouse construction worksite due to a crane misadventure while the contractor was in the process of erecting the tower crane 3.</p> <p>Crane misadventure - "misadventure" means a contact with a high voltage electrical source, a shock load, a loss of a load, a brake failure, a collision or upset, or any other circumstance that may impair the safe operation of the crane or hoist</p>			
		<b>No Orders</b>	July 2, 2019
<p><b>Inspection #6:</b> WorkSafeBC conducted a general inspection at the quality control lab at the Project. A goal of the inspection was to verify crystalline silica management as part of the high risk strategy.</p>			
Low Risk	Safety Administration	<b>Order #1 – WCA 138(B):</b> The contractor failed to post or kept the posted report of the three most recent joint committee meetings. A worker produced a set of minutes from January and the committee meets bi-weekly.	July 4, 2019
Low Risk	Safety Administration	<b>Order #2 – WCA 138(a):</b> The contractor failed to post and keep posted the names and work locations of the joint committee members.	
<i>Rescinded</i>	Safety Documentation	<b>Order #3 – OHS 5.14(2):</b> When a supplier safety data sheet obtained under subsection (1) for a hazardous product that is three years old, the contractor failed to obtain from the supplier an up-to-date supplier safety data sheet in respect of any of the hazardous project in the workplace at that time.	
<i>Rescinded</i>	Exposure Control Plan	<b>Order #4 – OHS 5.57(2):</b> The contractor failed to implement an exposure control plan for 600 basolit sulfur cement to maintain worker exposures to designated substances as low as reasonably achievable below the exposure limit established under section 5.48.	

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
High Risk	Occupational First Aid	<b>Order #5 – OHS 5.85:</b> The contractor failed to ensure that appropriate emergency washing facilities are provided within a work area where a worker's eyes or skin may be exposed to harmful or corrosive materials or other materials which may burn or irritate.	
Low Risk	Occupational First Aid	<b>Order #6 - OHS5.88:</b> The contractor failed to ensure that the selection of emergency washing facilities is based upon an assessment of the risks present in the workplace.	
High Risk	Safety Documentation	<b>Order #7 – OHS 5.10(1):</b> The contractor had various products in containers other than the supplier container and the contractor failed to ensure that the container has a workplace label applied to it.	
Low Risk	Occupational First Aid	<b>Order #8 – OHS 5.93(2):</b> The contractor failed to ensure that a plumbed emergency eyewash or shower facility is full flow tested at least once per month, for a sufficient length of time to completely flush the branch of the water line supplying the eyewash.	
Low Risk	Ventilation	<b>Order #9 – OHS 5.67(2):</b> The exhaust ventilation system used to control air contaminants at the 600 Sulfur Cement pots and the sieve testing machines has not been regularly inspected or monitored to ensure that it remains effective.	
Low Risk	Ventilation	<b>Order #10 – OHS 5.61:</b> The ventilation system for controlling airborne contaminants from the molten 600 basolit sulfur cement in the workplace has not been designed and/or installed using established engineering principles as there one round collection point that does not cover the area of both pots.	

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
High Risk	Exposure Control Plan	<b>Order #11 – OHS 5.54(2)(e):</b> The contractor failed to ensure the exposure control plan incorporates hygiene facilities and decontamination procedures, when required.	
High Risk	Noise Exposure	<b>Order #12 – OHS 7.7(1)(b):</b> If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor failed to post warning signs in the noise hazard areas.	
High Risk	Noise Exposure	<b>Order #13 – OHS 7.3(1):</b> The contractor failed to measure the noise exposure for the use of the diamond coring tool where a worker is, or may be, exposed to potentially harmful levels of noise, or if information indicates that a worker may be exposed to a level exceeding 82dBA Lex.	
High Risk	General Duties	<b>Order #14 – WCA 115(1)(a)(i):</b> The contractor failed to ensure the health and safety of all workers working for the contractor.	
<b>Inspection #7:</b> A near miss incident resulted from two 50mm shotcrete support layers at heading section failed within a newly constructed left bank diversion Tunnel No. 1 outlet area.			
Low Risk	Reporting and Investigation	<b>Order #1 – WCA 172(1)(b):</b> The contractor failed to immediately notify WorkSafeBC of the occurrence of a shotcrete failure incident that involved a major structural failure or collapse of a building, bridge, tower, crane, hoist, temporary construction support system or excavation.	July 8, 2019
Low Risk	Reporting and Investigation	<b>Order #2 – WCA 172(2):</b> The contractor disturbed the scene of an incident that is reportable.	
High Risk	Special Inspection	<b>Order #3 – OHS 3.7:</b> The contractor failed to conduct a special inspection when required by malfunction or accident.	

