BC Hydro
Power smart

Site C Clean Energy Project

Quarterly Progress Report No. 23

F2022 Second Quarter

July 1 to September 30, 2021

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1 Executive Summary

1.1 Overview and General Project Status

In June 2021, Treasury Board approved a revised budget for the Site C Project (the **Project**) of $16 billion and a revised schedule with an in-service date in 2025. This revised budget and schedule had been announced by the Government of British Columbia on February 26, 2021. The revised budget and schedule address significant cost pressures and delays faced by the Project due to the COVID-19 pandemic, as well as the right bank foundation enhancements and other cost pressures being managed by the Project prior to COVID-19, as summarized in previous progress reports. With the Project more than 50 per cent complete, BC Hydro continues to actively manage potential cost and schedule risks.

The most significant challenge as of the reporting date of September 30, 2021, continues to be the impacts of the global COVID-19 pandemic. In August 2021, the Northern Health Authority (**Northern Health**) declared a second COVID-19 outbreak on the Site C Project. A substantial majority of the workers testing positive were not vaccinated, and the cases were a combination of workplace transmission at the Project and community transmission from outside of the Project. The outbreak was declared over on October 12, 2021. The Project continues to operate under health orders related to industrial camps and large projects.

The second significant challenge relates to the work required to respond to the geotechnical issues on the right bank. By early 2020, BC Hydro had determined that significant foundation enhancements were required to increase the stability of the bedrock foundations under the powerhouse, spillways, right bank dam core area and other structures on the right bank. During the quarter, the Technical Advisory Board and independent dam experts continued to review and provide input to the design and construction of the right bank foundation enhancements. These enhancements

include installation of large piles to further extend the foundation deeper into the bedrock and changes to the design of the approach channel above the powerhouse and spillways. During the quarter, installation of the steel piles began in the spillway stilling basin. The Technical Advisory Board and independent dam experts have confirmed that the Project design continues to meet the highest safety standards and international best practices.

BC Hydro continues to monitor and assess these challenges, and other significant risks with potential cost, schedule and scope implications, including the continuation of the COVID-19 pandemic and potential impacts to on-site construction activities; commercial negotiations with contractors; design finalization for the foundation enhancements and related procurements; procurements for the balance of plant contracts; the ability of the Project to attract and retain sufficient skilled craft workers; and the possibility that the Blueberry River Decision affects the timing of the issuance of provincial permits required for the completion of the Project. Despite challenges, the Project continued to advance through the important summer construction season and achieved significant construction milestones with the full completion of the Project's roller-compacted concrete buttress and significant progress on the earthfill dam. BC Hydro and Site C contractors continue to schedule work and explore strategies to accelerate the work delayed by the COVID-19 pandemic. If successful, this will result in lowering the schedule risk and could result in an earlier in-service date; however, achieving an earlier in-service date remains subject to uncertainty and to the risks summarized in this report. The sections below discuss the major challenges and successes during the quarter in further detail.

1.2 COVID-19 Pandemic at Site

In August 2021, after a period of five weeks with no COVID-19 cases at site, COVID-19 cases on the Project began to rise as British Columbia entered the pandemic's fourth wave. On August 18, 2021, Northern Health declared a second

COVID-19 outbreak on the Site C Project. Project construction continued as planned with the implementation of additional safety measures. In total, 92 cases were associated with the outbreak (involving separate clusters of COVID-19 activity); the substantial majority of which occurred in unvaccinated workers. All the individuals diagnosed with COVID-19 have since recovered.

During the reporting period, BC Hydro was directed by Northern Health to collect the vaccination status of workers on the Site C Project. The Project is required to provide the percentage of workers who are fully or partially vaccinated with a Health Canada approved COVID-19 vaccine, and the percentage of workers who are unvaccinated. Subsequent to the reporting period, as of October 12, 2021, the Project had received a total of 2,788 completed vaccination status records out of an expected 3,880 forms (72 per cent response rate). Assuming the vaccination profile of workers who did not submit their forms is similar to the Northern Health region vaccination profile, which is significantly lower than British Columbia overall, the data showed Site C workers are between 75 per cent to 83 per cent vaccinated. If the number of unvaccinated workers among those who did not submit their forms is substantially higher than the Northern Health region rate, the Site C overall percentage would be higher. This information is helpful in the planning of next steps for BC Hydro's vaccination policy and ongoing COVID-19 exposure prevention measures.

As of September 30, 2021, the onsite medical clinic had administered 3,578 COVID-19 vaccinations, of which 1,985 were first doses and 1,593 were second doses.

Subsequent to the reporting period, on October 7, 2021, BC Hydro announced it would require proof of vaccination from all BC Hydro employees and from all other individuals working at a BC Hydro facility, including those working at the Project.

BC Hydro employees will be required to have one dose of the COVID-19 vaccine by November 22, 2021, and be fully vaccinated by January 10, 2022. The November 22, 2021, date aligns BC Hydro with the date announced by the Province of British Columbia for the Public Service Agency and allows enough time for unvaccinated employees to be fully vaccinated.

Consultants and employees of contractors and sub-contractors working at a BC Hydro facility, including the Project, will also be required to be fully vaccinated by January 10, 2022. BC Hydro is monitoring the potential impacts on employee and contractor workforces as a result of the implementation of the vaccine policy.

1.3 The B.C. Supreme Court decision in Yahey v British Columbia

On June 29, 2021, the Supreme Court of British Columbia released its decision in *Yahey v British Columbia* (the **Blueberry River Decision**), determining that the cumulative impacts from a range of provincially authorized industrial activities (primarily oil and gas and forestry) within Blueberry River First Nations traditional territory constituted an infringement of Blueberry River First Nations Treaty 8 rights. BC Hydro was not a party to that court case.

To date, BC Hydro continues to be issued permits and authorizations in accordance with its construction timelines. As of September 30, 2021, 519 of the estimated 600 provincial and federal permits required for the Project have been received and are actively being managed. The remaining authorizations fall within the footprint and description of the Project that was approved in 2014. The remaining permits are required for construction activities to achieve completion of Site C, as approved.

BC Hydro continues to consult with Blueberry River First Nations and all Treaty 8 First Nations, and remains willing to negotiate an Impact Benefit Agreement with Blueberry River First Nations.

1.4 Right Bank Foundation Enhancements Reviews Continue, Installation Begins

Ongoing reviews by the Technical Advisory Board and independent dam experts continue to confirm that the design of the foundation enhancements to address geotechnical issues in the bedrock foundation on the Project's right bank meet the highest safety standards and international best practices. The foundation enhancements include the installation of large piles to further extend the foundation deeper into the bedrock and enhancements to the design of the approach channel above the powerhouse and spillways.

During the reporting period, activities on the right bank foundation enhancements focused on finalizing the design of the steel piles, continuation of design enhancements for the approach channel, and, in September 2021, the commencement of the installation of the steel piles located within the spillways stilling basin.

1.5 Upholding Commitments to the Environment, Indigenous Groups and Local Communities

Work advanced in the areas of environmental monitoring and assessment as well as in the Project's fish, wildlife, habitat, vegetation management and heritage programs. During the reporting period, environmental activities focused on responding to and assessing noise, light and air quality concerns within the Hudson's Hope area as well as refining the operations of the temporary fish passage and operating a contingency trap and haul program to augment the fish passage.

Throughout the quarter, BC Hydro continued to engage, build relationships and find solutions together with the First Nations communities most impacted by Site C.

1.6 Despite the COVID-19 Pandemic, Construction Progress Continued

Despite the challenges of the COVID-19 pandemic, construction of the Project continued to advance through the busy summer construction season. BC Hydro and Site C contractors continue to schedule work and explore strategies to accelerate the work delayed by the COVID-19 pandemic. If successful, this will result in lowering the schedule risk and could result in an earlier in-service date; however, achieving an earlier in-service date remains subject to uncertainty and to the risks summarized in this report.

In the generating station and spillways civil works area, construction progressed with the ongoing placement of concrete in the powerhouse, intakes and spillways; installation of the penstock segments; and construction of the steel super-structure for the powerhouse. By concrete volume, the generating station and spillways civil works sub-project is approximately 55 per cent complete.

In the main civil works area, roller-compacted concrete placements continued at the dam and core buttress on the right bank, and on October 8, 2021, the dam and core buttress was substantially completed. This marked the final completion of the Project's roller-compacted concrete buttress. In total, since 2017, crews placed nearly 1.7 million cubic metres of roller-compacted concrete in the combined powerhouse, spillways and dam and core buttresses.

Placements of dam core and fill material continued on the left, centre section and right banks of the earthfill dam. Excavations for the approach channel also continued.

Off-dam site, during the reporting period, stringing began on the second 500 kV transmission line connecting Site C to the Peace Canyon generating station. Crews completed the Halfway River bridge deck and construction advanced on six segments of Highway 29. Construction continued on the Hudson's Hope berm.

1.7 Update on the Implementation of the Peter Milburn Recommendations

As of September 30, 2021, all recommendations from the independent review of the Project by special advisor Peter Milburn were completed. All governance-related recommendations were fully implemented. This includes changing the structure of the Project Assurance Board by having a majority of independent members on the Board with expertise in the following areas: capital project construction and management; delivery of major civil projects; commercial negotiations; construction-related claims settlements; and other areas.

The Project Assurance Board has also appointed a commercial sub-committee, which has been actively providing oversight on ongoing key construction, schedule, cost reporting, claims management and other commercial matters.

BC Hydro has added additional resources to the risk management, claims management and construction management teams, as recommended.

1.8 Project Status Dashboard for the Quarter

BC Hydro, with oversight from the Project Assurance Board, is focused on completing the Site C Project within the budget of $16 billion and a 2025 in-service date, without compromising on safety, scope and quality. To report on Project status, BC Hydro uses a dashboard system where key Site C Project areas are classified as red (at risk), amber (moderate issues) or green (on target).

The Project Status Dashboard is provided in Table 1 below. The notable change from the previous quarter includes the procurement indicator changing to “amber” this quarter. The “amber” indicator reflects the ongoing procurement processes for balance of plant and the right bank foundation enhancements.

Table 1 Project Status Dashboard

● On Target ● Moderate Issues ● At Risk

Status as of:		September 2021
Overall Project Health	●	Overall Project health remained "amber" during the quarter. The budget and schedule were approved in June 2021 and address significant cost pressures and delays faced by the Project due to the COVID-19 pandemic, as well as the right bank foundation enhancements and other cost pressures being managed by the Project prior to COVID-19. The Technical Advisory Board and independent experts continued to review and confirm BC Hydro's foundation enhancements solution is appropriate and sound, and will make the right bank structures safe and serviceable over the long operating life of Site C. The Project is more than 50 per cent complete. BC Hydro continues to review, assess, manage and monitor significant potential risks to the Project.
Safety	●	Safety remained "amber" during the quarter. Management of COVID-19, including working through a second declared outbreak and a higher rate of cases in general, remained a priority in the reporting period. BC Hydro continues to work closely with Northern Health on case and contact management, asymptomatic rapid testing, compliance with health orders including vaccination status reporting, and other containment measures. The Site C medical clinic continues to provide vaccinations, which are offered to all Site C workers working at onsite and offsite work locations. As of September 30, 2021, the onsite Site C medical clinic had administered 3,578 COVID-19 vaccinations, of which 1,985 were first doses and 1,593 were second doses. Subsequent to the reporting period, on October 7, 2021, BC Hydro announced that commencing January 10, 2022, it would require proof of full vaccination from all BC Hydro employees and from all other individuals working at a BC Hydro facility, including those working at the Project. During the reporting period, there were nine serious or significant safety incidents consisting of seven near misses with the potential for a serious injury, and two serious injuries that required medical attention. There has been an overall increase in safety incidents during this high activity construction season. To encourage active learning from significant safety incidents across all work fronts and contractors, the Project held 41 Safety Incident reviews. The safety trends for this reporting period were hot work, confined space, working at heights and object falls from height.
Scope	●	Scope remained "amber" during the quarter as a number of aspects of the Project still require finalization. Provisions are included in the Project plans for potential scope adjustments to site conditions and interfaces. As construction progresses, there remains a risk of design changes due to unknown field conditions. The Technical Advisory Board and independent experts have confirmed that BC Hydro's right bank foundation enhancements solution is appropriate and sound and will make the right bank structures safe and serviceable over the long operating life of Site C; they will continue to review the designs as they are finalized and the remaining construction of the Project.

Status as of:		September 2021
Schedule	🟡	The Project is currently on schedule to achieve the approved 2025 in-service date; however, schedule risks remain. As the Project is more than 50 per cent complete, there are still potential scheduling risks that BC Hydro is reviewing, assessing and managing. BC Hydro and Site C contractors continue to schedule work and explore strategies to accelerate work delayed by COVID-19. If successful, this will result in lowering the schedule risk and could result in an earlier in-service date; however, achieving an earlier in-service date remains subject to uncertainty and to the risks summarized in this report.
Cost	🟡	Cost remained "amber" during the quarter. The revised budget addresses cost pressures due to the COVID-19 pandemic, need for foundation enhancements on the right bank, and other cost pressures the Project was managing prior to the COVID-19 pandemic. Significant potential cost risks remain, including the continuation of the COVID-19 pandemic, the continuation of commercial negotiations with contractors, procurements for the remaining work and equipment, and the availability of skilled craft workers. As of September 30, 2021, the life-to-date actual costs are $7.9 billion, which results in a remaining budget of $8.1 billion.
Quality	🟢	The overall quality rating for the Project continued to be good during the reporting period, indicating that the work generally conforms to the requirements of the drawings and specifications. At the dam site, the quality of work by the main civil works, generating station and spillways civil works and turbine and generators contractors continues to be good. For offsite manufacturing, including hydromechanical equipment, cranes, electrical components and foundation-enhancement pilings, BC Hydro continues its regular meetings with the respective suppliers to plan upcoming inspections and to coordinate with local quality assurance representatives to ensure quality requirements are satisfied prior to components being shipped.
Regulatory, Permits and Tenures	🟡	The status of the regulatory, permits and tenures indicator remains "amber" this quarter. The "amber" status reflects the possibility that the Blueberry River Decision could affect the timing of the issuance of provincial permits required for the completion of the Project. To date, BC Hydro continues to be issued permits and authorizations in accordance with its construction timelines. As of September 30, 2021, 519 of the estimated 600 provincial and federal permits required for the Project have been received and are actively being managed. The remaining authorizations fall within the footprint and description of the Project that was approved in 2014. The remaining permits are required for construction activities to achieve completion of Site C, as approved. BC Hydro is awaiting a decision on a proposal that BC Hydro amend one of three boat launch locations required by the Environmental Assessment Certificate from Cache Creek to a location close to Halfway River. A decision is expected in the late fall/winter of 2021. BC Hydro is awaiting the decision on the amendment to provide for contingency haul trucking from the 85th Avenue quarry. The conveyor will restart moving quarry materials in spring 2022 and the contingency haul trucking plan would be required next season if there are any issues with the conveyor.

Status as of:		September 2021
Environment	●	During the reporting period, the focus of the environmental work was on daily environmental compliance inspections. Focus remains on minimizing sediment and erosion across the dam site, care of water, hydrocarbon management, wildlife attractant management and invasive weed control. Operation of the temporary fish passage facility was refined during the reporting period and was periodically augmented by a contingent "trap and haul" program. As of August 30, 2021, more than 2,300 fish from seven species had been moved through the facility. Environment Canada initiated an investigation on October 10, 2018, with regards to a rainfall event in September 2018. In the month of September 2018, approximately 55 mm of rain fell causing the release of approximately four million litres of low pH storm water into the Peace River. BC Hydro subsequently increased the care of water system capacity along with other actions to reduce the potential of future similar events and no similar events have occurred; however, the investigation is still ongoing.
Procurement	●	The status of the procurement indicator changed to "amber" this quarter. In the previous quarter, the performance indicator was "green." The "amber" indicator is a result of the continued procurement process for balance of plant and right bank foundation enhancements. The balance of plant contract has been split into six packages and is being procured through 2021. During the reporting period, the balance of plant mechanical and electrical contracts were awarded and the remaining four contracts were posted on BC Bid. Evaluation of the architectural request for proposals is in progress. A number of commercial agreements have been established for the right bank foundation enhancements scope of work. With the design work still ongoing, additional agreements are required following the completion of the design.
Indigenous Relations	●	BC Hydro has a mandate from the Province of British Columbia to reach project or impact benefit agreements with the 10 Indigenous groups that are most impacted by Site C. Seven of 10 agreements are fully executed and in implementation. There are three mandated First Nations with whom BC Hydro has not negotiated agreements. West Moberly First Nations withdrew from confidential discussions to seek alternatives to litigation related to Site C in August 2019 and filed an amended Notice of Civil Claim in September 2019. Consultation is ongoing with impacted First Nations regarding options and site-specific plans for identified burial and cultural sites impacted by reservoir inundation, in particular in the Halfway River and Cache Creek Bear Flats areas.
Litigation	●	The treaty infringement claim filed by West Moberly First Nations in January 2018 remains active. An amended Notice of Civil Claim filed by West Moberly First Nations in September 2019, among other things, expanded their original treaty infringement action to include all three Peace River facilities, not just Site C, and their alleged cumulative impacts. BC Hydro is preparing for the trial, which is scheduled to commence in March 2022.

Status as of:		September 2021
Stakeholder Engagement	●	BC Hydro continues to work with the communities, regional district and stakeholder groups on the implementation of various community agreements. Throughout the reporting period, BC Hydro continued sharing recurring COVID-19 updates (through calls and emails) with local community representatives and Northern Health. The District of Hudson's Hope commissioned their replacement water well system and the works are considered substantially complete. BC Hydro is providing water quality expertise to assist the District in refining the operation of their new system.

1.9 Significant Project Updates for the Quarter

Significant Project updates that occurred between July 1 and September 30, 2021, include the following:

- The balance of plant mechanical contract, the first of six procurement packages for the balance of plant, was awarded on July 29, 2021. Subsequent to the reporting period, the balance of plant electrical contract was awarded on September 22, 2021. Refer to section 3.1.5 for more information.
- In July 2021, BC Hydro contributed $36,075 to support four Peace Region non-profit groups through the Site C Project's Generate Opportunities (**GO**) Fund. Refer to section 12.1 for more information.
- Also in July 2021, stringing of the Project's second 500 kV transmission line, connecting Site C to the Peace Canyon substation, began. By the end of the reporting period, approximately 40 per cent of the line had been strung. Refer to section 3.1.7 for more information.
- In July 2021, BC Hydro concluded a settlement agreement with the generating station and spillways civil contractor on the impacts due to the COVID-19 pandemic. The agreement includes schedule recovery of most completion milestones that were impacted by the pandemic. Refer to section 3.1.3 for more information.
- On August 12, 2021, crews completed the final concrete deck placements on the Halfway River bridge, as part of the Highway 29 realignment sub-project. A

total of 2,300 cubic metres of concrete was placed on the 1.05-kilometre-long bridge deck in 13 concrete placements. Refer to section 3.1.8 for more information.

- On August 18, 2021, Northern Health declared a COVID-19 outbreak on the Site C Project. This step was taken to ensure the health and safety of the workforce and members of the public. A total of 92 workers were connected to this outbreak; all cases recovered. Northern Health declared the outbreak over on October 12, 2021. Refer to sections 1.2, and 2.1.1 for more information.
- On September 1, 2021, BC Hydro began accepting applications from non-profit recreation groups, local governments and Indigenous groups to develop rustic recreation sites along the Peace River or outside the Site C dam site and reservoir area. The $200,000 Rustic Recreation Site Fund was first launched in 2019.
- During the reporting period, BC Hydro was directed by Northern Health to collect the vaccination status of workers on the Site C Project. The Project is required to provide the percentage of workers who are fully or partially vaccinated with a Health Canada approved COVID-19 vaccine, and the percentage that are not vaccinated. Refer to sections 1.2 and 2.1.2 for more information.
- In September 2021, there were 4,963 total workers on the Site C Project. Of the total workers, 3,448 (69 per cent) were from British Columbia, and there were 1,031 workers on site from the Peace River Regional District (24 per cent of the construction and non-construction contractors' workforce). The onsite contractor workforce number also includes 12 per cent women (493 workers), 390 Indigenous workers and 183 workers who are working for various contractors as apprentice carpenters, electricians, millwrights, ironworkers,

mechanics, boilermakers and heavy equipment operators. Refer to section 11.3 for further information.

- Powerhouse construction continued throughout the reporting period, including concrete placements at the powerhouse, intakes and spillways; installation of penstock segments; and construction of the steel super-structure for the powerhouse. Refer to section 3.1.3 for more information.
- As of September 30, 2021, all recommendations from the independent review of the Project by special advisor Peter Milburn were complete. Refer to section 5.1 for more information.
- Subsequent to the reporting period, on October 8, 2021, crews completed the final placement of roller-compacted concrete in the dam and core buttress, marking the overall completion of the Project's roller-compacted concrete buttress. Refer to section 3.1.1 for more information.

Refer to Appendix A for site construction photos for the reporting period and refer to Appendix B for a list of work completed since the Project commenced in 2015.

2 Safety and Security

With the Project's work activities shifting to an increased focus on the building of the dam itself and new work scopes inside the powerhouse (the installation of turbines and generators and the initiation of the balance of plant sub-project), there was a shift in safety priorities during the reporting period. Management of COVID-19 was also a continued focus from July to September 2021.

2.1.1 COVID-19 Outbreak

From July to September 2021, the Project continued to see a steady increase in the number of COVID-19 cases at site, reflective of the Delta variant surge across the province. A second outbreak was declared by Northern Health on August 16, 2021,

and subsequently declared over on October 12, 2021. During the quarter, there were 135 positive cases on Site C, including 92 cases that were directly connected to the second outbreak.

Enhanced safety measures were reinstated during the second outbreak, including mandatory mask wearing in work sites (masks had remained mandatory in camp common areas prior to the outbreak), restrictions on community access for camp residents, and limitations on crew bus capacity. Additionally, rapid testing was implemented and used for enhanced case and contact tracing. With the outbreak declared over, all measures remain in place, except for restrictions on community access (camp residents are again able to visit the local community).

2.1.2 Site C COVID-19 Vaccinations

The Site C medical clinic continues to promote and provide vaccinations to all workers, both onsite and offsite. As of September 30, 2021, the onsite clinic had administered a total of 3,578 vaccinations (1,985 first doses and 1,593 second doses). Subsequent to the reporting period, the Site C medical clinic began to see a significant increase in vaccinations in response to the federal government announced requirement of mandatory vaccinations for domestic flights (commercial and charter), as well as BC Hydro's mid-October 2021 introduction of a mandatory vaccination policy for all BC Hydro employees and contractors. By January 10, 2022, BC Hydro will require proof of COVID-19 vaccination from all employees and contractors working at a BC Hydro facility across the province, including the construction site for the Site C Project; this gives contractors about three months to implement the new policy. Subsequent to the reporting period, as of October 29, 2021, the onsite clinic had administered a total of 3,882 vaccinations (2,157 first doses, 1,725 second doses and four third doses).

During the reporting period, BC Hydro was directed by Northern Health Authority to collect and report active workers' vaccination status. This vaccination status data

collection was completed in mid-October 2021; the Project achieved a 72 per cent response rate and, assuming a Northern Region vaccination profile for workers who did not submit their forms, a vaccination rate of about 83 per cent for at least one vaccine dose.

Seasonal flu vaccinations are now available at the Site C onsite medical clinic.

2.1.3 Confined Space Ventilation for Generating Units Spiral Case

In mid-summer 2021, the Project's main contractor for the turbines and generators sub-project started installing and welding inside the spiral case components of the generating units in the powerhouse. Once the bulkhead is installed into a spiral case, confined spaces are created with the resulting air quality safety hazards for workers. Project team safety verifications identified that the contractor's confined space and ventilation procedures were neither adequate nor compliant with new WorkSafeBC regulations.

