

# MONTHLY FIELD STUDIES SUMMARY

## July and August 2014

The Site C Clean Energy Project is continuing to conduct environmental and engineering field studies on and around the Peace River between the Williston Reservoir and the Alberta border to inform detailed mitigation and monitoring planning as part of the project's environmental assessment process. Project construction will not take place unless Site C receives environmental certification, regulatory permits and authorizations, and approvals to proceed.

This notice provides a list of field work planned for July and August 2014. Helicopters may be required for some of this work. BC Hydro will obtain permits, and complete environmental management plans and archeological assessments as required.

Overview
<b>Environment Studies</b>
<ul style="list-style-type: none"> <li>Fish and Fish Habitat Site Inspections</li> <li>Heritage Study Program</li> <li>Feasibility Study – Field Trial for Biochar (Non-Merchantable Fibre Alternative Disposal)</li> <li>Forestry Site Inspections</li> <li>Rare Plants Study</li> <li>Amphibian Surveys and Bald Eagle Productivity Surveys</li> <li>Jackfish Lake Moose and Elk Monitoring Program</li> <li>Peace River Turbidity and Suspended Sediment Monitoring</li> <li>Climate and Air Quality Monitoring</li> </ul>
<b>Engineering Investigations</b>
<ul style="list-style-type: none"> <li>Distribution Line Site Inspections</li> <li>Geotechnical Investigations and Soil Resistivity Testing Along Transmission Right-of-Way</li> <li>Geotechnical Investigations: West Pine and Wuthrich Quarries</li> <li>Dam Site Investigations</li> <li>Visual Inspections for Environmental and Archaeological Assessments</li> <li>South Bank Construction Access Road Site Inspections</li> <li>Instrumentation Monitoring</li> </ul>

Current and previous field study activities are available at [www.sitecproject.com/news-and-information/field-study-notices](http://www.sitecproject.com/news-and-information/field-study-notices) and in the Community Consultation offices in Fort St. John and in the Pearkes Centre in Hudson's Hope.

Regular and ongoing BC Hydro work may also be taking place on the Peace River and tributaries related to BC Hydro's Peace River water licence requirements or other operations work.

For further information, please contact:

**Kate O'Neil, Community Relations**

Office: 250-785-3415 Cell: 250-793-5416

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Study Name	Description	Timing
<p><b>Environment Studies – Fish and Fish Habitat Site Inspections</b></p>	<p>BC Hydro will be conducting fish and fish habitat site inspections within the proposed dam site area on the north and south bank of the Peace River, and the side channels near Old Fort and access roads on the south bank in the area of the existing transmission corridor.</p> <p>The work will include fisheries personnel walking watercourses to assess fish habitat conditions and may include fish sampling, measurements and photographs.</p> <p>Vehicles may be stopped on the side of the road where fisheries assessments are being conducted.</p> <p>Jet-boats may be used to access sites along the north and south banks of the Peace River.</p>	<p>July – October 2014</p>
<p><b>Environment Studies – Heritage Study Program</b></p>	<p>BC Hydro will be continuing the Heritage Study Program of the Site C project area.</p> <p>The assessment will identify, record and evaluate archaeological sites and further investigate previously recorded archaeological sites located within the proposed Site C project area; assess potential impacts by the Site C project to these sites; and recommend mitigation options.</p> <p>The majority of the work will be shovel tests, as well as visual inspections of areas with good soil exposures, such as freshly tilled fields.</p> <p>Crews will be primarily on foot, with land access by road or boat, supported occasionally by helicopter or all-terrain vehicles.</p>	<p>June – October 2014</p>
<p><b>Environment Studies – Feasibility Study Field Trial for Biochar (Non-Merchantable Fibre Alternative Disposal)</b></p>	<p>The feasibility study is part of BC Hydro’s work to seek out options to utilize non-merchantable wood fibre in a way that would reduce the volume of fibre for traditional disposal, reduce greenhouse gas emissions and manage local air emissions.</p> <p>BC Hydro is conducting a feasibility study to analyse biochar produced from waste wood for its fuel properties and to test whether biochar can be used to improve the quality of Peace Region soils.</p>	<p>May – September 2014</p>