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<b>Inspection #8:</b> A near miss incident resulted from two 50mm shotcrete support layers at heading section failed within a newly constructed left bank diversion Tunnel No. 1 outlet area.			
Low Risk	Reporting and Investigation	<b>Order #1 – WCA 172(1)(b):</b> The contractor failed to immediately notify WorkSafeBC of the occurrence of a shotcrete failure incident that involved a major structural failure or collapse of a building, bridge, tower crane, hoist, temporary construction support system or excavation.	July 9, 2019
Low Risk	Reporting and Investigation	<b>Order #2 – WCA 172(2):</b> The contractor disturbed the scene of an incident that is reportable.	
High Risk	Special Inspection	<b>Order #3 – OHS 3.7:</b> The contractor failed to conduct a special inspection when required by malfunction or accident.	
High Risk	Special Inspection	<b>Order #4 – OHS 3.7:</b> The contractor failed to ensure that the temporary shotcrete support structure within the left bank diversion Tunnel No. 1 outlet is capable of withstanding any stress likely to be imposed on it.	
<b>Inspection #9:</b> WorkSafeBC was on site during the installation of a new, 34 mm x 600 meter load line onto the tower crane, the wire mesh grip device used to attach the lead-line to the load line failed. The failure allowed the new load line to be dropped uncontrolled approximately 90 Meters from the jib trolley sheave area to the ground.			
		<b>No Orders</b>	July 16, 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #10:</b> The contractor requested to pre-construction meeting to comply with the requirements of section 22.5 for the left bank drainage adit. The contractor stated that it planned to commence construction on September 17, 2019.</p> <p>The left bank drainage adit will be constructed using a drill and blast method of excavation. Due to the two left bank diversion tunnels are being directly below the contract must meet the requirements of OSH section 22.68</p> <p>The contractor is constructing the entrance to the left bank drainage adit adjacent to the outlet of the left bank diversion tunnels is being asked to provide a traffic review to WorkSafeBC.</p> <p>The contractor is requested to provide the following to WorkSafeBC:</p> <ul style="list-style-type: none"> <li>• Engineering documents that outline the evaluation of blasting above the left bank diversion tunnel and the required measures to meet section 22.68; and</li> <li>• An evaluation of the potential impacts from traffic and ventilation equipment operation (normal and upset conditions) at the left bank drainage adit on ventilation equipment at the left bank diversion tunnel outlets and any measures, if any to address impacts.</li> </ul> <p>Prior to the documents and measures (if any are required) being in place no work may commence for the left bank drainage adit.</p>			
		<b>No Orders</b>	July 26, 2019
<p><b>Inspection #11:</b> WorkSafeBC conducted an inspection at Gate B on the Site C Project. The inspection was requested due to an employee refusing unsafe work.</p>			
Low Risk	Safe Buildings and Structures	<b>Order #1 – OHS4.2:</b> The contractor failed to ensure that each building and temporary or permanent structure in a workplace is capable of withstanding any stresses likely to be imposed on it.	July 29, 2019
Low Risk	Working Alone	<b>Order #2 – OSH 4.20.2(1):</b> Before a worker is assigned to work alone or in isolation, the contractor failed to identify any hazards to that worker.	
Low Risk	Safety Equipment	<b>Order #3 – OHS 4.3(1)(b)(i):</b> The contractor failed to ensure that each tool, machine and piece of equipment in the workplace is capable of safely performing the functions for which it is used and is selected, used and operated in accordance with the manufacturer's instructions. The extension cords at Gate B are being used to supply power where hardwired connections should be used.	