The contractor has since made some immediate improvements for capture of welding fumes at source, established worker-friendly job aids for working in confined space (e.g., activity decision flowcharts posted at the entrance to each spiral case), and the contractor's occupational hygienist is working closely with BC Hydro on consistent air quality testing methods using new WorkSafeBC guidelines. The contractor is also working with a third-party firm on a longer-term engineered ventilation system to vent welding fumes outside the powerhouse. Learning from early ventilation challenges with unit 1, the contractor has changed their construction procedure to install the bulkhead later in the process, reducing confined spaces and the need for enhanced ventilation. The engineering solution is expected to be fully installed and operational by mid-November 2021.

2.1.4 Construction Traffic on Right Bank Cofferdam Haul Roads

In early September 2021, to support the building of the earthfill dam, the first contingent of one-tonne haul trucks arrived at site. Substantially increased haul traffic on roads shared with light duty vehicles and the addition of one-tonne haul trucks created traffic safety hazards in the congested cofferdam area. The contractor responsible for shared construction roads has now built single-direction construction roads with safety berms, installed extensive traffic signage and additional road lighting, and implemented a new traffic management plan for all workers using the construction roads. Additionally, the BC Hydro Site C safety team worked with the contractor to develop a haul road safety video, which is required training for all Project workers driving on those roads. Further road design and lighting improvements will be implemented before the 2022 construction season.

2.1.5 BC Hydro Safety Bulletins

In late June 2021, BC Hydro's Site C safety team launched a biweekly series of safety bulletins, focused on informing all project employees and direct contractors about active safety hazards related to the Project. Since the launch, the team has issued bulletins on extreme heat, BC Hydro's safe work observation program, safety responsibilities, tower crane safety, electrical safety, wildlife collisions, and excavation safety. An example is included in Appendix C.

2.1.6 Public Safety

Prior to the diversion of the Peace River in October 2020, BC Hydro implemented several public safety measures, including warning and danger signs upstream and downstream on the river itself. Some members of the public either did not see or did not take the warnings seriously, and travelled upstream to, or just past, the Site C construction bridge across the Peace River and into the area of the diversion outlet tunnels. In July and August 2021, BC Hydro responded to 17 incidents involving

boater trespassing. In early September 2021, the Project installed a large and clear danger sign directly onto the bridge, and there have been zero incidents since.

2.1.7 Summary of Safety and Regulatory Performance Metrics

From July 2015 through June 2021, all Project work fronts completed almost 37 million work hours, with no fatalities and one permanent partial disabling injury in 2017.

In this reporting period, there were nine serious safety incidents consisting of seven near misses with the potential to be a serious injury and two serious injuries that required significant medical attention treatment (e.g., surgery) and became lost time injuries. The workers are expected to make a full recovery. There were 283 non-serious incidents reported, including 104 near misses and 179 low-grade injuries that required first aid and some that required medical attention treatment such as stitches or prescriptions. A near miss is defined as an incident that could have resulted in an injury but did not because of effective hazard barriers or the person was out of harm's way/missed. BC Hydro considers near miss reporting as indicative of a strong and improving safety culture and is strongly encouraging all Site C contractors and employees to report near misses.

To encourage active learning from significant safety incidents across all work fronts and contractors, the Project held 41 Safety Incident Reviews this quarter which included reviews with senior BC Hydro and contractor leaders (serious safety incident investigations actions) and reviews with only the construction management and safety teams from BC Hydro and contractors (less-serious incidents). The top safety incident review themes were hot work, confined space, working at heights and object falls from height.

Table 2 below reflects the safety performance results for the Project, including all contractors and all sub-projects.

Table 2 Summary of Site C Safety Metrics

	Reported July 1, 2021 to September 30, 2021 [1]	Reported Since Inception (July 27, 2015 to September 30, 2021)[1]
Fatality[2]	0	0
Permanently Disabling Injury[3]	0	1[4]
Serious Incidents[5]	9	94
Lost Time Injuries[6]	2	38
All-Injury Incidents[7] (Lost Time Injuries[6] and Medical Attention requiring Treatment[8])	19	251

2.1.8 Safety Verifications

In this reporting period, the Site C safety team completed a total of 205 formal planned safety verifications for the Project (on dam-site and off dam-site) – an average of 68 per month. The closure rate for these verifications (indicating the number of nonconformances resolved) was 93 per cent, illustrating a strong collaboration between the BC Hydro construction and safety teams. Of these 205 safety verifications, 25 per cent were clean sheet verifications, where no nonconformances were found during the verification. Further, 88 per cent of all safety verifications conducted during the reporting period identified good safety practices even if there were some nonconformances. For example, good use of

1 Numbers are subject to change due to timing of when data is retrieved and when injury is categorized.

2 Excludes any non-occupational incidents.

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 are work-related medical attention requiring treatment, lost time injuries, and fatalities.

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.

flagging around work areas, workers using their masks and safety glasses properly, and scaffolding having proper tags and current engineer certificates on the unit.

2.1.9 Regulatory Inspections and Orders

WorkSafeBC, under the authority of the *Worker's Compensation Act*, is the primary regulator with jurisdiction for safety for the Project. WorkSafeBC oversees all worker safety (employee and contractor) for the Project, both on the dam site and off the dam site. The Ministry of Energy, Mines and Low Carbon Innovation is the regulatory authority for worker safety on any work fronts subject to the *Mines Act*, specifically West Pine Quarry, Portage Mountain Quarry, and Wuthrich Quarry.

From July to September 2021, WorkSafeBC issued 22 regulatory inspection reports and 53 regulatory orders. The Ministry of Energy, Mines and Low Carbon Innovation issued one regulatory inspection and two regulatory orders during this period.

Table 3 Safety Regulatory Inspection and Orders

	Reported July 1, 2021 to September 30, 2021[9]	**Reported Since Inception (July 27, 2015 to September 30, 2021)**[9]
Regulatory Inspections	23	258
Regulatory Orders	55	373

During this reporting period, WorkSafeBC issued two stop use orders – one for an offsite contractor's medical transport unit and the other for an onsite contractor who failed to lock out a three-axle truck after a release of energy from a damaged tire. A stop work order was issued for the Halfway River bridge construction contractor following an incident where a section of slab-supporting formwork failed under strong winds and struck a worker.

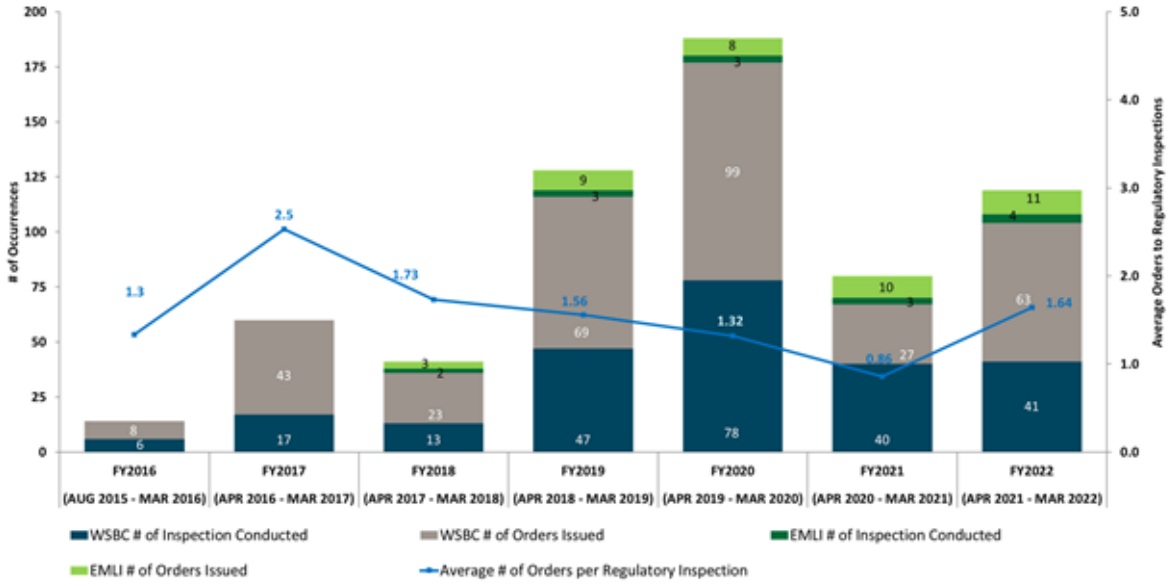
Of the 23 inspection reports, 11 were 'clean sheets' with no orders. This is a slight improvement from the same quarter in 2020. One of the clean sheets was related to

[9] Numbers are subject to change due to timing of when data is retrieved and when injury is categorized.

COVID-19. Refer to Appendix B for a list of safety regulatory inspections and orders received from July to September 2021.

The Project monitors an additional metric – average number of orders per regulatory inspection. As shown in Figure 1, between April 2021 and September 2021, the average number of orders per inspection was 1.64, which is trending higher than fiscal 2021 when WorkSafeBC did not attend site as much due to COVID-19. This metric is consistent with fiscal 2019 and 2020.

Figure 1 Number of Orders to Regulatory Inspections, August 2015 to September 2021



2.1.10 Safety Performance Frequency Metrics

To assess safety performance over time, the Project uses safety frequency metrics (safety performance incidents / worker hours) to account as much as possible for the volume of work. Note there is not a strict linear relationship between incidents and work hours; other factors such as congestion of active work fronts, higher hazard work activities, environmental working conditions, etc., also influence the number of safety incidents. If the number of safety incidents increases or decreases at a higher

rate than work hours, frequency metrics will typically also increase or decrease at proportionally different rates.

Table 4 below summarizes these key safety frequencies by quarter, based on a rolling 12-month average.

Table 4 Summary of Safety Performance Frequency Metrics

	Fiscal 2021 April 2020 – March 2021 (Rolling 12-Month Average)				Fiscal 2022 April 2021 – March 2022 (Rolling 12-Month Average)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Serious Incident Frequency	0.55	0.62	0.48	0.48	0.45	0.51	n/a	n/a
Lost Time Injury Frequency	0.23	0.21	0.21	0.12	0.09	0.13	n/a	n/a
All Injury Frequency	1.92	1.46	1.33	1.14	1.19	1.40	n/a	n/a

Fiscal 2022 Q3 and Q4 will be updated when information is available.

Comparing results from the quarter ended September 30, 2021 (current reporting period) to the quarter ended September 30, 2020, all Site C safety performance frequencies (serious incident, lost time injury and all-injury) have improved. The serious incident frequency for this quarter is 0.51, a slight but not significant decrease compared to 0.62 for the same period in 2020. Lost time injury frequency this quarter is 0.13, a significant 29 per cent decrease compared to 0.21 from the same quarter last year, due primarily to contractor's improved return to work programs. Finally, all-injury frequency is at 1.40 this quarter, a slight but not significant decrease compared to 1.46 for the same quarter last year. Refer to Appendix C, Figure C-1 for safety performance frequency metrics in graphic format.

3 Construction and Engineering Major Accomplishments, Challenges and Work Completed

3.1 Construction

Construction continued to advance through the busy summer construction season despite the challenges of the COVID-19 pandemic.

3.1.1 Main Civil Works

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

- Diversion works, including two concrete-lined, 10.8-metre-diameter tunnels. Tunnel No. 1 is 700 metres in length and Tunnel No. 2 is 790 metres in length;
- Diversion tunnel inlet and outlet portals, and approach channels;
- Excavation and bank stabilization;
- Relocation of surplus excavated materials (including management of discharges);
- Dams and cofferdams (including a zoned earth embankment dam 1,050 metres long and 60 metres above the present riverbed, and stage 1 and 2 cofferdams);
- Roller-compacted concrete (including a powerhouse, spillways and dam buttress approximately 800 metres long made up of approximately 1.7 million cubic metres of concrete); and
- Haul roads.

An update on construction activities currently underway or completed during the reporting period are described below under four main areas: (1) left bank, (2) right bank, (3) earthfill dam; and (4) conveyor belt system. Refer to the Earthfill Dam section for updates on the right and left bank earthfill dam core trench excavation.

Left Bank

During the reporting period, the finishing concrete work inside the 454-metre-long left bank drainage adit tunnel was completed.

Right Bank

The activities currently underway or completed for the quarter ending September 30, 2021, on the right bank include:

Right Bank Drainage Tunnel

Remediation and completion of the shotcrete work in the right bank drainage tunnel was completed in the previous quarter. With the shotcrete work complete in the right bank drainage tunnel, the invert slab is planned to be placed over the winter of 2021/2022.

Dam and Core Roller-Compacted Concrete

Subsequent to the reporting period, on October 8, 2021, the final placement of roller-compacted concrete on the dam and core buttress was completed. With this final placement, the roller-compacted concrete buttress for the powerhouse, spillways and dam and core buttress is complete with approximately 1.7 million cubic metres placed between 2017 and 2021.

Earthfill Dam

Overall earthfill dam placements continued in the quarter, with approximately 2.2 million cubic metres of material placed during this reporting period and a total of approximately 2.4 million cubic metres as of October 6, 2021.

Subsequent to the reporting period, by October 23, 2021, placements of core (till) material (material used in the impervious centre section of the dam) progressed to elevation 410.2 metres in the core trench; placements are now complete for the year. Approximately 794,000 cubic metres of core (till) material was placed between

May 5, 2021 and October 27, 2021, exceeding the target for the season. The till will be insulated for protection from winter temperatures. Despite placements of core material being complete for this year, placements of other shell (granular) materials on the dam will continue to progress into November and December 2021, depending on temperatures.

The increased placement of till and other shell materials on the earthfill dam in 2021 is one of the strategies adopted by BC Hydro to attempt to accelerate the approved in-service date.

Conveyor Belt System

During this reporting period, the conveyor system that transports till material that is being used for the construction of the dam core operated as per plan. An additional feeder system was also installed and commissioned this reporting period, adding capacity and reliability to the conveyor system. To mitigate potential shutdowns in the conveyor system, materials are also stockpiled at the site.

3.1.2 Infrastructure and Site Operations

Infrastructure and site operations include construction and operations updates for worker accommodation, debris management, and temporary fish passage operations for the reporting period.

Worker Accommodation

The total capacity of the worker accommodation, including camp operations staff, is 2,350.

Since January 2020, BC Hydro and the camp operator have implemented numerous measures to protect employees, contractors and facilities as a result of the COVID-19 pandemic. The changes made at the worker accommodation lodge to increase cleaning and physical distancing continued through the quarter.

Prior to workers boarding flights, all workers continue to be required to complete the B.C. Ministry of Health self-assessment and confirm their results with their employer.

Every person accessing the site is screened and their temperature is scanned daily at the gate before entering the work site. BC Hydro and its contractors also set up thermal scanners at various exit and entry points in the worker accommodation lodge that are used before workers board crew buses or leave camp to go to other Project work sites. This supports the employers and employees with the required daily self-assessment before reporting to work each day.

BC Hydro continues to implement the protocols mandated by the Provincial Health Authority and the British Columbia Centre for Disease Control for the worker accommodation lodge. During the COVID-19 outbreaks that were declared on the Site C Project, the camp operator and the onsite health clinic worked collaboratively with Northern Health to manage isolations, positive cases and contact tracing requirements.

On August 19, 2021, Northern Health directed BC Hydro to implement additional control measures requiring guests in camp to remain in the camp for the duration of their shift. This control measure was lifted subsequent to the reporting period on October 12, 2021.

Debris Management

There are four debris retention structures on the Moberly and Peace Rivers that provide coverage for all head pond elevations to capture and prevent debris from entering the diversion tunnels. Debris management is seasonal with activities from approximately April to November each year and no activities over the winter season (approximately December to March).

During the quarter, the debris management contractor performed debris management operations on the BC Hydro Peace River boom, the Moberly River

Debris Piles and the Moberly River Log Boom. This included mobilizing debris management equipment to the Moberly River debris management area. Debris clearing and stockpiling also occurred as required, based on debris accumulations on the debris structures mentioned above. The current contract to manage debris at both the Peace River and Moberly River is in place until the end of 2023, with an option to extend to 2024.

Temporary Fish Passage

The temporary fish passage facility is a trap-and-haul facility located on the left bank of the Peace River diversion tunnel outlet channel and provides safe and efficient fish passage from the outlet channel to upstream release locations during the construction of the Project. The operational season for the temporary fish passage is approximately April to October each year and the facility is winterized for the period of approximately October to the end of March. The facility continued to operate during the reporting period augmented by a contingent trap and haul program. From July 1 to September 30, 2021, 1,599 fish passed through the facility. After reservoir inundation, fish passage operations will be transferred to the permanent upstream fish passage facility that will be constructed at the outlet of the generating station. Refer to section 10.1 for information on refinements to the operations of the temporary fish passage facility during the reporting period.

3.1.3 Generating Station and Spillways

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

- Generating station and spillways civil works, including:
  - Powerhouse: Concrete placements, installation of structural steel, and installing hydraulic gates;

- Inlet headworks: Concrete placements, construction of the penstocks, and installing hydraulic gates; and
- Spillways: Concrete placements and installing hydraulic gates.

- Cranes, which includes the supply and commissioning of the powerhouse cranes, tailrace gantry crane, and headworks gantry crane; and
- Hydromechanical equipment, including the supply of all gates.

Construction progress is taking place in the generating station and spillways civil works, cranes and hydromechanical equipment as described below.

Generating Station and Spillways Civil Works

The generating station and spillways civil works contract includes the delivery of civil works associated with the powerhouse, intakes, penstocks, and spillways.

In July 2021, BC Hydro concluded a settlement agreement with the generating station and spillways civil contractor on the impacts due to the COVID-19 pandemic. Under the terms of the settlement agreement, all major completion milestones are to be recovered, with the exception of the stilling basins completion date. The stilling basins completion date was delayed from the original milestone date in order to accommodate the right bank foundation enhancements work. The contractor has been working to this schedule since April 2021.

By concrete volume, the generating station and spillways civil works sub-project is approximately 55 per cent complete.

Powerhouse

Powerhouse concrete is more than 78 per cent complete. The first stage concrete (the concrete foundation of the powerhouse) is complete. The second stage concrete (concrete that embeds the turbines and forms the floors) is advancing at a pace to match the turbines and generators contractor’s schedule. The contractor

started to remove its infrastructure from the downstream adjacent area (the tailrace) to enable the foundation enhancements work to proceed on schedule.

Intakes Headworks

Intakes first stage concrete is more than 70 per cent complete. The status of the intakes first stage concrete is: intake 1 (100 per cent), intake 2 (95 per cent), intake 3 (100 per cent), intake 5 (30 per cent) and intake 6 (95 per cent); intake 4 will start in early November 2021. Intakes are about 15 per cent behind plan. BC Hydro continues to work with the contractor to recover the schedule by assigning additional resources.

Penstocks

Penstock steel is more than 80 per cent complete. Penstocks production is approximately 10 per cent behind plan. The contractor has placed 73 penstock sections out of a total of 90 sections. The steel for penstocks 1, 2, 3 and 6 is complete. Penstock 4 is 20 per cent complete and penstock 5 is 70 per cent complete.

Spillways

The contractor has completed about 45 per cent of the spillways concrete. Some concrete work in the spillways stilling basins has been postponed until the right bank foundation enhancements work is complete in early 2022. The contractor is placing some stilling basin concrete concurrent to the foundations work as a way to mitigate the impacts of the foundation enhancements work. The spillway headworks is on the critical path for the generating station and spillways civil works sub-project.

Cranes

The powerhouse bridge cranes have been commissioned. The headworks gantry crane has been delivered to site and will be erected in the summer of 2022. The tailrace gantry crane is scheduled to be delivered by February 2022.

Hydromechanical Equipment

All draft tube gates, intake operating gates, and intake maintenance gates and components will be on site by early 2022. Deliveries from Europe have been impacted by shipping constraints. This schedule is acceptable to the installation contractor.

3.1.4 Right Bank Foundation Enhancements

During the reporting period, construction commenced on the right bank foundation enhancements. In September 2021, work started on the installation of the piles located within the spillways stilling basin. The full scope of piles work in the spillways includes the drilling and installation of 48 large diameter vertical steel piles.

The sequence of pile installations includes starting work within the eastern side of the spillways stilling basin, followed by the western side of the basin. The scope of piling work includes first drilling vertical shafts through the spillways roller-compacted concrete slab and underlying bedrock foundation with large scale rotary pile drilling rigs. While pile drilling takes place, separate crews assemble shorter lengths of steel pipe into the full-length steel piles, via submerged arc welding. Once each shaft is drilled and the pile is fully welded, a steel pile is lowered into the vertical open shaft by an overhead crane. Once the steel pile is inserted within the shaft through the roller-compacted concrete and bedrock foundation, the pile is fully encased in concrete, filling the void inside the steel pile and the void between the wall of the steel pile and the lager shaft.

Subsequent to the reporting period, as of October 15, 2021, a total of six vertical pile shafts had been drilled to full length, four steel piles fully welded, and three steel piles lowered into the vertical shafts and fully encased in concrete.

3.1.5 Balance of Plant

The balance of plant procurement has been split into six contract packages and the schedule for the balance of plant work is being aligned with the turbines and generators schedule. The six contract packages include: mechanical; electrical; architectural; heating, ventilation, and air conditioning; fire detection and protection; and permanent upstream fishway and other out structures. During the reporting period, the balance of plant mechanical and electrical contracts were awarded and the remaining four contracts were posted on BC Bid. Evaluation of the architectural request for proposals is in progress.

3.1.6 Turbines and Generators

The scope of work for turbines and generators includes the complete design, supply, installation, testing and commissioning of six turbines, generators, governors and exciters. Generally, the manufacturing and installation for the turbines and generators are on schedule; however, some delay is occurring with the contractor completing the turbine spiral cases ready for pressure testing. BC Hydro directed a night shift be added to ensure the contractor completes spiral case welding for units 1, 2 and 3, ready for pressure testing, as close to schedule as is achievable for this component of the work. In addition, BC Hydro is having daily production meetings with the contractor.

The contractor’s São Paulo, Brazil, factory will supply most of the turbine and generator components. There are some impacts due to the COVID-19 pandemic, but work is continuing. Meetings regarding manufacturing progress of the turbine and generator components in the São Paulo factory are continuing and have been held concurrently with visits by BC Hydro’s subcontracted inspection agencies to many of the contractor’s subcontractors in the São Paulo area and Europe.

Two turbine runners have been transported from São Paulo, Brazil, and are currently being stored at site. The remaining four turbine runners were shipped from Brazil at

the end of September 2021 and are expected to arrive on site between January and February 2022.

3.1.7 Transmission

The transmission sub-project connects the Site C substation to the BC Hydro transmission system. The scope of work includes the following major components:

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

The following reflects progress to September 30, 2021:

Transmission Towers and Lines

Transmission Lines

Construction of the second 500 kV transmission line continues as the transmission line contractor started stringing the conductor in July 2021. This work is expected to continue until March 2022. As of September 30, 2021, 82 of the 205 towers (40 per cent) that support the second 500 kV transmission line had been strung.

3.1.8 Highway 29 and Hudson's Hope Shoreline Protection Berm

The creation of the Site C reservoir requires realignment of six segments of Highway 29 totalling approximately 32 kilometres. The scope of the highway realignment includes relocation of existing 25 kV distribution lines adjacent to the highway and the decommissioning of some sections of the existing highway.

BC Hydro is working with the Ministry of Transportation and Infrastructure on Highway 29 construction.

The Highway 29 sub-project also includes the construction of a shoreline protection berm within the District of Hudson's Hope to protect against bank erosion due to reservoir wind waves and water table rise, and the development and operation of the Portage Mountain Quarry, which will supply riprap and filter materials for highway and berm construction. The permanent highway realignment is planned to be completed by spring 2023 to ensure the highway remains accessible once the reservoir is inundated and the dam is operational.

The Highway 29 sub-project is divided into the following components:

- Cache Creek highway realignment and bridge;
- Halfway River highway realignment and bridge;
- Farrell Creek East highway realignment;
- Farrell Creek highway realignment and bridge;
- Dry Creek highway realignment and bridge;
- Lynx Creek highway realignment and bridge;
- Portage Mountain Quarry development and operation; and
- Hudson's Hope shoreline protection berm.

