Appendix D

Canadian Environmental Assessment Agency
Correspondence

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61 Airport Road
Edmonton, Alberta
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File Number: 004629

September 1st, 2011

Mr. Vince Parsons
Senior Environmental & Regulatory Advisor
Suite 1700, BVS II
205-5th Ave. S.W.
Calgary, AB T2P-2V7

Dear Mr. Parsons:

Re: **Southern Pacific Resources Corp. STP McKay Thermal Phase 2 Project**

On February 22nd, 2011 the Canadian Environmental Assessment Agency (the Agency) received a project description for Southern Pacific Resources Corporation's proposed STP McKay Thermal Phase 2 Project (the Project). The Project description was referred by the Agency to appropriate federal departments on March 17th, 2011 for review.

I am writing as a follow up to the letter sent to Alberta Environment on April 19th, 2011 which outlined the additional information required by federal departments to determine if the *Canadian Environmental Assessment Act* (the Act) applies to the project.

The Agency understands that Alberta Environment has required Southern Pacific Resources Corp. to undertake an EA for the proposed Project and that the final Terms of Reference were issued on July 22nd, 2011 . To utilise the remaining alignment opportunities with Alberta Environment's EA process and to avoid duplication in the process, the Agency strongly recommends that Southern Pacific Resources Corp. provide this information to the Agency as soon as possible.

If upon submission of this additional information it is determined that a federal EA is required, the Project will likely be subject to a comprehensive study type of EA (see Section 10 of the *Comprehensive Study List Regulations).*

Environment Canada (EC), Transport Canada (TC) and Fisheries and Oceans Canada (DFO) will be participating in Alberta Environment's EA process under Appendix 3 of the *Canada-Alberta Agreement for Environmental Assessment Cooperation.* As part of their participation in the provincial process the information included in Appendix A should be provided to the Agency upon submission of the Environmental Impact Assessment Report to Alberta Environment.

If a federal EA is required for the Project, additional information will be required ancillary to the information requirements outlined in Appendix A. These additional information requirements are provided for your information in Appendix B.

To conclude, a federal EA under the Act will not commence unless DFO or TC confirms a responsibility or potential responsibility under section 5 of the Act.

If you should have any questions please contact the undersigned by telephone at 780-495-2530 or by electronic mail at sean.carriere@ceaa-acee.gc.ca.

Yours truly,

Sean Carriere
Canadian Environmental Assessment Agency

Cc:	Stephanie Jerred	Fisheries and Oceans Canada
	Sophia Garrick	Transport Canada
	Christi Horne	Environment Canada
	Melissa Styba	Alberta Environment

Appendix A
Federal Information Requirements
Federal Government Participation under Appendix 3 of the
Canada-Alberta Agreement on Environmental Assessment Cooperation

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
Air Emissions Management		
Provide an existing emissions case that describes the air emissions from existing and/or operating projects or activities only.		Section 2.5[A]
Provide explanations for any differences between greenhouse gas emission intensities computed for this Project and those of other similar projects		Section 2.5[A]
Explain how the Proponent's Project design and overall greenhouse gas management plans have taken into account the need for continuous improvement with respect to greenhouse gas emissions.		Section 2.5[A](e)
Surface Water		
Provide details of watercourse crossings, including: a) Type of watercourse crossing, construction methods and anticipated flows during construction; b) Location (latitude and longitude); and c) Details on capacity of crossing to withstand extreme flood events including design flood and design criteria used for the crossing.		Section 2.6.2

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
Wastewater Management		
Describe the chemical criteria used for the release of wastewater to the environment.	A sufficient level of information on the aquifer properties should be presented in order to adequately assess the suitability of the re-injection sites. Detailed modeling of re-injection should be provided to support the predictions provided in the EIA Report.	Section 2.6.3
Describe the volume and rate of wastewater to be disposed in groundwater aquifers.		Section 2.6.3
Conservation and Reclamation		
Describe how the reclaimed areas will differ from existing areas with respect to wetland form and function, species diversity and occurrence of rare species and *Species at Risk* and COSEWIC listed species.		Section 2.8
Discuss uncertainties relating to the re-establishment of faunal and floral biodiversity in reclaimed areas.		Section 2.8[C]
Hydrogeology		
Describe the nature and significance of the potential Project impacts on groundwater as a result of steaming and recovery operations (i.e., ground heave and/or subsidence) and wastewater disposal.	For potential impacts of steaming and recovery operations (i.e., ground heave and/or subsidence) on groundwater, Proponents should support their discussions with geochemical model predictions and maps where possible.	Section 3.2.2[B]
Aquatic Ecology		
Describe and map the fish, fish habitat and aquatic resources (e.g., aquatic and benthic invertebrates) of the lakes, rivers, ephemeral water bodies and other waters. Describe the species composition, distribution, relative abundance, movements and general life		Section 3.5.1[A](b) and (c)

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
history parameters of fish resources. Also identify any species that are: a) listed in the federal *Species at Risk Act* b) listed by COSEWIC		
Vegetation		
Describe and map the vegetation communities, wetlands, rare plants, old growth forests, and communities of limited distribution. Identify the occurrence, relative abundance and distribution and also identify and species that are: a) listed in the federal *Species at Risk Act* b) listed by COSEWIC		Section 3.6.1[A](b) and (c)
Describe the current extent of habitat loss.		Section 3.6.1[B]
Identify any species listed under the federal *Species at Risk Act* and by COSEWIC used to assess the Project impacts.		Section 3.6.1[C]
Wildlife		
Describe and map wildlife resources (amphibians, reptiles, birds, terrestrial and aquatic mammals). Describe species relative abundance, distribution and their use and potential use of habitats. Also identify any species that are: a) listed in the federal *Species at Risk Act* b) listed by COSEWIC	For migratory bird surveys, baseline information should include on the ground surveys (e.g., point count). Proponents must ensure surveys are: • Appropriately timed (i.e., time of year). • Performed under appropriate weather conditions. • Distributed across all habitat types (ecosite phases). • Of sufficient intensity/effort to determine presence and relative abundance of species within habitats.	Section 3.7.1[A](b) and (c)
Describe and map important wildlife areas.		Section 3.7.1[B]

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
Identify any species listed under the federal *Species at Risk Act* and by COSEWIC used to assess the Project impacts.	Proponents must assess all *Species and Risk Act* (SARA) and COSEWIC listed species that may interact with the Project. Proponents should be advised that indicator or surrogate species cannot be used as key indicator resources in lieu of any species listed in SARA or COSEWIC.	Section 3.7.1[C]
For all species assessed, describe: a) occurrence, distribution, relative abundance, habitat use and availability, population size and trends; b) population or herd ranges based on current data; c) important areas and/or critical habitat (as defined in the *Species at Risk Act)*; d) limited factors and sensitivity to disturbance, including known thresholds of disturbance; and e) existing environmental effects and significance of existing effects on local and regional populations	When discussing how the Project will affect wildlife relative abundance, distribution, habitat availability, mortality and movement patters, Proponents must provide a quantitative analysis of effects where possible. When describing Project effects, Proponents must first identify existing environmental effects and the significance of those effects on the species addressed. This provides a complete understanding of the existing environment within which the Project is proposed. Significance of effects should be based on known thresholds of disturbance (e.g., linear feature density, amount of habitat loss), where known. Proponents should refer to the available federal guidance documents for additional direction on completing environmental assessments for species at risk. These include: *Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada (2004)* and *Addressing Species at Risk Act Considerations Under the Canadian Environmental Assessment Act for Species under Responsibility of the Minister Response for Environment Canada and Parks Canada (2010)..*	Section 3.7.1
Describe and assess the potential impacts of the Project to wildlife and wildlife habitats	Resource delineation activities (e.g., seismic, well, excavations etc.) carried out prior to the submission of the	Section 3.7.2[A](e)

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
considering all exploration (i.e., completed, proposed and planned), seismic, including monitoring/4D seismic and core hole activities, related to the project.	Environmental Impact Assessment report should be included as part of the Application Case.	
Discuss the impacts to wildlife habitat, wetlands and surface water quality and quantity as a result of changes to ground surface during steaming and recovery operations (i.e., ground heave and/or subsidence).		Section 3.9.2[B]
Monitoring		
Provide the scale and duration of any current and proposed monitoring plan.		Section 9[A]

Appendix B
Federal Information Requirements
Federal Environmental Assessment Required (Comprehensive Study)[1]

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
Project Description		
Discuss any alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means.		Section 2.1
Discuss the effects of the environment on all stages and elements of the Project.		Section 2.1
Describe the purpose of the Project.		Section 2.1
Describe the capacity of the renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future.		Section 2.1
Waste Management		
Provide the volume of sand generated as a result of Project activities and discuss how it will be managed (e.g., landfill, re-injection etc.)		Section 2.7
Air Emissions Management		
Provide an inventory of all potential contaminants and emissions from the proposed Project, including criteria air contaminants, air pollutants on the *List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act*; diesel PM and other possible contaminants.		Section 2.5

[1] These requirements are in addition to those already identified in Appendix A

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
Noise		Section 3.1.2[C]
Identify components of the Project that have the potential to increase noise levels, discuss the implications and a) identify all potential noise-sensitive receptors and their locations; b) identify and assess baseline noise levels for both daytime and night-time at the receptor locations; c) identify all potential noise sources during construction, operation and decommissioning; d) describe the methods used to obtain the baseline predicted noise levels; e) compare baseline noise levels with predicted noise levels at receptors; f) provide expected duration of noise to construction activities; g) evaluate the severity of predicted changes in noise levels that may affect human health; h) identify mitigation measures when health effects are predicted; and i) provide noise management and monitoring plans including complaint resolution if applicable.		
Hydrology		
Describe the extent of hydrological changes as a result of the Project, include disturbances to ground cover.		Section 3.3.2[A]

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
Surface Water Quality		
Describe the potential impacts of the Project on drinking and recreational water qualities, and proposed mitigation measures to maintain those water qualities at all stages of the Project and: a) identify all sources of drinking water and water used for recreational purposes; b) identify potential human receptors who may be exposed to contaminants through drinking water sources and recreational waters; c) examine the potential impacts on the quality of drinking water sources during all phases of the project, as well as the potential for cumulative effects on the water quality of water sources; d) provide a discussion to determine whether the type of treatment used and/or the capacity of the facility will be able to address the predicted or possible changes in water quality; e) indicate the baseline levels of naturally-occurring contaminants to assess impacts on drinking water; f) if potential impact on drinking water is identified, describe measures to be employed to inform potentially affected treatment facilities and well owners		Section 3.4.2[B]

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
and to mitigate risk; and g) examine the potential impact on recreational waters during all phases of the project. If any changes to recreational waters are predicted, discuss potential effects on human health. If potential impacts on recreational waters are identified, describe the measures to be employed to inform users and to mitigate any risk to human health.		
Health		
Provide information regarding the location of the Project and the distance to all potential human receptors.	Proponents should refer to Health Canada's *Useful Information for Environmental Assessments* when discussing potential impacts to human health as a result of the Project.	Section 6.1
Describe those aspects of the Project that may have implications for public health or the delivery of regional health services and provide the following: a) the data and methods used by the Proponent to assess the impacts of the Project on human health; b) the potential health implications of the compounds that will be released to the environment from the proposed operation in relation to exposure limits established to prevent acute and chronic adverse effects on human health; c) the human health impact of the potential contamination of country		Section 6.1

Federal Information Requirements	Federal Guidance, where available	Reference to Alberta Environment's Final Terms of Reference
foods and natural food sources talking into consideration all Project activities; d) the potential to increase human exposure to contaminants from changes to water quality including drinking water quality and recreational water quality, air quality, and soil quality taking into consideration all Project activities; e) cumulative health effects that are likely to result from the Project in combination with other existing, approved and proposed projects (projects that have been advanced to the public disclosure stage) or reasonable foreseeable activities in the region; and f) information on samples of selected species of vegetation known to be consumed by humans.		
Monitoring		
Describe the monitoring programs proposed to verify the accuracy of the environmental assessment.		Section 9[B]

March 19, 2012

Mr. Sean Carriere
Canadian Environmental Assessment Agency
61 Airport Road
Edmonton, Alberta
T5G 0W6

Dear Mr. Carriere

Re: STP MacKay Thermal Project - Phase 2
Watercourse Evaluation

Southern Pacific Resource Corp. (STP) plans to expand its in-situ oil sands operations located approximately 40 km northwest of Fort McMurray in the Athabasca Oil Sands area. The STP McKay Thermal Project – Phase 2 (Project) is designed to be an expansion of the company's existing STP McKay Thermal Project – Phase 1. In November 2011, STP submitted an application and Environmental Impact Assessment (EIA) for the Project to the Energy and Resources Conservation Board (ERCB) and Alberta Environment and Water (AEW)

STP is in receipt of the Canadian Environmental Assessment Agency (CEA Agency) letters dated April 19 and September 1, 2011 which request information on behalf of Transport Canada (TC) and Fisheries and Oceans Canada (DFO) in order to determine whether the Project triggers a federal environmental assessment (EA). The following information is being provided to assist Transport Canada in determining if an EA is triggered due to works being undertaken within a navigable water.

As part of the Phase 2 development several crossings of mapped watercourses will be required. STP has conducted an evaluation of each of the mapped watercourses in order to determine their potential navigability. It was determined that out of the 23 mapped watercourses only four of the watercourses had a defined bed and bank, the other 19 mapped watercourses were drainages with no defined channel. Of the four watercourses with a defined bed and bank, one has been has been characterized as a minor navigable water as defined in *Transport Canada's Minor Waters User Guide, 2010*. The other three appear to be non-navigable but do not have the characteristics of a minor navigable water as outlined in the guide. These three watercourses are also the only watercourses with fish or fish habitat as outlined in the EIA submitted in November.

STP plans to construct clear span arch structures at these three locations in accordance with the DFO *Operational Statement for Clear-Span Bridges*. The clear span structures over these three watercourses would be <30 m long and <20 m wide and therefore would be exempt from an environmental assessment in accordance with the *Canadian Environmental Assessment Act*. As required, STP will submit an application for approval of these crossings to Transport Canada prior to construction. These crossings are not associated with the first phase of Project development and therefore, are not required for at least 10 years.

Please find attached, written and photographic documentation of each of the 23 mapped watercourses. Based on the information collected and the commitment to construct clear span structures at three of the watercourse crossing location, STP does not believe that the Project would trigger a federal environmental assessment.

If you have any questions regarding this submission, please contact the undersigned at (403) 984-5335.

Sincerely,

Southern Pacific Resource Corp.

Vince Parsons
Senior Environmental & Regulatory Advisor

cc Sophia Garrick – Transport Canada
Corinne Kristensen – Alberta Environment and Water
Stephanie Jerred – Fisheries and Oceans Canada

STP McKay Thermal Project – Phase 2
Watercourse Navigability Evaluation

Prepared for:
Southern Pacific Resource Corp.

Prepared by:
Millennium EMS Solutions Ltd.
#208, 4207 – 98 St
Edmonton, Alberta
T6E 5R7

March 13, 2012
File #10-037

Table of Contents

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1.0 INTRODUCTION

Southern Pacific Resources Corp. (STP) plans to expand its in-situ oil sands operations located approximately 40 km northwest of Fort McMurray in the Athabasca Oil Sands area (Figure 1). The STP McKay Thermal Project – Phase 2 (Phase 2) is designed to be an expansion of the company's existing STP McKay Thermal Project – Phase 1 (Phase 1). In November 2011, STP submitted an application and Environmental Impact Assessment (EIA) to the Energy and Resources Conservation Board (ERCB) and Alberta Environment and Water (AENV) for the Phase 2 Project.

Over the life of the Phase 2 Project a number of well pads, borrow pits and access roads will be required to maintain production. As part of the environmental assessment undertaken for the Phase 2 Project, STP conducted an aerial reconnaissance survey of all the watercourse crossings that will be required over the life of the Project, within the Project Area. Results indicated that there were 23 watercourses and 28 potential watercourse crossings associated with the Project (Figure 2).

2.0 WATERCOURSE ASSESSMENT METHODOLOGY

An aerial survey of each of the watercourses intersected by the Phase 2 Project footprint was undertaken on July 21, 2011. The survey was helicopter-based and consisted of capturing photographs for an approximate 500 m length upstream and downstream of the proposed crossing sites. This aerial photographic coverage of the watercourses provides information on watercourse characteristics and identify features that may reduce navigability.

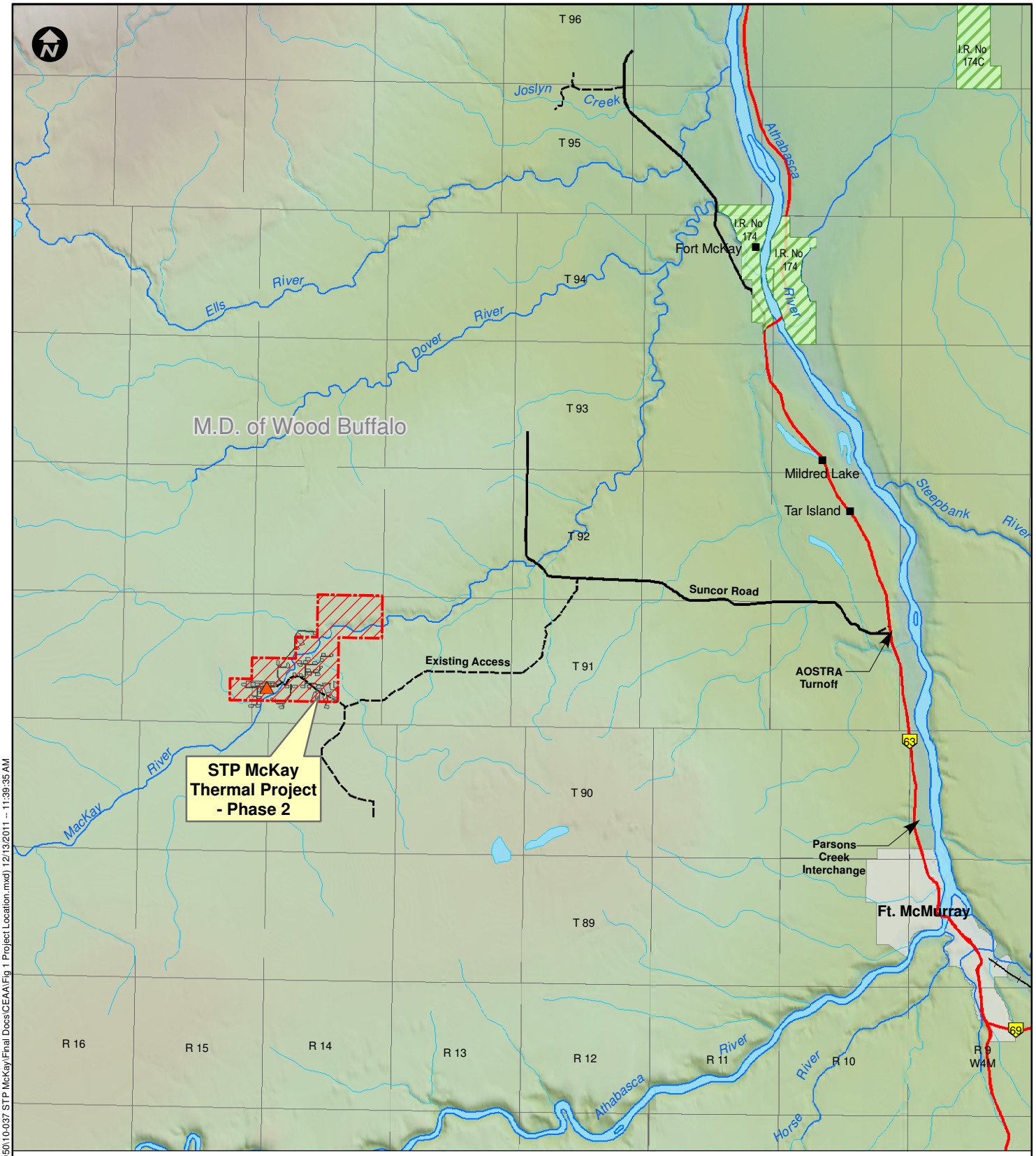
The vast majority of watercourses within the STP Project Area are drainages without defined channels or banks. Of the 23 potential watercourses identified only four were found to have defined channels. A ground survey was completed as per Transport Canada's *Minor Waters User Guide, 2010* for watercourses determined to have defined channels in order to obtain watercourse measurements. Three measurements were taken along each reach sampled; one at the proposed crossing site, one approximately 50 to 200 m upstream and one approximately 50 to 200 m downstream.