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #12:</b> WorkSafeBC conducted a site inspection in the right bank drainage tunnel. The excavation of the tunnel has been completed and the contractor is working on finishing the floor area as per design. At the time of the inspection the air operated chipping hammer did not have a restraint on the air line. In addition, there was a skid steer parked in the tunnel at work location and the fire suppression system on the skid steer did not have an actuate in the cab.</p>			
Low Risk	Restraining device	<p><b>Order #1 - OHS12.15(a):</b> The air operated chipping hammer did not have a restraint between the tool and the airline. The contractor failed to have an effective means of restraint on a connection of a hose or a pipe if inadvertent disconnection could be dangerous to a worker.</p>	July 31, 2019
Low Risk	Fire suppression	<p><b>Order #2 - OHS22.86(2):</b> The skid steer did not have an activator for the fire suppression in the cab. The contractor failed to install a device to manually activate the fire suppression system by means of easily accessible ground level devices from the operator's station and from each side of the machine, and the activation of the system must cause engine shutdown.</p>	
<p><b>Inspection #13:</b> The purpose of this inspection is to document the contractor's request to extend the date for submitting their final investigation report for an incident that occurred on July 8, 2019 in the main civil works area.</p>			
		<b>No Orders</b>	August 8, 2019
<p><b>Inspection #14:</b> WorkSafeBC conducted an inspection to verify concerns expressed in a discriminatory action complaint.</p> <p>A worker expressed concerns about the operation of rock trucks at the Site C Dam Project. Specifically the excavation of the core trench on the right bank. The worker had concerns about the height of the berm/curb where trucks could dive over an edge. The worker expressed concerns about communication amongst drivers and other equipment operators, the worker had concerns about orientation and training and the lack of wheel chock use.</p> <p>The worker expressed these concerns to the general foreman and later a member of the health and safety team. The same evening that the concerns were expressed, the worker was told their employment was being terminated.</p> <p>It was confirmed from discussions with the contractor that the worker's concerns were not fully investigated and it was observed at the time of inspection they had not been remedied without undue delay.</p>			

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
Low Risk	Reporting unsafe conditions	<b>Order #1 - OHS3.10:</b> Whenever a person observes what appears to be an unsafe or harmful condition or act, the person must report it as soon as possible to a supervisor or to the contractor, and the person receiving the report must investigate the reported unsafe condition or act and must ensure that any necessary corrective action is taken without delay.	August 9, 2019
Low Risk	General Conditions	<b>Order #2 - OHS4.63:</b> The contractor failed to install a curb, where practicable, whenever there is a danger of a vehicle or other equipment running off the edge of an elevated area.	
Low Risk	General Conditions	<b>Order #3 - OHS4.3(1)(b)(i):</b> The contractor failed to ensure that each tool, machine and piece of equipment in the workplace is capable of safely performing the functions for which it is used and is selected, used and operated in accordance with the manufacturer's instruction, if available.	
Low Risk	Safety Documentation	<b>Order #4 - OHS3.25:</b> The contractor failed to keep records of all training proved under sections 3.23 and 3.24 as the contractor does not have written records of the on-the-job-training (e.g., ride along/competency verification)	
Low Risk	General duties of employers	<b>Order #5 - WCA115(2)(e):</b> The contractor failed to provide the workers the information, instruction, training and supervision necessary to ensure the health and safety of those workers in carrying out their work and to ensure the health and safety of other workers at the workplace.	
Low Risk	General duties of employers	<b>Order #6 - WCA115(1)(a):</b> The contractor failed to ensure the health and safety of all workers working for that contractor and any other workers present at a workplace where the contract is being carried out.	