The following reflects progress to September 30, 2021:

Cache Creek

Construction continued on the Cache Creek East segment during the reporting period. At the end of the reporting period, the bridge foundation piles were 100 per cent complete, foundation concrete was 85 per cent complete, and the

highway grading was 80 per cent complete. Construction on this segment was 58 per cent complete at the end of the reporting period.

Halfway River

The Halfway River segment includes the realignment of 3.7 kilometres of highway and the construction of a new one-kilometre long bridge crossing the Halfway River, approximately 500 metres north of the current structure.

At the end of the reporting period, the contractor had substantially completed the bridge and had completed the highway grading to 90 per cent.

Farrell Creek East

The Farrell Creek East segment includes the realignment of 8.4 kilometres of highway. Geotechnical studies in 2019 concluded that 5.7 kilometres of this segment could be removed from the scope of work and monitored following the creation of the Site C reservoir, reducing the length of Farrell Creek East realignment work to 2.7 kilometres.

During the reporting period, the contractor had completed approximately 54 per cent of the construction of the highway re-alignment, including grading, drainage and fencing work, and commenced the preparations of paving the alignment to start in October 2021. Subsequent to the reporting period, on October 20, 2021, vehicles were diverted onto the Farrell Creek East segment, making it the first segment of the Highway 29 sub-project to open to traffic.

Farrell Creek

The Farrell Creek segment includes the realignment of 1.9 kilometres of highway, including the construction of a new 411-metre-long bridge.

At the end of the reporting period, the contractor had completed 86 per cent of the concrete bridge and bridge abutment foundations and 74 per cent of the highway

grading and drainage work. Construction on this segment was 58 per cent complete at the end of the reporting period.

Dry Creek

The Dry Creek segment includes the realignment of 1.4 kilometres of highway, including the construction of a new 192-metre-long bridge.

At the end of the reporting period the contractor had completed the bridge to 78 per cent, including the completion of concrete foundations and the installation of steel bridge girders. Overall construction on this segment was 60 per cent complete at the end of the reporting period.

Lynx Creek

The Lynx Creek segment includes the realignment of 9.1 kilometres of highway and the construction of a 169-metre-long bridge.

During the reporting period the Lynx Creek contractor continued gravel extraction, hauling and placement along the highway alignment and completed the bridge foundations. The installation of steel bridge girders was started. At the end of the reporting period, the Lynx Creek work was 47 per cent complete.

Portage Mountain Quarry

Portage Mountain Quarry supplies riprap and berm filter materials for various segments of the Highway 29 realignment and the construction of the shoreline protection berm in the District of Hudson's Hope.

Quarry rock blasting was complete in August 2021 and the quarry contractor demobilized from site. All production of riprap for Highway 29 was completed; however, there was a shortfall of some material for the Hudson’s Hope berm. The shortfall will be made up by the Hudson’s Hope berm contractor.

Hudson's Hope Shoreline Protection Berm

The Hudson's Hope berm is a 2.6-kilometre-long shoreline protection berm that will protect the slopes adjacent to the reservoir from erosion.

As of the end of the reporting period, the contractor had completed 92 per cent of the berm stripping and vegetation clearing, 100 per cent of the construction of the toe berm, which forms the base of the berm, and 60 per cent of overall berm construction.

In September 2021, a small area of the slope above the berm sloughed, which caused approximately 500 cubic metres of material to cover the berm. Work was temporarily halted in the area of the slough for approximately one week while geotechnical experts determined the required repairs and stabilization measures, which were subsequently implemented. The overall berm construction schedule remains on track.

3.1.9 Reservoir

Reservoir Clearing

The reservoir clearing scope of work is divided into two main regions:

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

Clearing in the lower reservoir, Moberly River drainage, eastern reservoir including Cache Creek drainage and middle reservoir up to Halfway River was required to support river diversion. All other clearing is scheduled for completion by summer 2023.

The following reflects progress to September 30, 2021:

Lower Reservoir, Moberly River Drainage and Eastern Reservoir including Cache Creek Drainage

All clearing and burning activities are now substantially complete for these areas except for some minor waste wood disposal on the north bank of the Peace River and nearby islands between the dam site and Cache Creek. Any remaining works are scheduled to be completed in early fall after bird nesting is complete.

Middle Reservoir, Halfway River Drainage and Western Reservoir

The procurements for two new clearing contract packages for the western reservoir occurred during the reporting period. Works are direct award contracts to First Nations-designated businesses and will account for more than 750 hectares of clearing.

Clearing activities began in late August 2021 and are scheduled to continue until March 2022. Works include removing trees that were outstanding from last season (e.g., wildlife buffers) in the middle reservoir as well clearing new contract areas.

Other Reservoir Work

The scope of other reservoir work includes infrastructure relocations and environmental mitigation works, which are required as part of reservoir filling.

BC Hydro's existing 1L364 transmission line crossing of the Halfway River drainage needs to be relocated prior to inundation. Procurement for the supply and install of the pole foundations works occurred during the reporting period. Construction of this work is scheduled to start in late fall 2021 and finish in summer 2022.

Detailed designs for three fish habitat enhancements sites in the eastern and western reservoir were developed during this reporting period. Procurement for the construction of one of the sites that is situated within the western reservoir occurred as part of a clearing procurement as it fell within the work area. The contract will be a First Nations direct award with construction planned to start in late fall 2021. The

remaining sites will be constructed between spring 2022 and winter 2023 with procurement starting in early 2022.

3.2 Engineering

The engineering team provides technical support to all aspects of the Project. Through the reporting period, substantial effort was given to support the achievement of the contractor's schedule for both the main civil works and the generating station and spillways civil works contracts, as well as advancing the selection and design of required foundation enhancements to the structures on the right bank.

3.2.1 Main Civil Works

Support for the main civil works contract continued during the reporting period supporting excavations, grouting and instrumentation and mapping of foundation shears, along with all the foundation preparations and approvals for the main dam core trench. Dam fill placements continued in this reporting period and the placement of till and filters on the right and left abutments of the core trench was completed to 408 metres and 410 metres respectively. Till placement then continued with focus in the centre (river) section, with productivity ramping up significantly in September 2021, once the foundation preparations and approvals were complete and till could be placed in large continuous lifts. Instrumentation monitoring in the reporting period has indicated positive results with respect to dam stability and has confirmed that the dam foundation is responding to dam fill placement as predicted.

Detailed geological mapping of the excavations will continue in the approach channel in the next reporting period as excavations shift to this work front. This geological information will continue to be used to update the design parameters for the site geology and foundations.

3.2.2 Right Bank Foundation Enhancements

During the reporting period, value engineering activities continued in support of advancing the design of the foundation enhancements measures required to increase the stability below the powerhouse and spillways.

Work included finalizing the design of the 48 piles and pile cap located downstream of the powerhouse to stabilize the powerhouse foundation.

Value engineering of the enhancements to improve the water-tightness of the approach channel continued. Work included advancing the design of the channel's lining, drainage and additional instrumentation.

BC Hydro continued to engage the independent dam experts, Technical Advisory Board and other subject matter experts to provide oversight of value engineering activities associated with the design of the foundation enhancements. Refer to section 3.2.7 for a summary of the Technical Advisory Board meetings and Appendix E for the report issued by the independent dam experts during this reporting period.

3.2.3 Large Cranes, Hydromechanical and Turbines and Generators

Engineering support to construction and manufacturing, as well as vendor submittal review and integration, continued throughout the reporting period for the large cranes, hydromechanical equipment and turbines and generators contracts.

3.2.4 Generating Station and Spillways, Balance of Plant and Equipment Supply

During the reporting period, work focused on the production of record drawings for the powerhouse, along with supporting construction with review of submittals for the powerhouse, intakes, penstocks, and spillways.

For the balance of plant scope of work, engineering focused on preparation and issuance of the technical specifications and issued for proposal drawings for the

balance of plant fire protection and heating, ventilation, and air conditioning request for proposals packages. The engineering team continues to support the procurement process for the electrical, architectural, and permanent upstream fishway request for proposal packages through responding to requests for information, proposal evaluations, negotiations and other requests. Work also commenced on preparation and issuance of the issued-for-construction drawings for the balance of plant mechanical contract and support to construction activities under this contract including review of the technical submittals and contractor design drawings. The balance of plant team also continued to support the review of the technical submittals and design drawings, factory acceptance testing, and virtual factory visits for the nine equipment supply contracts, including the generator terminal equipment, generator circuit breakers, generator step-up transformers, AC station service, DC station service, 500 kV motor-operated disconnects, diesel generators, large valves and compressed air receivers contracts.

Engineering design and fabrication continued to be advanced on the protection and control systems and integrated testing is also progressing on fabricated equipment.

Overall, the detailed engineering on the generating station and spillways is complete. This excludes the foundation enhancements design, for which the detailed engineering is approximately 85 per cent complete.

3.2.5 Transmission

During the reporting period, engineering support was provided to complete substation and transmission line record drawings and the foundation construction record drawings for the transmission lines that will connect the Site C substation to the Site C powerhouse.

3.2.6 Highway 29

The 95 per cent detailed design was completed for the highway decommissioning work. Engineering support is being provided to the various highway segments and the Hudson's Hope berm as required to progress construction activities.

3.2.7 Technical Advisory Board

A series of video conferences occurred from July to September 2021. There were no reports issued by the Technical Advisory Board during the reporting period. Refer to Appendix E for the report issued by the independent dam experts in August 2021.

3.3 Quality Management

The Project has a quality management plan that outlines activities to ensure materials, equipment and the constructed works meet contract quality requirements. The plan identifies resources and procedures necessary for achieving the quality objectives, roles and responsibilities, and is the framework document for the quality management program.

During the reporting period, the Project team continued its activities to support the Project quality plan, including:

1. Ongoing meetings with the quality management teams of key manufacturers in countries affected by COVID-19;
2. Ongoing meetings with the quality management teams of the site contractors to address quality issues; and
3. Continuing with monthly quality performance indicator assessments for the engineering, manufacturing and construction activities across each sub-project.

The Project team continues to track and manage quality nonconformances. Table 5 summarizes quality nonconformity instances during the reporting period.

Table 5 Quality Management Nonconformity Report (NCRs) Metrics Reporting Period – July 2021 to September 2021

Contract	NCRs Reported July 1, 2021 to September 30, 2021	NCRs Closed July 1, 2021 to September 30, 2021	NCRs Reported to Date	NCRs Closed to Date	NCRs Open as of September 30, 2021
Main Civil Works	83	20	1,930	1,853	77
Turbines and Generators (total = manufacturing + installation)	67 (=44+23)	68 (=48+20)	592 (=504+88)	502 (=448+54)	90 (=56+34)
Generating Station and Spillways Civil Works	88	97	853	806	47
Large Cranes	0	0	26	26	0
Hydromechanical Equipment	5	6	38	37	1
Transmission	0	0	115	115	0

BC Hydro's ability to travel to participate in equipment inspections and final acceptance tests continues to be restricted due to the COVID-19 pandemic. In order to mitigate the quality risks associated with these restrictions, BC Hydro continues to meet virtually with contractors in affected areas, including the turbines and generators contractor (Brazil) and the hydromechanical equipment contractor (Italy) on a weekly basis to plan upcoming inspections and to coordinate with local quality assurance representatives. For critical components, BC Hydro's local inspectors continue to maintain a full-time equivalent presence in order to monitor the progress and quality of the manufacturing.

During the reporting period, the main civil works contractor continued the material processing and material placements for the main dam. During the initial stages of the processing and placements (between May and June 2021), the contractor had

experienced challenges keeping up with the number of tests required by the technical specifications due to insufficient availability of quality inspectors and laboratory technicians. To address these challenges, BC Hydro issued letters, raised nonconformity reports and performed two quality audits to influence the contractor to take corrective actions. As the work progressed, BC Hydro observed the contractor increasing its quality inspector and laboratory technician staffing levels and improving its testing workflows, and by July 2021, the contractor was able to keep up with the testing. The independent materials testing facility that BC Hydro had set-up on site to perform testing alongside the contractor continued, and there continued to be good correlation between the test results. Since the resumption of roller-compacted concrete production and placements, following the June 25, 2021 quality stop, the contractor continued to be diligent about implementing the corrective actions agreed to with BC Hydro (wetting and cooling of the aggregates, more stringent control of water-cement ratios in the batching plant, protection of the roller-compacted concrete during transportation to the placement area and increased diligence in wet curing following placements). As a result, the quality of the roller-compacted concrete processed and placed was good. BC Hydro and the contractor continue to meet weekly to discuss and resolve open nonconformity reports as well as discuss broader topics related to the contractor's quality performance.

The quality of the constructed works in the generating station and spillways and intake structures continues to be good. During the reporting period, the contractor continued to monitor its concrete mix designs and the consistency of the fly ash and cement to ensure that the 56-day requirements for compressive strength continue to be met. The contractor also focussed on wet-curing and maintenance of the cooling lines within the concrete placements in order to achieve the specified thermal control requirements during the hot summer months. BC Hydro continues to meet with the contractor daily to discuss the thermal control performance of placements under

cure, and to push for timely corrective actions when excursions are noted. The quality of the penstock welding continues to be good and Powertech Labs remains onsite to assist with BC Hydro's quality assurance program. BC Hydro and the contractor continue to meet weekly to discuss and resolve open nonconformity reports as well as discuss broader topics related to the contractor's quality performance.

For the turbines and generators contract, the quality of the components manufactured to date continues to be good. BC Hydro continues to meet with the contractor on a weekly basis to discuss upcoming inspections, quality issues and the overall quality assurance program.

3.4 Assets In Service

Prior to the first generating unit coming into service, there are several construction activities that need to be substantially completed both on the dam site and off the dam site.

The first generating unit is scheduled to be in service approximately one year before the sixth and final generating unit goes into service. Activities required on the dam site before the first generating unit is put into service include completing the earthfill dam, approach channel, powerhouse and spillways; having the first generating unit ready for commissioning; connecting the powerhouse to the substation via transmission lines; removing the right bank cofferdam; watering up the powerhouse and spillway tailraces; and converting the diversion tunnels. Activities required to be completed off the dam site include clearing the reservoir, realignment of Highway 29, energizing the second 500 kV transmission line, and the Hudson's Hope shoreline protection berm.

Before all major pieces of equipment and assets are placed into service on the Project, inspecting, testing, and commissioning activities are completed to ensure that all components are fit for service and safe to transition to operations.

The pre-commissioning testing includes testing of individual pieces of equipment. The offline testing leads up to the signing of a Commissioning Notice to Energize, which states that the asset is safe to connect to the BC Hydro grid to commence the online testing. At the conclusion of the online testing, the signing of a Commissioning Notice to Operate formalizes the handover of the asset to the operations group to operate. The commissioning process undertaken for the earthfill dam and associated assets will form part of the comprehensive dam safety and reservoir inundation plan.

Once assets are placed in service, BC Hydro Operations is responsible for the long-term operations and maintenance of the equipment and assets.

To date, the following permanent assets have been placed into service on the Project:

- Site C substation;
- 500 kV gas-insulated switchgear expansion at the Peace Canyon substation; and
- The first of two new 500 kV transmission lines.

4 Project Schedule

4.1 Project In-Service Dates

In June 2021, Treasury Board approved the revised Project in-service date of 2025, which was announced in February 2021. The Project's revised schedule reflects the delays and impacts of the COVID-19 pandemic. BC Hydro is currently on track to achieve the approved in-service date; however, BC Hydro continues to monitor and assess significant risks with potential cost, schedule, and scope implications, including the continuation of the COVID-19 pandemic and potential impacts to on-site construction activities; commercial negotiations with contractors; design finalization for the foundation enhancements and related procurements;

procurements for the balance of plant contracts; the ability of the Project to attract and retain sufficient skilled craft workers; and the possibility that the Blueberry River Decision affects the timing of the issuance of provincial permits required for the completion of the Project.

BC Hydro and Site C contractors continue to schedule work and explore strategies to accelerate work on the Project delayed by the COVID-19 pandemic. These activities, if successfully implemented, could result in an earlier in-service date: however, achieving an earlier in-service date remains subject to uncertainty and to the risks summarized in this report.

Table 6 shows the status of key Project milestones in relation to the approved in-service date of 2025.

Table 6 In-Service Dates

Description	In-Service Dates based on Approved Budget and Schedule (June 2021)[10]	Status
5L5 500 kV transmission line	October 2020	Complete
Site C substation	October 2020	Complete
5L6 500 kV transmission line	July 2023	On track
Unit 1 (first power)	December 2024	On track
Unit 2	February 2025	On track
Unit 3	May 2025	On track
Unit 4	July 2025	On track
Unit 5	September 2025	On track
Unit 6	November 2025	On track

[10] In-service dates based on Treasury Board's approval of the revised budget in June 2021.

5 Project Governance, Costs and Financing, and Risk

5.1 Project Governance

In February 2021, the Province of British Columbia released an independent review of the Project by special advisor Mr. Peter Milburn. Mr. Milburn's review included 17 recommendations aimed at improving oversight and governance and strengthening Site C risk reporting and management. Seven recommendations were specifically related to Project governance. As of September 30, 2021, all recommendations made by Mr. Milburn were fully implemented.

Other activities during the reporting period related to the measures to improve Project governance include:

- The commercial sub-committee has been actively providing oversight for ongoing key schedule, cost reporting, claims management, commercial strategy and other commercial matters;
- EY Canada continues to provide independent oversight for the Project, including budget oversight, schedule and commercial management evaluation and risk assessment analysis; and
- During the reporting period, BC Hydro and EY Canada worked collaboratively to plan and complete the cost risk analysis and schedule risk analysis for the Project with a data date of July 1, 2021. Mr. Milburn also performed a review of the implementation of his recommendations related to these analyses. The results from the cost risk analysis and schedule risk analysis were provided to the Project Assurance Board and Treasury Board.

5.2 Project Budget Summary

The revised budget and schedule were approved by Treasury Board in June 2021 and address significant cost pressures and delays faced by the Project due to the COVID-19 pandemic, as well as the right bank foundation enhancements and other cost pressures being managed by the Project prior to COVID-19.

BC Hydro continues to monitor and assess significant risks with potential cost, schedule and scope implications, including the continuation of the COVID-19 pandemic and potential impacts to on site construction activities; commercial negotiations with contractors; design finalization for the foundation enhancements and related procurements; procurements for the balance of plant contracts; the ability of the Project to attract and retain sufficient skilled craft workers; and the possibility that the Blueberry River Decision affects the timing of the issuance of provincial permits required for the completion of the Project. Despite these risks, based upon information currently available to BC Hydro, BC Hydro expects that the Project will be completed within the revised budget of $16 billion. As of September 30, 2021, the life to date actual costs of the Project are $7.9 billion, which results in a remaining budget of $8.1 billion to complete the Project.

The Project Budget in Table 7 below reflects the Project budget of $16 billion approved in June 2021 by key work area, life to date actual expenditures to September 30, 2021, and the remaining budget.

Table 7 Project Budget by Key Work Area ($ million)

Description	Project Budget (Note 4)	Actuals, Life to date (as of September 2021)	Remaining Budget (as of September 2021)
Dam, Power Facilities and Associated Structures and Transmission (Note 1)	8,258	4,314	3,944
Offsite Works, Direct Construction Supervision and Site Services (Note 2)	2,895	1,607	1,288
Total Direct Construction Cost	**11,153**	**5,921**	**5,232**
Indirect Costs (Note 3)	2,082	1,160	922
Total Construction and Indirect Costs	**13,235**	**7,081**	**6,154**
Interest During Construction	2,028	775	1,253
Contingency	737	0	737
Total	**16,000**	**7,856**	**8,144**

Note 1: Key items included are river diversion infrastructure, earthfill dam and related works, spillways, powerhouse, generation equipment and transmission and substation work.

Note 2: Key items included are highway re-alignment and reservoir related work, direct construction supervision, and site services such as workers accommodation.

Note 3: Key items included are mitigation and compensation programs, development and regulatory costs, project management, engineering and other support services such as project controls, contracts management, environmental, and Indigenous relations.

Note 4: The Project Budget, approved in June 2021 by Treasury Board, is the same budget as the revised Project cost estimate reported in Quarterly Progress Report No. 21.

5.3 Project Expenditure Summary

Table 8 provides a summary of the approved total Project budget, the current forecasts, and related variances. The table also presents the cumulative plan and actual costs to September 30, 2021 and the related variances.

Table 8 Total Project Budget Compared to Forecast Amounts to Completion and Life to Date Plan Compared to Actuals to September 2021 ($ million Nominal)

	Total Project			Life to Date (LTD), to September 2021		
Description	**Budget**	**Forecast to Completion**	**Variance**	**Plan**	**Actual**	**Variance**
Total Construction & Indirect Costs	13,235	13,235	0	7,704	7,081	623
Interest During Construction	2,028	2,028	0	798	775	23
Contingency	737	737	0	66	-	66
Total	**16,000**	**16,000**	**0**	**8,568**	**7,856**	**712**

Details of the variances between actual and plan are in Appendix H.

Table 9 below provides a Fiscal 2022 year-to-date (**YTD**) summary as of September 30, 2021, for the plan, actual cost and related variance based on the 2021/22 to 2023/24 Service Plan.

Table 9 2021/22 to 2023/24 Service Plan Compared to Actuals to September 2021 ($ million Nominal)

Description	2021/22 to 2023/24 Service Plan (September 2021)	Actuals, YTD (September 2021)	Variance
Total Project	1,581	990	591

Details of the variances between actual and plan are in Appendix H.

5.4 Site C Project Financing

Most of BC Hydro's capital projects, including the Site C Project, are debt financed. The Site C Project costs are included as part of BC Hydro's overall borrowing and included in the Province of British Columbia's budget and fiscal plan. The debt and related interest costs are managed corporately by BC Hydro.

5.5 Material Project Risks and Opportunities

Material project risks and opportunities are identified and reviewed by BC Hydro management and the Project Assurance Board on an ongoing basis. Project risks are uncertain events that, if they occur, could result in a negative impact or loss to a project. Similarly, opportunities are uncertain events that, if they occur, could result in a positive impact, or benefit, to a project.

As the Project progresses through implementation phase, the Project risks and opportunities will continue to evolve.

In response to recommendations from the independent review of the Project by Mr. Milburn, the criteria for selecting those risks and opportunities to include in internal and external reporting were updated. The criteria include both objective and subjective measures, and these criteria have been utilized to select the risks and opportunities included in the list below.

Refer to Table 10 below for a list of the material Project risks and refer to Table 11 below for a list of the material Project opportunities as of September 30, 2021.

Table 10 Material Project Risks

Risk Description	Impact and Response Plan Summary
Risk that COVID-19 event impacts continuation of construction activities at site or in Vancouver	**Impact**: BC Hydro and contractors do not have access to the required labour for daily construction and project management activities. BC Hydro and contractor costs increase to respond to COVID-19 and schedule delay impacts; camp capacity reduction and/or shutdown due to COVID-19 outbreaks. **Response:** Minimize non-essential travel to site. Screen workers before they travel to site and at site before entry; implemented camp mitigation measures (additional cleaning, closed cafeteria self serve stations, establish isolation wings); put in place BC Hydro and contractor worker vaccine policies and protection exposure protocols and plans.