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Study Name	Description	Timing
	<p>There are three stages to the study. First, wood samples from the Peace River Region are converted into biochar for soil trials, then the soil samples and the biochar is tested. The final stage is a field trial in the Peace River Region in an area with soils that could most benefit from biochar application.</p> <p>The field soil trial area is on BC Hydro owned land on the north bank of the Peace River near the Halfway River.</p>	
<p><b>Environment Studies – Forestry Site Inspections</b></p>	<p>BC Hydro will be conducting forestry site inspections of proposed clearing routes on the north and south banks of the Peace River at the proposed dam site, and Moberly River area between late April and October 2014.</p> <p>The work will include foresters walking or driving the proposed clearing routes to conduct visual surveys of the area to confirm topography and terrain, and may include taking measurements and photographs. Helicopters may also be used to access and assess the proposed clearing routes.</p> <p>Vehicles may be stopped on the side of the road where assessments are being conducted.</p> <p>Jet-boats will be used to complete visual inspections on the north and south banks of the Peace River. Engineers will stop the boat at select sites and conduct walkabouts to determine local topography and take bathymetrical measurements and photographs.</p>	<p>April – October 2014</p>
<p><b>Environment Studies – Rare Plants Study</b></p>	<p>BC Hydro is conducting general rare plant surveys in association with engineering investigations along the transmission line and within the dam site area on the south bank. Surveys will be conducted in areas not surveyed during previous baseline rare plant surveys.</p> <p>Additional surveys will be conducted targeting persistent-sepal yellowcress and Peace daisy, two rare plants that have been found within the proposed project area.</p>	<p>July – August 2014</p>

**July and August 2014**

Study Name	Description	Timing
	<p>Surveys will occur along the Peace River downstream of the proposed dam and within grasslands outside the proposed reservoir footprint. A subset of surveys will occur outside the Peace River Valley but within the broader Peace Region, in areas identified as having potential to support these two rare plants.</p> <p>Sampling will be conducted by a professional botanist and field technician between mid-July and mid-August when target species are most easily identified. Surveys will be conducted on Crown and BC Hydro owned lands.</p> <p>Accessing properties for the field studies will be through a mix of road, quad and foot. A boat may be required to access some portions of the river where there are no access roads to the sampling locations.</p>	
<p><b>Environment Studies – Amphibian Study</b></p>	<p>BC Hydro is conducting additional amphibian surveys along existing petroleum access roads east of the Jackfish Lake Road on the south bank of the Peace River, to collect additional data that will be used to assist in mitigation planning. This field study will build on the baseline data collected in 2006, 2008 and 2013.</p> <p>Surveys will focus on the western toad, which is a species of special concern that is known to breed in the area, and will document toad dispersal locations along the road alignment.</p> <p>During the summer months the juveniles can conduct mass migration away from breeding habitats. The study area includes the length of the existing access roads on the south bank. Special attention will be paid to areas where upgrades are planned.</p> <p>Juvenile migration surveys will be conducted.</p> <p>The surveys will be conducted by two professional biologists. Data collected will be used to provide site specific recommendations for mitigation measures that can be incorporated in road design.</p>	<p>August 2014</p>