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #15:</b> WorkSafeBC attended the workplace as a result of a shotcrete failure incident that involved the potential for serious injury to workers. The contractor noted a failure of fibre reinforced shotcrete at station 0+672 to 9+690. Work was stopped and WorkSafeBC was notified. No workers were present at the time of failure.</p>			
High Risk	Stop Work Order	<p><b>Order #1 - WCA191(1):</b> Pursuant to section 191(1) of the Workers Compensation Act, the Board orders that all work in the right bank drainage tunnel is immediately stopped, and that the workplace or any part of the workplace be cleared of persons and isolated by barricades, fencing or any other means suitable to prevent access to the area until the danger is removed.</p>	August 14, 2019
Low Risk	Special inspection	<p><b>Order #2 - OHS3.7:</b> A special inspection must be made of the right bank drainage tunnel due to a failure of the shotcrete between stations 0+670 and 0+690.</p>	
<p><b>Inspection #16:</b> This inspection report contains an order for BC Hydro to complete a special inspection of the right bank drainage tunnel following a shotcrete collapse. BC Hydro is pursuing completion of this activity. This had been immediately reported to WorkSafeBC by the responsible prime contractor (not BC Hydro). BC Hydro's involvement is related to engineering and design.</p>			
Low Risk	Special inspections	<p><b>Order #1 - OHS3.7:</b> A special inspection must be made when required by malfunction or accident.</p>	August 14, 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #17:</b> Due to some questions being posed by BC Hydro, the following comments are from WorkSafeBC.</p> <p>The remediation procedures accepted for the left bank diversion tunnel outlet #1 may need to be revisited for the following reasons:</p> <ul style="list-style-type: none"> <li>• The outlet portal has been excavated, leaving a 20 to 30 foot drop to ground level that has changed the access;</li> <li>• The rock/tunnel conditions may have changed since the original incident; and</li> <li>• Due to the above two items procedures may need to be adjusted to reflect the current situation and ensure all of part 22 and other parts of the regulation are being followed.</li> </ul> <p>After the verification and potential re-submission of the remediation plan, WorkSafeBC would expect to see the following steps:</p> <ul style="list-style-type: none"> <li>• Remediation;</li> <li>• Assurance in writing that the tunnel is now safe;</li> <li>• Apply the updated inspection/verification process as occurred in left bank diversion tunnel outlet #2. After work is fully completed an updated package signing off the changes by a qualified professional; and</li> <li>• In left bank diversion tunnel outlet #1 apply potential changes that align with CO275 as completed in left bank diversion tunnel outlet #2. Same sign off as the line above. Across site apply the updated inspection/verification process and resulting work.</li> </ul>			
		<b>No Orders</b>	August 23, 2019
<p><b>Inspection #18:</b> Due to some questions being posed by the prime contractor, the following comments are from WorkSafeBC.</p> <p>The remediation procedures accepted for the left bank diversion tunnel outlet #1 may need to be revisited for the following reasons:</p> <ul style="list-style-type: none"> <li>• The outlet portal has been excavated, leaving a 20 to 30 foot drop to ground level that has changed the access;</li> <li>• The rock/tunnel conditions may have changed since the original incident; and</li> <li>• Due to the above two items procedures may need to be adjusted to reflect the current situation and ensure all of part 22 and other parts of the regulation are being followed.</li> </ul> <p>After the verification and potential re-submission of the remediation plan, WorkSafeBC would expect to see the following steps:</p> <ul style="list-style-type: none"> <li>• Remediation;</li> <li>• Assurance in writing that the tunnel is now safe;</li> <li>• Apply the updated inspection/verification process as occurred in left bank diversion tunnel outlet #2. After work is fully completed an updated package signing off the changes by a qualified professional; and</li> <li>• In left bank diversion tunnel outlet #1 apply potential changes that align with CO275 as completed in left bank diversion tunnel outlet #2. Same sign off as the line above. Across site apply the updated inspection/verification process and resulting work.</li> </ul>			
		<b>No Orders</b>	August 23, 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #19:</b> The contractor has provided inspection results as part of the incident immediate compliance inspection report on August 14, 2019. This inspection report revealed that there are known hazard areas in the right bank drainage tunnel. Through meetings and conversation it has been revealed that the contractor intends to proceed to the failure area unless significant hazards are discovered following their entry procedures. The contractor report risk ranked known hazards and an area (670 m to 690 m) highlighted in orange failed while working on area further into the tunnel system. This indicates that the contractor has previously been traveling past known hazard areas to conduct work.</p>			
Low Risk	Emergency Requirements	<p><b>Order #1 OHS22.53(1):</b> Only workers trained for emergencies may enter or remain in any underground working dangerous to life or health by virtue of other hazardous conditions, and no other work may be performed until the hazardous condition has been eliminated or controlled.</p>	August 27, 2019
<p><b>Inspection #20:</b> WorkSafeBC conducted an inspection on the sub-contractor's river boat vessel.</p>			
Low Risk	Vehicle design	<p><b>Order #1 - OHS17.10(1)(h):</b> The contractor failed to equip the vessel with the appropriate first aid equipment, under Occupational Health and Safety Regulation section 3.16 or 3.2, and with appropriate fire extinguishers in good working order.</p>	August 28, 2019
Low Risk	Seating design	<p><b>Order #2 - OHS17.12(a):</b> The contractor failed to equip the vessel with seats that are safely located and securely attached to the vehicle, with a width of at least 41 cm (16 in) for each passenger and an upholstered seat and seat back which provides normal and comfortable seating for passengers.</p>	
Low Risk	Maintenance and inspection	<p><b>Order #3 - OHS17.24(1):</b> The contractor failed to ensure the vessel is inspected before initial use that is fit for safe operation, and at intervals that will prevent the development of unsafe conditions.</p>	