3.0 ASSESSMENT RESULTS

Watercourse measurements and a summary of characteristics for each of the watercourses with defined channels are provided in Table 1. Photographs of the watercourses at each potential crossing location are provided in the following section.

Based on the information collected, Unnamed Creek 2 is deemed to be a minor navigable water and therefore the crossing over this watercourse (MC23) would not require an approval in accordance with the *Navigable Waters Protection Act*. Birchwood Creek and Unnamed Creeks 1 and 3 would not be defined as minor navigable water and therefore an approval in accordance with the *Navigable Waters Protection Act* may be required prior to construction of the crossings.

Of the four watercourses with a defined channel only Birchwood Creek, and Unnamed Creeks 1 and 3 were found to have fish and fish habitat. STP will construct clear span bridges or arch structures at these locations in accordance with the Department of Fisheries and Oceans Operational Statement for Clear-Span Bridges. No fisheries authorizations will be required. The clear span structures over these three watercourses would be <30 m long and <20 m wide and therefore would be exempt from an environmental assessment in accordance with the *Canadian Environmental Assessment Act*.



Legend

- Existing STP McKay Termal Project - Phase 1
- Project Area
- Project Footprint
- First Nations

0 4 8 16
Kilometres

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE:

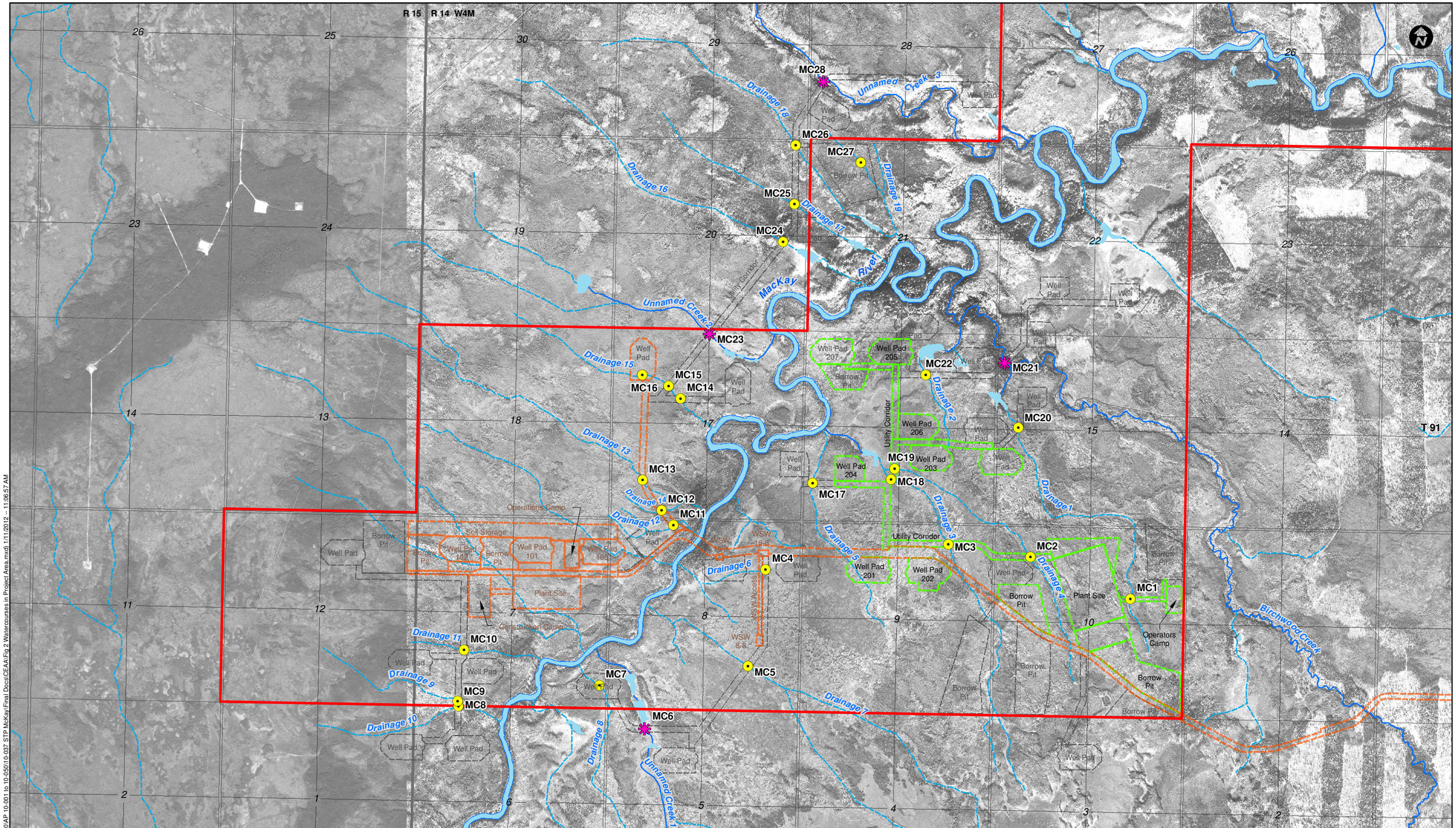
Project Location

DRAWN:	JDC/SL
CHECKED:	SR
DATE:	Dec 13/11
PROJECT:	10-037

FIGURE: 1

REF: Geobase, 2011.

Map Document: (K:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\CEAA\Fig 1 Project Location.mxd) 12/13/2011 – 11:39:35 AM



Legend

- Proposed Stream Crossing Location
- Proposed Drainage Crossing Location
- Streams with Defined Channels
- Drainages without Defined Channels
- Open Water
- Project Area
- Existing Phase 1 Development
- Proposed Phase 2 Development
- Future Well Pad/Borrow Pit/Access

0 300 600 1,200
Metres

REF: NHC, 2011, David Loucks, EIA PRELIMINARY LAYOUT 5-27-2011.dwg.

Map Document: (K:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\CEAA\Fig 2 Watercourses in Project Area.mxd) 1/11/2012 - 11:06:57 AM

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE: **Watercourses within the STP McKay Project Area**

DRAWN:	SL
CHECKED:	SR
DATE:	Jan 11/12
PROJECT:	10-037

FIGURE: **2**

Table 1 Stream Crossing Navigability Evaluation

Crossing	Coordinates		Primary Factor				Secondary Factor				Navigability Determination
	Easting	Northing	Average Width (m)	Average Depth (m)	<1.2m Width or <0.3m Depth	Average Width > 3m	Average Depth = or <0.6	Slope >4%	Three or More Natural Obstacles Over Reach	Sinuosity Ratio >2	
MC21 Birchwood Creek	428482	6305078	5.5	0.5	No	Yes	Yes	No	Yes	No	Not a Minor Navigable Water[1]
MC6 Unnamed Creek 1	425200	6303621	6.0	1.0	No	Yes	No	No	Yes	No	Not a Minor Navigable Water[1]
MC23 Unnamed Creek 2	425752	6306971	2.3	0.5	No	No	Yes	No	Yes	No	Minor Navigable Water[1]
MC28 Unnamed Creek 3	426722	6309111	5.0	0.3	No	Yes	Yes	No	Yes	No	Not a Minor Navigable Water[1]

[1] *According to the criteria in Transport Canada's Minor Waters User Guide.*

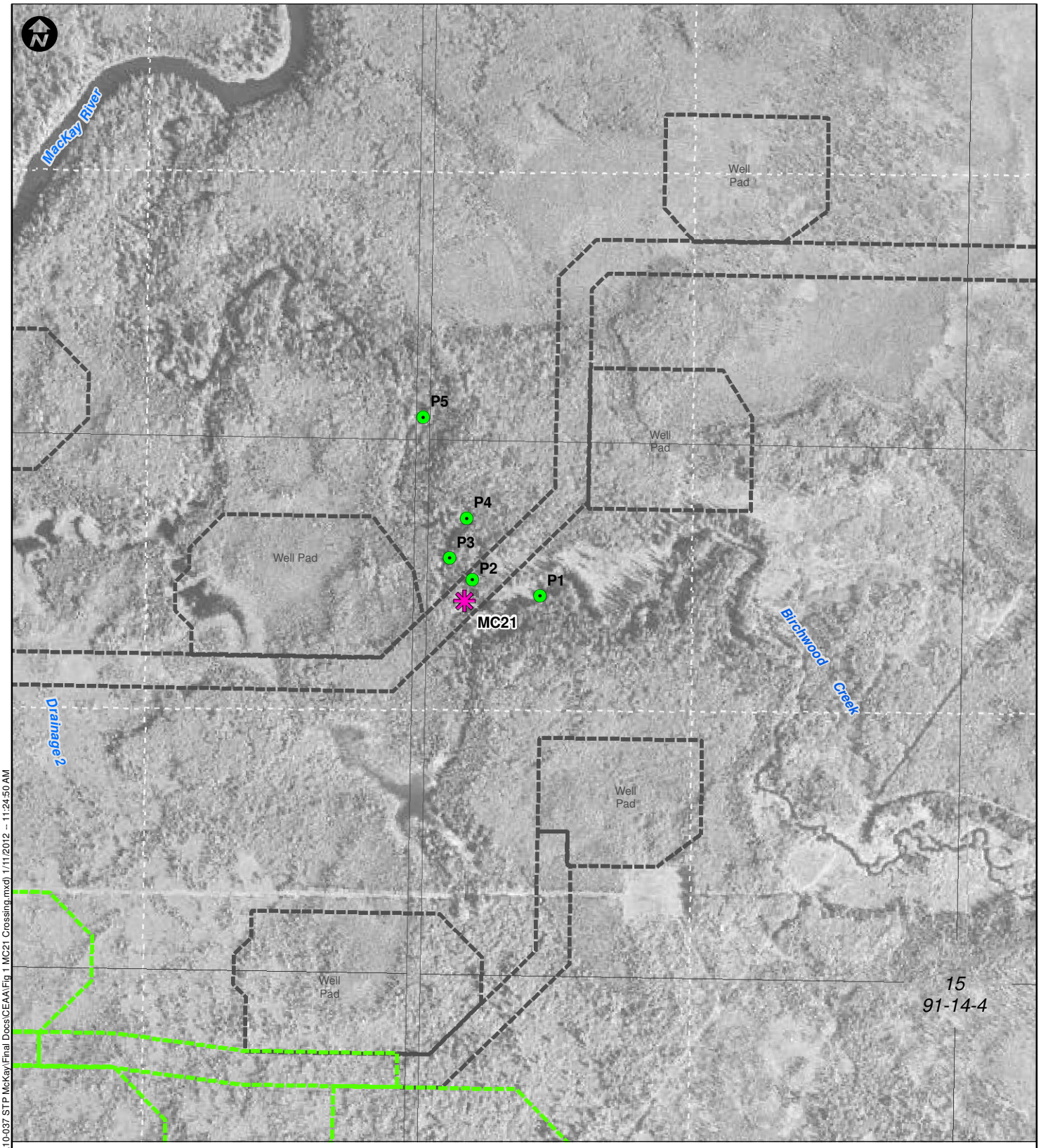
3.1 Birchwood Creek (Crossing MC21)

Birchwood Creek is a tributary to the MacKay River, located on the east side of the MacKay River, and meanders through spruce forest in a westerly direction. It has a defined channel and banks. A proposed watercourse crossing for Birchwood Creek is located at 428482E and 6305078N as shown in Figure 3. Birchwood Creek has a run morphology with an average wetted channel width of 5.5 m and average depth of 0.5 m. The creek banks are vertical and the stream bed is comprised mainly of silt and fines. Riparian species are dominated by grasses and shrubs that merge into upland spruce forests. Beaver dams and log barriers are numerous along the watercourse downstream of crossing site.

Photos 1 to 5 show the location of the proposed crossing site and provides photographic overview (aerial and ground) of the watercourse and conditions at the crossing site and reach. The assessment results indicate that this watercourse is likely non-navigable due to the numerous beaver dam and log barriers found within the reach and downstream of the crossing site along the watercourse. These features provide barriers within the watercourse that significantly reduce navigability at the proposed crossing site.

It is to be noted that, prior to construction of the access road to the Phase 1 Project, STP requested a determination of navigability for a crossing located approximately 4 km upstream of the MC21 crossing (TC File No. 8200-09-10744). In a letter dated December 21, 2009, Transport Canada determined that the Birchwood Creek was non-navigable at this upstream location.

Although this watercourse does not appear to be navigable, it would not be defined as a minor navigable water as outlined in the *Minor Waters User Guide* and therefore may require approval in accordance with the *Navigable Waters Protection Act* prior to construction of the crossing.



Legend

- Stream Crossing
- Photograph Location
- Project Area
- Existing Phase 1 Development
- Proposed Phase 2 Development
- Future Development

0 75 150 300
Metres

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE:

Watercourse Crossing MC21

DRAWN:	PS/SL
CHECKED:	SR
DATE:	Jan 11/12
PROJECT:	10-037

FIGURE: 3

REF: Image Date: 2008.

Map Document: (K:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\CEAA\Fig 1 MC21 Crossing.mxd) 1/11/2012 -- 11:24:50 AM

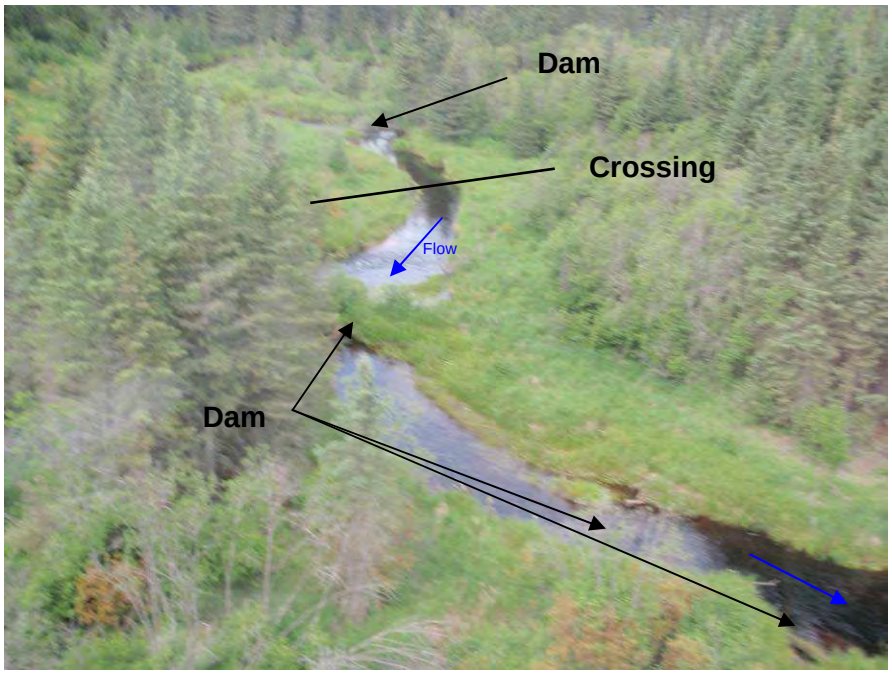


Photo 1 Aerial view of Birchwood Creek along watercourse crossing site MC21

Photo 2 Ground view of Birchwood Creek looking upstream of crossing site MC21

Photo 3 Aerial View of Birch Wood Creek looking north east approximately 50 m upstream of crossing site MC21

Photo 4 Aerial view of Birchwood Creek looking north approximately 80 m downstream of crossing site MC21

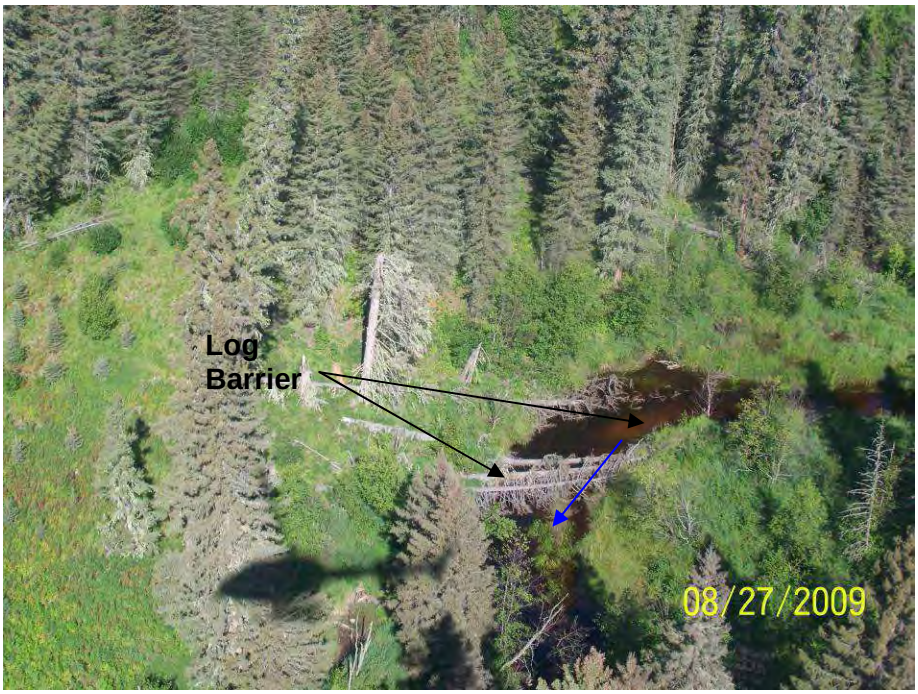


Photo 5 Aerial view of Birchwood Creek looking north east approximately 170 m downstream of crossing site MC21