July and August 2014

Study Name	Description	Timing
<p><b>Environment Studies – Bald Eagle Productivity Surveys</b></p>	<p>BC Hydro will be conducting bald eagle productivity surveys within and adjacent to the Peace River valley between Hudson's Hope and the Alberta border.</p> <p>These studies are being conducted to collect additional data to inform the development of wildlife mitigation and monitoring plans.</p> <p>Bald eagle nest surveys in April and May documented the presence and status of nests along the Peace River, major tributaries and select sites.</p> <p>In August, active nests will be re-surveyed to determine the number of young that the nest produced.</p> <p>Surveys will be conducted by helicopter.</p>	<p>August 2014</p>
<p><b>Environment Studies – Jackfish Lake Moose and Elk Monitoring Program</b></p>	<p>BC Hydro is conducting a moose and elk monitoring study on the south bank of the Peace River, around the Jackfish Lake Road area, between the Peace River and Chetwynd, and in the area of the transmission corridor right-of-way.</p> <p>The first phase of the study took place between winter 2012 and spring 2013, and involved the capture and outfitting of 32 moose and elk with GPS collars. An additional 12 animals were captured in the winter of 2014.</p> <p>Phase II involves tracking collared animals for up to two years, and phase III, the final phase, will involve removing the collars from the study animals following the monitoring period. Ground based track surveys will also be conducted to document road crossings.</p>	<p>December 2012 – April 2015</p> <p><i>Phase II, tracking collared animals, occurs between May 2013 and April 2015.</i></p>
<p><b>Environment Studies – Peace River Turbidity and Suspended Sediment Monitoring</b></p>	<p>BC Hydro is continuing the collection of baseline turbidity and suspended sediment data in the Peace River to inform the evaluation of potential effects of project construction on water quality as it relates to fish habitat and municipal/ industrial water supplies.</p> <p>In 2014, BC Hydro will continue maintenance and operation of six turbidity monitoring stations located on either river bank both upstream and downstream of the Site C dam site, as well as just upstream of the town of Taylor and at the Spectra water intake.</p>	<p>April – December 2014</p>

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## July and August 2014

Study Name	Description	Timing
	<p>A service trip was conducted prior to the spring freshet to clean the sensors, replace batteries, perform a calibration check, and collect sediment samples. Additional service and sampling trips will be conducted as required throughout the year.</p> <p>Field crew access will be by boat and foot.</p>	
<p><b>Environment Studies – Climate &amp; Air Quality Monitoring</b></p>	<p>BC Hydro is collecting climate and air quality data from monitoring stations on private and BC Hydro owned land between Hudson’s Hope and Old Fort, south of Fort St. John.</p> <p>Information on various climate parameters is being gathered, including: air temperature, humidity, wind speed and direction, fog frequency and density, snow depth and precipitation. Monitoring of particulate matter (mixture of solid particles and liquid droplets in the air) is being conducted at Old Fort, Halfway River and 85<sup>th</sup> Avenue.</p> <p>These data were used to establish baseline conditions that informed the effects assessment of the Site C project on in-valley climate and air quality in the area. BC Hydro is continuing to collect the data to verify actual changes should the project be built and to forecast periods of high tributary inflows for construction planning.</p> <p>BC Hydro also monitors climate within the Peace River watershed in order to forecast periods of high tributary inflows for construction planning.</p> <p>Stations are visited regularly to retrieve data and for maintenance. Access to the monitoring stations is by vehicle, foot and helicopter.</p>	<p>Ongoing monitoring from February 2009.</p>
<p><b>Engineering Investigations – Distribution Line Site Inspections</b></p>	<p>BC Hydro is planning an upgrade to the distribution lines that run from the Fort St. John substation on 81 Avenue to the location of the proposed Site C dam.</p> <p>The upgrade work is planned for 2015 and will include increasing the capacity of existing above ground and underground lines, new terminal poles, new fibre optic cable for communications, and connections into existing underground distribution.</p>	<p>July 2014</p>