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #21 – 201917876042A (Peace River Hydro Partners):</b> The purpose of this inspection report is to document the contractor request to extend the date for submitting their final investigation report for an incident that occurred on July 8, 2019.</p> <p>This incident resulted from two 50mm shotcrete support layers at heading section failed within a newly constructed left bank diversion Tunnel No. 1 outlet area.</p>			
No Orders			August 29, 2019
<p><b>Inspection #22 – 201918983014A (Duz Cho Construction):</b> WorkSafeBC conducted an inspection as part of the 2019 WorkSafeBC Forestry High Risk Strategy.</p> <p>The contractor is in a multiple employer workplace which have the responsibility to coordinate activities relating to occupational health and safety.</p>			
Low Risk	Coordination at multiple-employer workplaces	<b>Order #1 - WCA 118(2)(b):</b> The prime contractor of a multiple-employer workplace failed to do everything that is reasonable practicable to establish and maintain a system or failed to ensure compliance with the <i>Workers Compensation Act</i> Part 3 and the regulations in respect of the workplace.	September 5 , 2019
<p><b>Inspection #23:</b> WorkSafeBC conducted an inspection as part of the 2018-2020 WorkSafeBC Forestry High Risk Strategy.</p> <p>The contractor has been contracted to conduct hand falling, bucking, and slashing operations. The job-site (Block OLTC7) has been established as boat access only and is located approximately 7 km up river from the Site C main boat launch.</p> <p>Due to the isolated location and high risk of work activities, the following was discussed:</p> <ul style="list-style-type: none"> <li>• Emergency Response Plan;</li> <li>• Falling cuts and maintaining control of the tree being felled;</li> <li>• Avoiding unnecessary brushing of standing trees and timber; and</li> <li>• Falling plan and active falling area.</li> </ul>			
Low Risk	Access to work areas	<b>Order #1 - OHS4.32:</b> The contractor failed to ensure a safe way of entering and leaving each place where work is performed and a worker must not use another way, if the other way is hazardous.	September 5 , 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #24:</b> This inspection report is related to a July 16, 2019 tower crane misadventure that included contractors worker dropping, uncontrolled a new, 34 mm X 600 meter load line approximately 90 meters from tower crane 3 jib to the ground during installation. This was the final assembly of the tower crane before placing it into service at this workplace.</p>			
Low Risk	Modifications	<p><b>Order #1 OHS14.15(1):</b> Each crane or hoist must be erected, dismantled, operated, adjusted, inspected and maintained as specified by the manufacturer's manual unless otherwise approved by the original equipment manufacturer or a professional engineer.</p>	September 9, 2019
High Risk	Tower Crane Erection	<p><b>Order #2 OHS14.73.2:</b> The erection, climbing and dismantling of a tower crane must be done by qualified persons and in accordance with the instructions of:</p> <ul style="list-style-type: none"> <li>(a) the crane manufacturer; or</li> <li>(b) a professional engineer; if the installation varies from the crane manufacturer's instructions.</li> </ul>	
<p><b>Inspection #25:</b> This inspection report is the result of discussions between WorkSafeBC and BC Hydro. The Inspection report contains one order to BC Hydro. The order is a Directive Order and is not a regulatory non-compliance order. The order directs BC Hydro, as owner of the Site C project, to provide certain technical information to the prime contractor on the Project.</p>			
Low Risk	General duties of owner	<p><b>Order #1 WCA119(b):</b> Every owner of a workplace must give the prime contractor at the workplace the information known to the owner that is necessary to identify and eliminate or control hazards to the health or safety of persons at the workplace. The Prime contractor responsible for tunneling work does not have the information they require to make decisions.</p>	September 10, 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #26:</b> WorkSafeBC conducted an inspection as part of the WorkSafeBC's 2018-2020 Construction High Risk Strategy Initiative.</p> <p>The goal of this initiative is to prevent unsafe acts or conditions that cause workplace serious injuries and fatalities by addressing identified shortcomings in planning and supervision and by ensuring a proper selection of tools, equipment, or processes.</p> <p>At the time of the inspection, scaffolding and formwork was being erected and maintained at the left bank diversion tunnels for the purpose of constructing various inlet and outlet structures.</p>			
Low Risk	Scaffold stability	<p><b>Order #1 - OHS 13.17(2):</b> The contractor failed to ensure the base of the scaffold at the base of the Fishway entrance pool formwork have sills resting on a solid surface and are sufficient to support the weight of the scaffold.</p>	September 18, 2019
Low Risk	Manufactured components	<p><b>Order #2 - OHS 13.15(a):</b> The contractor failed to ensure the major components of scaffolds are used in accordance with the technical data provided by the manufacturer, or in writing by a professional engineer, that shows the rated load, erection procedures and compliance with an applicable standard under section 13.2</p>	
Low Risk	Inspections	<p><b>Order #3 - OHS 13.3:</b> The contractor failed to ensure the stair tower at the left bank diversion Tunnel No. 2 Inlet is inspected before use on each shift, after any modification, and any condition that might endanger workers that must be remedied before the equipment is used.</p>	
<p><b>Inspection #27:</b> WorkSafeBC conducted an inspection in the new rebar laydown area within the left bank cofferdam area above the tunnel outlet portal as part of the 2019 Construction High Risk Strategy. WorkSafeBC discussed with the contractor's health and safety responsibilities with regards to preventing falls from heights.</p>			
High Risk	Specifications for guards and guardrails	<p><b>Order #1 – OHS 4.58(2):</b> The contractor failed to install complaint guardrails to ensure the workers are protected from the fall hazard.</p>	September 18, 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #28:</b> WorkSafeBC conducted a follow-up meeting with the contractor. The purpose of the conversation was in part to review the progress towards submission of the final investigation report for the 50 mm shotcrete support layers at the heading section failed within a newly constructed left bank diversion Tunnel No. 1 outlet area.</p> <p>Following a meeting on September 20, 2019, the contractor sent an email to WorkSafeBC to formally request an extension until November 4, 2019.</p> <p>The original due date for the contractor 30 day 'full investigation' report was August 8, 2019 as per inspection report issued by the Occupational Safety Officer.</p> <p>An extension had been previously granted which was documented within an inspection report to extend the due date.</p> <p>A further extension had been granted by the Occupational Safety Officer.</p> <p>After considering the most recent explanation and progress report provided by the contractor and further verified by BC Hydro, another extension has been granted until November 4, 2019 to complete and submit the incident investigation report.</p>			
No Orders			September 20, 2019
<p><b>Inspection #29:</b> WorkSafeBC has learned that a misunderstanding has occurred in regards to roles, responsibilities and compliance requirements.</p> <p>BC Hydro, the owner of the Site C Project has conducted the engineering and is the official engineer of record for the design on the main civil works contracts for the Site C Clean Energy Project. The contractor has entered into a contract from the owner that identifies them as the prime contractor for main civil works, the contract provides for the construction activities to execute the work process to complete to the final design as per the engineer of record.</p> <p>During previous inspection activities, the contractor has been requested, advised or directed, through inspectional text or orders, to provide assurances relating to some of the construction activities. In order to clarify those expectations, the following parameters are being provided to identify who is expected to provide the assurances.</p> <p>Where the requested/directed assurance is related to: safe workplace, safe for entry, (etc.), the assurance must be provided by the engineer of record. Where the requested/directed assurance is related to confirming work practices or standards, conformity to design or field instruction, the assurance is to be provided by the contractor or the engineer of record.</p> <p>BC Hydro was previously directed to provide information to the prime contractor information in their possession, as per the requirements of WCA 119, to date this has been substantially complied. The opportunity has been provided to the contractor to review the design criteria and modelling. The contractor's responsibility for the design is limited to the implementation of the design or any field instructions which have been prepared in accordance with good engineering principles.</p>			
No Orders			September 26, 2019