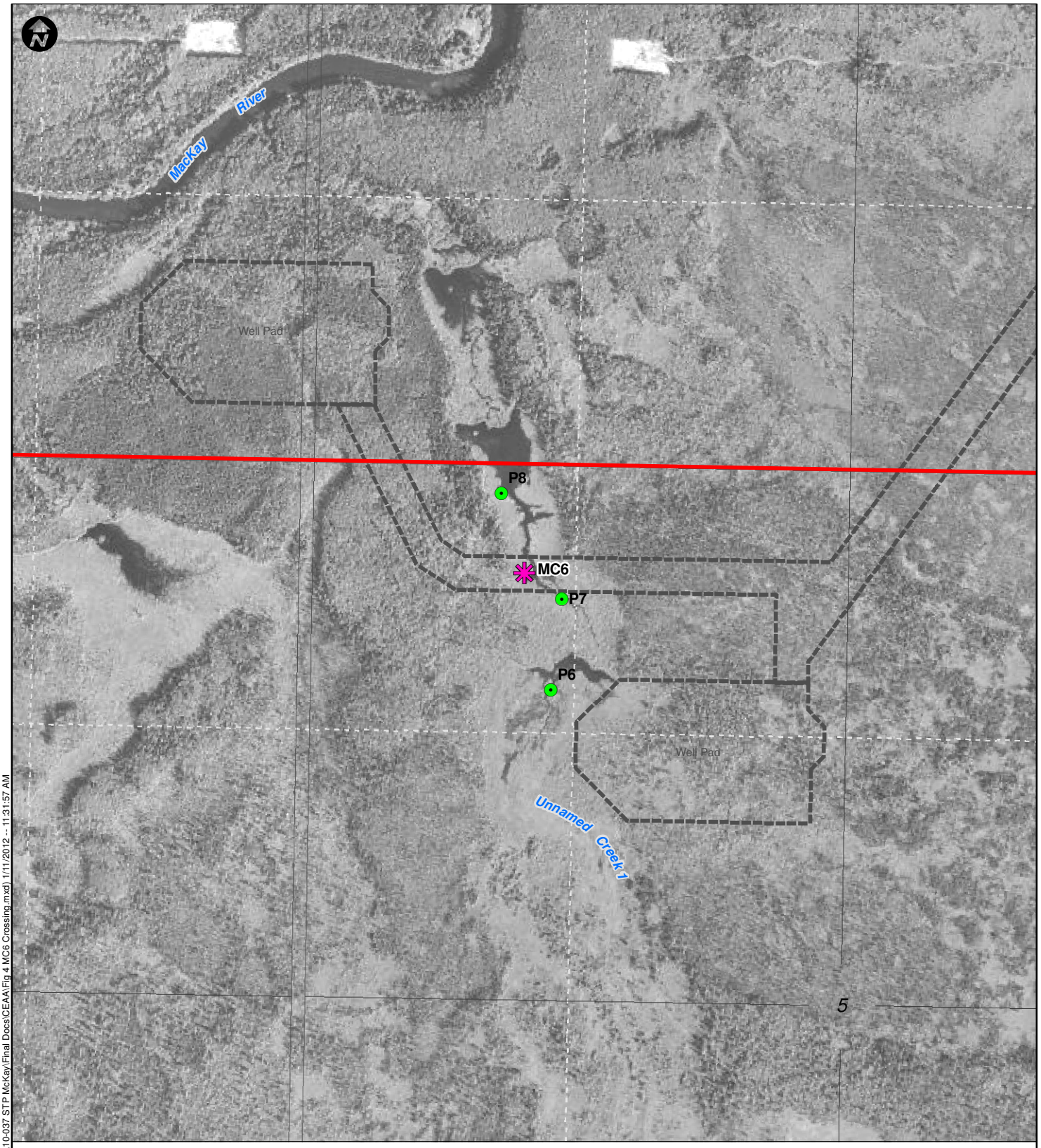
3.2 Unnamed Creek 1 (Crossing MC6)

Unnamed Creek 1 is a tributary to the MacKay River that is approximately 1.5 km in length and flows in a north westerly direction. It is located to the east of the MacKay River with its headwaters starting in a grassy fen area and feeds into several large open waterbodies along its length before connecting to the MacKay River. The watercourse crossing site (MC6) is located at 428482E and 6305078N (Figure 4).

The watercourse channel has an average width of 6.0 m and an average depth of 1.0 m at the proposed crossing site. The channel incises a riparian flood plain area comprised mosses, aquatic plants, and shrubs. Instream vegetation is present throughout the reach assessed and is particularly heavy at the inlet end of open water bodies upstream and downstream of the proposed crossing site.

Photos 6 to 9 show the location of the proposed crossing site and provides a photographic overview (aerial and ground) of the watercourse and conditions at the crossing site and reach. Based on the information collected this crossing is likely non-navigable due to the heavy instream vegetation throughout the watercourse.

Although this watercourse does not appear to be navigable, it would not be defined as a minor navigable water as outlined in the *Minor Waters User Guide* and therefore may require approval in accordance with the *Navigable Waters Protection Act* prior to construction of the crossing.



Legend

- Stream Crossing
- Project Area
- Existing Phase 1 Development
- Proposed Phase 2 Development
- Future Development

0 75 150 300
Metres

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE:

Watercourse Crossing MC6

DRAWN:	SL/PS
CHECKED:	SR
DATE:	Jan 16/12
PROJECT:	10-037

FIGURE: 4

REF: Image Date: 2008.

Map Document: (K:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\CEAA\Fig 4 MC6 Crossing.mxd) 1/11/2012 -- 11:31:57 AM

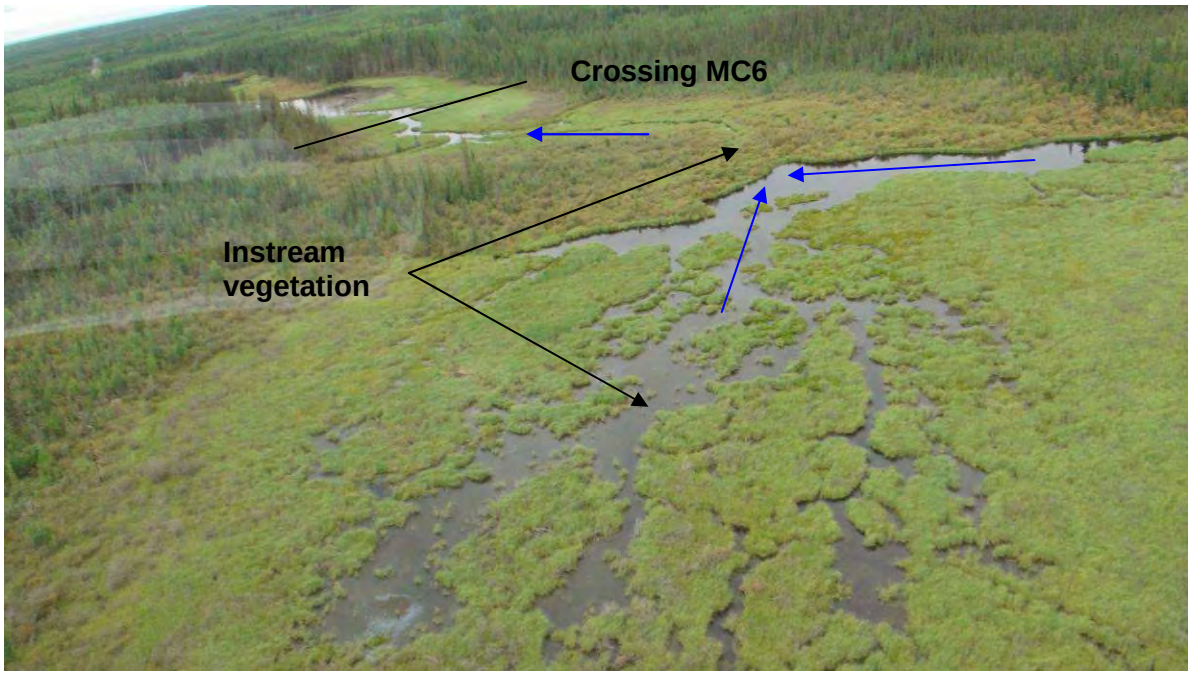


Photo 6 Aerial view of Unnamed Creek 1 looking upstream towards crossing site MC6

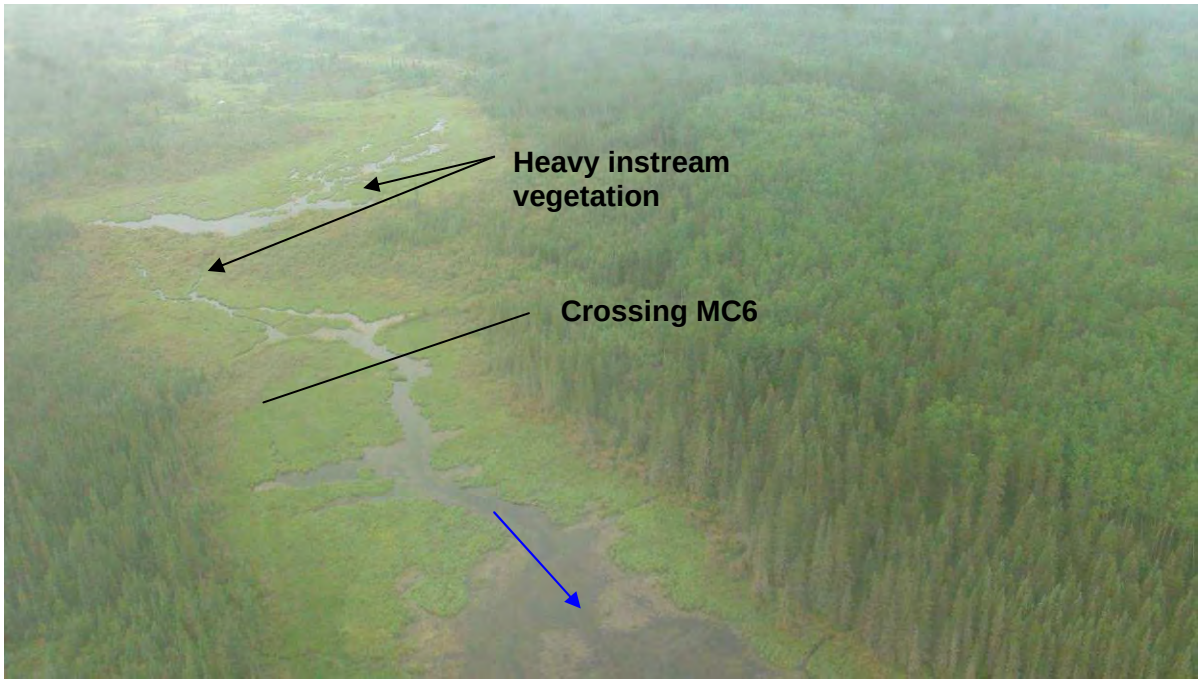


Photo 7 Aerial view of Unnamed Creek 1 looking downstream of crossing site MC6

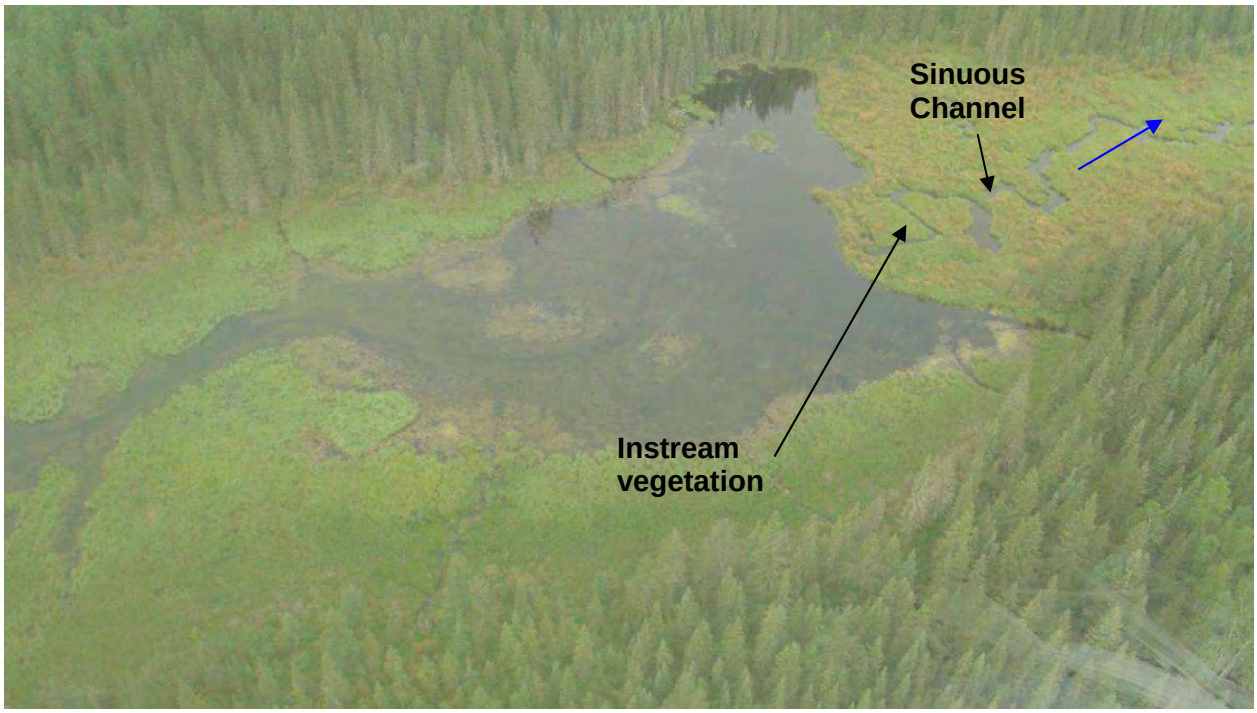


Photo 8 Aerial View of Unnamed Creek 1 downstream from crossing site MC6

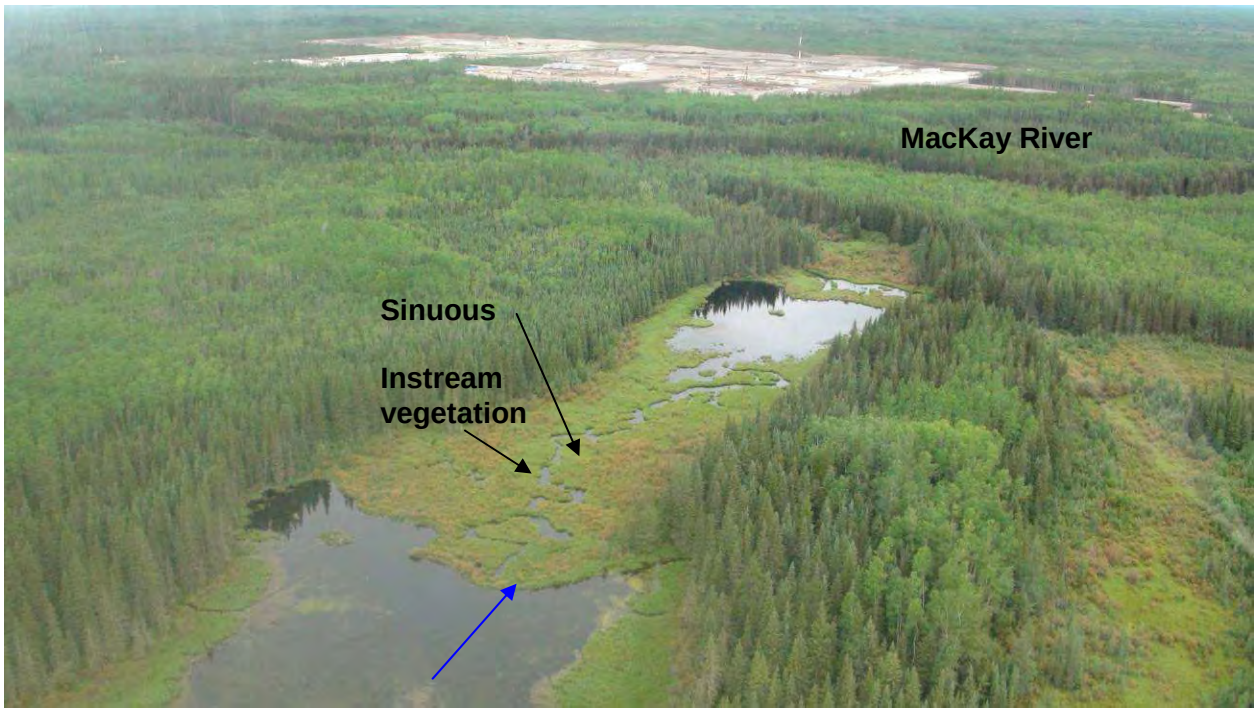


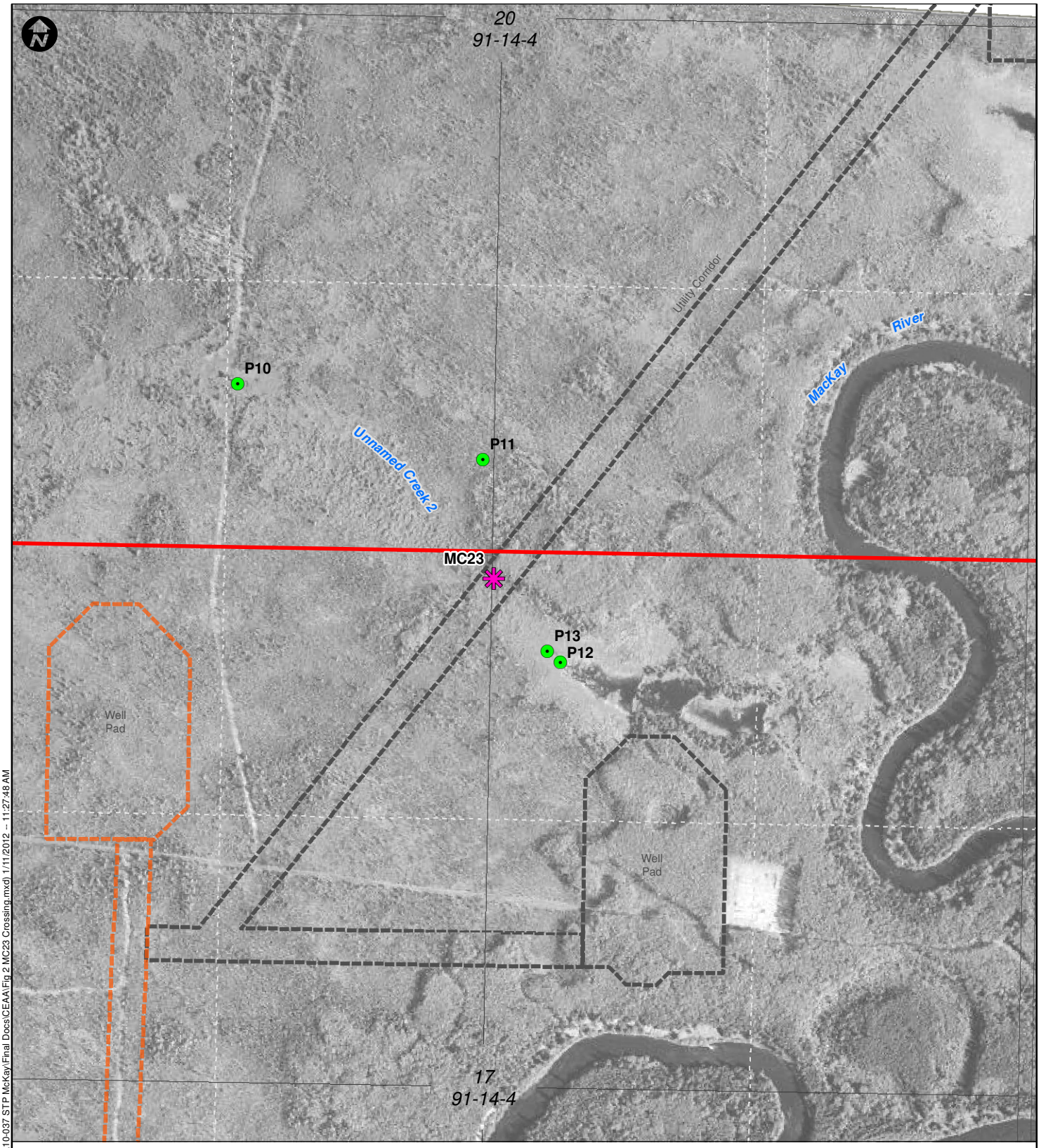
Photo 9 Aerial view of Unnamed Creek 1 looking downstream from crossing site MC6

3.3 Unnamed Creek 2 (Crossing MC23)

Unnamed Creek 2 is a tributary to the MacKay River that is approximately 1.0 km in length and flows in an easterly direction. It is located to the west of the MacKay River with its headwaters starting near the proposed crossing location. Immediately upstream of the crossing the watercourse turns into a drainage without a defined channel covered with shrubs and grasses. The proposed watercourse crossing site is located at 425752E and 6306971N (Figure 5).