Risk Description	Impact and Response Plan Summary
Risk that the Project contractors cannot attract and retain sufficient skilled craft workers	**Impact:** 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, the requirement for specialized workers, and the effects of COVID-19. This may result in potential impacts to schedule, safety, productivity and cost. **Response**: 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.
Risk of contractor claims	**Impact**: Increased construction management and contract management effort required to respond to and investigate claims; settlement of claims may result in increased costs. **Response**: Ensure sufficient commercial management resources in place, proactively resolve claims as received, and ensure commercial management procedures are in place and are being followed.
Risk of a safety incident resulting in a fatality or disabling injury	**Impact:** Serious worker injury or fatality; project delays and associated costs. **Response**: 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; continue to include safety in BC Hydro and contractor on boarding orientations; and continue to promote a strong safety culture.
Risk of erosion of the diversion outlet riprap material	**Impact**: Cost of remediation; schedule delay and potential generation flow restriction on G.M. Shrum and Peace Canyon generation stations. **Response**: Complete both temporary and permanent solutions to prevent erosion. Monitor outlet area for any signs of erosion.
Risk of right bank foundation enhancement interface conflicts	**Impact**: Existing contractors' scope of work and schedule impacted by potential new right bank foundation enhancements contractor interfaces. **Response:** Rely on change schedule terms of existing contracts to proceed with change orders for the right bank foundation enhancements work scope.
Risk of insufficient acceptable on-dam site aggregate supply to meet demand	**Impact:** Decreased productivity, schedule delays and increased cost that could impact multiple contracts. **Response:** Increase aggregate stockpiles; work with contractors to minimize waste and maximize aggregate production; release additional contingency aggregate excavation sites; seek out additional aggregate sources and procure off site and haul in additional aggregate.
Risk that permits are not available by the date required for construction	**Impact:** Delays to the Project while permits are acquired, and an increase in costs. **Response:** Ongoing engagement with contractors, regulators, and First Nations.

Risk Description	Impact and Response Plan Summary
Risk that BC Hydro is unable to attract and retain enough skilled BC Hydro employees to work on the project	**Impact:** Unable to meet Project requirements. **Response:** Increase employee engagement activities to increase retention; develop and implement end of project resource transition plans and communicate to employees; hire consultants if necessary.

Table 11 Material Opportunities

Opportunity Description	Impact and Response Plan Summary
Lower interest during construction due to timing of Project contingency expenditures	**Impact**: Lower Project interest costs than the amount budgeted. **Response:** Monitor Project contingency expenditure timing. Where feasible, delay contingency expenditures.

6 Key Procurement and Contract Developments

6.1 Key Procurements

The procurement approach was approved by the board of directors in June 2012 for the construction of the Project. The procurement approach defined the scope of the major contracts and their delivery models. The remaining procurements on the Project are summarized in Table 12 below.

Table 12 Remaining Major Project Contracts and Delivery Models

Component	Contract	Procurement Model	Anticipated Timing
Reservoir/ Transmission Clearing	Multiple reservoir clearing contracts to be awarded over seven to eight years	Design-Bid-Build	Fifteen contracts completed (reservoir 13, transmission two). Two reservoir access and clearing contract packages were awarded and work is underway. One remaining access and clearing package is expected to be procured in 2022 or 2023.
Generating Station and Spillways	Balance of Plant – Mechanical contract	Design-Bid-Build	Contract was awarded on July 29, 2021.
	Balance of Plant – Electrical contract	Design-Bid-Build	Contract was awarded on September 22, 2021.

Component	Contract	Procurement Model	Anticipated Timing
	Balance of Plant – Architectural contract	Design-Bid-Build	Request for proposals was posted in June 2021 and response(s) being evaluated.
	Balance of Plant – Permanent upstream fishway and other structures	Design-Bid-Build	Request for proposals was posted in July 2021.
	Balance of Plant – Fire detection and protection contract	Design-Build	Request for proposals was posted in August 2021.
	Balance of Plant – Heating, ventilation and air conditioning contract	Design-Build	Request for proposals was posted in September 2021.

6.2 Major Construction Contracts Exceeding $50 million

Since inception of the Project, 12 major construction contracts have been awarded that exceed $50 million in value, as shown in Table 13.

All construction contracts have been procured and awarded as per BC Hydro procurement policies.

Table 13 Major Project Construction Contracts Awarded

Contract	Contract Value at September 30, 2021[11] ($ million)	Contract Execution Date
Site Preparation: North Bank	60	July 2015
Worker Accommodation	566	September 2015
Main Civil Works	2,789	December 2015
Turbines and Generators	464	March 2016
Transmission and Clearing	93	October 2016
Quarry and Clearing	127	February 2017
Generating Station and Spillways Civil Works[12]	2,018	March 2018
Hydromechanical Equipment	70	April 2018

[11] Contract value reflects the current value including executed change orders to the end of the reporting period.
[12] Includes some of the scope of work for the right bank foundation enhancements.

Contract	Contract Value at September 30, 2021[11] ($ million)	Contract Execution Date
Transmission Line Construction	138	May 2018
Highway 29	376	October 2019
Balance of Plant Mechanical	70	July 2021
Balance of Plant Electrical	128	September 2021

6.3 Contracts Exceeding $10 million

For open contracts procured and awarded in excess of $10 million, refer to Appendix F.

6.4 Contract Management

6.4.1 Material Changes to the Major Contracts

The main civil works contract is a unit price contract and as such variations in quantities and design are expected over the term of the contract. Since contract award in December 2015, the main civil works contract value has increased by $1.04 billion to reflect approved changes to September 30, 2021. This increase in contract value is primarily the result of a number of contract amendments since contract award in 2015, including two larger contract amendments, one in 2018 and the second in March 2020.

The generating station and spillways contract is also a unit price contract and, as such, variations in quantities and design are expected over the term of the contract. Since contract award in March 2018, the generating station and spillways contract value has increased by $414 million to reflect approved changes to September 30, 2021. The increase in contract value is the result of contract amendments to support the right bank foundation enhancements, COVID-19 related items, and variations in quantities and design. During the reporting period, BC Hydro concluded a settlement agreement with the contractor that is consistent with the terms in the memorandum of understanding on the impacts due to the COVID-19 pandemic.

7 First Nations Consultation

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

Accommodation offers were originally extended to 10 First Nations communities. Seven agreements have been fully executed and are in various stages of implementation. In February 2019, the Government 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 the Site C Project. West Moberly First Nations withdrew from the discussions in August 2019 and filed an amended Notice of Civil Claim in September 2019. The Government of British Columbia and BC Hydro have since negotiated an agreement with Prophet River First Nation to settle this litigation, which was publicly announced in August 2020. To date, Impact Benefits Agreements with McLeod Lake Indian Band, Doig River First Nation, Halfway River First Nation, Prophet River First Nation, and Saulteau First Nations, and Project Agreements with Dene Tha' First Nation and Duncan's First Nations have been publicly announced.

Engagement on Project construction activities has continued through regular Project update meetings with First Nations. The Environment Forum and Culture and Heritage Resource Committee have also continued to meet regularly, primarily through virtual means. The Culture and Heritage Resource Committee has concluded their work on most cultural recognition projects to date, such as signage at the Site C viewpoint describing the culture and history of Treaty 8 First Nations communities. The Committee has recently agreed to focus their efforts on a proposed Cultural Centre Development Project and are currently finalizing the terms

of reference for that project. A Cultural Centre Working Group, comprised of most of the impacted First Nations, has already held two visioning workshops to plan for the proposed cultural centre. The Environment Forum has discussed key topics including Project reclamation planning, developing additional aggregate sources, and methylmercury monitoring in the future reservoir.

Consultation is ongoing with impacted First Nations regarding options and site-specific plans for identified burial and cultural sites impacted by reservoir inundation, in particular in the Halfway River and Cache Creek Bear Flats areas. A number of non-intrusive field investigations have been undertaken to plan management options for these sites. BC Hydro will take direction from impacted First Nations on the most appropriate management options and any community support needs.

The cultural monitoring program continues with First Nations monitors observing Project construction at Highway 29 locations as well as environmental enhancement and mitigation programs. Due to COVID-19 safety measures, cultural monitors will not be on the dam site until further notice.

In October 2020, in collaboration with the Project's Cultural and Heritage Resources Committee, BC Hydro launched a new interactive travelling exhibit that tells the story of Indigenous peoples in the Peace Region and displays replicas of artifacts found during the construction of Site C. The travelling exhibit will be transferred from Halfway River First Nation to Doig River First Nation in November 2021 and at Tse'Kwa (a property owned by Treaty 8 First Nations), and will resume travel to communities once COVID-19 health orders are lifted.

The exhibit describes past use of the Peace Valley area, tells stories from various communities, and commemorates sites that will be lost to inundation from the future Site C reservoir. It includes important archaeological evidence uncovered from the Site C construction area, which spans from 12,500 years ago until the recent past.

8 Litigation

The details of open proceedings as of September 30, 2021, are summarized in Table 14 below.

Table 14 Litigation Status Summary

Description		Date
B.C. Supreme Court: Treaty Infringement Claim		
West Moberly First Nations	Civil claim filed. Injunction application filed. Injunction hearing date. Injunction denied (no appeal filed). Amended civil claim filed. Scheduled trial date.	January 15, 2018 January 31, 2018 July 23 to August 3, 2018 and September 4 to 7, 2018 October 24, 2018 September 25, 2019 March 2022
B.C. Supreme Court: Civil Claims		
Building and Construction Trades Council	Civil claim filed. Response to claim filed. No steps have been taken in litigation that require a response from BC Hydro.	March 2, 2015 April 10, 2015
Michael Acko, etal (residents of Old Fort community)	Civil claim filed. Application for particulars hearing date. Response to claim filed.	January 18, 2021 June 25, 2021 September 8, 2021
Allianz Global Risks US Insurance Company, etal	Civil claim filed. Claim was filed by BC Hydro to preserve BC Hydro's rights to claim under Site C property insurance for losses related to left bank tension crack events.	February 5, 2021
Allianz Global Risks US Insurance Company, etal	Civil claim filed. Claim was filed by BC Hydro to preserve BC Hydro's rights to claim under Site C property insurance for losses related to rockfall event near a diversion tunnel inlet portal.	July 13, 2021

Description		Date
B.C. Supreme Court: Civil Claims – Expropriation Act		
Joy Eileen Ross	Notices of claim filed to keep open plaintiffs' rights to claim further compensation under the *Expropriation Act*. Further appraisal and other reports are required prior to commencing settlement negotiations in all but one claim, where an agreement has been reached. No requirement for BC Hydro to file responses at this time.	July 22, 2019
Chipmunk Holding Ltd., *et al*		July 22, 2019
Samuel James Mahood and Judy Edith Mahood		July 22, 2019
Gordon Roy Kelly and Heather Marie Kelly		May 13, 2020
Kenneth Victor Boon and Arlene Lois Boon (aka Arleen Lois Boon)		January 15, 2021
Lois Caroline Bentley		January 15, 2021
Dale Alvin London and Clara Anne London		January 15, 2021
Carla Jane Salmond		January 15, 2021
Lloyd Stewart Bentley, *et al*		January 15, 2021
Hudson's Hope Historical Society		March 18, 2021
Hudson's Hope Holdings Ltd., Robert Edward Bach and Beverly Jean Bach		March 26, 2021
Lloyd Stewart Bentley and Katheryn Lynn Bentley		April 23, 2021
Butler Ridge Energy Services (2011) Ltd.		April 23, 2021
Gwen Lillian Johansson		August 19, 2021
Robert Edward Bach and Beverly Jean Bach		September 20, 2021

9 Permits and Government Agency Approvals

9.1 Background

Before the Site C Project could start construction, an extensive environmental assessment process was undertaken which resulted in the issuance of the Provincial Environmental Assessment Certificate and the Federal Decision Statement in support of the Project. In addition, the Project is required to apply for multiple provincial permits, water licences, leaves to commence construction and federal authorizations. Timing of the application for these permits and authorizations is staged and aligned with the construction schedule, availability of detailed design information, and by Project component. Permitting approaches and requirements are also determined through regular meetings with regulatory agencies and are subject to change throughout the Project.

To date, BC Hydro continues to be issued permits and authorizations in accordance with its construction timelines. As of September 30, 2021, 519 of the estimated 600 provincial and federal permits required throughout the life of the Project had been obtained and are actively being managed.

Multiple conditions are attached to each permit or authorization, which cover subjects such as air quality, water quality, fish and aquatics, wildlife, heritage, health and safety, construction environmental management and First Nations consultation. As of September 30, 2021, all required conditions and submissions have been met in accordance with the schedule and requirements of the conditions.

9.2 Federal Authorizations

Federal authorizations are required under the *Fisheries Act* (Fisheries and Oceans Canada) and the *Navigation Protection Act* (Transport Canada). All major federal authorizations for construction and operation of the Site C dam and reservoir were received in July 2016. As of September 30, 2021, one additional *Fisheries Act*

authorization is anticipated for the temporary placement of fill material immediately downstream of the downstream cofferdam. Additional *Canadian Navigable Waters Act* (formerly *Navigation Protection Act)* approvals and notifications for discrete works in the reservoir (e.g., shoreline works, debris booms and Highway 29 bridges) are anticipated to be issued at the regional level. As of September 30, 2021, a total of 109 federal approvals had been received and are actively being managed. Eighteen future approvals are planned.

9.3 Provincial Permits

Site C requires provincial permits primarily under the *Land Act, Water Sustainability Act, Forest Act, Wildlife Act, Heritage Conservation Act,* and *Mines Act*. These permits include investigative permits, licences to occupy land, water licence approvals, leaves to commence construction and leaves to construct, and licences to cut vegetation, among others.

As of September 30, 2021, 403 of the estimated 470 provincial permits and approvals that are required throughout the life of the Project had been obtained and are actively being managed. These include permits for the dam site, worker accommodation, Highway 29 realignment, transmission line and eastern, middle, and western reservoir clearing. Future provincial permits are being planned for the remainder of the generating station construction, reservoir filling and operations, as well as decommissioning the existing Highway 29.

On June 29, 2021, the Supreme Court of British Columbia released its decision in *Yahey v British Columbia*, determining that the cumulative impacts from a range of provincially authorized industrial activities (primarily oil and gas and forestry) within Blueberry River First Nations traditional territory constituted an infringement of Blueberry River First Nations Treaty 8 rights. BC Hydro was not a party to that court case.

BC Hydro continues to consult with Blueberry River First Nations and all Treaty 8 First Nations and remains willing to negotiate an Impact Benefit Agreement with Blueberry River First Nations.

9.4 Environmental Assessment Certificate

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

On March 16, 2021, BC Hydro submitted a draft Environmental Assessment Certificate amendment request to the Environmental Assessment Office regarding the use of haul trucks on a contingency basis to transport till material from 85th Avenue Industrial Lands to the dam site area. Prior to submitting the final submission in June 2021, BC Hydro engaged with local governments, First Nations and local residents on the proposed activity and responded to concerns. Hauling will comply with all requirements for the use of public roadways. The amendment request is currently under review by the Environmental Assessment Office. The work associated with this amendment request is scheduled to commence in spring 2022.

On June 14, 2021, BC Hydro submitted a request to amend Condition 40 of the Environmental Assessment Certificate, proposing that BC Hydro amend one of three boat launch locations required by the Certificate from Cache Creek to a location close to Halfway River. The amendment request is currently under review by the Environmental Assessment Office.

All amendments and amendment requests are posted on the Environmental Assessment Office website.

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

10 Environment

10.1 Mitigation, Monitoring and Management Plans

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

Focus remains on minimizing sediment and erosion across the dam site, care of water, hydrocarbon management and invasive weed control. Given the size of the Project and the length of construction, wildlife is becoming less wary of the site. As such, wildlife attractant management continues to be a focus.

Operation of the temporary fish passage facility was refined during the reporting period and was periodically augmented by a contingent “trap and haul” program using large river electrofishing equipment. These refinements were intended to improve the operation of the facility and maximize passage based on lessons learned from previous quarters.

On the right bank, the water treatment plant and holding ponds to treat potentially acid generating rock contact water were fully operational throughout the reporting period.

Throughout the spring and summer, focus was on wildlife sweeps for nesting birds, fish salvage due to fluctuations in water levels, and wildlife awareness to avoid conflicts.

Field monitoring for noise and dust continues in the Hudson's Hope area related to works within the berm and along the truck haul route, as needed. So far, this monitoring has not identified air quality or noise exceedances coming from the Site C works. The Site C Project team continues to monitor the area and work with inspectors from the Environmental Assessment Office.

Care-of-water systems within the till conveyor performed well over the reporting period.

The Environmental Assessment Office completed one physical inspection, and one remote inspection of the Project during the quarter. Results of both inspections remain outstanding.

10.2 Environmental Compliance Inspections and Enforcement

During the reporting period, the Project was inspected by the Independent Environmental Monitor, who performed more than 418 hours of inspections.

Throughout the course of the onsite inspections, environmental compliance was focused on the following areas:

- Invasive plants management and procedures. BC Hydro has updated signage/awareness regarding noxious weeds management and potential spread. Signage updates include, but are not limited to, restrictions, control measures, and increased visibility and sediment fencing management around the wetland complex at the 72/2 tower site on the transmission line. BC Hydro has installed fencing near the wetland area to effectively protect the area from runoff. This also includes periodic monitoring to ensure the fence is functioning as intended.
- Ensuring all construction areas are clean of anthropogenic food sources, with garbage stored in verified bear-proof containers. BC Hydro's contractors have continued to make improvements to the management of anthropogenic food

waste across the Project. Such improvements include installation of appropriate animal-proof waste containers, increased frequency of toolbox talks to address wildlife attractant issues, and the creation of a waste management team.

- Equipment spill/leak monitoring. BC Hydro continues to promptly identify the presence of leaks and spills on equipment and report the findings in daily logs. Further actions to address issues include continuing to utilize spill pads and drip trays, and monitoring of equipment with appropriate storage and disposal.

BC Hydro completed 11,074 environmental compliance inspections in the reporting period, with a compliant or partial compliant result of 99 per cent across all contractors and works areas.

The Site C Project team continues to meet with provincial regulators to ensure ongoing focus and attention to the areas of most importance and concern for the regulators, and to proactively address any environmental or regulatory issues that may arise.

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

10.3 Heritage

In accordance with Environmental Assessment Certificate and Federal Decision Statement conditions, the Site C Heritage Resources Management Plan addresses

the measures that will be used to mitigate the adverse effects of the Project on heritage resources.

During the reporting period, the heritage program focused on conducting field work that met regulatory requirements for pre-construction archaeological impact assessments at selected locations, as well as providing Project construction support.

During the reporting period, two archaeological reports were submitted to the B.C. Archaeology Branch and Indigenous groups in accordance with *Heritage Conservation Act* permit terms and conditions.

Heritage reviews of contract documents, contractor environmental plans and construction readiness plans, as well as construction-related field inspections at archaeological sites were performed to ensure compliance. Two reported palaeontological chance finds were collected for further analysis and documentation.

10.4 Agricultural Mitigation and Compensation Plan Framework

As part of the Site C Agricultural Mitigation and Compensation Plan, BC Hydro has established a $20 million BC Hydro Peace Agricultural Compensation Fund to support agricultural production and related economic activity in the Peace Region. The fund is governed by a regional decision-making board made up of representatives from five regional agricultural organizations, the Peace River Regional District, three agricultural producer members-at-large and one Peace River Valley agricultural producer. Northern Development Initiative Trust is the fund administrator and manages the investment of the funds.

As of September 30, 2021, more than $770,000 in funding had been approved for 33 projects. The fall 2021 grant intake closed on September 30, 2021, with application review to take place in November 2021.

11 Employment and Training Initiatives and Building Capacity Initiatives

11.1 Labour

To date, unions that have participated in the construction of Site C are listed in Table 15 below.

Table 15 Participating Unions

Union
Construction Maintenance and Allied Workers (CMAW)
Christian Labour Association of Canada (CLAC), local 68
Canada West Construction Union (CWU)
Construction and Specialized workers Union (CSWU), local 1611
International Union of Operating Engineers (IUOE), local 115
Millwrights Union local 2736
Ironworkers, local 97
International Brotherhood of Electrical Workers (IBEW)
MoveUP, local 378
Pile Drivers 2402
Boilermakers, lodge 359
United Association of Journeymen & Apprentices of the Plumbing & Pipefitting Industry of the U.S. & Canada, local 170
Teamsters, local 213

The labour approach for the Site C balance of plant contracts will be for the contractors to retain the Construction Labour Relations Association to enter into an agreement, with the Bargaining Council of B.C. Building Trades Unions or another consortium of Building Trades Unions that covers an agreed set of labour requirements.

11.2 Labour Update on Scaled Back Activities at Dam Site due to COVID-19 Pandemic

BC Hydro continues to provide updates to key project unions on site, with information that is being shared with workers.

The latest number of people in camp in isolation, applicable Northern Health Orders, and the status of COVID-19 testing results are available on the Site C website.

In early August 2021, Northern Health's Medical Health Officer declared a COVID-19 outbreak at Site C. As per the Northern Health Medical Health Officer order related to the outbreak, there was a return to restrictions regarding workers accessing local communities. During the outbreak, camp workers were restricted from leaving site during their work rotation. Exemptions were granted for work-related reasons, medical emergencies and critical appointments. Mandatory mask use was also re-instated for both indoor and outdoor areas at site, including when inside a vehicle or while operating equipment with another person for the purpose of work; as of September 30, 2021, this requirement continued to be in effect.

As directed by a Northern Health order to the industrial projects, vaccine status information is to be collected to determine the percentage of workers who are fully vaccinated, partially vaccinated, and not vaccinated with a Heath Canada-approved COVID-19 vaccine.

During the reporting period, BC Hydro and Site C contractors continued working to implement both of these orders.

11.3 Employment

Contractors submit monthly workforce data electronically to BC Hydro. Table 16 presents the monthly number of construction contractors, non-construction contractors, engineers, and Project team workers for this period. As with any construction project, the number of workers – and the proportion from any particular

location – will vary month-to-month and also reflects the seasonal nature of construction work.

Table 16 Site C Jobs Snapshot Reporting Period – April 2021 to June 2021

Month	Number of B.C. Primary Residents[13]	Total Number of Workers[14]
July 2021	3,578	5,108
August 2021	3,513	5,087
September 2021	3,448	4,963

In September 2021, there were 4,963 total workers on the Site C Project. Sixty-nine per cent (3,448 workers) of the workforce was made up of residents of British Columbia, while 24 per cent (1,031 workers) of the workforce lived in the Peace River Regional District. The onsite contractor workforce number also includes 12 per cent women (493 workers) and 183 workers who are working for various contractors as apprentice carpenters, electricians, millwrights, ironworkers, mechanics, boilermakers and plumbers.

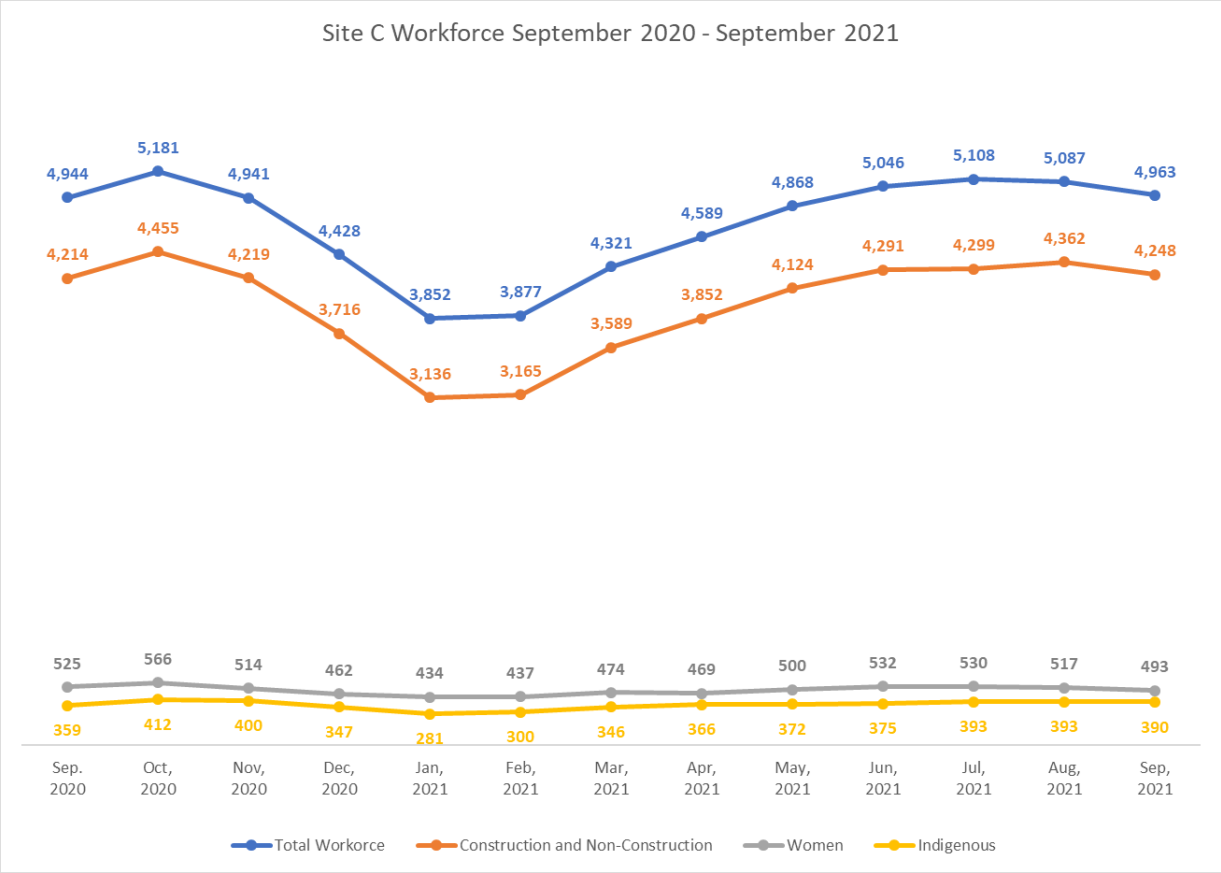
Figure 2 below shows the monthly Site C workforce over the period from September 2020 to September 2021. The *Industrial Projects Restart Order*, which limited workers returning to site in January and February 2021, continued to impact the construction and non-construction workforce during the reporting period.