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #30:</b> The inspection report cancels and replaces inspection report that was issued on August 23, 2019 to the contractor and suggested specific revisions to safe work procedures for the remediation of a shotcrete failure in diversion tunnel one at Site C. This updated inspection report specifies that written safety assurances are expected to come from the engineer of record.</p>			
		No Orders	September 26, 2019
<p><b>Inspection #31:</b> The inspection report cancels and replaces inspection report that was issued on August 23, 2019 to BC Hydro and suggested specific revisions to safe work procedures for the remediation of a shotcrete failure in diversion Tunnel No. 1 at Site C. This updated inspection report specifies that written safety assurances are expected to come from the engineer of record.</p>			
		No Orders	September 26, 2019

1 **Ministry of Energy, Mines and Petroleum Resources**

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
<p><b>Inspection #1:</b> The Portage Mountain quarry is being developed by the contractor with the material destined for BC Hydro's Site C project. The mine is located on a hillside, and the working face has been narrowed due to wildlife issues. This has resulted in a steep switchback ramp going up the face.</p>			
Low Risk	Emergency Preparedness	<b>Order #1 <i>Mines Act</i> Section 3.9.1:</b> The contractor failed to ensure the fire extinguishers on the contract drills parked in the laydown area have up-to-date inspection records	July 25, 2019
Low Risk	Mine Design	<b>Order #2 <i>Mines Act</i> Section 6.9.1:</b> The contractor failed to ensure that the haul roads for single lane traffic must be twice the width of the largest haul truck running on that road and berms must be $\frac{3}{4}$ height of the largest tire running the road.	