The watercourse channel has an average width of 2.3 m and an average depth of 0.5 m at the proposed crossing. The creek banks are defined and the stream bed is comprised mainly of silt and fines. The watercourse channel runs through an open area dominated by grasses and shrubs. There is debris (logs, brush) found throughout the length of the channel that impedes navigability of the watercourse. Heavy instream vegetation at the proposed crossing site is present where it transitions into a drainage which significantly reduces navigability at proposed crossing site.

Photos 10 to 13 show the location of the proposed crossing site location and provides photographic overview (aerial and ground) of the watercourse and conditions at the crossing site and reach. Based on the information collected this watercourse meets the criteria of a minor navigable water as it is <3 m wide, <0.6 m deep and has three or more upstream and downstream natural obstacles. As such, no approval in accordance with the *Navigable Waters Protection Act* will be required for crossing this watercourse.



Legend

- Stream Crossing
- Project Area
- Existing Phase 1 Development
- Proposed Phase 2 Development
- Future Development

0 75 150 300
Metres

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE:

Watercourse Crossing MC23

DRAWN:	PS/SL
CHECKED:	SR
DATE:	Jan 16/12
PROJECT:	10-037

FIGURE: **5**

REF: Image Date: 2008.

Map Document: (K:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\CEAA\Fig 2 MC23 Crossing.mxd) 1/11/2012 -- 11:27:48 AM

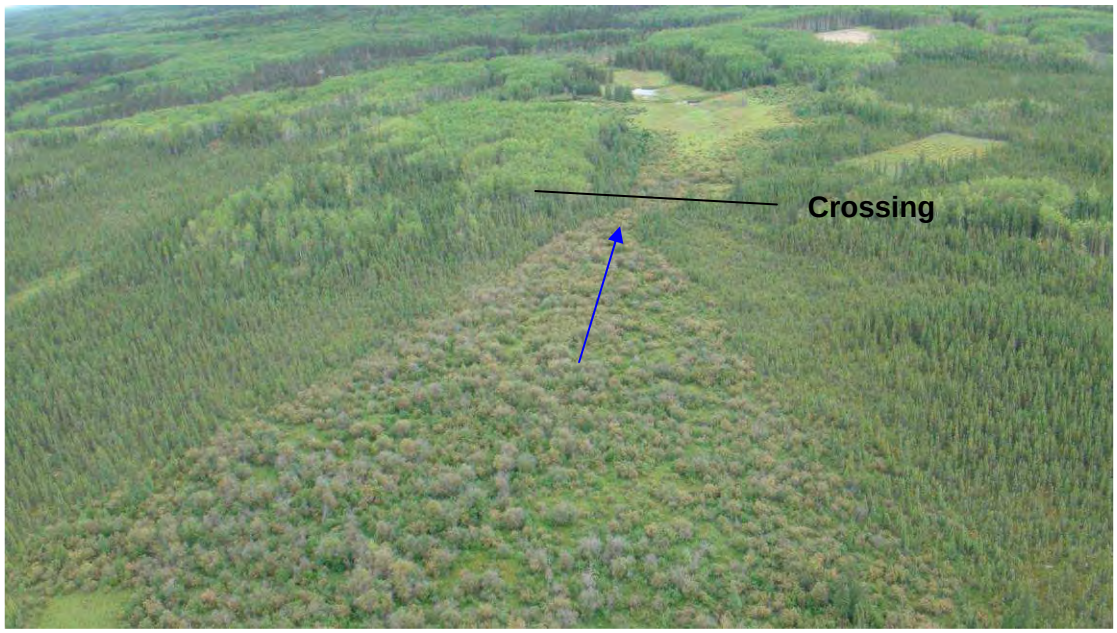


Photo 10 Aerial view of Unnamed Creek 2 looking downstream towards site crossing MC23

Photo 11 Aerial view of Unnamed Creek 2 looking south east across site crossing MC23

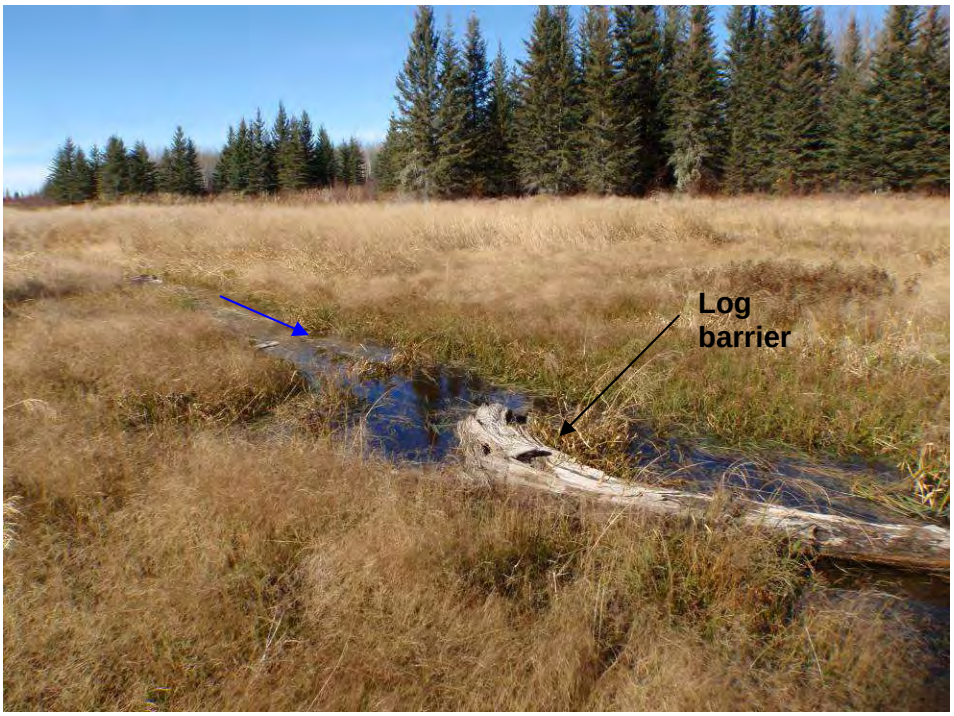


Photo 12 Ground view of Unnamed Creek 2 downstream of the crossing site looking upstream.

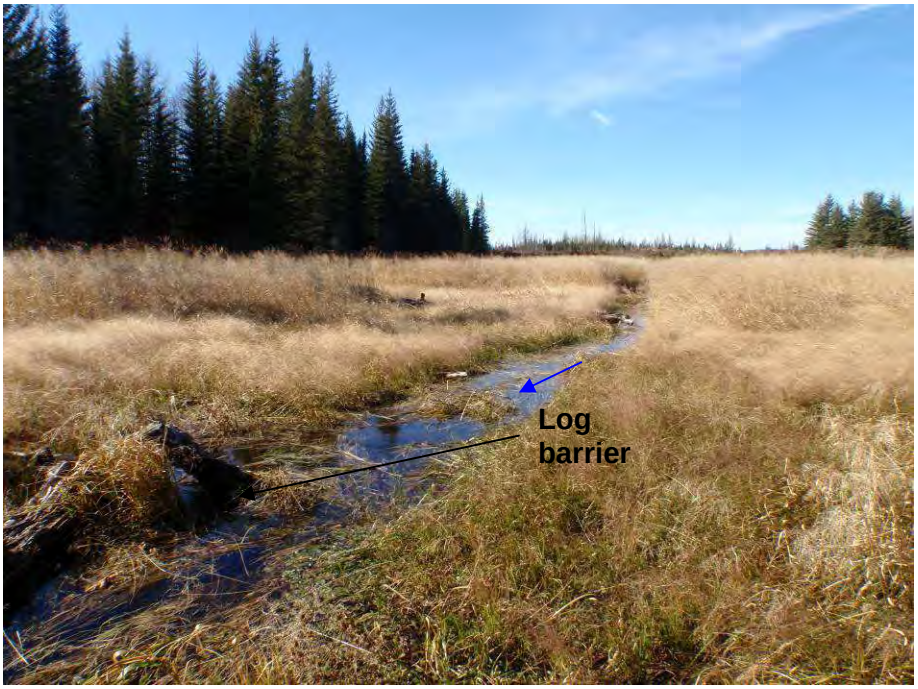


Photo 13 Ground view Unnamed Creek 2 looking downstream from site crossing MC23

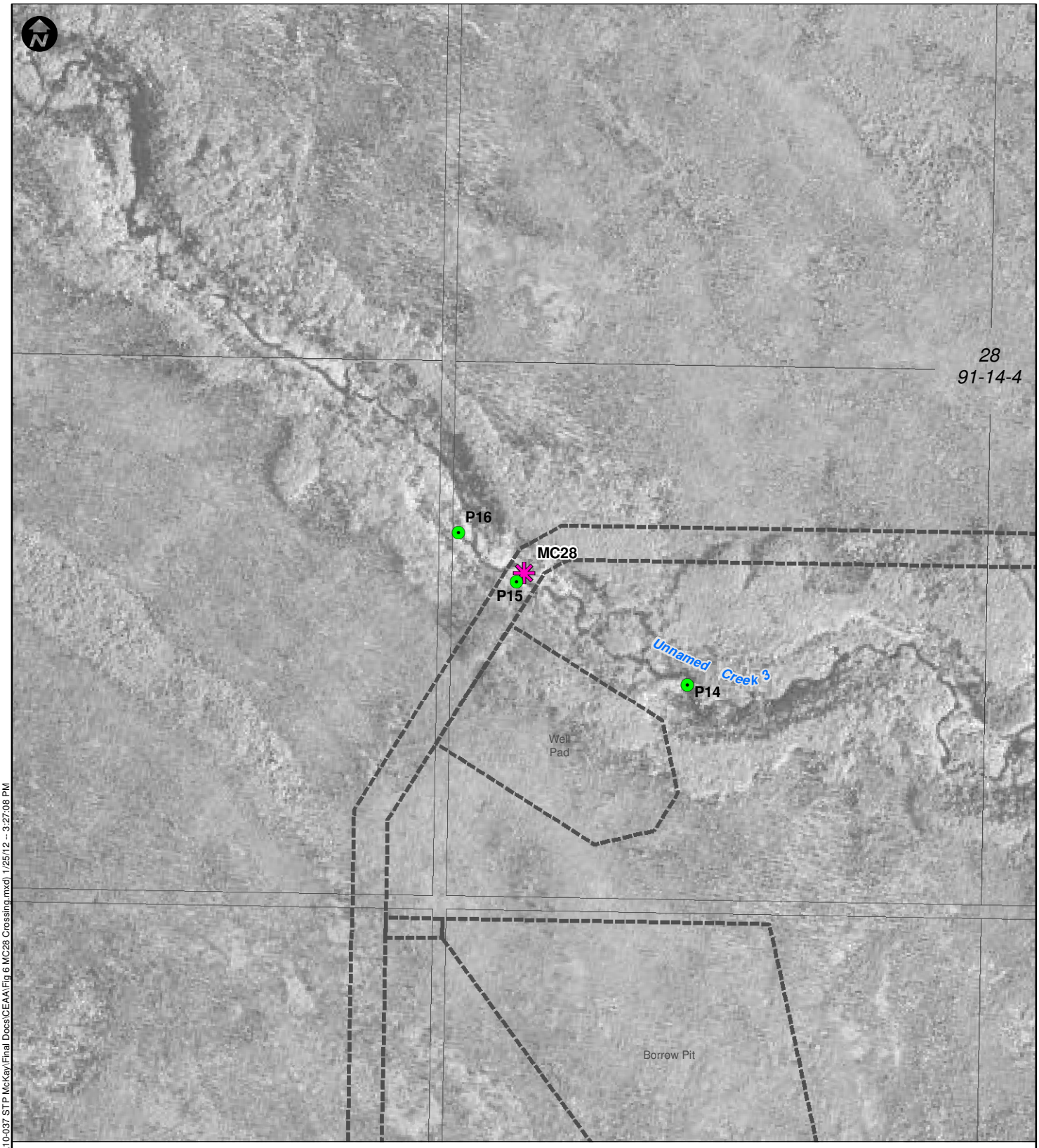
3.4 Unnamed Creek 3 (Crossing MC28)

Unnamed Creek 3 is a tributary to the MacKay River located on the west side of the MacKay River. The creek has a defined channel and banks and meanders through upland forests in an easterly direction. A proposed watercourse crossing for Unnamed Creek 3 is located at 426722E and 630911N as shown in Figure 6.

Unnamed Creek 3 has a run morphology with an average wetted channel width of 5.0 m and average depth of 1.2 m. The creek banks are well defined and the stream bed is comprised mainly of silt and fines. Riparian species are dominated by grasses and shrubs that transition into upland deciduous and coniferous forests. Beaver dams and log barriers are numerous along the watercourse upstream and downstream of the proposed crossing site. These features provide barriers within the watercourse that significantly reduce navigability at the proposed crossing site.

Photos 14 to 16 show the location of the proposed crossing site and provides a photographic overview (aerial and ground) of the watercourse and conditions at the proposed crossing site and reach. Based on the information collected it is likely that this watercourse is non-navigable due to the numerous beaver dams and log barriers found within the reach and downstream of the crossing location.

Although this watercourse does not appear to be navigable, it would not be defined as a minor navigable water as outlined in the *Minor Waters User Guide* and therefore may require approval in accordance with the *Navigable Waters Protection Act* prior to construction of the crossing.



0 75 150 300
Metres

Legend

- Proposed Stream Crossing
- Photograph Location
- Existing Phase 1 Development
- Proposed Phase 2 Development
- Future Development

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE:

Watercourse Crossing MC28

DRAWN:	SL/PS
CHECKED:	SR
DATE:	Jan 25/12
PROJECT:	10-037

FIGURE: 6

REF: Image Date: 2008.

Map Document: (K:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\CEAA\Fig 6 MC28 Crossing.mxd) 1/25/12 -- 3:27:08 PM

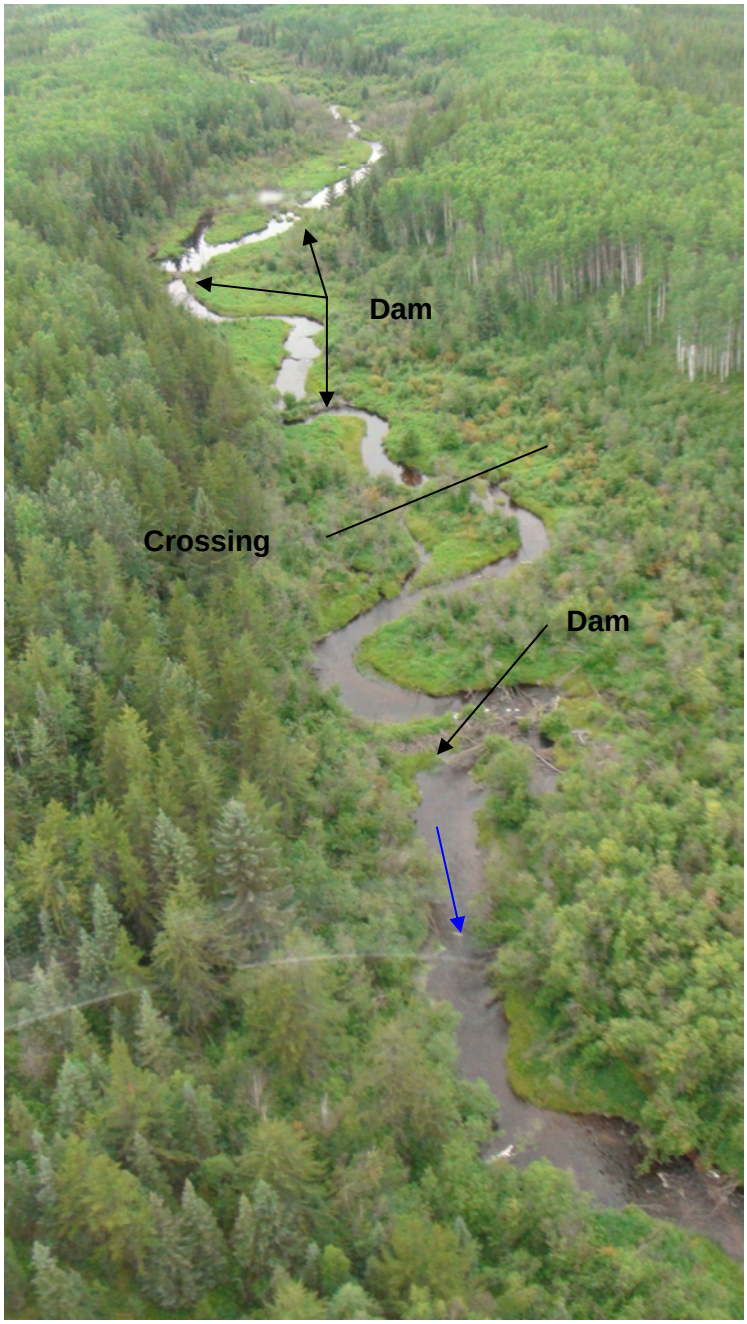


Photo 14 Aerial view of Unnamed Creek 3 showing crossing site MC28

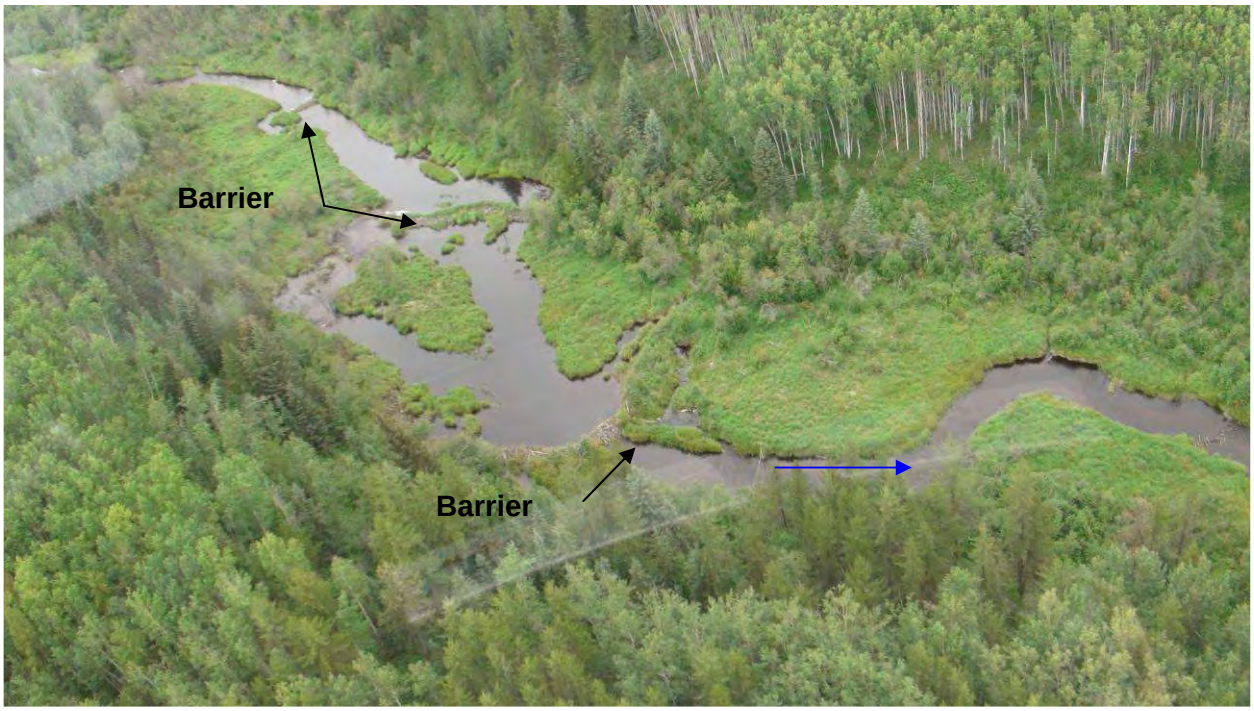


Photo 15 Aerial view of Unnamed Creek 3 showing barriers located immediately upstream of MC28