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Study Name	Description	Timing
	<p>BC Hydro will be conducting site inspections of the distribution lines that require upgrades.</p> <p>Engineers will walk the routes of the distribution lines to take photographs of existing overhead distribution lines, assess ground conditions, and gather measurements for determining spacing for poles. This work is expected to take up to five days.</p> <p>The inspections will occur on the distribution lines which run along the following roads:</p> <ul style="list-style-type: none"> <li>• In the area of 86 Street and 87 Streets, between the Alaska Hwy and 81 Avenue;</li> <li>• In the area of 81 Avenue, between 86 Street and 89a Street;</li> <li>• 81 Avenue, between 89A Street and 100 Street (265 Road);</li> <li>• 98 Street, between 81 Avenue and 85 Avenue;</li> <li>• 100 Street (265 Road), between 81 and 85 Avenue;</li> <li>• 85 Avenue, between 98 Street and Old Fort Road;</li> <li>• Old Fort Road, between 85 Avenue and 240 Road;</li> <li>• 240 Road, between Old Fort Road and 269 Road; and</li> <li>• 269 Road, south of 240 Road to the end of the existing road.</li> </ul> <p>In addition to the above work, BC Hydro will be conducting site inspections in the area of Septimus Siding at the top of slope in the area of the transmission lines, along the toe of slope between the proposed dam site and transmission line, and along the existing transmission right-of-way corridor.</p>	
<p><b>Engineering Investigations - Geotechnical Investigations and Soil Resistivity Testing Along Transmission Right of Way</b></p>	<p>BC Hydro is conducting geotechnical investigations and soil resistivity testing on the south bank of the Peace River starting at Peace Canyon dam, following the existing BC Hydro 138 kV transmission line right-of-way, for approximately 77 km to the north-east.</p> <p>The work is to investigate the proposed 500 kV transmission tower foundation locations for the design of the 500 kV transmission lines, which would run from Peace Canyon dam to the substation on the south bank of the Site C dam site.</p> <p>Contractors will be using an auger to drill holes up to 250 mm in diameter. Cuttings generated from the auger</p>	<p>July – September 2014</p>

July and August 2014

Study Name	Description	Timing
	<p>will be used to backfill the holes upon completion.</p> <p>To maximize safety and efficiency, it is anticipated that a low and slow flying helicopter will be used to access select boreholes.</p> <p>At select locations, soil resistivity testing will also be carried out to provide information for design of the transmission line grounding system. Resistivity testing measures how much the soil resists the flow of electricity. Work includes inserting a series of 1" diameter metallic test probes into the ground and applying a test current.</p> <p>BC Hydro will obtain the necessary permissions before assessment work is performed.</p>	
<p><b>Engineering Investigations - Geotechnical Investigations: West Pine and Wuthrich Quarries</b></p>	<p>Geotechnical investigations will be carried out at West Pine Quarry and Wuthrich Quarry, both existing Ministry of Transportations and Infrastructure quarries.</p> <p>West Pine Quarry is located approximately 36 km east of MacKenzie and approximately 63 km west of Chetwynd. Wuthrich Quarry is located approximately 10km north of Fort St. John.</p> <p>Investigations will examine the quality of bedrock beyond the existing quarries for rip-rap (large bedrock blocks).</p> <p>Work at West Pine Quarry will include the development of a new access road, excavation of exploratory test pits to determine overburden thickness and rotary drilling to investigate the presence of joints and fractures within the rock.</p> <p>Work at Wuthrich Quarry will include include engineering field crews walking through the identified area completing field mapping; drilling of exploratory drillholes using an auger drill; digging of exploratory test pits; and clearing of necessary access routes.</p>	<p>August – September 2014</p>

July and August 2014

Study Name	Description	Timing
<p><b>Engineering Investigations – Dam Site Investigations</b></p>	<p>BC Hydro is continuing the following engineering investigations at the proposed dam site area:</p> <ul style="list-style-type: none"> <li>• Geotechnical investigations</li> <li>• Geophysical seismic reflection surveys</li> <li>• Trench excavation</li> <li>• Topographic surveys</li> <li>• Site inspections</li> <li>• Construction materials investigations</li> <li>• Danger tree assessment and removal</li> </ul> <p><b>Geotechnical investigations</b> will include subsurface drilling on the north and south banks using a drill rig and a backhoe to dig test pits and trenches. On the south bank, drilling investigations and resistivity testing will be carried out along the existing BC Hydro 138 kV transmission line right-of-way, the proposed alignment of the 500 kV transmission line, Septimus Road, and in the locations of the temporary and permanent substations. Site preparation for this work may include removal of vegetation as required. At the dam site on the north and south banks, drill holes from historic investigations will be re-drilled to fill with grout.</p> <p>For select drill sites on the south bank, a low and slow flying helicopter will be used to access the site to maximize safety, efficiency and to minimize the impact on the surrounding environment.</p> <p><b>Geophysical seismic reflection surveys</b> will be conducted on both the north and south banks and on the Peace River to characterize geological conditions. Site preparation for this work may include removal of vegetation as required.</p> <p><b>Trench excavation</b> - A trench on the south bank at the proposed dam site will be excavated to assess rock conditions. An excavator will be used for this work, and personnel and equipment will access the site through existing access roads. Site preparation will include removal of trees.</p> <p><b>Topographic surveys</b> will be conducted to establish a survey control network; confirm the accuracy of Light Detection and Ranging (LiDAR) data through ground truthing; and survey the general site topography, the locations of historical boreholes, test pits, and other geotechnical instrumentation</p>	<p>June – October 2014</p>