[13] Employment numbers provided by Site C contractors and consultants are subject to revision. Data not received by the Project deadline may not be included in the above numbers. Employment numbers are direct only and do not capture indirect or induced employment.

[14] 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 onsite and offsite workers.
- The Project team, which includes BC Hydro construction management and other offsite personnel. An estimate is provided where possible if primary residence is not given.

Figure 2 Site C Workforce September 2020 to September 2021



Note: The Indigenous and women numbers are a subset of the construction and non-construction contractors workforce number.

11.4 Training and Capacity Building Initiatives

In September 2017, the Contractors Labour Committee agreed to establish an Indigenous labour sub-committee. The purpose of the sub-committee 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.

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

In August 2013, Northern Lights College Foundation started distributing the BC Hydro Trades and Skilled Training Bursary Awards. As of September 30, 2021, a total of 284 students had received bursaries, including 132 Indigenous students who have benefitted from the bursary in programs such as electrical, welding, millwright, cooking, social work, and many others. BC Hydro has worked with the Northern Lights College Foundation to extend the bursary timeline and reserve a portion of bursary amounts for trades programs directly needed for Project work. Part of this agreement was to set aside funds for the BC Hydro and Northern Lights College pre-carpentry skills pilot program for Site C as well as other joint pre-skills programs. In March 2021, BC Hydro provided funds to the Northern Lights College Foundation to continue the bursary for an additional year.

BC Hydro continues to work with local employment agencies to ensure that as job opportunities become available, they are posted on the WorkBC website as well as on the Fort St. John Employment Connections website.

On June 15, 2021, the B.C. Construction Association announced that BC Hydro and seven Site C contractors had become the first multi-contractor project to sign the Builders Code, setting a new industry standard with a project-wide commitment to eradicate hazing, bullying and harassment. Signing this pledge jointly demonstrates the Project's commitment and belief that everyone has a right to be safe and protected at the worksite. This initiative between BC Hydro and Site C contractors demonstrates that inclusion, diversity and respectful workplace behavior is jointly valued on the Project. During the reporting period, the Builders Code continued to be implemented on site.

Site C contractors have noted that certain trades will continue to be in high demand during peak Project construction periods. As such, in early 2020, major onsite contractors started exploring opportunities for apprentice and other training to take place onsite. Further in 2020, BC Hydro worked with Northern Lights College and Site C contractors to develop three onsite pilot programs. The programs included a new program with Northern Lights College designed for local Indigenous candidates interested in becoming heavy equipment operators on the Site C Project, a re-launch of the Pre-Carpentry Skills Program with Northern Lights College, and a Fish Monitoring Program. These programs were temporarily postponed in March 2020, due to COVID-19. The program for local Indigenous candidates interested in becoming heavy equipment operators on the Site C Project was restructured and was delivered in October 2021.

The BC Hydro and Northern Lights College Fish Monitoring Program was restructured to contain additional wildlife training and was renamed the Environmental Training Program. With COVID-19 safety plans in place, the program was successfully delivered offsite in June 2021. The program included workforce training certifications in preparation for employment opportunities on the Project. Eight participants from Treaty 8 Nations participated in the online and in-person training program. All candidates successfully completed the program.

12 Community Engagement and Communication

12.1 Local Government Liaison

There are a number of Environmental Assessment Certificate conditions that are relevant to local communities in the vicinity of the Project. BC Hydro is implementing some of these conditions through community agreements offered to five local governments. Through these agreements and discussions, BC Hydro has, in some instances, agreed to additional measures to address concerns about local community impacts from construction and operation of the Project. BC Hydro provided update emails at a frequency agreed upon with the Regional Community Liaison Committee regarding actions taken to respond to the pandemic and, in 2020, launched a Site C COVID-19 website for public information. Teleconferences continued as needed through the reporting period with the Regional Community Liaison Committee to continue to engage with local governments and Indigenous groups in partnership with Northern Health and Emergency Management B.C.

BC Hydro continues to reach out to the Peace River Regional District with regards to the creation of the reservoir and if it will increase the risk of instability to the Charlie Lake wastewater system outfall. Assessments to date indicate the creation of the reservoir does not materially increase the risk of slope instability. BC Hydro is also in the process of confirming that the creation of the reservoir does not materially diminish the in-river dilution.

The Regional Community Liaison Committee, which is comprised of local elected officials and local First Nations communities, most recently met virtually on September 29, 2021. Eight local governments and four local First Nations communities (McLeod Lake Indian Band and Doig River First Nation, Saulteau First Nations and Blueberry River First Nations) as well as the two MLAs for Peace River North and Peace River South, are invited to participate as committee members.

Representatives from the Project's major contractors may also attend the meetings as invited guests.

As part of the Site C Project, BC Hydro is working with communities to provide lasting benefits for residents of the Peace Region. In 2016, BC Hydro launched the Generate Opportunities (GO) Fund, an $800,000 fund to support Peace Region non-profit organizations. The GO Fund is being distributed over an eight-year period to organizations that provide services to vulnerable populations including children, families and seniors.

The GO Fund is administered by Northern Development Initiative Trust on behalf of BC Hydro. During this reporting period, BC Hydro distributed $36,075 to four non-profit organization in the Peace Region and as of September 30, 2021, nearly $540,066 had been distributed to 61 projects since the fund was launched in 2016.

12.2 Business Liaison and Outreach

BC Hydro continued to implement its Site C Business Participation Plan, which supports local and regional business participation in the Project. The Project team sent out two procurement notifications to the Site C business directory in the third quarter of the year.

12.2.1 Community Relations and Construction Communications

Throughout the reporting period, BC Hydro continued to implement its construction communications program. The program includes updating and maintaining the Project website (www.sitecproject.com) with current information, and photos and videos of construction activities, as well as providing information to local and regional stakeholders as required.

Due to COVID-19 restrictions, the Site C community relations team has not hosted any external site tours since before the beginning of the pandemic.

Construction Bulletins

Bi-weekly construction bulletins continued to be issued throughout the reporting period. These bulletins are posted on the Project website and sent by email to the web-subscriber list. There were six construction bulletins and one quarterly construction notification letter issued in the third quarter of 2021.

Public Enquiries

In total, BC Hydro received 145 public enquiries between July 1 and September 30, 2021. Table 17 shows the breakdown of some of the most common enquiry types.

In total, BC Hydro has received more than 13,000 enquiries since August 2015.

Table 17 Public Enquiries Breakdown

Enquiry Type[15]	July 1 to September 30, 2021
Job Opportunities	46
Business Opportunities	24
General Information	50
Construction Impacts[16]	14
Other[17]	11
Total	**145**

12.2.2 Communications Activities

Based on a search using the media database Infomart, there were 164 stories about the Site C Project in B.C. news media between July 1 and September 30, 2021.

12.3 Labour and Training Plan

In accordance with an Environmental Assessment Certificate condition, a Labour and Training Plan was developed and submitted to the Environmental Assessment

[15] This table is a sample of enquiry types and does not include all enquiry types received.

[16] The nature of the construction impact inquiries is primarily air quality, noise and traffic conditions.

[17] "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.

Office on June 5, 2015. This plan, as well as Environmental Assessment Certificate Condition 45, includes reporting requirements to support educational institutions in planning their training programs to support potential workers in obtaining Project jobs in the future. This report was issued to the appropriate training institutions in the northeast region of B.C. in July 2016, July 2017, July 2018, July 2019, September 2020 and July 2021. The next report will be issued in July 2022.

12.4 Human Health

12.4.1 Health Care Services Plan and Emergency Service Plan

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

The clinic provides workers with access to primary and preventative health care and work-related injury evaluation and treatment services and is currently open seven days a week, 24 hours a day. Since opening the health clinic, there have been a total of 31,920 patient interactions. During the reporting period, there were 4,275 patient interactions, of which 268 were occupational and 4,007 non-occupational. Several preventive health themes were promoted to workers including hepatitis (World Hepatitis Day July 28), air pollution as related to the extensive wildfire season, and cardiovascular disease with key messaging on improving cholesterol and your overall health.

12.5 Property Acquisitions

In the fall of 2021, with all required land rights for the Highway 29 realignment now acquired, BC Hydro continues to focus on land acquisitions to enable upcoming reservoir clearing and inundation.

12.6 Plans During Next Six Months

Based on the new schedule and in-service date of 2025, Table 18 below shows the key milestones for activities planned during the next six months, October 2021 to March 2022.

Table 18 Key Milestones for Activities Planned During the Next Six Months (October 2021 to March 2022)

Milestone	Performance Measurement Baseline (June 2021)	Plan Date (Control Date[18])	Forecast[19]	Status[20] (Measured by Month)
Generating Station and Spillways				
Gate Guides, Gates, and Wire Rope Hoists for SPOG, SPSL Supplied	October 2021	October 2021	December 2021	At risk
INOG and INMG (incl Lifting Beam, HPU, and Hoist) Supplied	November 2021	November 2021	November 2021	On track
U1 - Spiral Case Embedded and Generator 2nd Stage Concrete Complete; Pit Free	January 2022	January 2022	March 2022	At risk
Balance of Plant				
Contract Award – Balance of Plant Architectural	December 2021	January 2022	January 2022	On track
Contract Award – Balance of Plant Out Structures	January 2022	January 2022	January 2022	On track
Contract Award - Balance of Plant Fire Protection	February 2022	February 2022	February 2022	On track

18 Control date reflects plan, adjusted for approved changes to milestone dates.
19 As at September 30, 2021.
20 As at September 30, 2021.

Milestone	Performance Measurement Baseline (June 2021)	Plan Date (Control Date[18])	Forecast[19]	Status[20] (Measured by Month)
Contract Award - Balance of Plant Heating, Ventilation, and Air Conditioning	March 2022	March 2022	February 2022	On track
Main Civil Works				
Roller-compacted concrete buttress complete	September 2021	September 2021	October 2021	Complete
Left Bank Excavation Works Complete	December 2021	December 2021	December 2021	On track
Turbines and Generators				
Unit 1 – Stay ring and spiral case assembled and handover of generator embedded parts	June 2021	June 2021	October 2021	Complete
Unit 2 – Stay ring and spiral case assembled and handover of generator embedded parts	September 2021	September 2021	November 2021	At risk
Unit 3 – Stay ring and spiral case assembled and handover of generator embedded parts	November 2021	November 2021	November 2021	On track
U4 - Stay Ring and Spiral Case Assembled and Handover of Generator Embedded Parts	January 2022	January 2022	February 2022	At risk
U5 - Stay Ring and Spiral Case Assembled and Handover of Generator Embedded Parts	March 2022	March 2022	April 2022	At risk
Highways				
Contract Awarded - Grading, Paving, & Bridge Decommissioning	March 2022	March 2022	February 2022	On track
Transmission				
5L6 Transmission Line In-Service Date	July 2022	July 2022	March 2022	On Track

13 Impacts on Other BC Hydro Operations

During the reporting period, the operation of system storage at Williston Reservoir (including GM Shrum and Peace Canyon powerplants) was planned to meet flow releases necessary for Site C construction, and this operation continues. Water releases from Peace Canyon Generating Station were maintained at or below the levels necessary for Project construction. BC Hydro maintained adequate vacant storage in Williston Reservoir to protect Site C construction works from flows that could otherwise exceed the capacity of the diversion works.

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Site C Clean Energy Project

Quarterly Progress Report No. 23

Appendix A

Site Photographs

Figure A-1 **An aerial view of the headpond and debris boom where a barge is used for clearing debris materials from the boom (July 2021)**

Figure A-2 **Bridge formwork is under construction at the Dry Creek section of Highway 29 (July 2021)**

Figure A-3 Penstocks for units 1, 2 and 3 (July 2021)

Figure A-4 Construction progresses at the spillway headworks east low-level outlet gate. The spillway will allow the passage of large volumes of water from the reservoir into the river channel downstream (July 2021)

Figure A-5 **A top view (from right to left) of the unit 1 to 6 intakes and penstocks in varying stages of construction. Unit 4 is going to be the last to be built (July 2021)**

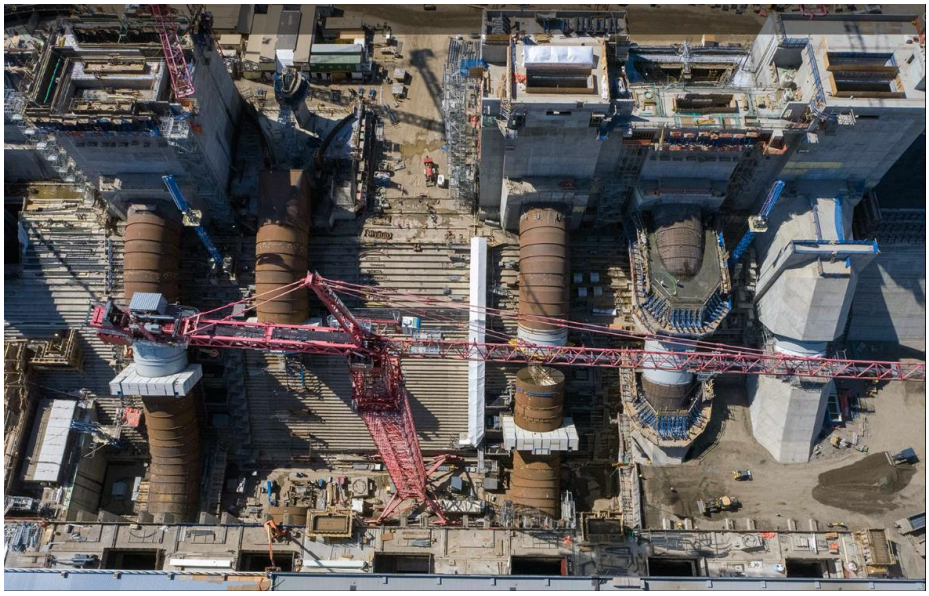

Figure A-6 **The first of four spiral case inlet bulkheads is delivered from the Voith warehouse at site to the powerhouse (August 2021)**

Figure A-7 Construction is ongoing on the spillway headworks centre pier at bay 2 and 3 (August 2021)

Figure A-8 Construction of the concrete piers for the Lynx Creek bridge along Highway 29 (August 2021)

Figure A-9 **Glacial till is extracted at the 85th Ave. Industrial Lands and sent by conveyor belt to the dam site (August 2021)**

Figure A-10 **Crews in the dam core trench are busy placing till, filters and aggregates (September 2021)**

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Appendix B

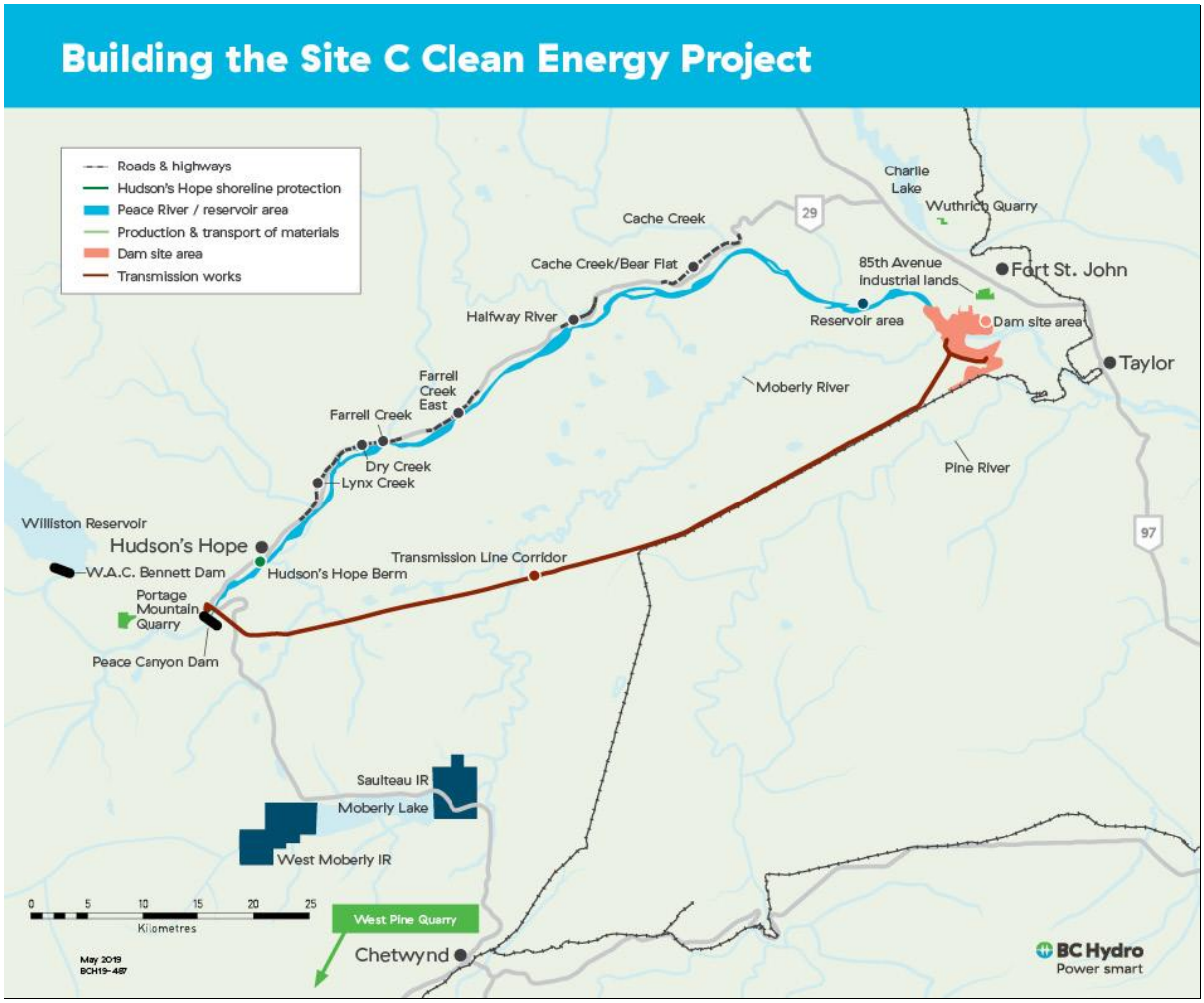
Work Completed Since Project Commencement in 2015

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

- Site preparation, including onsite access roads;
- Clearing of the left and right banks at the dam site and clearing of the lower reservoir area;
- Construction of the worker accommodation lodge and Peace River construction bridge;
- Powerhouse excavation, and placement of 650,000 cubic metres of roller-compacted concrete in the powerhouse buttress;
- Spillways excavation, and the placement of 600,000 cubic metres of roller-compacted concrete in the spillways buttress;
- Construction of dam site access public roads;
- Construction of the Site C viewpoint;
- The completion of 50 affordable housing units in Fort St. John.
- Fish habitat enhancements downstream of the dam site;
- Excavation of the diversion tunnel inlet (upstream) and outlet (downstream) portals, allowing for the commencement of diversion tunnel excavations;
- Excavation of the right bank drainage tunnel, which will be used to monitor and drain the water from within the foundation under the powerhouse, spillways and dam buttresses and will eventually be connected to services within the powerhouse;
- Clearing activities in the lower reservoir;

- Completion of two river diversion tunnels, which are used to reroute a short section of the Peace River to allow for the construction of the main earthfill dam;
- Completion of the upstream and downstream cofferdams;
- Construction and commissioning of the temporary fish passage facility;
- Diversion of the Peace River around the Site C construction site;
- Completion of the Peace Canyon 500 kV gas-insulated switchgear expansion to enable connection of Site C to the BC Hydro electrical system;
- Completion of the Site C substation and first of two new 500 kV transmission lines;
- Completion of the finishing concrete work inside the 454-metre-long left bank drainage tunnel; and
- Dam and core excavation, and the placement of 450,000 cubic metres of roller-compacted concrete in the dam and core buttress, marking the completion of the Project's overall roller-compacted concrete placement program. In total, nearly 1.7 million cubic metres of roller-compacted concrete has been placed since 2017.

Figure B-1 Site C Project Components



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Site C Clean Energy Project

Quarterly Progress Report No. 23

Appendix C

Safety and Security

Safety Incidents

The following safety incidents occurred during the quarter ending September 30, 2021:

Serious Safety Incidents

The nine serious incidents that occurred during this reporting period include:

4. A worker was removing a tire on a water truck and a sudden pressure released from the tire, which forced the impact wrench to contact the worker.
5. Two workers were changing a 60-pound deflector plate on a concrete mixer in the batch plant, which dropped and contacted a worker's knee. The equipment was not properly locked-out and the workers did not have proper fall protection.
6. A worker was attempting to free a large rock wedged between the inner and outer tires when the inner tire suddenly failed and released pressure. The worker suffered a minor injury to their hand.
7. A worker was observed working from a scaffold platform that was approximately 15 feet high. The worker was wearing fall protection harness with a lanyard connected to it, but the lanyard was not connected to an anchor point.
8. During the installation of section 6 of the unit 5 penstock, a lower portion of the penstock moved about 100 mm out of its original position on the saddles.
9. A trailer contacted a van door, forcing a worker to jump out of the way.
10. A worker was walking on rebar approximately 40 feet in elevation without fall protection.
11. A handfaller was struck by a falling tree. The worker sustained serious injuries. The worker was admitted to the hospital and is now recovering.

12. A worker at Dry Creek was struck by a section of the bridge deck formwork that was lifted during extreme wind. The worker was admitted to the hospital and subsequently placed on modified duties.

All Injury Incidents

The 19 injury incidents that occurred during this reporting period include two lost-time injuries and 17 medical attention requiring treatment injuries. Note that serious incidents resulting in an injury will be listed in both the list of serious incidents and the list of all injury incidents.

Lost time injuries:

1. A handfaller was struck by a falling tree. The worker sustained serious injuries. The worker was admitted to the hospital and is now recovering.
2. A worker at Dry Creek was struck by a section of bridge deck formwork that was lifted during extreme wind. The worker was admitted to the hospital and subsequently placed on modified duties.

Medical attention requiring treatment injuries:

1. A worker pinched a finger when a haul truck belly pan was dropped during installation.
2. A worker scraped their arm on a piece of coil rod. The worker suffered a laceration.
3. A worker scraped their elbow the end of an uncapped 35 mm rebar. The worker suffered a laceration that required stitches.
4. A worker was grinding steel tubing and steel debris entered their eye.
5. A worker was cutting rebar with a portable band saw, which jumped and contacted the worker’s left index finger. The worker suffered a laceration that required stitches.