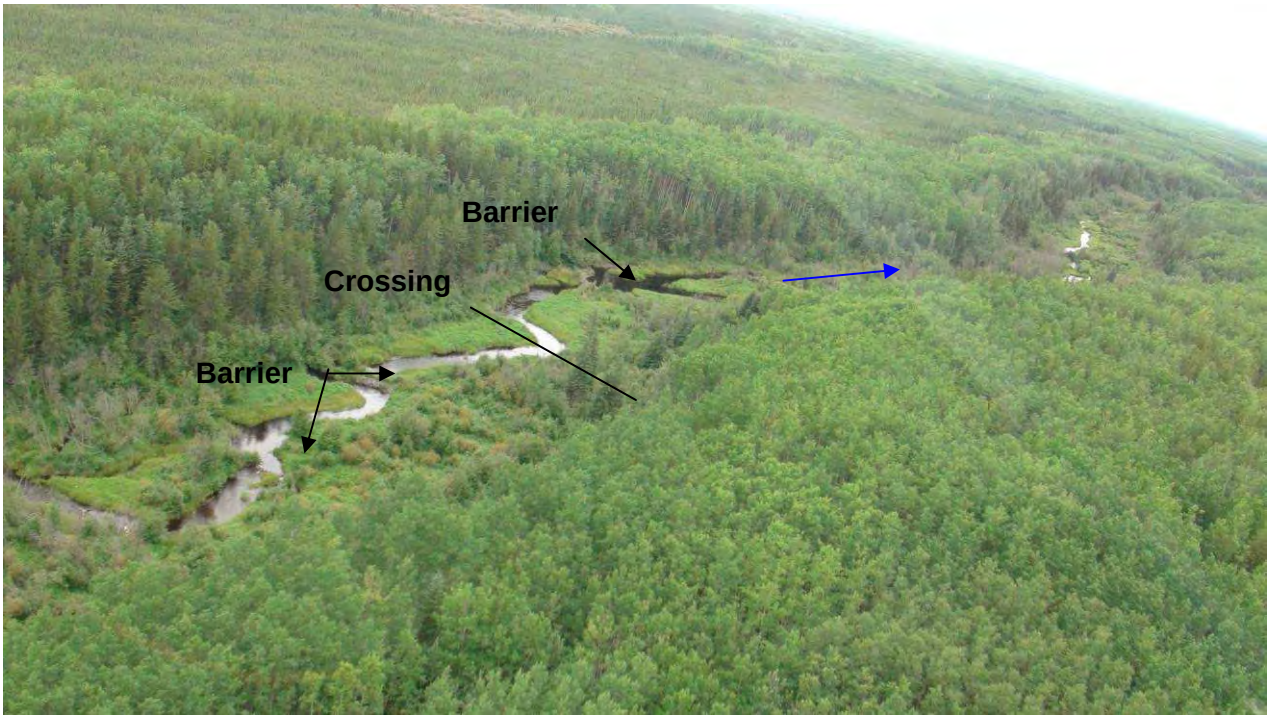


Photo 16 Aerial view of Unnamed Creek 3 showing crossing site MC28

3.5 Drainages without Defined Channels

All other watercourses in the Project Area were assessed and found to be drainages without defined channels and therefore are non-navigable. The drainages and proposed crossing locations are shown on Figure 2. Photos 17 to 38 are aerial views of the drainages at each proposed crossing site.