**Site C Clean Energy Project**

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**Quarterly Progress Report No. 17**

**Appendix C**

**Summary of Individual Contracts Exceeding  
\$10 Million**

**PUBLIC**

# **CONFIDENTIAL ATTACHMENT**

## **FILED WITH BCUC ONLY**

**Site C Clean Energy Project**

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**Quarterly Progress Report No. 17**

**Appendix D**

**Project Progression**

**PUBLIC**

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**Quarterly Progress Report No. 17**

**Appendix E**

**Detailed Project Expenditure**

**PUBLIC**

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## **Site C Clean Energy Project**

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### **Quarterly Progress Report No. 17**

#### **Appendix F**

#### **Workforce Overview**

1  
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**Table F-1 Current Site C Jobs Snapshot  
 (July 2019 to September 2019)<sup>18</sup>**

	<b>Number of B.C. Workers and Total Workers</b>	<b>Construction and Non-construction Contractors<sup>19</sup> (including some Subcontractors). Excludes Work Performed outside of B.C. (e.g., Manufacturing)</b>	<b>Engineers and Project Team<sup>20</sup></b>	<b>Total</b>
July 2019	BC Workers	2,925	671	3,596
	Total Workers	4,070	727	4,797
August 2019	BC Workers	3,060	641	3,701
	Total Workers	4,177	693	4,870
September 2019	BC Workers	2,949	685	3,634
	Total Workers	4,057	733	4,790

3 Employment numbers provided by Site C contractors are subject to revision. Data  
 4 not received by project deadline may not be included in the above numbers.

5 BC Hydro has contracted companies for major contracts, such as main civil works,  
 6 who have substantial global expertise. During the month of September 2019 there  
 7 were seven workers in a specialized position working for Site C construction and  
 8 non-construction contractors, which were subject to the Labour Market Impact  
 9 Assessment process under the Federal Temporary Foreign Worker Program.  
 10 Additionally, there were 60 management and professionals working for Site C  
 11 construction and non-construction contractors through the Federal International  
 12 Mobility Program.

<sup>18</sup> Employment numbers are direct only and do not capture indirect or induced employment.

<sup>19</sup> Construction and non-construction contractors includes work performed on the Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services.

<sup>20</sup> Engineers and project team are comprised of both on-site and off-site workers. The Project team includes BC Hydro construction management and other off-site Site C project staff. An estimate is provided where possible if primary residence is not given.

1 **Table F-2 Preliminary Site C Apprentices Snapshot**  
2 **(July 2019 to September 2019)**

Month	Number of Apprentices
July 2019	204
August 2019	184
September 2019	185

3 Data is subject to change based on revisions received from the contractors.

4 **Table F-3 Current Site C Job Classification**  
5 **Groupings**

Biologists and laboratory	Carpenters	Inspectors	Construction managers/supervisors	Crane operators	Electricians	Engineers
Foresters	Health care workers	Heavy equipment operators	Housing staff	Heating, ventilation, and air conditioning	Kitchen staff	Labourers
Mechanics	Millwrights	Office staff	Pipefitters	Plumbers	Sheet metal workers	Truck drivers
Underground mining	Welders	Surveyors	Security guards	Boilermakers	Cement Masons	Crane Operators
Ironworkers						

6 **Table F-4 Indigenous Inclusion Snapshot**  
7 **(July 2019 to September 2019)**

Month	Number of Indigenous Workers
July 2019	377
August 2019	418
September 2019	401

8 The information shown has been provided by BC Hydro's on-site<sup>21</sup> construction and  
9 non-construction contractors and their subcontractors that have a contractual  
10 requirement to report on Indigenous inclusion in their workforce.

11 Employees voluntarily self-declare their Indigenous status to their employer and  
12 there may be Indigenous employees that have chosen not to do so, therefore, the  
13 number of Indigenous employees may be higher than shown in the table.

<sup>21</sup> On-site includes work performed on Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services.

1 As with any construction project, the number of workers, and the proportion from any  
2 particular location, will vary month-to-month and also reflects the seasonal nature of  
3 construction work. The number of workers will also vary as a contract's scope of  
4 work is completed by the contractor.