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Study Name	Description	Timing
	<p>locations, and environmental and archaeological features.</p> <p><b>Site inspections</b> or visual surveys will be completed on the north and south banks at the proposed dam site and Moberly River area. Engineers will walk or drive potential access roads to conduct visual surveys of the area to confirm topography and terrain. Work may include taking measurements, surveying and taking photographs. This data is being collected to plan the design for distribution lines, temporary substation, early cell phone coverage, clearing activities and access roads required for construction on the south bank of the Peace River.</p> <p><b>Construction materials investigations</b> may be conducted in the area of the proposed dam site. This work may include engineering field crews walking through the identified area completing field mapping; drilling of exploratory drillholes using an auger drill; digging of exploratory test pits; and clearing of necessary access routes. Site preparation for this work may include removal of vegetation as required.</p> <p><b>Danger tree assessment and removal</b> will be conducted during July as part of establishing safe access for workers to the proposed dam site areas from the north and south banks. In accordance with WorkSafeBC regulations, trees identified as prone to falling are required to be removed before workers can access the area. As required, environmental monitors will carry out mandatory bird nesting surveys where trees have been identified as dangerous by certified danger tree assessors. Trees will be felled and on-site environmental monitors will advise on the best treatment for the wood; left on site or bucked for firewood.</p> <p><b>Other Investigations</b> such as water sampling, remediation work, potential contaminated site investigations and road maintenance work may be conducted as required throughout the field season.</p> <p>Engineering investigations will be occurring on both private and Crown land.</p> <p>Access to the site will be through existing roads on the north and south bank of the Peace River; and boats will be used to transport crews and supplies</p>	

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	<p>across the river.</p> <p>Helicopters will be used periodically to access the south bank at the dam site for the subsurface investigations.</p>	
<p><b>Engineering Investigations – Visual Inspections for Environmental and Archaeological Assessments</b></p>	<p>BC Hydro is conducting visual inspections of the dam site area, including the right bank terrace and Septimus Siding, and the proposed location of the temporary and permanent substations, to assist with planning and permit preparations to support future field investigations.</p> <p>Work will include archaeological and environmental investigations and assessments of proposed work areas. Field crews will also be traversing the areas on foot. Work may include taking measurements and photographs.</p>	<p>May - October 2014</p>
<p><b>Engineering Investigations – South Bank Construction Access Road Site Inspections</b></p>	<p>BC Hydro is conducting site inspections of access roads required for construction on the south bank of the Peace River.</p> <p>These visual surveys will be happening on the petroleum development and forestry service roads north of the Jackfish Lake Road area, between the intersection with Highway 29 at Chetwynd and the proposed dam site.</p> <p>Work will include engineers walking or driving the potential access roads to conduct visual surveys of the area to confirm topography and terrain, and may include taking measurements and photographs.</p> <p>Worker vehicles may be parked on the side of the road where assessments are being conducted.</p>	<p>April – October 2014</p>
<p><b>Engineering Investigations – Instrumentation Monitoring</b></p>	<p>BC Hydro is continuing instrumentation monitoring at the proposed dam site and along the reservoir shoreline.</p> <p>There are approximately 80 sites throughout the reservoir area where geotechnical instruments are installed.</p> <p>These sites are visited approximately every three to six months throughout the year for reading and</p>	<p>February – October 2014</p>

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	maintenance.  Access to the sites will be by vehicle, foot and helicopter.	

*Note: Access to public and private land may be required in order to complete study work. BC Hydro will obtain permission from land owners and provide notification to BC Hydro leaseholders before entry onto private or leased lands. BC Hydro will adhere to seasonal road restrictions.*