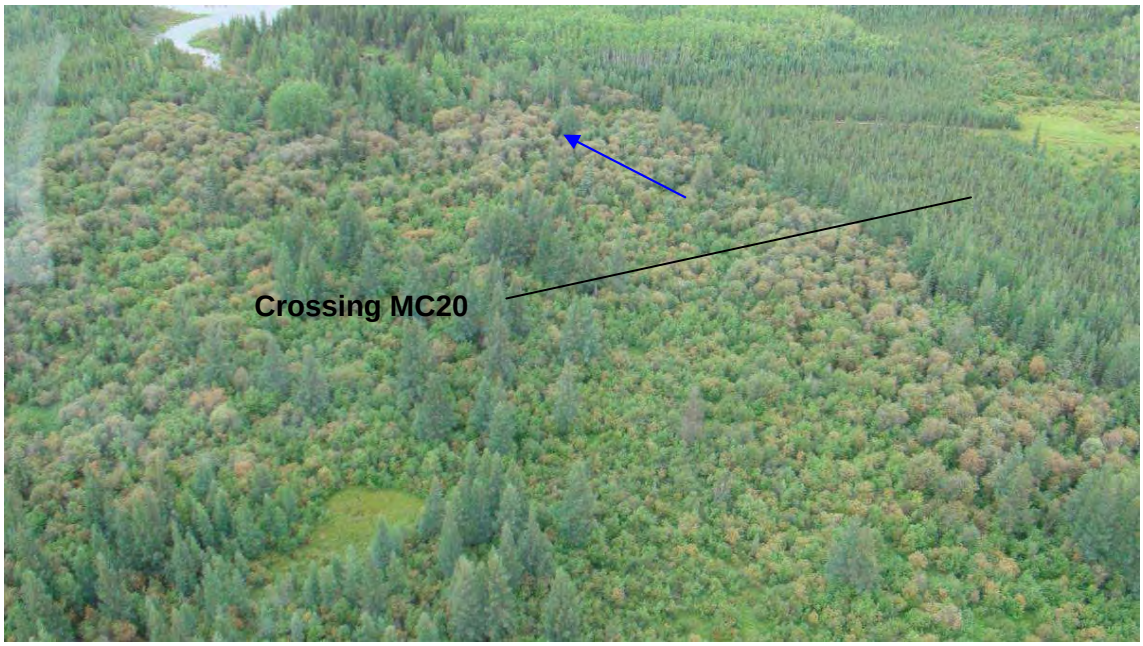


Photo 17 Drainage 1 at proposed crossing site MC20

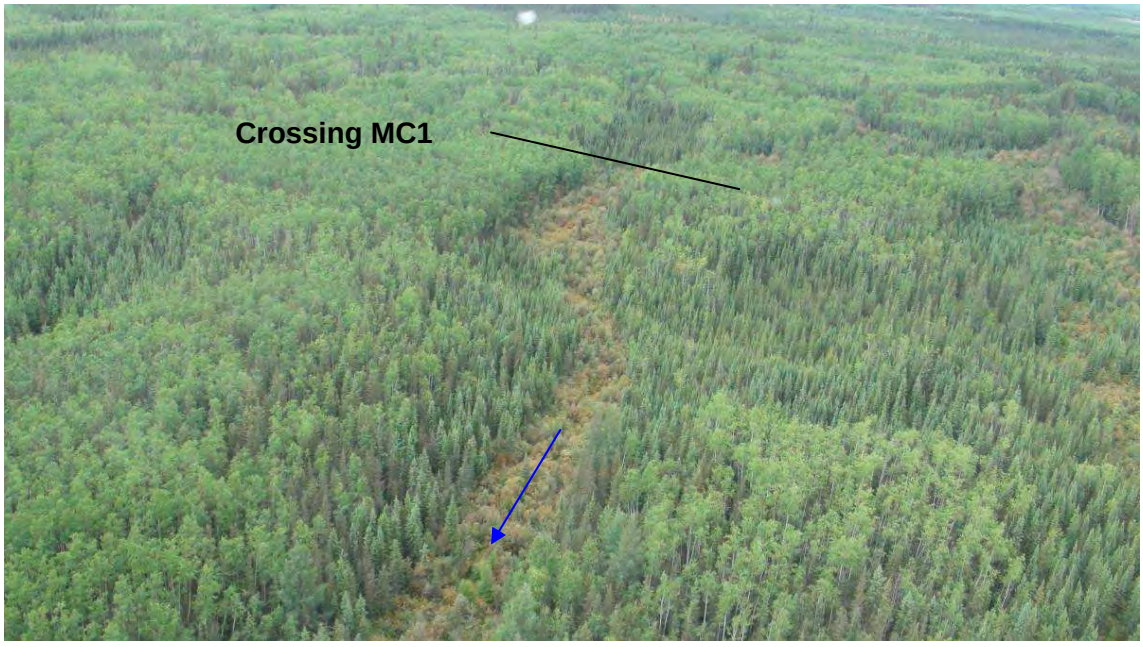


Photo 18 Drainage 1 at proposed crossing site MC1

Photo 19 Drainage 2 at proposed crossing site MC22

Photo 20 Drainage 3 looking upstream from proposed crossing site MC3

Photo 21 Drainage 3 looking downstream from proposed crossing site MC3

Photo 22 Drainage 4 immediately upstream of site MC2

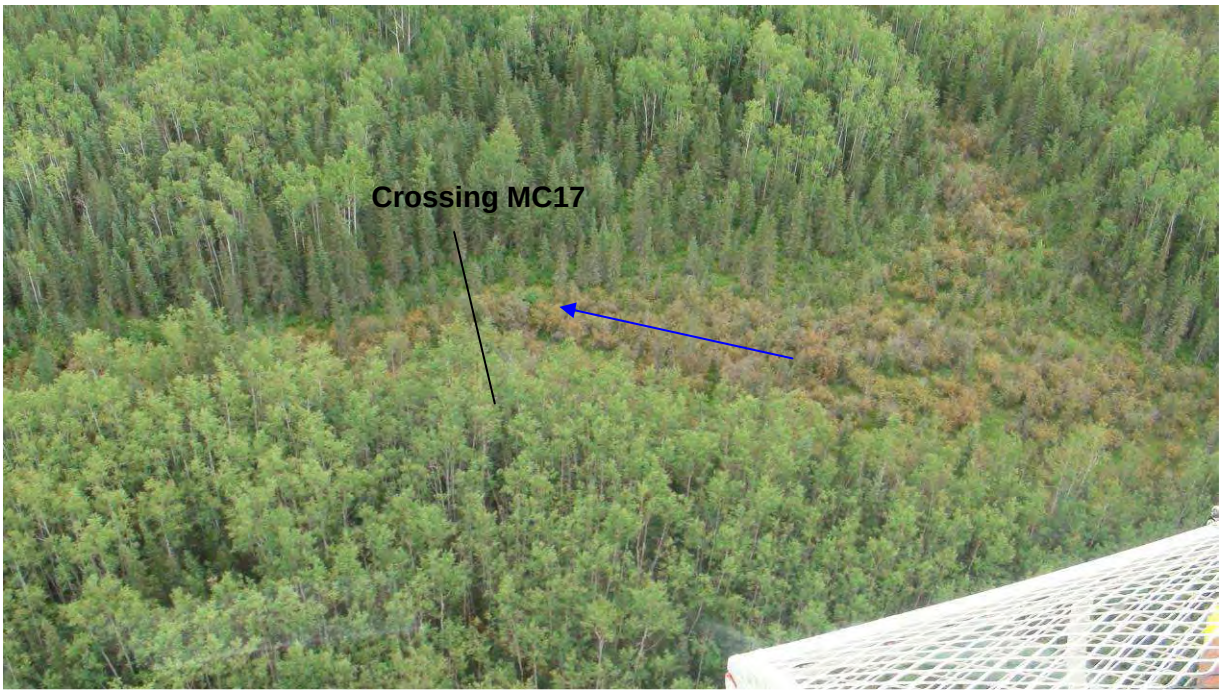


Photo 23 Drainage 5 looking south east at proposed crossing site MC17

Photo 24 Drainage 6 looking north at crossing site MC4

Photo 25 Drainage 7 looking north east at proposed crossing site MC5

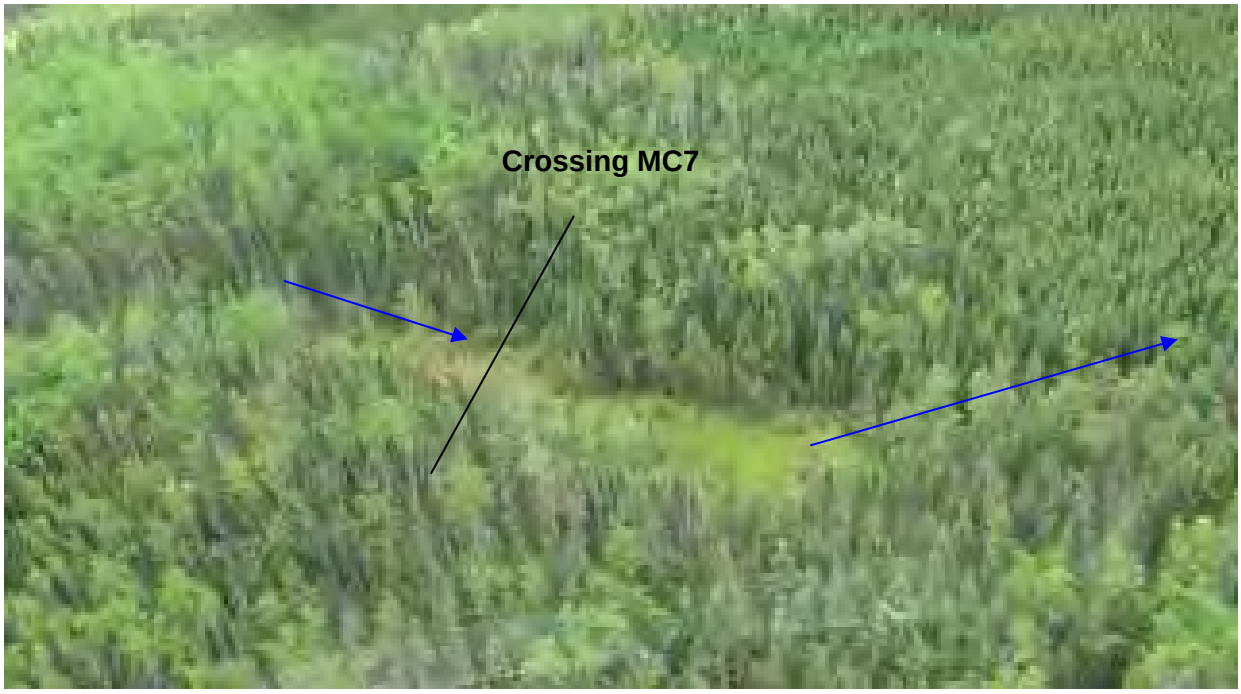


Photo 26 Drainage 8 looking south west at proposed crossing site MC7

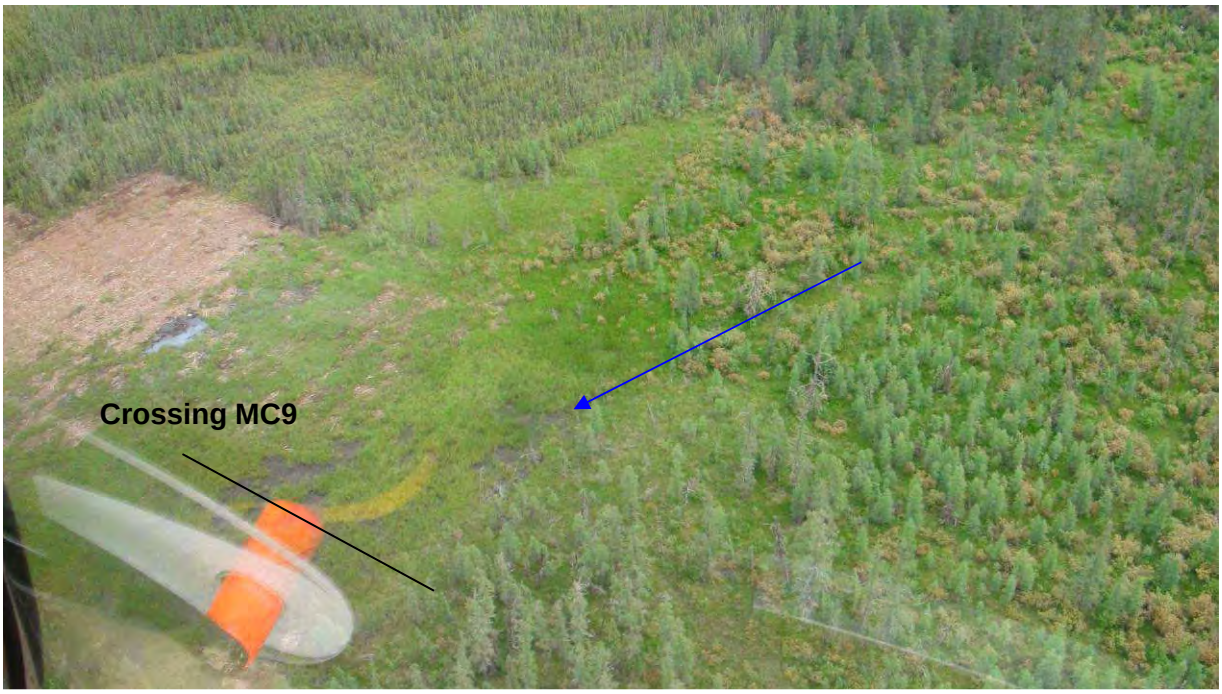


Photo 27 Drainage 9 at proposed crossing site MC9

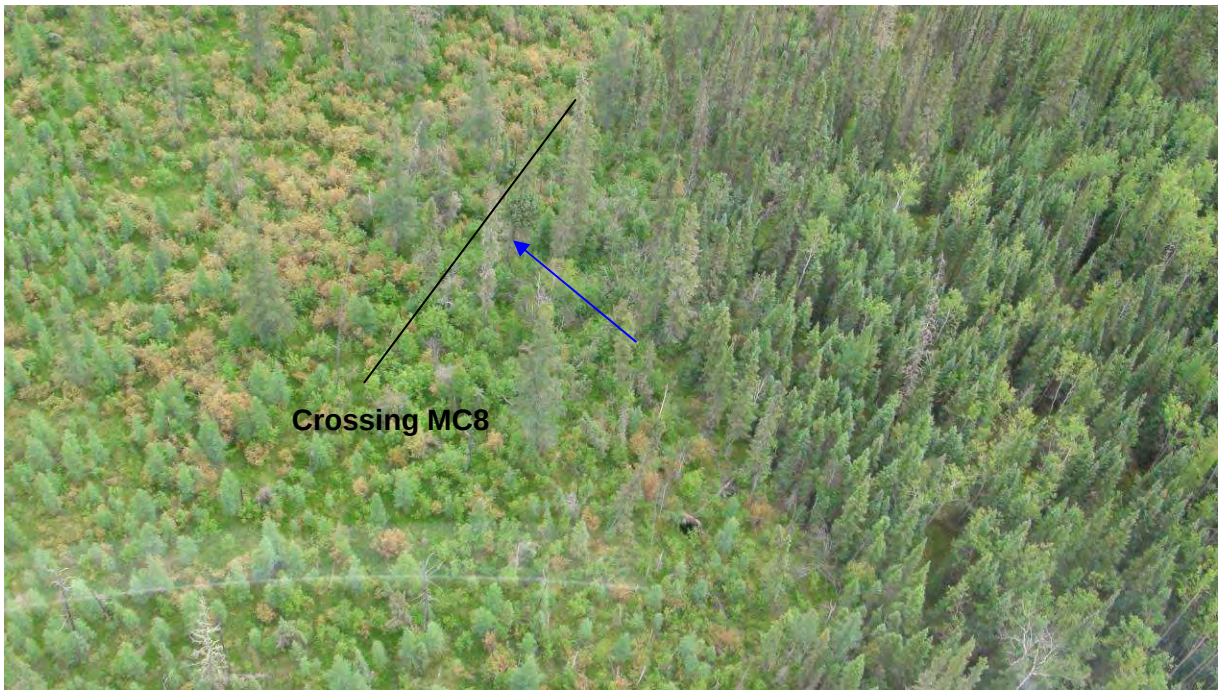


Photo 28 Drainage 10 at proposed crossing site MC8

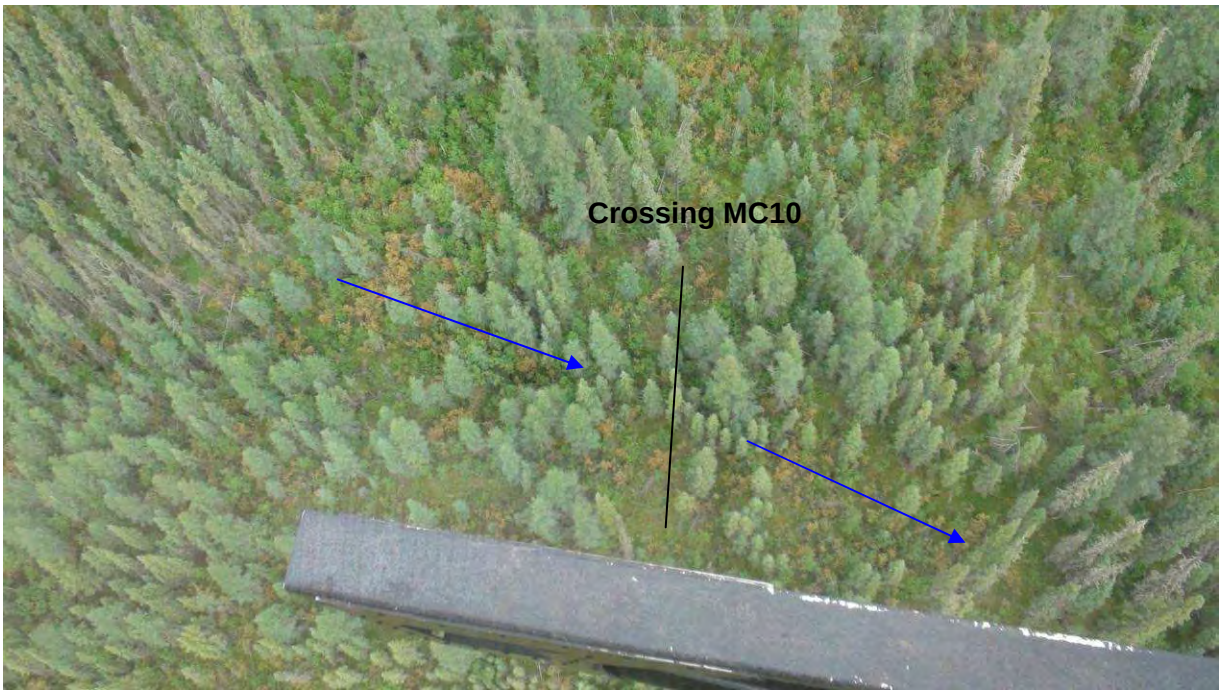


Photo 29 Drainage 11 at proposed crossing site MC10

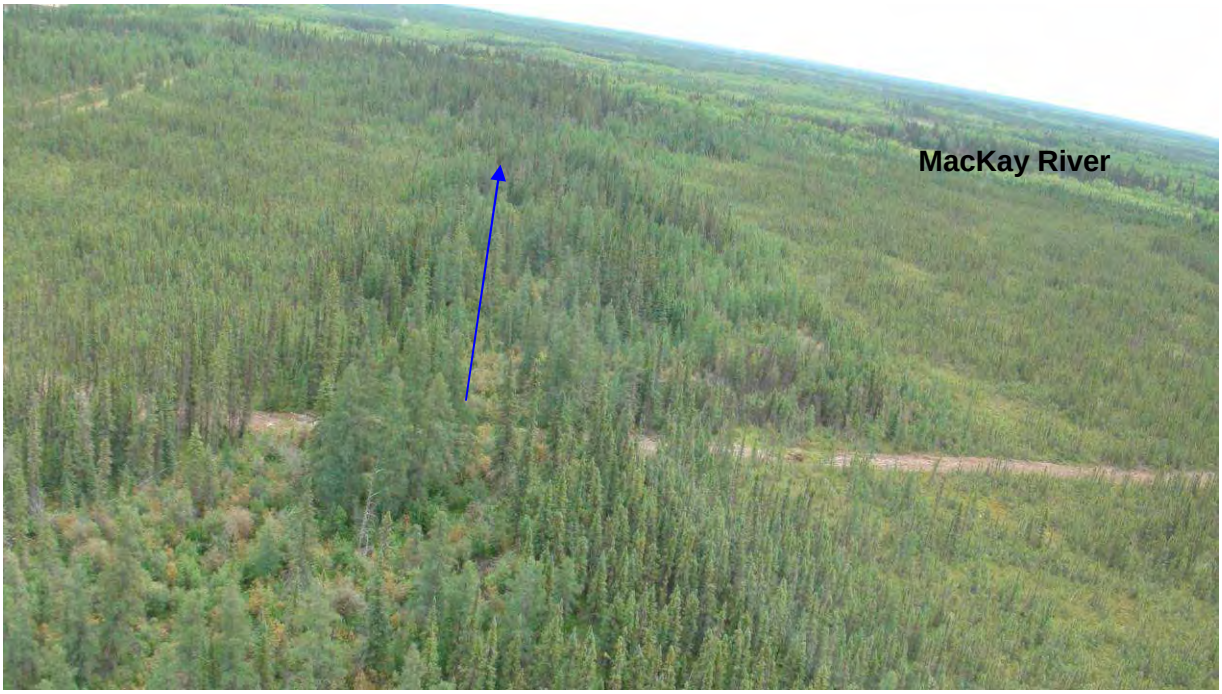


Photo 30 Drainage 11 looking east

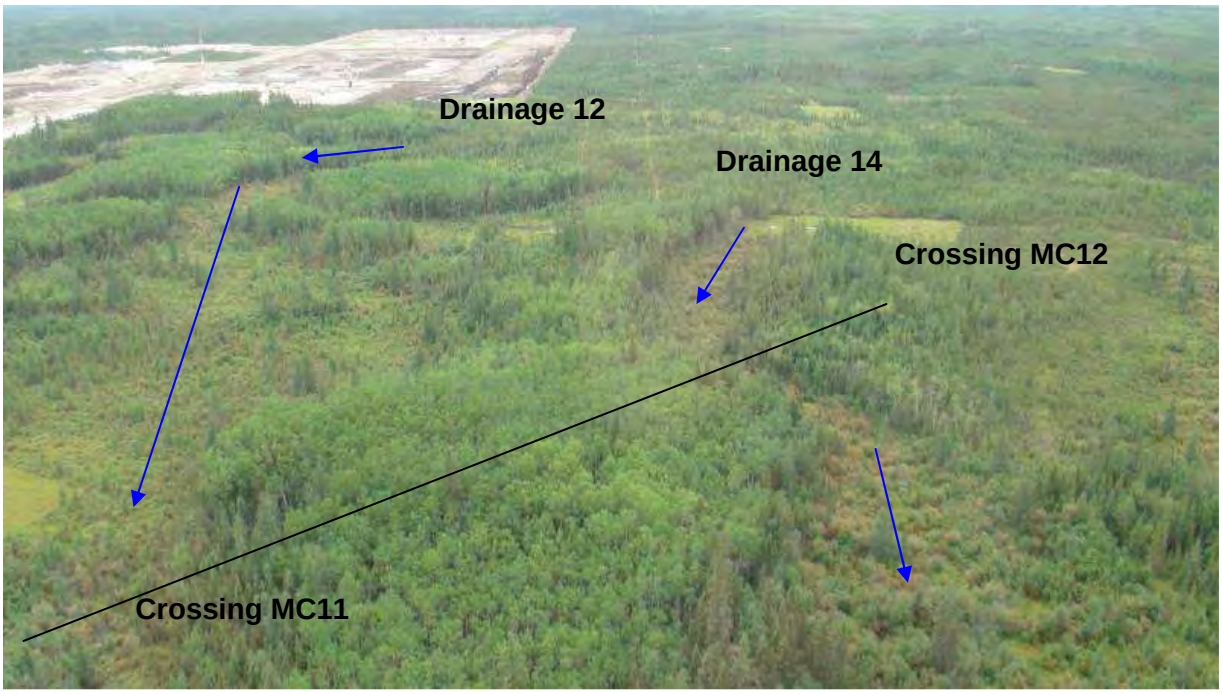


Photo 31 Drainage 12 and 14 looking west at proposed crossing sites MC14 and MC11