5 ***Women***

6 In September 2019, there were 517 women working for Site C construction and  
7 non-construction contractors. The number of women was provided by  
8 on-Site Construction and non-construction contractors and engineers that have a  
9 contractual requirement to report on the number of women in their workforce.

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## **Site C Clean Energy Project**

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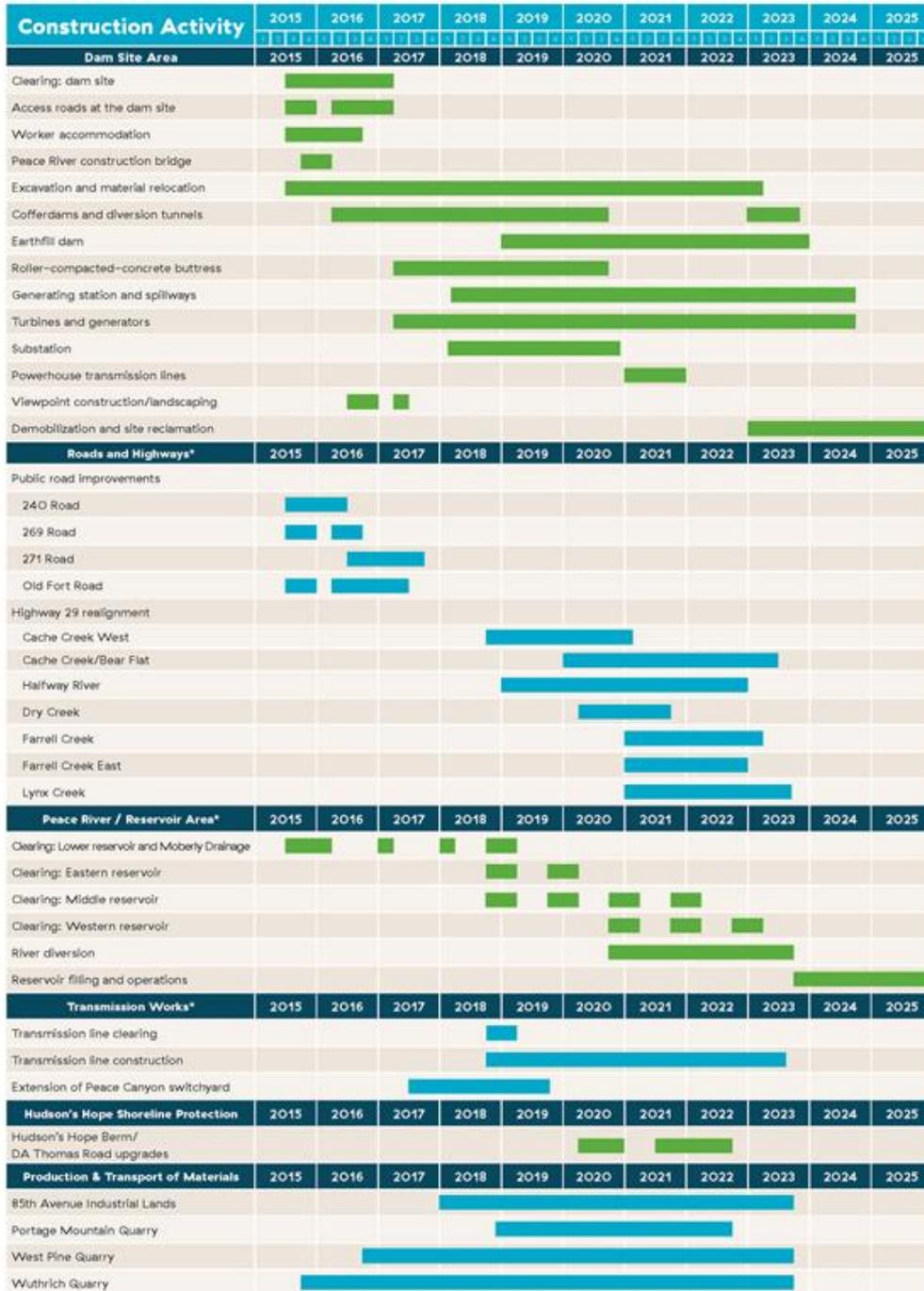
### **Quarterly Progress Report No. 17**

#### **Appendix G**

#### **Site C Construction Schedule**

## Site C Construction Schedule

October 2018  
SC19-1008



The construction schedule is indicative only and subject to change. The purpose of the schedule is to illustrate the general sequence of construction activities, but the dates and schedule may change.  
\* Timelines do not include site preparation or wood disposal.