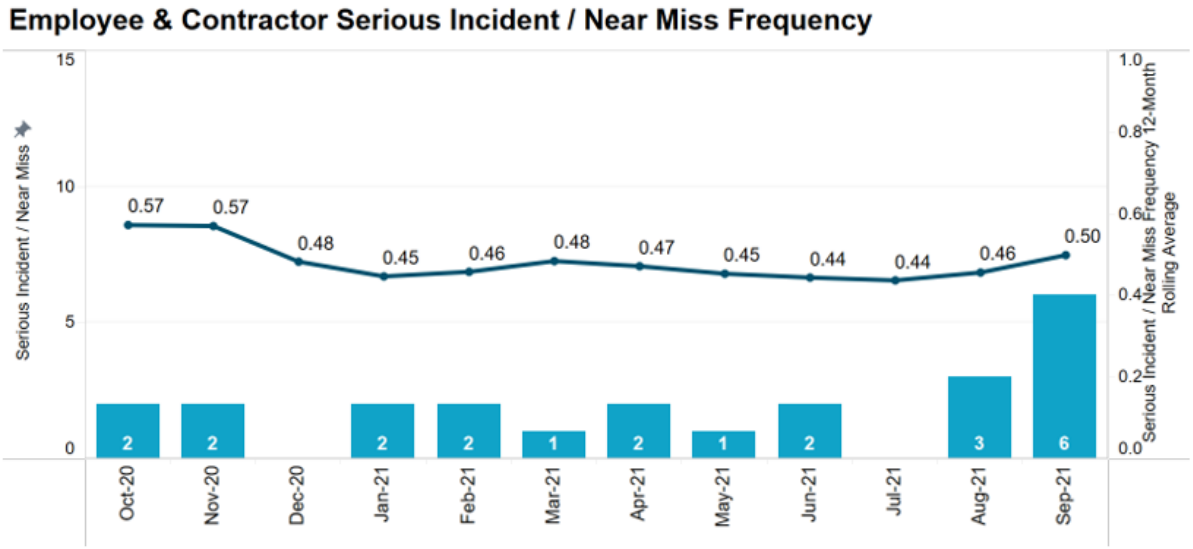
6. A worker was rigging panels, as the crane hoisted the panel, the worker pinched their finger between the two formwork walers. The worker suffered a laceration that required stitches.
7. A worker was using a three-pound hammer to punch holes into rubber belting when they struck their finger with the hammer;
8. A worker was stepping backwards off of rebar cage and tripped, which led to their hand contacting the corner of a coil rod plate. The worker suffered a laceration that required stitches.
9. A worker was using a skill saw when the blade got caught and moved forward. The worker suffered lacerations in two fingers that required stitches.
10. While a worker was rigging a panel, it pivoted and caused the worker to pinch their finger between the panel and concrete wall. The worker suffered a laceration that required stitches.
11. A worker slipped and fell on their knee while exiting a trailer.
12. A worker was attempting to free a large rock wedged between the inner and outer tires when the inner tire suddenly failed and released pressure. The worker suffered a laceration to their hand that required stitches.
13. A worker was using a utility knife to cut strings used to tie down a vacuum hose stack when the knife slipped. The worker suffered a laceration on their arm that required stitches.
14. A worker was performing routine maintenance on the vertical shaft impactor on a crusher. The worker suffered a laceration that required stitches.
15. While a worker was dry packing leak-stopping cement on the dam core the powder got into their eyes. The worker suffered eye irritation.
16. A worker stepped on uneven ground and experienced discomfort in their ankle.

17. A worker was nailing a block for a ledger when they struck their finger with the hammer.

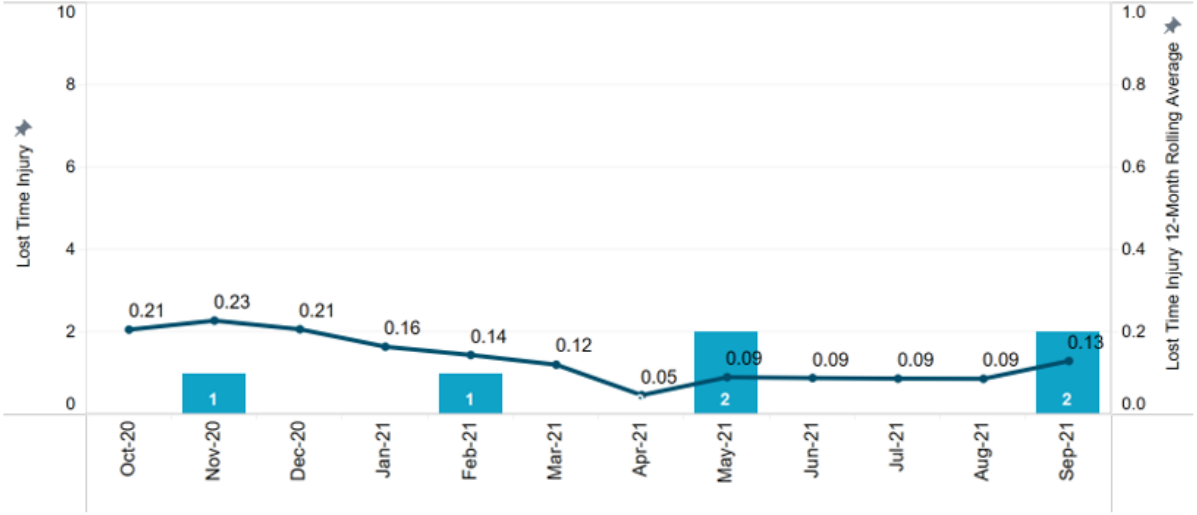
Safety Performance Frequency Metrics

Figure C-1 below provides information on employee and contractor serious incidents/near miss frequency, lost time injury frequency and all-injury frequency from November 2020 until September 2021.

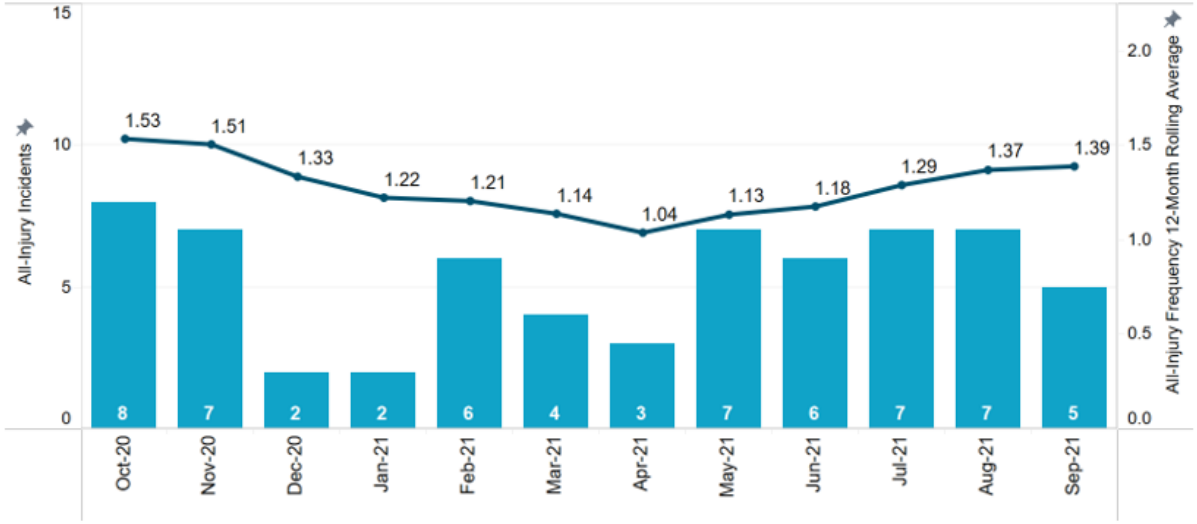
Figure C-1 Employee and Contractor Serious Incidents/Near Miss Frequency, Lost Time Injury Frequency and All-injury Frequency



Employee & Contractor Lost Time Injury Frequency



Employee & Contractor All-Injury Frequency



BC Hydro Site C Safety Bulletins – Examples

BC Hydro Site C – Safety Bulletin (July 23)

Safety Responsibilities

When it comes to health and safety, everyone in the workplace has distinct responsibilities. Whether you're an owner, employer, supervisor, prime contractor, or worker, you have a role to play in keeping the workplace safe. As a worker, you have rights to a safe and healthy workplace, which includes the right to refuse unsafe work.

WORKER

On a worksite, everyone has varying levels of responsibility for workplace health and safety. You should know and understand your responsibilities — and those of others. If you're a worker, you also have

- The right to know about hazards in the workplace.
- The right to participate in health and safety activities in the workplace.
- The right to refuse unsafe work.

As a worker, you play an important role in making sure you — and your fellow workers — stay healthy and safe on the job. As a worker, you must:

- Be alert to hazards. Report them immediately to your supervisor or employer.
- Follow safe work procedures and act safely in the workplace at all times.
- Use the protective clothing, devices, and equipment provided. Be sure to wear them properly.
- Co-operate with joint health and safety committees, worker health and safety representatives, WorkSafeBC prevention officers, and anybody with health and safety duties.
- Get treatment quickly should an injury happen on the job and tell the health care provider that the injury is work-related.
- Follow the treatment advice of health care providers.
- Return to work safely after an injury by modifying your duties and not immediately starting with your full, regular responsibilities.
- Never work under the influence of alcohol, drugs or any other substance, or if you're overly tired.

SUPERVISOR

Supervisors play a key role with very specific health and safety responsibilities that need to be understood.

A supervisor is a person who instructs, directs, and controls workers in the performance of their duties. **A supervisor can be any worker — management or staff — who meets this definition, whether or not he or she has the supervisor title**. If someone in the workplace has a supervisor's responsibilities, that person is responsible for worker health and safety.

Your responsibilities as a supervisor:

- Ensure the health and safety of all workers under your direct supervision.
- Know the WorkSafeBC requirements that apply to the work under your supervision and make sure those requirements are met.
- Ensure workers under your supervision are aware of all known hazards.
- Ensure workers under your supervision have the appropriate personal protective equipment, which is being used properly, regularly inspected, and maintained.

WORK SAFE BC

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BC Hydro Site C – Safety Bulletin (August 2021)

Tower Cranes in BC

- Approximately 265 tower cranes are currently operating in B.C.
- In the last decade, B.C. had 48 incidents involving tower cranes.
- Between 2011 and 2020, there were no fatalities in B.C. related to tower cranes. However, the recent incident in Kelowna resulted in 5 fatalities.
- On average, there is one near miss involving tower cranes reported every month in BC.
- WorkSafeBC has found the majority of crane collapses and other incidents have occurred during the assembly and disassembly phases.
- OHS Regulation 14.73.2 states that *the erection, climbing and dismantling of a tower crane must be done by qualified persons and in accordance with the instructions of the crane manufacturer, or a professional*

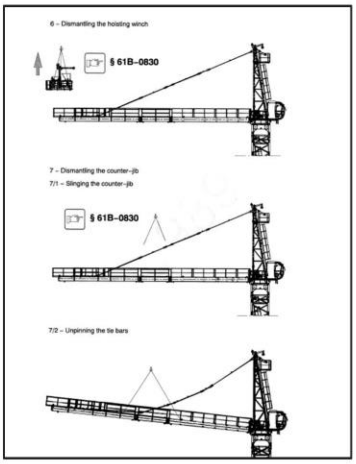

Figure 2 An excerpt from the crane dismantling procedure used when AFDE dismantled Tower Crane A.

Figure 1 Sir Pix-A-Lot, a Potain MD 3200 tower crane supports construction of the Site C penstocks.

TOWER CRANES AT SITE C

There are currently **eight tower cranes** in operation at Site C including "Sir Pix-a-Lot", a Potain MD 3200, the largest tower crane ever used in North America.

Site C tower cranes are all installed, maintained and operated by AFDE in support of construction of the generating station and spillways. Last week, AFDE successfully dismantled a tower crane located downstream from the tailrace.

WorkSafeBC conducted inspections on tower cranes 5, 6, 7, 8 and tower crane C in September of 2020 as part of the Provincial Tower Crane Inspection Initiative. The inspections focused on tower crane planning, assembly, and disassembly. No regulatory orders were issued during these insections.

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NOTEWORTHY TOWER CRANE INCIDENTS

2008 – New York, NY

- Seven people were killed when a 250 foot high tower crane collapsed while workers were extending the crane in Manhattan.
- Investigators concluded that improper rigging equipment and techniques were used during the extension process.

2019 – Halifax, NS

- A 73-metre high crane collapsed due to a weld failure during the high winds of post-tropical storm Dorian.
- There were no deaths or injuries as a result of this incident.

2019 – Seattle, WA

- Four workers were killed when a tower crane collapsed while working on the Google Seattle Campus.
- Investigators find that pins securing sections of the tower crane together were prematurely removed.

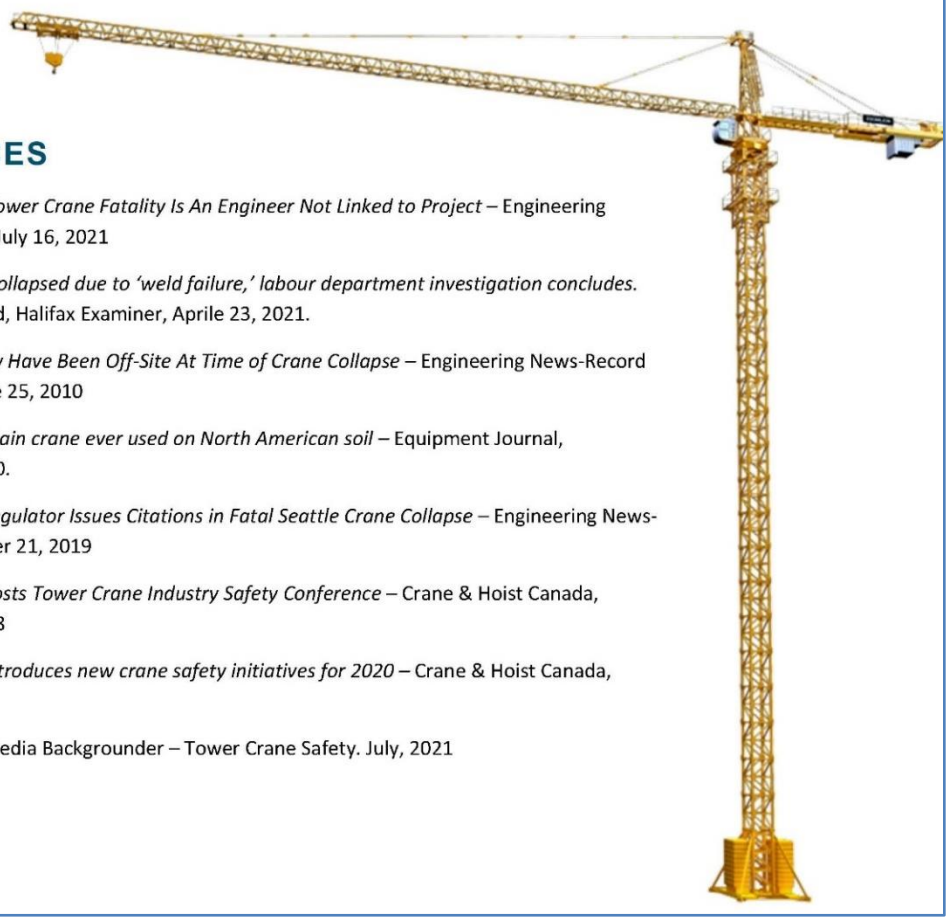
2021 – Kelowna, BC

- Four workers and one other person were killed when a tower crane attached to a condo tower collapsed.
- This incident is still under investigation.

Figure 3 AFDE points nine tower cranes towards Kelowna, and sounds their horns five times as a tribute to those who died after a tower crane collapsed in Kelowna.

WHAT DO EMPLOYERS NEED TO KNOW?

- Site planning during assembly and disassembly of tower cranes is critical to ensuring tower cranes are used safely. The BC Crane Safety Tower Crane Assembly/Disassembly Industry Best Practice Tool was developed by industry leaders in 2020 to define employer (prime contractor, crane owner, crane erector and others) responsibilities. The tool also includes pre-job checklists and tool box talks.
- Operators must be adequately trained and supervised. A Crane Supervisor Tool was developed with BC Crane Safety and industry that defines roles and responsibilities for the supervision of apprentice crane operators. BC Crane Safety has also developed Crane Operator Qualification Questions. The purpose of the document is to ensure employers confirm that workers can demonstrate competency and are familiar with machine operating instructions, prior to operating the equipment.
- Mechanical failure can have catastrophic consequences. An Annual Equipment Inspection and Certification in British Columbia professional practice guideline was developed with the Engineers and Geoscientists of BC, which prescribes the process that engineers must use to inspect equipment.



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- *Fifth Canada Tower Crane Fatality Is An Engineer Not Linked to Project* – Engineering News-Record, July 16, 2021
- *Halifax crane collapsed due to 'weld failure,' labour department investigation concludes.* Zane Woodford, Halifax Examiner, Aprile 23, 2021.
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- *The largest Potain crane ever used on North American soil* – Equipment Journal, March 16, 2020.
- *Wash. State Regulator Issues Citations in Fatal Seattle Crane Collapse* – Engineering News-Record, October 21, 2019
- *WorkSafeBC hosts Tower Crane Industry Safety Conference* – Crane & Hoist Canada, March 20, 2018
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- WorkSafeBC Media Backgrounder – Tower Crane Safety. July, 2021

BC Hydro Site C – Safety Bulletin (September 4th)

Overhead High-Voltage Conductors

Figure 1 A crane operates near high voltage conductors

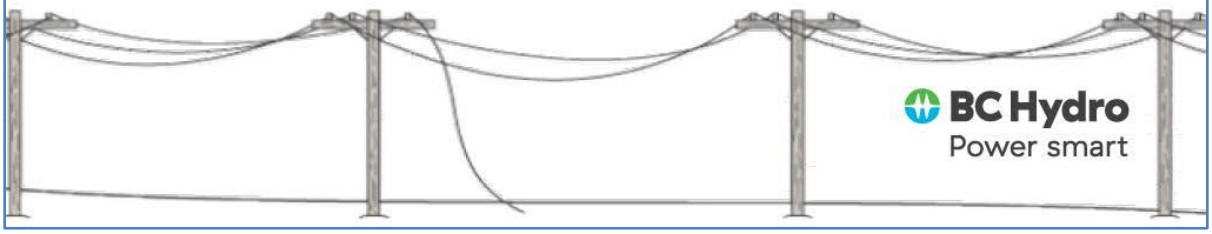
Working unsafely around electricity can result in serious injuries, ranging from shock to severe burns. Injuries and fatalities can result from contact with low-voltage (less than 750 V) as well as high-voltage (more than 750 V) electricity.

When an electric current passes through the body, it generates heat and can extensively damage internal tissues. In some cases, the entry and exit wounds are so severe that a foot or hand must be amputated.

Electrical shocks and electrocutions resulted in 265 short-term disability, long term disability and work-related death claims in British Columbia between 2015-2019.

3 KEYS TO ELECTRICAL SAFETY

1. **Look up and down:** Plan your work so you can avoid contact with power lines. Make sure you look for power lines overhead and underground.
2. **Stay back:** If you're working around power lines, keep a safe distance from the lines. You should be at least 10 metres (33 feet) away from the lines and your equipment should be at least 6 metres (20 feet) away. Use a spotter to make sure you're maintaining this minimum safe distance.
3. **Call for help:** If you come across a fallen power line, an exposed underground power line, or any object comes into contact with a power line, stay back 10 metres (33 feet) and call 911. If your equipment contacts a line, stay calm and stay still until help arrives.



STEP POTENTIAL

Step potential is the difference in voltage between points contacting the ground.

With a fallen power line, it's important to know that even if you're standing a distance away, you could still be in danger if you're within the range of electrical current travelling through the ground. Each walking step within this distance creates a step potential and a path for the electricity to continue travelling.

Always remember to shuffle with your feet together until you're at least **10 metres**, or a bus-length, away from the source of the accident. This will ensure the current keeps flowing past your body through the ground, so that you can escape, unharmed. As you do this, it might be helpful to warn anybody in the surrounding area to also stay back, especially young children.

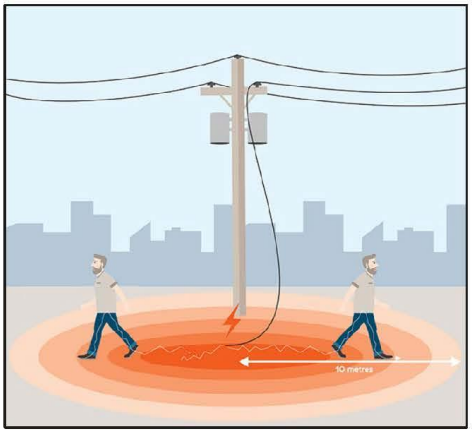


Figure 2 There will be a difference in the voltage in each of the person's legs as they walk near the downed wire.

LIMITS OF APPROACH

Knowing the limits of approach is critical to ensuring your safety when working around high-voltage conductors. Note that there are columns for three types of workers in the table below. Currently, most work on site is conducted by unqualified workers. These workers must abide by the limits of approach in the unqualified worker column.

Table 401
Limits of Approach (LOA)

Nominal Voltage (kV)	Actual Voltage Range Phase to Phase	Qualified Electrical Worker		Uninsulated equipment or Unqualified Worker and their equipment when continuously directed by Qualified Electrical Worker		Unqualified Worker	
		m	ft	m	ft	m	ft
.751 to 35	751V to 40kV	0.75	2.5	1.20	4	3.00	10
60	40kV to 75kV	0.90	3	1.50	5	3.00	10
138	75kV to 150kV	1.50	5	2.40	8	4.50	15
230	150kV to 250kV	2.10	7	3.00	10	4.50	15
287	250kV to 325kV	2.60	8.5	3.70	12	6.00	20
345	325kV to 425kV	3.00	10	4.30	14	6.00	20
500	425kV to 550kV	3.70	12	4.90	16	6.00	20

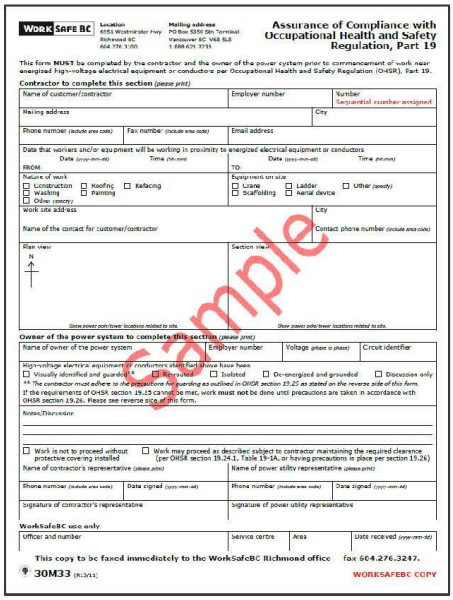
Figure 3 Table 401 from BC Hydro Safety Practice Regulation

WHAT IF DISTANCES CANNOT BE MAINTAINED?

If the minimum distance in the table above cannot be maintained because of the circumstances of the work or the inadvertent movement of persons or equipment, an assurance in writing (**30M33**) signed by a representative of the owner of the power system, must be obtained.

The 30M33 contains work-related information such as a work site description, diagrams, electrical hazards, and the required hazard controls.

Depending on where work is being conducted and who owns the high-voltage conductor at Site C, contractors working near the conductors may have to request a 30M33 from either BC Hydro, PRHP or AFDE.



WorkSafeBC

Assurance of Compliance with Occupational Health and Safety Regulation, Part 19

This form **MUST** be completed by the contractor and the owner of the power system prior to commencement of work near energized high-voltage electrical equipment or conductors per Occupational Health and Safety Regulation (OHSR), Part 19.