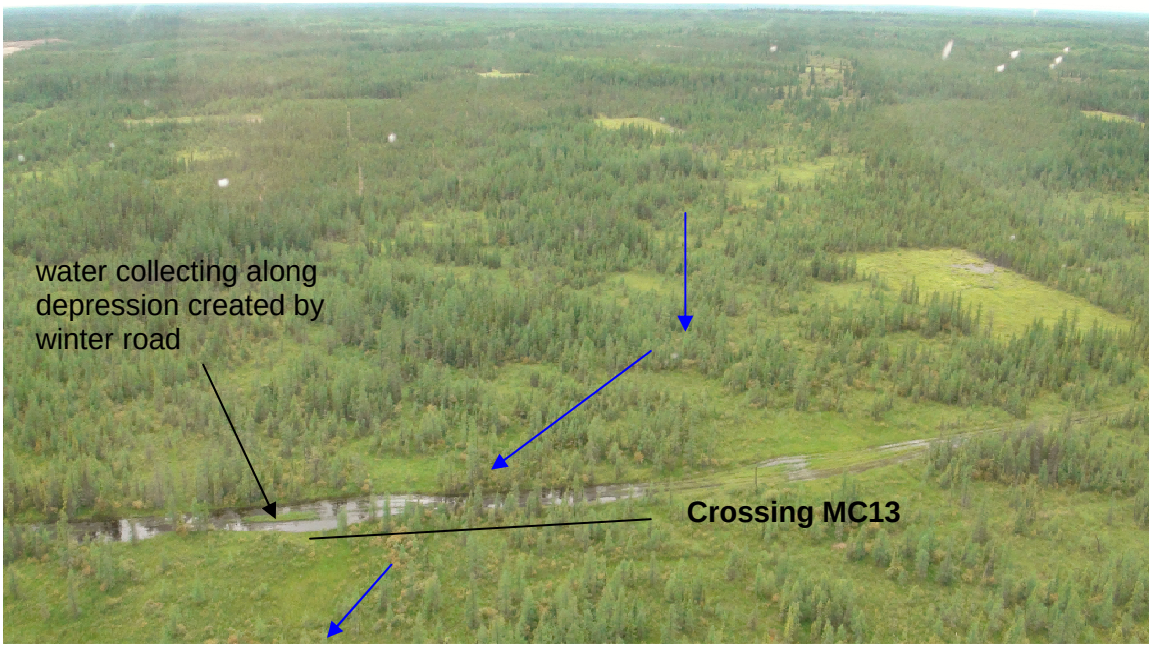


Photo 32 Drainage 13 looking west at proposed crossing site MC13

Photo 33 Drainage 15 looking at diversion site MC16

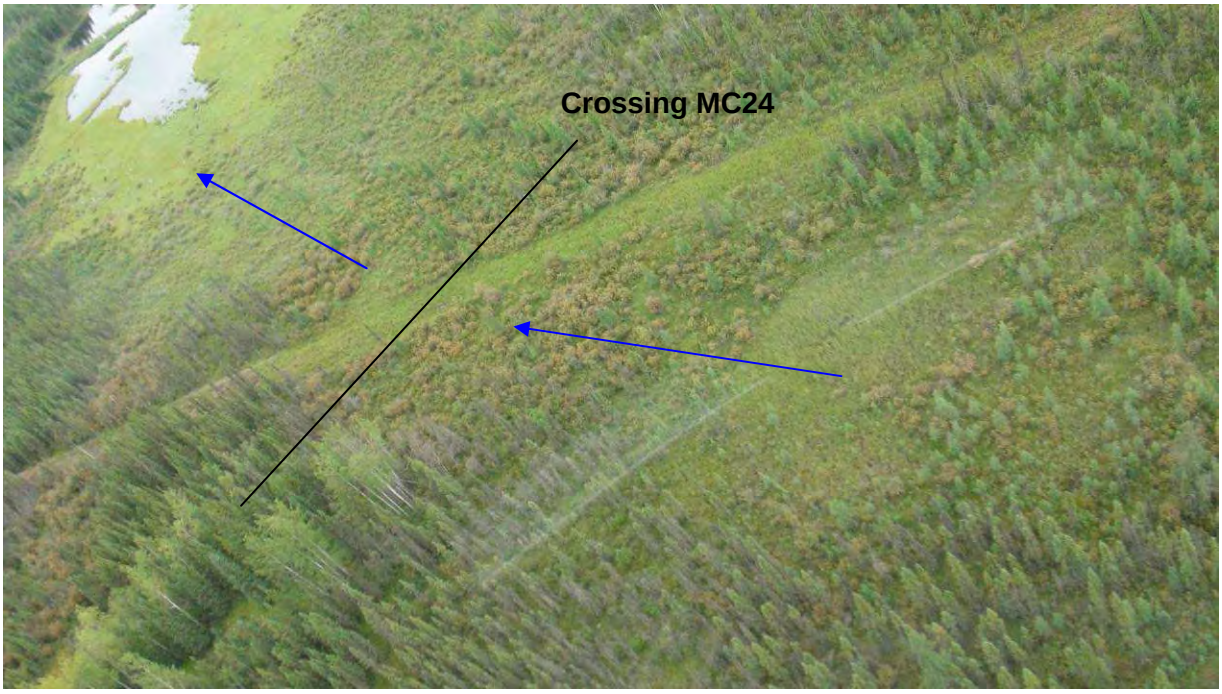


Photo 34 Drainage 16 looking south east at proposed crossing site MC24

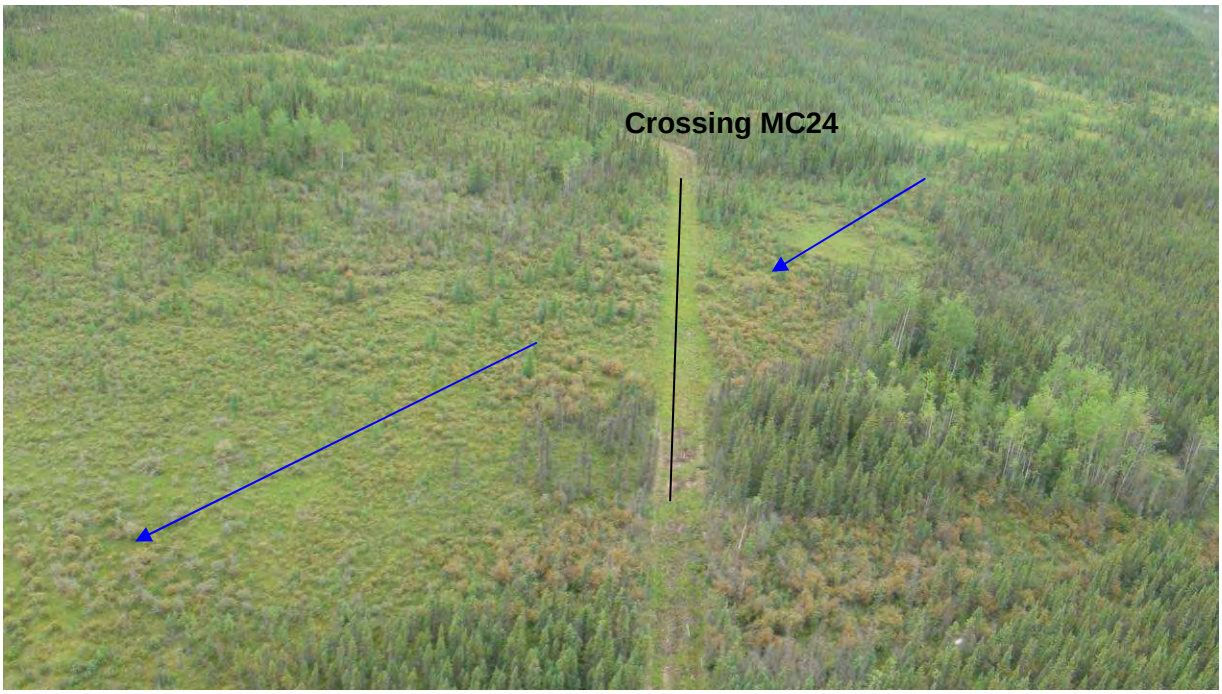


Photo 35 Drainage 16 looking north west at proposed crossing site MC24

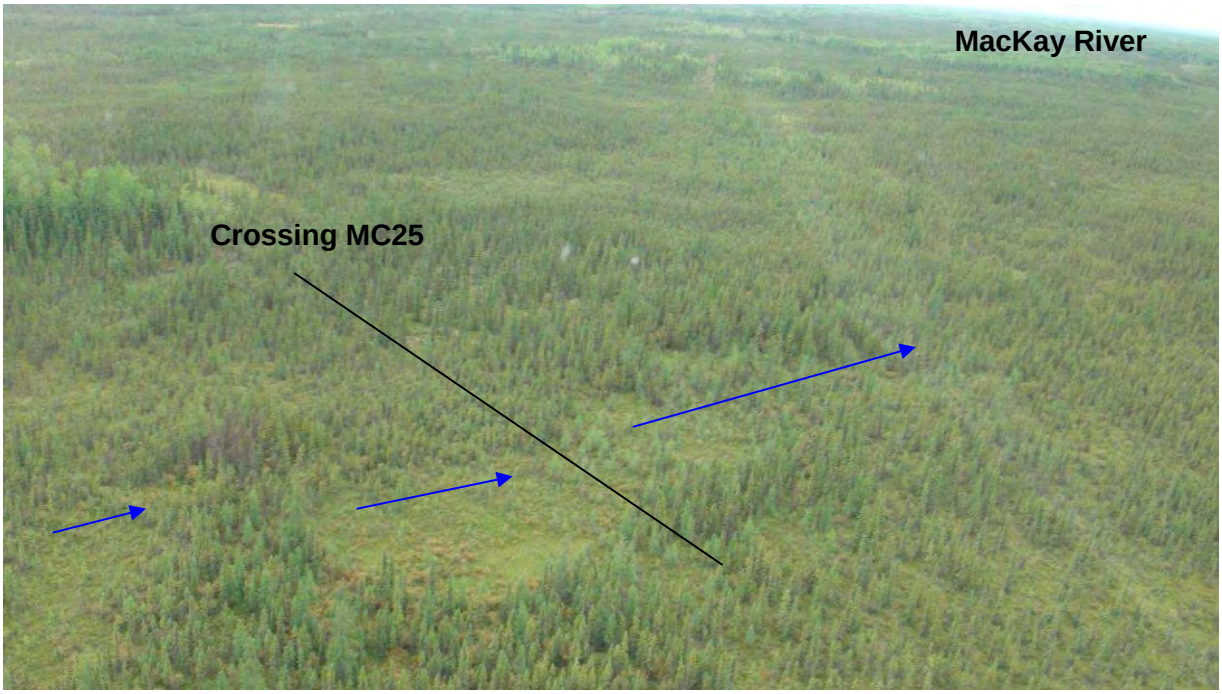


Photo 36 Drainage 17 looking south east at proposed crossing site MC25

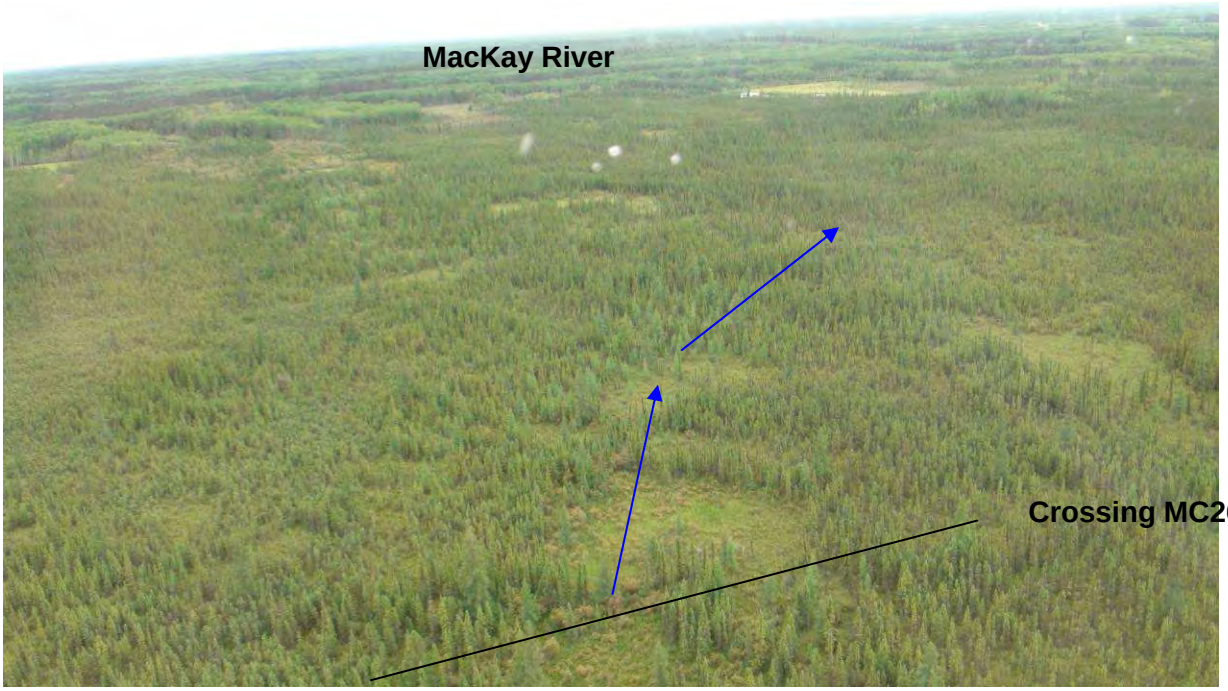


Photo 37 Drainage 18 looking at proposed crossing site MC26

Photo 38 Drianage 19 looking south towards the MacKay River

Photo 39 Downstream of Drainages 18 and 19 near the confluence with the MacKay River

4.0 CONCLUSION

Of the 23 potential crossings identified, only crossings MC21 (Birchwood Creek), MC6 (Unnamed Creek 1), MC23 (Unnamed Creek 2), and MC28 (Unnamed Creek 3) are located on a watercourse with a defined channel. Of these four crossings only Unnamed Creek 2 meets the definition of a minor navigable water in accordance with Transport Canada's *Minor Waters User Guide*. The watercourses at the other three crossings appear to be non-navigable due to the number of beaver dams, logs and debris, and instream vegetation present within the stream channels. Although these watercourses do not appear to be navigable, they would not be defined as a minor navigable water as outlined in the *Minor Waters User Guide,* and therefore may require approval in accordance with the *Navigable Waters Protection Act* prior to construction of the crossings.

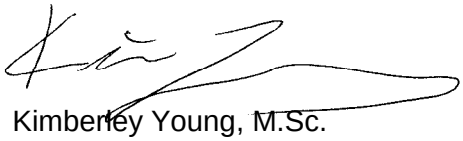
Of the four watercourses with a defined channel only Birchwood Creek, and Unnamed Creeks 1 and 3 were found to have fish and fish habitat. STP will construct clear span bridges or arch structures at these locations in accordance with the Department of Fisheries and Oceans *Operational Statement for Clear-Span Bridges*. No fisheries authorizations will be required. The clear span structures over these three watercourses would be <30 m long and <20 m wide and therefore would be exempt from an environmental assessment in accordance with the Canadian Environmental Assessment Act.

The other potential crossings are located on drainages without defined channels and therefore meet the criteria for a minor navigable water as defined in *Minor Waters User Guide* and do not require further review from Transport Canada.

If you require any additional information or clarification regarding the characteristics of the watercourses at the proposed crossing locations please contact the undersigned at 780-391-2542.

Yours truly,

Millennium EMS Solutions Ltd.



Kimberley Young, M.Sc.
Environmental Scientist

Fisheries and Oceans Canada **Pêches et Océans Canada**

Northern Alberta District
Peace River Office
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Peace River, Alberta T8S 1G9
Tel: (780) 618-3220
Fax: (780) 618-3235

District de l'Alberta du Nord
Bureau de Peace River
9001 94e Rue
Peace River (Alberta) T8S 1G9
Tél: (780) 618-3220
Téléc: (780) 618-3235

Your file *Votre reference*

Our file *Notre référence*

ED-11-1343

June 13, 2012

Southern Pacific Resource Corp.
C/o Vince Parsons
Suite 1700 BVSII 205-5th Avenue S.W.
Calgary, Alberta
T2P 2V7

Dear Mr. Parsons:

Subject: Southern Pacific STP McKay Thermal Project - Phase 2

Fisheries and Oceans Canada – Habitat Management (DFO) reviewed the additional information regarding STP McKay Thermal Project Phase 2 Watercourse Evaluation dated March 19, 2012.

Your proposal has been reviewed to determine whether it is likely to result in impacts to fish and fish habitat which are prohibited by the habitat protection provisions of the *Fisheries Act* or those prohibitions of the *Species at Risk Act* that apply to aquatic species.[1]

Watercourse Crossings:

DFO understands that Southern Pacific Resource Corp. proposes to construct watercourse crossings in conjunction with the development of the STP McKay Thermal Project – Phase 2.

Provided that the watercourse crossings will be constructed as outlined in the information submitted, DFO has concluded that the construction of the watercourse crossings are not likely to result in impacts to fish and fish habitat.

Surface / Groundwater Interactions and Surface Heave and Subsidence

Several uncertainties with the information provided and potential impacts to fish habitat resulting from the project still exist. DFO understands that Southern Pacific Resource Corp. is preparing a monitoring program intended to detect potential issues, validate conclusions and implement mitigation if required to reduce potential impacts to fish habitat. DFO suggests the following areas to focus monitoring efforts when developing and reporting on the monitoring plan:

- surface water – groundwater interactions to identify recharge and discharge rates and locations;
- linkages between hydrogeology and hydrology (water quantity, fish habitat);

[1] *Those sections most relevant to the review of development proposals include 20, 22, 32 and 35 of the *Fisheries Act* and sections 32, 33 and 58 of the *Species at Risk Act*. For more information please visit www.dfo-mpo.gc.ca.

If our understanding of the monitoring program discussed above is incorrect, please contact our office for further discussion.

DFO appreciates the willingness and cooperation of Southern Pacific Resource Corp. in regards to the collection of monitoring data. The data will contribute to the existing information that will help both operators and resource managers make more informed decisions with respect to potential environmental impacts of proposed projects. You will not need to obtain a formal approval from DFO in order to proceed with your proposal.

Please be advised that any impacts to fish and fish habitat which result from a failure to implement this proposal as described could lead to corrective action such as enforcement.

Please note that none of the foregoing should be taken as approval of the undertaking in accordance with any other federal, provincial or municipal legislation.

DFO is looking forward to the continued cooperation of Southern Pacific Resource Corp. If you have any questions please contact Wanda Watts at our Peace River Office by telephone at (780) 618-3228, or by email at Wanda.Watts@dfo-mpo.gc.ca

Sincerely,

Wanda Watts
Senior Habitat Biologist

cc. Brian Makowecki, Manager, DFO
Court Berryman, DFO
Sean Carriere, Canadian Environmental Assessment Agency

Canada

June 27, 2012

Wanda Watts
Senior Habitat Biologist
Fisheries and Oceans Canada
9001 – 94 Street
Peace River, Alberta
T8S 1G9

Dear Ms. Watts

Re: STP MacKay Thermal Project - Phase 2

On June 13, 2012, Fisheries and Oceans Canada (DFO) provided Southern Pacific Resource Corp. (STP) with a letter regarding DFO's understanding of STP's plans to prepare a monitoring and mitigation program for the MacKay Thermal Project – Phase 2. STP confirms that the monitoring and mitigation program will be implemented with the objective of the preventing impacts to fish and fish habitat; the following supporting information is being provided to support this assertion.

Watercourse Crossings

STP confirms that all crossing constructed on watercourses with fish or fish habitat will be clear span structures. These structures will be constructed in accordance with the DFO Alberta Operational Statement for Clear-Span Bridges. There will be an insignificant impact to fish and fish habitat due to the construction of watercourse crossings.

Surface Heave and Subsidence

STP is currently developing a heave monitoring plan to be implemented for the existing STP McKay Thermal Project - Phase 1. The results of this monitoring program will be utilized to inform the heave monitoring program which will be implemented for Phase 2. Heave monitoring for Phase 2 will be undertaken in conjunction with habitat monitoring along transects of the MacKay River. The goal of this monitoring will be to identify potential impacts to fish and fish habitat due to surface heave.

Surface/Groundwater Interaction

STP currently has in place a program to monitor potential effects of the existing Phase 1 Project on groundwater quantity and quality and the potential effects of groundwater use on surface

water bodies. This program will be utilized and expanded where required to monitor potential impacts of the Phase 2 Project.

Water for steam generation is currently sourced, for the Phase 1 Project, from existing wells completed in the Quaternary Empress Formation within the McKay Channel. Water for the Phase 2 Project will also be sourced from the Empress Channel. Currently, three water supply wells (WSW) are completed in the Empress Channel: WSW1 located 08-08-91-14W4, WSW2 located 16-08-91-14W4 and WSW3 located 15-08-91-14W4 (Figure 1 attached). In order to monitor the drawdown, as a result of pumping water from the WSWs, three observation wells have been installed at WSW1 and WSW2; one within the Empress Formation and two in different sand intervals within the overlying undifferentiated drift (Table 1 attached).

During pumping, the drawdown cone of depression will be largest near the pumping wells. The existing monitoring wells are installed in the overlying drift very close to the water source wells, where impacts, if any, are more likely to occur. In the event that drawdown is identified in the drift overlying the Empress Formation, additional wells may be installed to delineate the extent of the impact and allow further assessment with respect to any potential recharge losses to the MacKay River. Monitoring of groundwater levels will provide an early indication of potential impacts to surface water bodies or wetland areas and enable mitigative actions to be undertaken. In the event of a change in water levels, mitigative actions could include one or more of the following: reducing pumping rates in one or more source wells, adding more source wells to modify the drawdown distribution, completing water source wells in other aquifer units or utilizing alternative water sources. The current set of monitoring wells is deemed sufficient to monitor the vertical and lateral impacts of drawdown and therefore potential impacts to surface water bodies.

The existing groundwater monitoring program was also developed to monitor potential impacts to groundwater quality resulting from the operation of the surface facilities and production wells. The program will be expanded upon for the Phase 2 development. The existing monitoring network for Phase 1 includes two Grand Rapids wells, MW11-01 and MW11-02, which are installed in the Grand Rapids Sand 5 and Sand 4 respectively. In addition, five shallow monitoring wells are completed within the shallow drift sand intervals near the plant site (Table 1 attached). Four additional wells will be installed at the plant site within the shallow drift to complete the Phase 1 monitoring network.

The monitoring wells have been monitored and sampled to obtain baseline data of water levels and water chemistry. During Phase 1 operations STP has committed to monitor all wells in accordance with the conditions of the Environmental Protection and Enhancement Act Approval and Water Act Approval. Target and threshold limits have been established for water levels and water quality parameters and a groundwater response plan will be triggered in the event of

monitoring data that exceeds these limits. A similar monitoring program will be undertaken for the Phase 2 development.

If you have any questions regarding this submission, please contact the undersigned at (403) 984-5335.

Sincerely,

Southern Pacific Resource Corp.

Vince Parsons
Senior Environmental & Regulatory Advisor

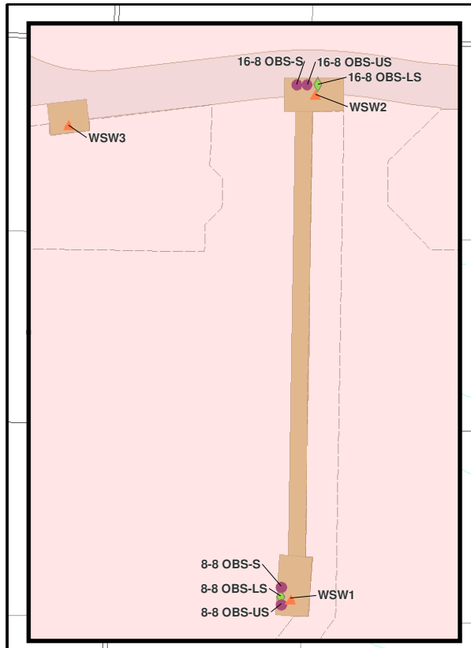
Attachments:

Table 1 Well Completion Details
Figure 1 Groundwater Supply Wells and Monitoring Wells Locations

cc. Sean Carriere - CEAA

Table 1: Well Completion Details			
Well ID	**Location**	**Formation**	**Screen Interval (mbgs)**
Water Supply Wells			
WSW1	08-08-91-14W4	Empress	75.6-84.8
WSW2	16-08-91-14W4	Empress	92.4-103.7
WSW3	15-08-91-14W4	Empress	94.5-106.7
Monitoring wells			
8-8 OBS-LS	08-08-91-14W4	Empress	80.8-86.9
16-8 OBS-LS	16-08-91-14W4	Empress	97.6-103.7
8-8 OBS-US	08-08-91-14W4	Undifferentiated drift	55.8-61.9
8-8 OBS-S	08-08-91-14W4	Undifferentiated drift	3.0-6.0
16-8 OBS-US	16-08-91-14W4	Undifferentiated drift	27.4-30.5
16-8 OBS-S	16-08-91-14W4	Undifferentiated drift	5.3-8.4
MW10-01	10-07-91-14W4	Undifferentiated drift	3.7-6.7
MW10-02	10-07-91-14W4	Undifferentiated drift	2.4-3.9
MW10-03S	09-07-91-14W4	Undifferentiated drift	2.3-3.8
MW10-03D	09-07-91-14W4	Undifferentiated drift	5.5-8.5
MW10-04	09-07-91-14W4	Undifferentiated drift	1.5-4.6
MW4-21	04-21-91-14W4	Undifferentiated drift	3.7-6.7
MW8-10S	08-10-91-14W4	Undifferentiated drift	3.1-6.1
MW8-10D	08-10-91-14W4	Undifferentiated drift	12.2-15.2
MW11-01	15-07-91-14W4	Grand Rapids Sand 5	81.1-84.1
MW11-02	15-07-91-14W4	Grand Rapids Sand 4	36.9-39.9

mbgs: meter below ground surface



Legend

- Water Source Well (Empress)
- Groundwater Monitoring Well (Empress)
- Groundwater Monitoring Well (Drift)
- Groundwater Monitoring Well (Grand Rapids)
- Groundwater Monitoring Well (Drift-Baseline Phase 2)
- Planned Groundwater Monitoring Well
- MacKay Channel

Existing Phase 1 Development

- Approved Project Area
- CPF
- Well Pad
- Utility Corridor
- Borrow Pit
- Construction Camp
- Operations Camp
- Soil Storage
- Access Road
- Water Source Well

Proposed Phase 2 Development

- CPF
- Operations Camp
- Utility Corridor
- Well Pad
- Borrow Pit
- Proposed Project Area
- Proposed Development Area
- Future Development

0 0.25 0.5 1
Kilometres

REF:David Loucks Consulting Drifter Projects Ltd., 2011; NHC (Hydrology) 2010.