Contractor to complete this section *(please print)*

Name of customer/contractor | Employer number | Number — Sequential number assigned

Mailing address | City

Phone number *(include area code)* | Fax number *(include area code)* | Email address

Date that workers and/or equipment will be working in proximity to energized electrical equipment or conductors

Date *(yyyy-mm-dd)* | Time *(hh:mm)* — FROM | Date *(yyyy-mm-dd)* | Time *(hh:mm)* — TO

Nature of work: ☐ Construction ☐ Roofing ☐ Refacing ☐ Washing ☐ Painting ☐ Other *(specify)*

Equipment on site: ☐ Crane ☐ Ladder ☐ Other *(specify)* ☐ Scaffolding ☐ Aerial device

Work site address | City

Name of the contact for customer/contractor | Contact phone number *(include area code)*

Plan view — N | Section view

Show power pole/tower locations related to site. | Show power pole/tower locations related to site.

Owner of the power system to complete this section *(please print)*

Name of owner of the power system | Employer number | Voltage *(phase to phase)* | Circuit identifier

High-voltage electrical equipment or conductors identified above have been:
☐ Visually identified and guarded ☐ Removed ☐ Isolated ☐ De-energized and grounded ☐ Discussion only

** The contractor must adhere to the precautions for guarding as outlined in OHSR section 19.27 as stated on the reverse side of this form.
If the requirements of OHSR section 19.13 cannot be met, work must not be done until precautions are taken in accordance with OHSR section 19.26. Please see reverse side of this form.

Notes/Discussion

☐ Work is not to proceed without protective covering installed ☐ Work may proceed as described subject to contractor maintaining the required clearance (per OHSR section 19.24.1, Table 19-1A, or having precautions in place per section 19.24)

Name of contractor's representative *(please print)* | Name of power utility representative *(please print)*

Phone number *(include area code)* | Date signed *(yyyy-mm-dd)* | Phone number *(include area code)* | Date signed *(yyyy-mm-dd)*

Signature of contractor's representative | Signature of power utility representative

WorkSafeBC use only

Officer and number | Service centre | Area | Date received *(yyyy-mm-dd)*

This copy to be faxed immediately to the WorkSafeBC Richmond office fax 604.276.3247.

30M33 (R:3/11) WORKSAFEBC COPY

Sample

Figure 4 A sample 30M33 form from WorkSafeBC

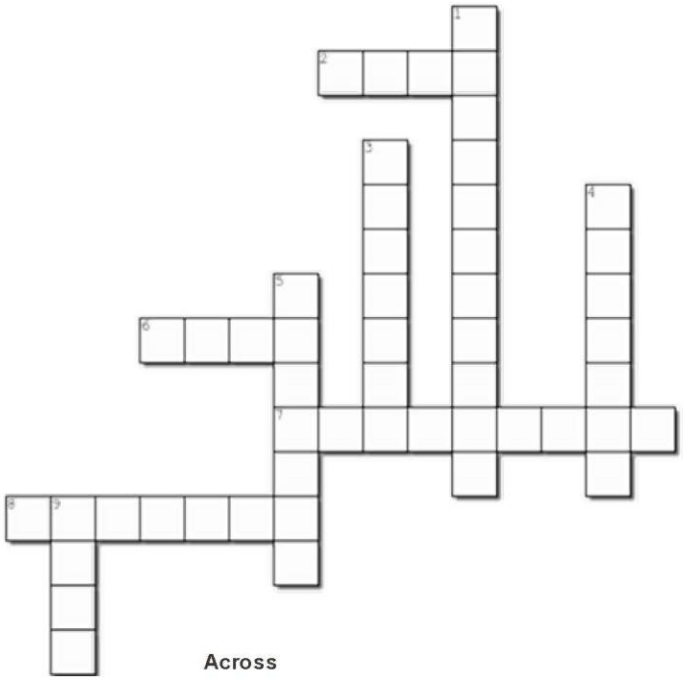
IS THIS PENSTOCK SECTION TOO CLOSE?

Clearance distances between passing equipment under exposed electrical conductors are limited by **table 19-1B** in the Regulation. If passing under an overhead conductor with a load, consult this table to ensure safe distances are maintained.

Figure 5 A section of penstock stored adjacent to a high voltage conductor.

Column 1 Voltage	Column 2 Min. Clearance Distance	
Phase to phase	**Metres**	**Feet**
Over 750 V to 75 kV	2	6.5
Over 75 kV to 250 kV	3	10
Over 250 kV to 550 kV	4	13

ELECTRICAL SAFETY CROSSWORD

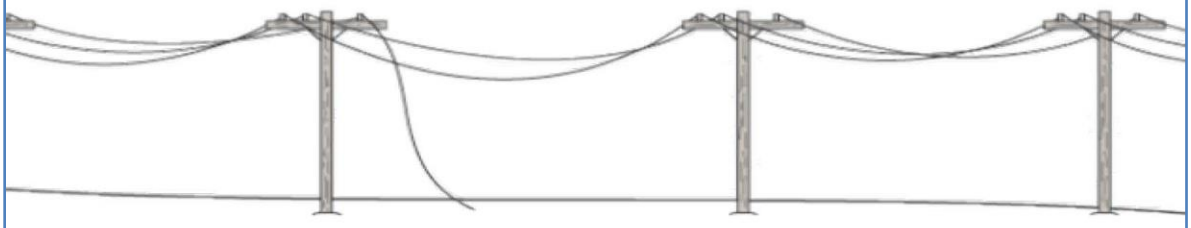


Across

2. Step one: look up and _____.
6. ____ potential.
7. Get this distance away from a downed conductor.
8. A foot-dragging walk.

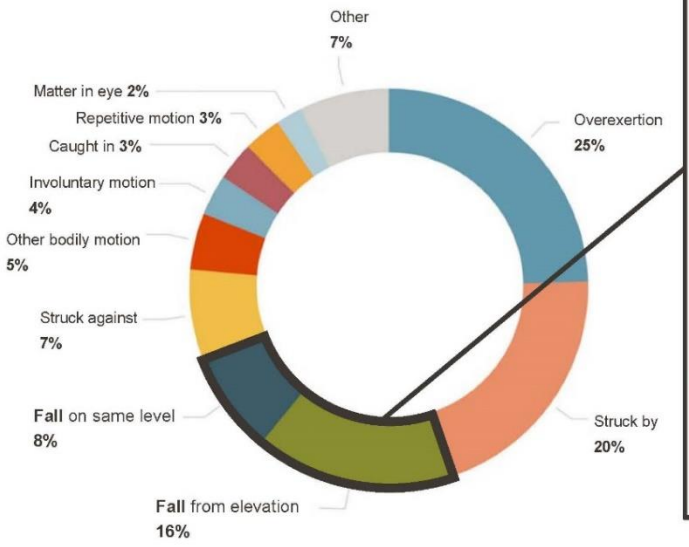
Down

1. Not officially recognized as a practitioner of a particular profession.
3. Distance one should stay back from a 150kV line.
4. Like a rock thrown in a pond, electricity can create _____through the ground.
5. Person who ensures a safe distance is maintained.
9. Generated when electricity passes through the body.



BC Hydro Site C – Fall Prevention (September 17th)

FALLING HURTS US ALL



Falls accounted for 24% of all workers' compensation claims in the construction industry in the past five years.

These accidents accounted for nearly 35% of all claims costs paid, a total of approximately 330 million dollars.

Falls often result in severe and life-altering injuries. Preventing falls is not difficult, this safety bulletin explores some of tried at testing methods of fall prevention.

HOW WOULD YOU CHANGE THIS LIGHT BULB?

There are best practices for just about any job or task. Did you know that there is a mandatory **hierarchy of fall protection systems** that we must follow when selecting a method of fall protection?

Even before we look at working into at heights, it is worth exploring if fall hazards can be eliminated all together.

BC Hydro Power smart

SELECTING A FALL PROTECTION SYSTEM

Whether it's using a pole mounted bulb-changer to change a light bulb or prefabricating an entire roof on the gound during building construction, there are often ways to **eliminate** fall hazards in our work.

If we must work at height, our first choice of fall protection system is a **guardrail**. Guardrails provide safe means of fall protection with minimal training requirements.

If guardrails are impracticable, we can then consider **fall restraint** systems. These systems hold you back from the fall hazard.

If the forms of fall protection shown above are impracticable, only then can we consider using a **fall arrest** system. Fall arrest systems work by stopping a fall after a person has fallen.

WHAT MUST BE INCLUDED IN FALL PROTECTION TRAINING?

- Instruction in the fall protection system for the area and the work procedures to be followed
- Review the manufacturer's instructions related to the fall protection system and equipment
- Proper methods of wearing/using any personal protective equipment that is part of the fall protection system
- Proper attachment points on the equipment

- Compatibility of components of the system
- Limitations of the system
- Anchor installation (including anchorage criteria), use, attachment points, maintenance, inspection, strength, etc.
- Anchor layout
- Any procedures to be followed for the specific fall protection system and/or worksite
- Any fall protection plans (if required)
- Emergency rescue procedures

WHAT DOES *IMPRACTICABLE* MEAN?

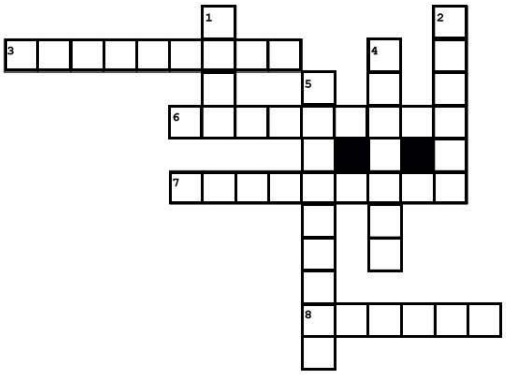
impracticable
/imˈpraktəkəb(ə)l/
adjective

(of a course of action) impossible in practice to do or carry out.
"it was impracticable to widen the road here"

We can only choose lower level fall protection systems when superior options have been shown to be **impracticable.**

What is practicable depends on the circumstances of each workplace and is a matter of assessment and judgment. Guideline G11.2-2 of the Regulation provides some examples of when certain fall protection methods may be considered impracticable.

CROSSWORD

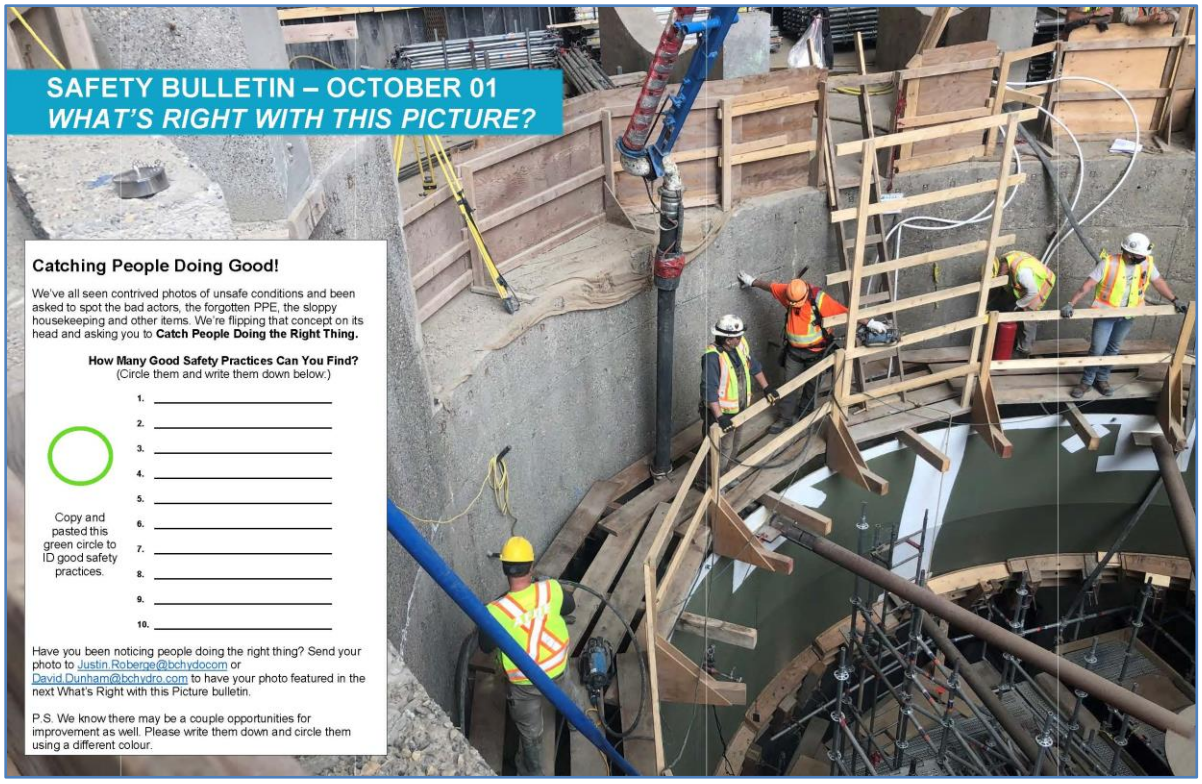


Down

1. To the ground, or in love
2. To stop
4. Always pulling us back to earth
5. A system of rank

Across

3. Has posts with top and mid-level members
6. Remove or rid of
7. Something holding you back
8. Measured from base to top


SAFETY BULLETIN – OCTOBER 01
WHAT'S RIGHT WITH THIS PICTURE?
Catching People Doing Good!
We've all seen contrived photos of unsafe conditions and been asked to spot the bad actors, the forgotten PPE, the sloppy housekeeping and other items. We're flipping that concept on its head and asking you to Catch People Doing the Right Thing.
How Many Good Safety Practices Can You Find?
(Circle them and write them down below:)
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
Copy and pasted this green circle to ID good safety practices.
Have you been noticing people doing the right thing? Send your photo to Justin.Roberge@bchydocom or David.Dunham@bchydro.com to have your photo featured in the next What's Right with this Picture bulletin.
P.S. We know there may be a couple opportunities for improvement as well. Please write them down and circle them using a different colour.

Regulatory Inspections and Orders

Table C-1 lists the safety regulatory inspections and orders received from July 1, 2021 to September 30, 2021.

Table C-1 Safety Regulatory Inspections and Orders

WorkSafeBC

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
Inspection #1: WorkSafeBC contacted the contractor via telephone as a result of a reported injury that involved a worker having a suspected wrist fracture. While workers were carrying a 4x6 piece of timber, one worker dropped it and inadvertently causing the other worker's wrist to be caught in between the 4x6 and a scaffold rail.			
		No Orders	July 2, 2021
Inspection #2: WorkSafeBC contacted the contractor via telephone as a result of a reported injury that involved a worker having a suspected finger fracture. While a worker had been repositioning a belly pan for final install, the belly pan inadvertently shifted, pinning the workers hand in between the pan and concrete floor.			
		No Orders	July 2, 2021
Inspection #3: WorkSafeBC contacted the contractor via telephone as a result of a reported medical event involving a worker at the end of a scheduled work shift.			
		No Orders	July 6, 2021
Inspection #4: WorkSafeBC contacted the contractor via telephone as a result of a reported injury that involved a worker having a suspected hand fracture; while lifting a pipe a worker's hand inadvertently became pinched in between the pipe being lifted and rebar.			
		No Orders	July 19, 2021
Inspection #5: WorkSafeBC conducted a site inspection as a result of an incident that involved a high potential for a serious injury and issued a stop use order in this inspection report. WorkSafeBC was notified that a service provider employee was potentially injured and transported to hospital. The worker was called to site by the contractor to change/repair a tire that had been suspected of being flat. While attempting to remove the tire, the side wall failed and released pressure, impacting the worker.			

Low Risk	Special Inspections	**Order #1 - OHS3.7**: The tire was on the second of three axles and was the outside tire. Eight of the twelve lug nuts were removed when the rear sidewall failed releasing enough pressure to throw the worker away from the tire. Due to the release of stored pressure, the contractor is being directed to conduct a special inspection of all adjacent under carriage components that could be impacted by pressure and pieces of the tire sidewall.	August 3, 2021
High Risk	Order to Stop Using	**Order #2 - WCA89(1)**: The contractor is ordered to immediately stop use of the water truck until WorkSafeBC is satisfied that the water truck is safe and complies with the OHS provision and the regulations and this order is cancelled by the board.	
Inspection #6: WorkSafeBC conducted a site inspection as a result of an incident that involved a high potential for a serious injury to a worker. WorkSafeBC was notified that the contractor's worker was potentially injured and transported to the hospital. The worker was called to site by the generating station and spillways contractor to change / repair a tire that had be suspected of being flat. While attempting the remove the tire the side wall failed and the released pressure, impacting the worker. The worker was assessed on site by the first aid attendant and transported to the hospital where they were released with only minor injuries. The sub-contractor is requested to provide the following document by August 4, 2021: 1. Procedures relating to changing heavy duty tires; 2. Procedures for changing heavy duty tires that have been damaged/run at low pressure and air up again; 3. Job hazard assessment or similar form of hazard/risk assessment for the water truck; 4. The e-mail requesting service from the client and other communications relating to the hazard(s) of the work to be completed; and 5. Training records for the injured worker to the above noted procedures.			
		No Orders	August 3, 2021
Inspection #7: On August 3, 2021, the sub-contractor was called to repair/replace an industrial tire on a three-axle water truck at Site C. The sub-contractor dispatched a mobile technician to conduct the work. As a result of this work the worker was injured and taken to the hospital for further assessment after the tire sidewall failed while under pressure.			

High Risk	Mobile Equipment	**Order #1 - OHS16.47(1)(a)**: The subcontractor did not establish and implement a complete safe work procedure for servicing mobile equipment tires, rims and wheels, as the procedure provided did not include procedures for inspecting suspected damaged tires and steps to address damaged tires.	August 3, 2021
High Risk	Mobile Equipment	**Order #2 - OHS16.48(1)**: The technician failed to deflate the tire before demounting.	
Low Risk	General Duties of Employers	**Order #3 - WCA21(2)(e)**: The subcontractor did not provide the worker / technician with adequate information, instruction, training and supervision 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 as it does not have procedures that outline how to treat suspected damaged tires.	

Inspection #8: WorkSafeBC conducted site inspection as a result of worker being injured by the release of stored pressure in an industrial tire.

On the morning of August 3, 2021, the contractor and owner of the water truck noted a low/flat tire and called a local tire service company to attend its workplace and repair / replace the tire as a result of the previous night shift truck operator noted the tire was low and the night shift foreman notified the deputy equipment manager of this damaged tire. The deputy manager then sent an email requesting service.

In between the tire being serviced and the service company arriving on site the morning shift driver attempted to use the truck and had to be stopped by the deputy equipment manager as the equipment was not locked/tagged out.

The contractor also had their day shift mechanic check the tire pressure and it was noted to be 70 psi. The mechanic then inflated the damaged tire to 100 psi (normal operating pressure). The truck was then parked.

The service worker was not informed that the tire they were being asked to work on had leaked to 70 psi from 100 psi and then re-inflated to 100 psi prior to them working on the tire. Industrial tires have a steel construction and when run at low pressure the steel belts/cords can be damaged and this damage can result in tire failure after pressure is added. All parties involved had workers that were aware of this fact.

The owner of the truck and the contractor at the workplace did not review the tire service technicians' procedures to ensure they completed the job properly and did not have procedure of their own to ensure their work and that of tire technician were done properly. The hazard of the damaged and re-inflated tire was not communicated to the visiting worker and the truck was not locked out and tagged out resulting in its own worker attempting to use a truck with a damaged tire.

This is all evidence that the contractor did not ensure the health and safety of all workers present at its workplace and resulted in an injury to the visiting worker.			
High Risk	Work on Energized Equipment	**Order #1 - OHS10.2:** If the unexpected energization or start up of machinery or equipment or the unexpected release of an energy source could cause injury, the energy source must be isolated and effectively controlled.	August 3, 2021
High Risk	Mobile Equipment	**Order #2 - OHS16.47(1)(a):** The contractor failed to establish and implement safe work procedures for servicing mobile equipment tires, rims and wheels, including safe procedures for inspecting tire, rim, and wheel components	
Low Risk	General Duties of Owners	**Order #3 - WCA25(b):** The contractor failed to provide sub-contractor at the workplace the information known to the contractor that is necessary to identify and eliminate or control hazards to health or safety of persons at the workplace.	
Low Risk	General Duties of Employers	**Order #4 - WCA21(1)(a):** The contractor failed to ensure the health and safety of all workers working for the contractor and any other workers present at the workplace at which that contractor's work is being carried out.	
Inspection #9: WorkSafeBC conducted a site inspection at the Cache Creek bridge as part of the construction high risk strategy and as part of the occupational disease strategy, specifically crystalline silica.			
Low Risk	Special Inspections	**Order #1 - OHS3.17(1):** The contractor failed to develop up-to-date written procedures for providing first aid at the worksite as they have part of the requirements in and among other Emergency Response Plan information and content is missing such as equipment supplies attendants, location and the authority of the attendant.	August 3, 2021

Low Risk	Basic Requirements	**Order #2 – OHS3.16(1.2):** The quality, maintenance and use of equipment, facilities and methods of transportation used by the contractor at this site must be acceptable to the board. The medical transport centre (MTC) had construction supplies inside the MTC, the MTC was not secured properly and there was no step mounted for access into the MTC.	
Low Risk	Vehicle Inspections	**Order #3 – OHS17.2(b):** If workers are to travel in a worker transportation vehicle, the contractor must ensure that an inspection of the worker transportation vehicle has been conducted by a qualified person before first use on a work shift.	
Low Risk	General Requirement for Employer to Establish Joint Committee	**Order #4 – WCA31:** The contractor failed to re-establish and maintain a joint health and safety committee: (a) in each workplace where 20 or more workers of the employer are regularly employed; and (b) in any other workplace for which a joint committee is required by order.	
Low Risk	Employer Must Post Committee Information	**Order #5 – WCA44:** The contractor failed to post and keep posted: (a) the names and work locations of the joint committee members; (b) the reports of the three most recent joint committee meetings; and (c) copies of any applicable orders under this Division for the preceding 12 months.	
Low Risk	Supplier SDS	**Order #6 – OHS5.14(2):** The Safety Data Sheets (SDS) for concrete curing compound were out of date. When a supplier SDS obtained under subsection (1) for a hazardous product is three years old, the contractor must obtain an up-to-date supplier SDS	

		in respect of any of that hazardous product in the workplace at that time.	
High Risk	Incomplete Risk Assessment	**Order #7 – OHS6.112.1(1):** Risk assessment indicated that a worker was or may be exposed to silica dust and the contractor failed to ensure that a qualified person developed and implemented an exposure control plan.	
High Risk	Hazard Assessment	**Order #8 – OHS9.9(1)(b):** The contractor failed to conduct a hazard assessment for each work activity, or group of work activities which present similar hazards, to be performed inside a confined space.	
Low Risk	Qualifications	**Order #9 – OHS9.11(1)(a):** The hazard assessment and written confined space entry procedures must be prepared by a qualified person who has adequate training and experience in the recognition, evaluation and control of confined space hazards.	
Low Risk	Procedures	**Order #10 – OHS9.10:** Written procedures specifying the means to eliminate or minimize all hazards likely to prevail must be developed, based on the hazard assessment required by section 9.9.	
Low Risk	Mechanical Ventilation	**Order #11 – OHS9.32(1):** A ventilation system for the control of airborne contaminants in a confined space must be designed, installed and maintained in accordance with established engineering principles and must be specified in the written procedures.	

Low Risk	Testing	**Order #12 – OHS13.23(1)(a)**: A vehicle-mounted elevating work platform and a self-propelled boom-supported elevating work platform must be inspected in accordance with good engineering practice at least every 12 months.	
Low Risk	Maintenance of Records	**Order #13 – OHS13.22(2):** If the inspection and maintenance records, other than pre-shift inspections, are not available, the equipment must not be used until it has been inspected and certified safe for use by the manufacturer or a professional engineer.	
Low Risk	Authority to conduct inspections	**Order #14 – WCA75(3)(g):** The contractor failed to produce within a reasonable time records in the person's possession or control that may be pertinent to an inspection by a board officer.	
High Risk	General Duties of Employers	**Order #15 – WCA21(2)(e):** 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.	
High Risk	General Duties of Employers	**Order #16 – WCA21(1)(a):** The contractor failed to ensure the health and safety of all workers working for the contractor, and any other workers present at a workplace at which that contractor's work is being carried out.	
Inspection #10: WorkSafeBC contacted the contractor as a result of an incident that involved a hand injury to a worker at the workplace. A worker was cutting a piece of plywood when the skill saw kicked/jammed then their fingers contacted the blade. The worker required eight stitches.			
		No Orders	August 9, 2021
Inspection #11: WorkSafeBC conducted a site inspection as a result of an incident that involved the potential for a serious injury or death of a worker.			

Two workers were required to change the deflector plates on a concrete mixer. One worker was positioned on top of the mixer chute / drum undoing bolt assemblies and the other worker was under the plates supporting them. When the last bolt was undone, the worker could not hold the plate and was struck in the left knee injuring the worker.			
Low Risk	First Aid Procedures	**Order #1 – OHS3.17(1):** The contractor failed to keep up-to-date written procedures for providing first aid at the worksite including (a) the equipment, supplies, facilities, first aid attendants and services available; (b) the location of, and how to call for, first aid; (c) how the first aid attendant is to respond to a call for first aid; (d) the authority of the first aid attendant over the treatment of injured workers and the responsibility of the employer to report injuries to WorkSafeBC; (e) who is to call for transportation for the injured worker, and the method of transportation and calling; and (f) pre-arranged routes in and out of the workplace and to medical treatment.	August 10, 2021
Low Risk	Basic Requirements	**Order# 2 - OHS3.16(1)(a):** The contractor failed to provide each workplace such as equipment, supplies, facilities, first aid attendants and services as are adequate and appropriate for (a) promptly rendering first aid to workers if they suffer an injury at work; and (b) transporting injured workers to medical treatment.	
Low Risk	Risk Identification	**Order #3 - OHS4.47:** The contractor failed to identify factors in the workplace that may expose workers to a risk of musculoskeletal injury.	
Low Risk	General Duties of Employers	**Order#4 - WCA21(1)(a):** The contractor failed to ensure the health and safety of all workers working and any other workers present at a workplace at which	

		that contractor's worker is being carried out.	
Low Risk	Reporting Unsafe Conditions	**Order #5 – OHS3.10:** 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 the employer, 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.	
High Risk	General Requirement	**Order #6 - OHS10.2:** If the unexpected energization or start up of machinery or equipment or the unexpected release of an energy source could cause injury, the energy source must be isolated and effectively controlled.	
High Risk	Lockout Procedures	**Order #7 - OHS10.4(2):** The contractor failed to ensure that each worker required to lock out has ready access to sufficient personal locks to implement the required lockout procedure.	
High Risk	Obligation to Use Fall Protection	**Order #8 - OHS11.2(1)(a):** The contractor failed to ensure that a fall protection system is used when work is being done at a place from which a fall of three metr**es** (10 feet) or more may occur.	
High Risk	Certification by Engineer	**Order #9 - OHS11.8:** The following types of equipment and systems, and their installation, must be certified by a professional engineer: (a) permanent anchors; (b) anchors with multiple attachments points; (c) permanent horizontal lifeline systems; and (d) support structures for safety nets.	
Low Risk	Contents of Program	**Order #10 - OHS3.3(c)**: The occupational health and safety program must be designed to prevent injuries and occupational	

		diseases, and without limiting the generality of the foregoing, the program must include appropriate written instructions, available for reference by all workers, to supplement this Occupational Health and Safety Regulation.	
Low Risk	Safe Access	**Order #11 - OHS20.4(1)**: Where practicable, suitable ladders, work platforms and scaffolds meeting the requirements of Part 13 (ladders, scaffolds and temporary work platforms) must be provided for and used by a worker for activities requiring positioning at elevations above a floor or grade.	
Low Risk	Safe Workplace	**Order #12 - OHS4.1**: A workplace must be planned, constructed, used and maintained to protect from danger any person working at the workplace.	
High Risk	Exposure Control Plan	**Order #13 - OHS6.112.1(1)(a):** If a risk assessment indicates that a worker is or may be exposed to respirable crystalline silica (RCS) dust, the employer must: (a) ensure that a qualified person develops an exposure control plan meeting the requirements of sections 5.54 and 5.57(2), and of subsection (3) of this section.	
Low Risk	Instruction and Training	**Order #14 - OHS6.112.7(b):** The contractor failed to ensure that a worker who is or may be exposed to RCS dust receives adequate instruction and training in all of the following: (b) safe work practices and procedures.	
Low Risk	General Duties of Employers	**Order #15 - WCA21(1)(a)(i):** The contractor failed to ensure the health and safety of all workers working for the contractor.	

High Risk	General Duties of Employers	**Order #16 - WCA21(2)(e):** The contractor failed to provide to the workers information, instructions, training and supervision necessary to ensure the health and safety of workers in carrying out their work and to ensure the health and safety of other workers at the workplace.	
Low Risk	Immediate Notice of Certain Accidents	**Order #17 - WCA68(1)(a):** The contractor failed to immediately notify WorkSafeBC of the occurrence of any accident that resulted in serious injury to or the death of a worker.	
Inspection #12: This inspection report forms a part of the above inspection report. The report is written as orientation is a key part of a young and new worker's success at the workplace.			
Low Risk	Young or new worker orientation and training	**Order #1 – OHS3.23(2)**: The contractor did not ensure that all of the following topics were included in the young or new worker's orientation and training: (a) the name and contact information for the young or new worker's supervisor; (d) hazards to which the young or new worker may be exposed, including risks from robbery, assault or confrontation; (g) personal protective equipment; (h) location of first aid facilities and means of summoning first aid and reporting illnesses and injuries; (j) instruction and demonstration of the young or new worker's work task or work process; and (m) contact information for the occupational health and safety committee or the worker health and safety representative, as applicable to the workplace.	August 10, 2021
Low Risk	Young or new worker orientation and training	**Order #2 – OHS3.23(1)**: The contractor failed to ensure that before a young or new worker begins work in a workplace, the young or new worker is given health and safety orientation and	

		training specific to that young or new worker's workplace.	
Inspection #13: WorkSafeBC conducted a site inspection as a result of an incident that involved a serious injury to a worker. Two workers were required to change the deflector plates on a concrete mixer. One worker was positioned on top of the mixer chute / drum undoing bolt assemblies and the other worker was under the plates supporting them. When the last bolt was undone the worker could not hold the plate and was struck in the left knee injuring the worker.			
Low Risk	First Aid Procedures	**Order#1 – OHS3.17(1):** The contractor failed to keep up-to-date written procedures for providing first aid at the worksite including: (a) the equipment, supplies, facilities, first aid attendants and services available; (b) the location of, and how to call for, first aid; (c) how the first aid attendant is to respond to a call for first aid, (d) the authority of the first aid attendant over the treatment of injured workers and the responsibility of the employer to report injuries to the board; (e) who is to call for transportation for the injured worker, and the method of transportation and calling; and (f) prearranged routes in and out of the workplace and to medical treatment.	August 10, 2021
High Risk	Coordination at Multiple-Employer Workplaces	**Order #2 – WCA24(1)(b):** The prime contractor of this multiple-employer workplace has not been doing everything that is reasonably practicable to establish and maintain a system or process ensure compliance, as a sub-contractor received 17 orders based on the above noted inspection reports, some of which are high risk.	
Inspection #14: WorkSafeBC contacted the contractor as a result of an incident that involved a heat stress related injury to a worker.			
		No Orders	August 12, 2021
Inspection #15: WorkSafeBC contacted the contractor via telephone as a result of a reported incident that involved minor injury to a worker. That incident is currently under investigation by			

WorkSafeBC and may result in orders being issued, in addition to any orders that are included in this inspection report.			
Low Risk	Mobile Equipment	**Order #1 - OHS16.47(1)(a)**: The contractor failed to establish and implement safe work procedures for servicing mobile equipment tires, rims and wheels, including safe procedures for inspecting tire, rim and wheel components.	August 17, 2021
Inspection #16: WorkSafeBC contacted the contractor via telephone as a result of a reported worker sustaining a suspected lower leg injury, while in the process of moving a ladder the worker stepped on an uneven surface at the roller-compacted concrete placement work area.			
		No Orders	September 14, 2021
Inspection #17: WorkSafeBC contacted the contractor via telephone as a result of a reported worker sustaining a suspected lower back injury, while in the process of loader operations.			
		No Orders	September 16, 2021
Inspection #18: WorkSafeBC contacted the contractor via telephone as a result of a reported worker sustaining an eye injury; while in the process of stripping the formwork, a gust of wind picked up and blew debris into the worker's face.			
		No Orders	September 24, 2021

Inspection #19: WorkSafeBC contacted the contractor via telephone as a result of a reported non-work related COVID-19 positive testing of a worker.			
		No Orders	September 24, 2021
Inspection #20: WorkSafeBC attended the workplace as a result of an incident that involved the serious injury of a subcontractor worker. The subcontractor for hand falling had a worker get injured when a danger tree was struck by a felled tree that subsequently rebounded and hit the faller.			
Low Risk	First Aid Procedures	**Order #1 - OHS3.17(1)**: The contractor did conduct a written first aid assessment. The contractor is directed to keep up-to-date written procedures for providing first aid at the worksite including: (a) the equipment, supplies, facilities, first aid attendants and services available, (b) the location of, and how to call for, first aid, (c) how the first aid attendant is to respond to a call for first aid,	September 25, 2021

		(d) the authority of the first aid attendant over the treatment of injured workers and the responsibility of the employer to report injuries to the board, (e) who is to call for transportation for the injured worker, and the method of transportation and calling, and (f) prearranged routes in and out of the workplace and to medical treatment.	
Low Risk	Immediate Notice of Certain Accidents	**Order #2 - WCA68(1)(a)**: The contractor did not notify WorkSafeBC of the serious injury that occurred, nor did they ensure that its subcontractor notified WorkSafeBC. The employer is directed to immediately notify WorkSafeBC of the occurrence of any accident that results in serious injury to or the death of a worker. This is in contravention of the Workers Compensation Act section 68 (1)(a).	
Inspection #21: WorkSafeBC attended the workplace due to a worker being seriously injured. The inspector inspected a mobile treatment center that was present while on site. The MTC was a rental unit from an Alberta supplier. The MTC requires numerous mounting points. The four tie downs were all loose. The two-rear bolt, washer and nut assemblies were not present and the driver's side rear bolt through the leg of the roll cage was not tied to the trucks frame as required by the manufacturer and the regulation. As the unit is not attached to the chassis as required, it was deemed not safe for transporting injured workers and a stop use o**rder** was issued.			
Low Risk	Safe Machinery and Equipment	**Order #1 - OHS4.3(2)** - The installation, inspection, and maintenance of the Sundowner Mobile Treatment Center is not being carried out in accordance with the manufacturer's instructions. The contractor must remove the unit from service or have the MTC installed as per the manufacturer's instructions which were provided to the contractor.	September 25, 2021
High Risk	Order to Stop Using or	**Order #2 - WCA89(1)** - The employer is ordered to immediately stop use of the	

	Supplying Unsafe Equipment	MTC. Pursuant to section 89(4) of the Workers Compensation Act, the MTC subject to this order must not be used until WorkSafeBC is satisfied that this MTC is safe and complies with the OHS provisions and the regulations and this order is cancelled by the board.	
Inspection #22: WorkSafeBC inspector attended the workplace as a result of an incident that involved the serious injury of a worker. This incident resulted from a ~50m deck section of the installed bridge overhang slab support formwork failed along the eastern downstream portion at the Project. The workers were in the process of investigating and cordoning-off a ~9 metre identified hazard area when the failure occurred, contacting the worker.			
High Risk	Safe Buildings and Structures	**Order #1 - OHS4.2**: The contractor has failed to ensure that the temporary bridge overhang slab support formwork erection and/or installation structures in a workplace is capable of withstanding any stresses likely to be imposed on it.	September 30, 2021
High Risk	Stop-Work Orders	**Order #2 - WCA90(1)**: Based upon the violation(s) cited in this inspection report, WorkSafeBC has reasonable grounds to believe there is a high risk of serious injury, serious illness or death to a worker at this workplace. WorkSafeBC, in accordance with subsection (2), may order that work at a workplace or any part of a workplace stop until the order to stop work is cancelled by WorkSafeBC.	

Ministry of Energy, Mines and Low Carbon Innovation

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
Inspection #1: Ministry of Energy, Mines and Low Carbon Innovations **i**nspected the Portage Mountain quarry site. The previous contractor had removed their equipment and operation. The new contractor was planning to mobilize their equipment and crew into site shortly and begin mining. The laydown, stockpile and processing areas were compliant, but the haul road and quarry area up top had a couple of issues that needed to be addressed prior to mining.			

Risk Level	Theme	Inspection Reports and Orders Received	Date of Inspection
High Risk	Excavations	**Order#1 - 177775-S1-O1**: It was observed that there are portions of the quarry walls that are overhung. Some overhung rocks have tension cracks on top/behind that indicate they could come loose and fall down on to haul roads, catchment berms and potentially the quarry floor. This is a risk to anyone who would be in the quarry area, so it must be addressed prior to workers being in the top quarry area.	September 27, 2021
High Risk	Road Design	**Order #2 - 177775-S1-O2**: It was observed that within the quarry area up top of the haul road, there were multiple working faces and haul roads that vehicles can access with drop offs greater than three metres and sections with no berms at all, sections with berms <3/4 the height of the largest tire, and sections where the berm was at the edge of the drop off and falling down the working face to the floor and road below.	

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Site C Clean Energy Project

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Appendix D

Workforce Overview

Table D-1 Current Site C Jobs Snapshot (July 2021 to September 2021)[21]

	Number of B.C. Workers and Total Workers	Construction and Non-construction Contractors[22] (including some Subcontractors). Excludes Work Performed outside of B.C. (e.g., Manufacturing)	Engineers and Project Team[23]	Total
July 2021	BC Workers	2,881	697	3,578
	Total Workers	4,356	752	5,108
August 2021	BC Workers	2,834	679	3,513
	Total Workers	4,362	725	5,087
September 2021	BC Workers	2,786	662	3,448
	Total Workers	4,248	715	4,963

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

BC Hydro has contracted companies for major contracts, such as main civil works, who have substantial global expertise. During the month of September 2021, there was one worker in a specialized position working for Site C construction and non-construction contractors, which were subject to the Labour Market Impact Assessment process under the Federal Temporary Foreign Worker Program. Additionally, there were 40 management and professionals working for Site C construction and non-construction contractors through the Federal International Mobility Program.

21 Employment numbers are direct only and do not capture indirect or induced employment.

22 Construction and non-construction contractors total workforce employment number includes work performed on the Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services.

23 Engineers and Project team are comprised of both onsite and offsite workers. The Project team includes BC Hydro construction management and other offsite personnel. An estimate is provided where possible if primary residence is not given.

Table D-2 Preliminary Site C Apprentices Snapshot (July 2021 to September 2021)

Month	Number of Apprentices
July 2021	189
August 2021	197
September 2021	183

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

Table D-3 Current Site C Job Classification 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						

Table D-4 Indigenous Inclusion Snapshot (July 2021 to September 2021)

Month	Number of Indigenous Workers
July 2021	393
August 2021	393
September 2021	390

The information shown has been provided by BC Hydro's onsite[24] construction and non-construction contractors and their subcontractors that have a contractual requirement to report on Indigenous inclusion in their workforce.

[24] Onsite includes work performed on Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services.

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

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

Women

In September 2021, there were 493 women working for Site C construction and non-construction contractors. The number of women was provided by onsite construction and non-construction contractors and engineers that have a contractual requirement to report on the number of women in their workforce.

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Quarterly Progress Report No. 23

Appendix E

Independent Experts Report

Site C Technical Review Panel
John W. France, P.E., D.GE, D.WRE and Kaare Hoeg, ScD, NAE
REPORT NO. 4
August 12, 2021

EXECUTIVE SUMMARY

This report presents an update to the Technical Review Panel's (Panel's) findings subsequent to Panel Reports Nos. 1, 2, and 3, issued on January 22, 2021, February 15, 2021, and April 6, 2021, respectively.

The Panel's opinions expressed in the previous reports remain unchanged. The work associated with the right bank design enhancements, the design of the approach channel, and the earthfill dam has been progressing as anticipated at the time of preparation of Panel Report No. 3.

The pile designs for the right bank enhancement have been completed. Steel pipe for the piles has been ordered and is expected to begin arriving on site soon. Pile installation is expected to commence later this year and be completed by Spring 2023.

With the steel pipe ordered, the Engineering Design Team (EDT) has turned its attention to progressing the work related to the approach channel. Designs are being advanced in anticipation of continuation of excavation of the approach channel commencing later this year and channel liner installation commencing in Spring 2022. The EDT is currently anticipating five work packages with two contractors and is in discussions with the contractors to finalize the work plans. As the EDT finalizes the approach channel design, the Panel encourages the team to give strong preference to construction of the Region 2 polyvinyl chloride (PVC) liner as a continuous liner beneath the center berm, rather than constructing the liner over the top of the berm.

The EDT is considering improvements to the existing right bank drainage tunnel (RBDT), in light of several local shotcrete liner failures that previously have occurred in the tunnel. The RBDT must be made safe, as it is indispensable for the future drainage work.

There have been no changes to the earthfill embankment design since early this year. Foundation grouting has progressed to near completion in the valley, and reported grouting records indicate an effective program and high-quality execution. Earthfill placement has commenced. Foundation preparation for earthfill placement appears to be carefully and appropriately done. Foundation conditions observed in the core trench have been quite favorable. The limited shears that have been found have been treated appropriately. Quality control / quality assurance (QC/QA) testing of the earthfill placed to date indicates placements and compaction in accordance with the project specifications.

The Panel concurs with the EDT's conclusion that the area (berm) of colluvium to be left in place beneath the earthfill embankment at the left bank will have no significant effect on the dam core and filter performance after reservoir filling.

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The EDT has developed instrumentation data presentation templates and a three-dimensional FLAC deformation model which will both be helpful in evaluating earthfill dam performance during construction and first reservoir filling.

INTRODUCTION

At the request of BC Hydro, the Technical Review Panel (Panel) has prepared this report as an update to the Panel's previous Reports Nos. 1, 2, and 3, dated January 22, 2021, February 15, 2021, and April 6, 2021, respectively.

Since April 6, the Panel has attended briefings to the Technical Advisory Board (TAB) by the EDT on April 23, May 10, May 13, May 14, June 16, July 16, and August 5, 2021, during which the EDT updated the TAB on activities related to the right bank enhancements, the approach channel, and the earthfill dam. The Panel has also reviewed project information provided by BC Hydro.

Based on the information provided to date, the Panel provides updated findings concerning the proposed right bank design upgrades, the approach channel, and the earthfill dam.

FINDINGS

Right Bank Design Enhancements

In the Panel's opinion, the EDT has been proceeding well with the implementation of the right bank enhancements. The principal activities completed since April 6 have been finalization of the pile system design, placing orders for the steel pile casings, and advancements of concept designs and details for the approach channel. Work remaining to be done includes finalization of designs for the pile caps downstream of the powerhouse, the approach channel, the foundation drainage system, and the approach channel foundation grouting program. A detailed schedule has been established for the remaining activities.

The Panel has been regularly updated on the various activities related to the right bank design enhancements through the TAB briefings.

Pile System Design – Subsequent to our Report No. 3, the EDT finalized the number, size, and configuration of piles to be installed downstream of the spillway and powerhouse. The steel pipe for the piles has been ordered and is expected to begin arriving on site soon. Installation of the piles is scheduled to begin later this year and be completed in Spring 2023. The EDT is still finalizing some details of the pile cap design for the powerhouse piles, but this should not affect the overall schedule.

The EDT has completed its documentation of the stability, displacement, and stress analyses to support the pile design.

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Approach Channel – With the pile design completed and documented and the steel pipe ordered, the EDT has turned its attention to progressing the design of the approach channel. Final selection of materials and configuration of the approach channel liner is currently in progress. The EDT is in discussions with contractors concerning the approach channel work. At this time, the EDT anticipates five work packages to be completed by two different contractors. The current estimated schedule, to be finalized after completion of designs and discussion with the contractors, is for continuation of excavation of the approach channel to begin later this year and liner installation to commence in Spring 2022. The current estimated completion date for the approach channel is in the middle of 2023.

In its design activities, the EDT is attempting to simplify construction, while still preserving the planned functions of the approach channel water control features. Among options being considered is to construct the Region 2 PVC liner as a continuous liner beneath the center berm, rather than constructing the liner over the top of the berm. In the Panel's opinion, the horizontal liner configuration seems significantly superior to the over-the-berm alternative and should be given strong preference.

Right Bank Drainage Features – The EDT is currently using the results of hydrogeological analysis of the right bank to complete the final design of the right bank water control measures and drainage features, with construction of these features scheduled to commence in 2022.

The EDT is considering improvements to the existing RBDT, in light of several local shotcrete liner failures that previously have occurred in the tunnel. As the Panel has stated previously, the RBDT provides access for some of the contingency actions for the right abutment, if such contingency actions are found to be needed. The RBDT also provides access for observation of right bank drainage and for conveyance of collected drainage. As such, the RBDT must be made safe, as it is indispensable for the future drainage work.

Earthfill Dam

There have been no significant changes in the earthfill dam design or stability analyses since Panel Report No. 2 issued on February 15, 2021. The Panel's findings remain unchanged from those stated in Report No. 2.

Foundation grouting for the earthfill dam has progressed substantially since Panel Report No. 3 issued on April 6, 2022. Consolidation grouting and curtain grouting in the valley section of the dam are nearly complete, with only some grouting in the abutments remaining to be done. Reports of grouting results presented at the TAB briefings indicate an effective and high-quality grouting program.

Placement of earthfill has commenced since Panel Report No. 3. Photographs presented at the TAB briefings indicate the foundation is being prepared appropriately before fill is placed. Foundation conditions observed in the core trench have been quite favorable. The Little Ricky Shear and an associated conjugate shear are the only significant shear zones observed in the core

trench foundation. These shears have been appropriately treated. Only minor shears have been observed elsewhere in the core trench foundation.

Records of QC/QA test results for the embankment fill indicate that the fill is being placed and compacted in accordance with the project specifications.

In our opinion, earthfill dam construction has started well.

The EDT has evaluated the potential consequences of leaving an area (berm) of colluvium in place beneath the earthfill dam on the left abutment and concluded that this will have no significant effect on the dam core and filter performance after reservoir filling. The Panel concurs with this conclusion.

The EDT has developed templates for plotting embankment dam instrumentation data and has populated these templates with initial data. The team is also developing a three-dimensional FLAC deformation model to evaluate predicted versus actual performance of the earthfill dam and its foundation. The instrumentation templates and the FLAC model will be valuable in assessing performance as construction proceeds and during first reservoir filling after construction.

STATEMENT OF LIMITATIONS

The Panel functioned as independent reviewers of the methodologies used by the EDT for analysis and design of the right bank enhancements, the approach channel, and the earthfill dam, based on information provided by the EDT. Given the large amount of work being completed by the EDT and the associated voluminous documentation, it was not possible for the Panel to perform a detailed review of all of the material in the available time. In particular, the Panel has not performed detailed checks of calculations and designs completed by the EDT. Such detailed checks are provided by the quality control/quality assurance programs for the Project. The Panel provides its opinions concerning the methods and approaches being used based on information provided by the Project Team. However, the ultimate decisions and responsibilities for the designs remains with BC Hydro.

Our review services were performed within the limits prescribed by BC Hydro in a manner consistent with the level of care and skill normally exercised in the current standard of professional engineering practice. No other representation to BC Hydro, expressed or implied, and no warranty or guarantee is included or intended.

Site C Technical Review Panel
John W. France, P.E., D.GE, D.WRE and Kaare Hoeg, ScD, NAE
REPORT NO. 4
August 12, 2021

Respectfully submitted,

[redacted]

John W. France

[redacted]

Kaare Hoeg

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Appendix F

Summary of Individual Contracts Exceeding $10 Million

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Appendix G

Project Progression

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Appendix H

Detailed Project Expenditure

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