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE:
Water Supply Wells and Monitoring Wells Locations

Millennium EMS Solutions Ltd.

DRAWN: JG/SL/JDC	FIGURE: 1
CHECKED: AuK	
DATE: Jun 20/12	
PROJECT: 10-037	

Map Document (k:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\GW\Fig X Water Supply Wells and Monitoring Wells Locations.mxd) 6/21/2012 -- 12:41:15 PM

Millennium
EMS Solutions Ltd.

File # 10-037

October 26, 2012

Southern Pacific Resource Corp.
Suite 1700 BVSII 205 – 5th Avenue SW
Calgary, Alberta
T2P 2V7

Attention: Mr. Parsons

RE: STP McKay Thermal Project – Phase 2
Watercourse Crossing Reconnaissance Update

INTRODUCTION

In November 2011, STP submitted an application and Environmental Impact Assessment (EIA) to the Energy and Resources Conservation Board (ERCB) and Alberta Environment and Sustainable Resource Development (ESRD) for the STP McKay Thermal Project - Phase 2. Over the life of the Phase 2 Project a number of well pads, borrow pits and access roads will be required to maintain production. Upon review of hydrological base maps it was determined that there were 23 mapped watercourses (plus the MacKay River) that may be directly impacted by development of the Phase 2 Project. As part of the environmental assessment undertaken for the Phase 2 Project, Millennium EMS Solutions Ltd. (MEMS) conducted an aerial reconnaissance survey of all the mapped watercourses and associated crossings that would be required over the life of the Project (MEMS 2012). Results indicated that of the 23 potential watercourses identified only four (plus the MacKay River) were found to have defined channels (Figure 1). Of the five watercourses with a defined channel only four (MacKay River, Birchwood Creek, and Unnamed Creeks 1 and 3) were found to have fish and fish habitat. This assessment was submitted by STP to the Canadian Environmental Assessment Agency (CEAA). Subsequently CEAA determined that an environmental assessment in accordance with the Canadian Environmental Assessment Act was not required for the STP McKay Thermal Project – Phase 2.

Since submission of the EIA and completion of the watercourse reconnaissance survey, STP has amended the Phase 2 development plans and therefore the Project footprint (Figure 1). MEMS has reviewed the updated Project footprint in order to determine if there are any potential direct impacts to watercourses that were not contemplated in the original assessment undertaken in 2011. Four

additional watercourses not previously evaluated, which may be impacted by the Project, were identified. Results indicated that of the now 27 potential watercourses identified only five were found to have defined channels (Figure 1). Watercourses with defined channels include the MacKay River, Birchwood Creek and Unnamed Creeks 1 to 3. As with the 2011 assessment of the five watercourses with a defined channel only four (MacKay River, Birchwood Creek, and Unnamed Creeks 1 and 3) were found to have fish and fish habitat. The other mapped watercourses identified in the Project area are drainages without defined channels.

METHODOLOGY

MEMS has reviewed the updated Project footprint and compared it to the watercourse information provided in the original watercourse assessment report (MEMS 2012). On August 12, 2012, MEMS conducted additional aerial reconnaissance surveys on mapped watercourses and crossings that were not previously assessed and in those areas where additional information was deemed to be necessary in order to determine potential direct impacts to watercourses. The survey was helicopter-based and consisted of capturing photographs for an approximate 500 m length upstream and downstream of the proposed crossing sites.

EVALUATION RESULTS

During the review of the updated Project footprint four additional mapped watercourses, which are encroached upon by the updated Project footprint and not assessed in 2011, were identified within the Project Area (Drainage 20 to 23). Based on the additional aerial reconnaissance survey it was determined that these four additional mapped watercourses are drainages with no defined channels. Photographs of the additional watercourses assessed during the reconnaissance survey are provided in Attachment 1 and their locations are shown on Figure 1.

There were also three areas (Drainage 1, Drainage 3/4 and Drainage 6) where information collected in the 2011 reconnaissance did not provide an adequate level of detail to determine the potential for direct impact to mapped watercourses due to development of the updated Project footprint. During the 2012 reconnaissance survey it was determined that there were no defined channels in these areas but the Project footprint may encroach upon three beaver ponds. These beaver ponds will fluctuate in size over time and as such mitigation measures will need to be developed prior to construction of the adjacent surface development.

As with the 2011 assessment only five of the mapped watercourses within the Project Area have defined channels. The other mapped watercourses identified in the Project area are drainages without defined channels. Of the five watercourses four will have watercourse or pipeline crossings including:

- McKay River (CR1): As identified in the EIA pipelines interconnecting the Phase 1 and Phase 2 CPFs will be constructed under the McKay River. The location of the crossing has changed

slightly but the construction methodology and potential impacts will not change from what was previously assessed. In order to minimize potential impacts to fish and fish habitat these pipelines will be constructed in accordance with the Department of Fisheries and Oceans Operational Statement for High Pressure Directional Drilling.

- Unnamed Creek 2 (CR2): With both the 2011 and updated Project footprint a crossing of Unnamed Creek 2 is required. During the 2011 assessment it was noted that this watercourse is approximately 1 km long and becomes a drainage without a defined channel immediately upstream of the originally proposed crossing. It was also noted that Unnamed Creek 2 meets the definition of a minor navigable water in accordance with Transport Canada's *Minor Waters User Guide*. With the updated Project footprint the crossing location has moved approximately 150 m upstream and is now located in an area where there is no defined channel. This crossing will be a Type 3 crossing (i.e. culvert) that will be constructed in accordance with the Code of Practice for Watercourse Crossings in accordance with the *Water Act*.
- Unnamed Creek 3 (CR3): With both the 2011 and updated Project footprint a crossing of Unnamed Creek 3 is required. Although with the updated Project footprint the crossing location has moved approximately 250 m upstream it can be constructed using the same methodology as previously outlined. That is, the crossing can be <30 m long, <20 m wide and constructed in accordance with the Department of Fisheries and Oceans Operational Statement for Clear Span Bridges. Although this watercourse does not appear to be navigable, it would not be defined as a minor navigable water as outlined in the *Minor Waters User Guide,* and therefore may require approval in accordance with the *Navigable Waters Protection Act* prior to construction.
- Birchwood Creek (CR4): With both the 2011 and updated Project footprint a crossing of Birchwood Creek is required. Although with the updated footprint the crossing location has moved approximately 1 km upstream it can be constructed using the same methodology as previously outlined. That is, the crossing can be <30 m long, <20 m wide and constructed in accordance with the Department of Fisheries and Oceans Operational Statement for Clear Span Bridges. Although this watercourse does not appear to be navigable, it would not be defined as a minor navigable water as outlined in the *Minor Waters User Guide,* and therefore may require approval in accordance with the *Navigable Waters Protection Act* prior to construction.

SUMMARY

In November 2011, STP submitted an application and EIA to the ERCB and ESRD for the STP McKay Thermal Project - Phase 2. Information regarding the potential impacts to watercourses due to development of the project was provided to the Canadian Environmental Assessment Agency and it was subsequently determined that the Project would not require an environmental assessment in accordance with the Canadian Environmental Assessment Act. Since that time STP has updated the Project development footprint.

MEMS conducted an evaluation of potential direct impacts to watercourses due to development of the updated Project footprint. The evaluation involved a comparison of the updated Project footprint with the watercourse reconnaissance survey conducted for the 2011 development footprint (MEMS 2012). The results of this comparison were utilized to focus an additional aerial reconnaissance survey conducted in 2012. The goal of the evaluation was to determine if the updated Project footprint has the potential to cause direct impacts to watercourses in the Project area that were not previously contemplated in the 2011 assessment.

As was found during the 2011 assessment, a majority of the mapped watercourses identified in the Project Area are drainages with no defined channel. In the 2011 assessment five watercourses with defined channels, which may be impacted by development of the Project, were identified, with all five requiring watercourse or pipeline crossings. With the updated Project footprint, five watercourses with defined channels were identified, with four requiring watercourse of pipeline crossings. Although the location of the crossings has changed, from what was originally assessed in 2011, they will be constructed using the same methodologies outlined in the 2011 assessment and therefore do not result in any changes to the original assessment. The development of the proposed updated Phase 2 Project footprint should not change the Canadian Environmental Assessment Agency's determination that no environmental assessment in accordance with the Canadian Environmental Assessment Act is required for the Project.

Should you require any additional information please contact the undersigned at 780.391.2542.

Yours truly,

Millennium EMS Solutions Ltd.

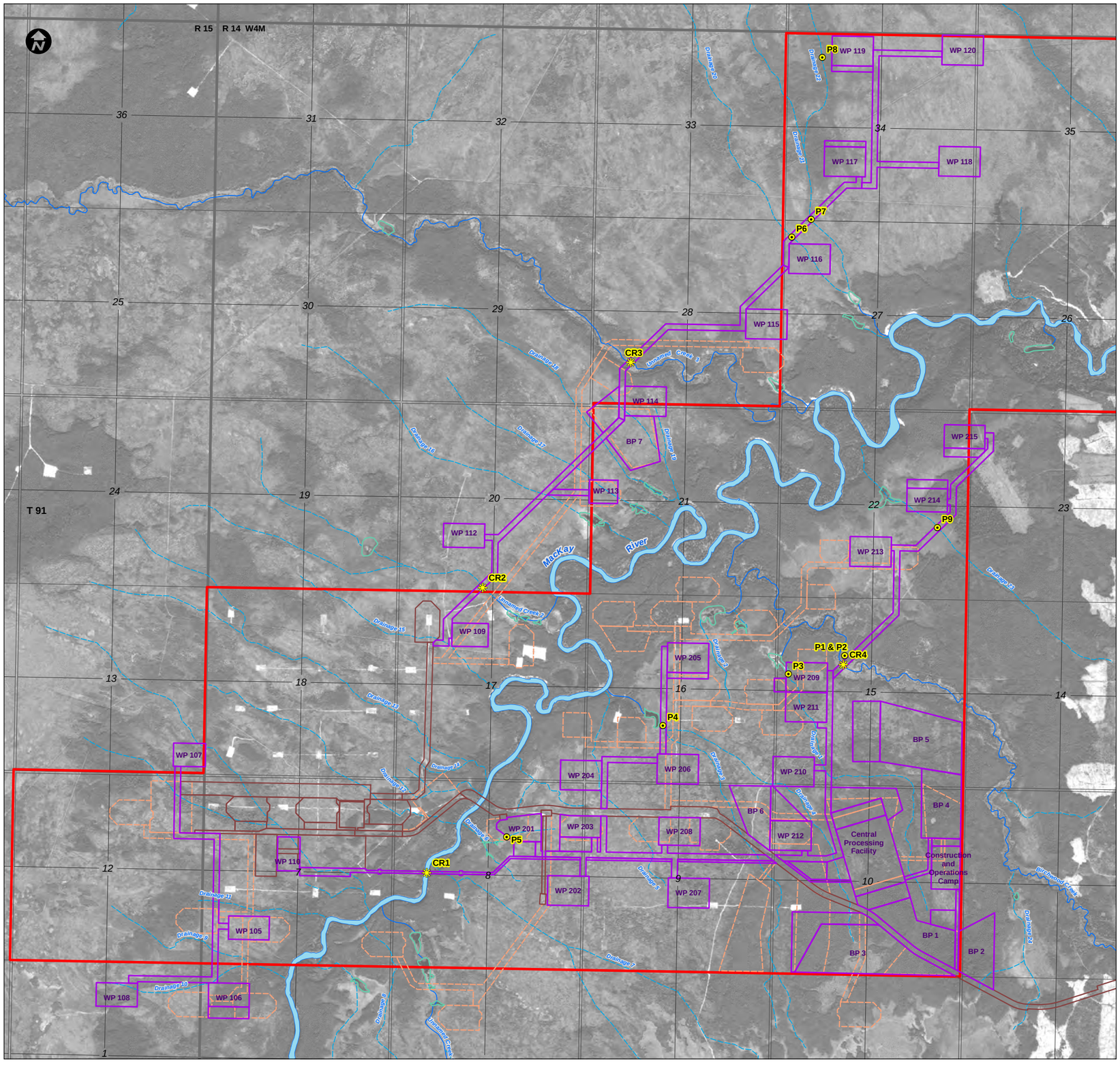
Kimberley Young, M.Sc.
Senior Regulatory Specialist

Reference:

MEMS 2012. STP McKay Thermal Project – Phase 2 Watercourse Navigability Evaluation. Prepared for Southern Pacific Resource Corporation, March 2012.

Attachments:

Figure 1 Watercourses within the STP McKay Project Area
Attachment 1 Photographs



Legend

- Crossing Location
- Photo Location
- Project Area
- Existing Phase 1 Development
- Proposed Phase 2 Development - 2011 EIA
- Proposed Phase 2 Development - 2012 Project Update
- Streams with Defined Channels
- Drainages without Defined Channels
- Beaver Pond
- River

0 300 600 1,200
Metres

REF: NHC, 2011, David Loucks, EIA LAYOUT 7-10-2012.dwg. Image Date: Aug 2009

SOUTHERN PACIFIC RESOURCE CORP.

STP McKay Thermal Project - Phase 2

TITLE:
Watercourses within the STP McKay Project Area

DRAWN:	PS/JG
CHECKED:	KY
DATE:	Oct 22/12
PROJECT:	10-037

FIGURE: 1

Map Document: (K:\Active Projects 2010\AP 10-001 to 10-050\10-037 STP McKay\Final Docs\Crossings\Fig 1 Watercourses in Project Area 2012 Footprint.mxd) 9/5/2012 -- 9:06:59 AM

ATTACHMENT 1: PHOTOGRAPHS

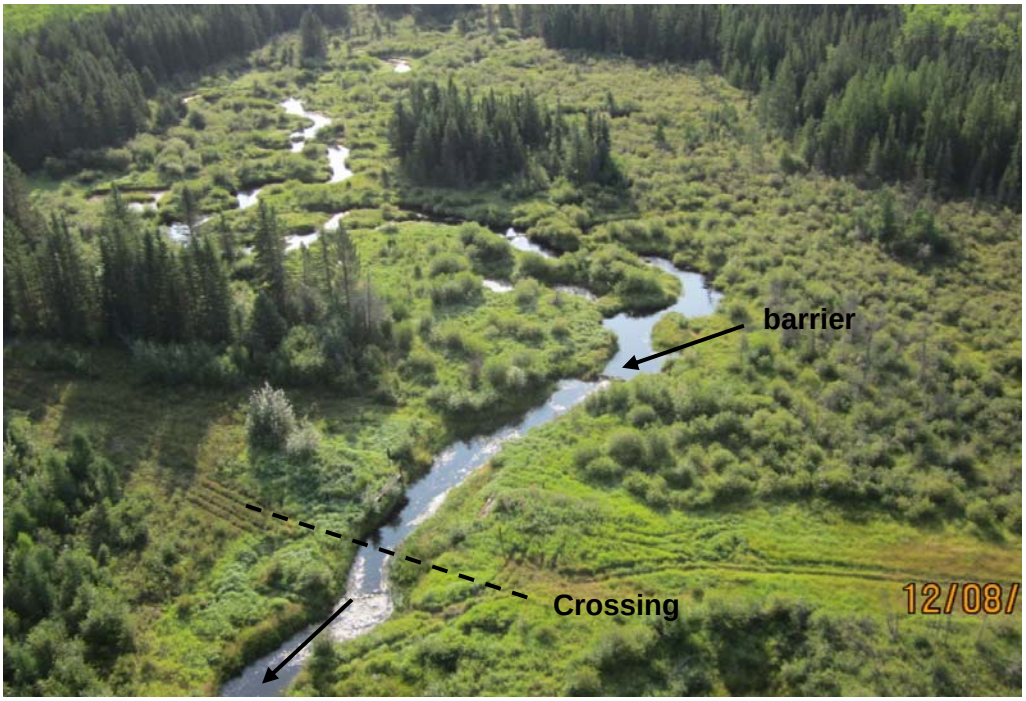


Photo 1 CR1 - Birchwood Creek crossing.

Photo 2 CR1 - Birchwood Creek looking downstream from crossing.

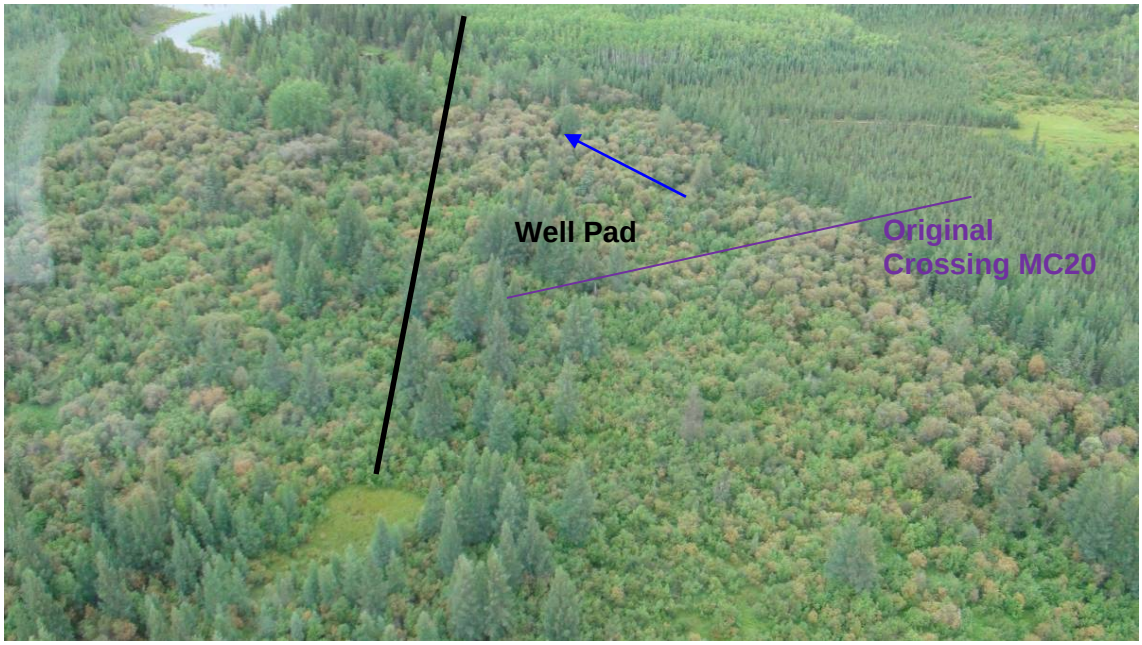


Photo 3 Drainage 1 showing original crossing location and revised well pad location

Photo 4 Beaver Dam on Drainage 3/4 located west of access road

Photo 5 Beaver Dam on Drainage 6 located south west of well pad

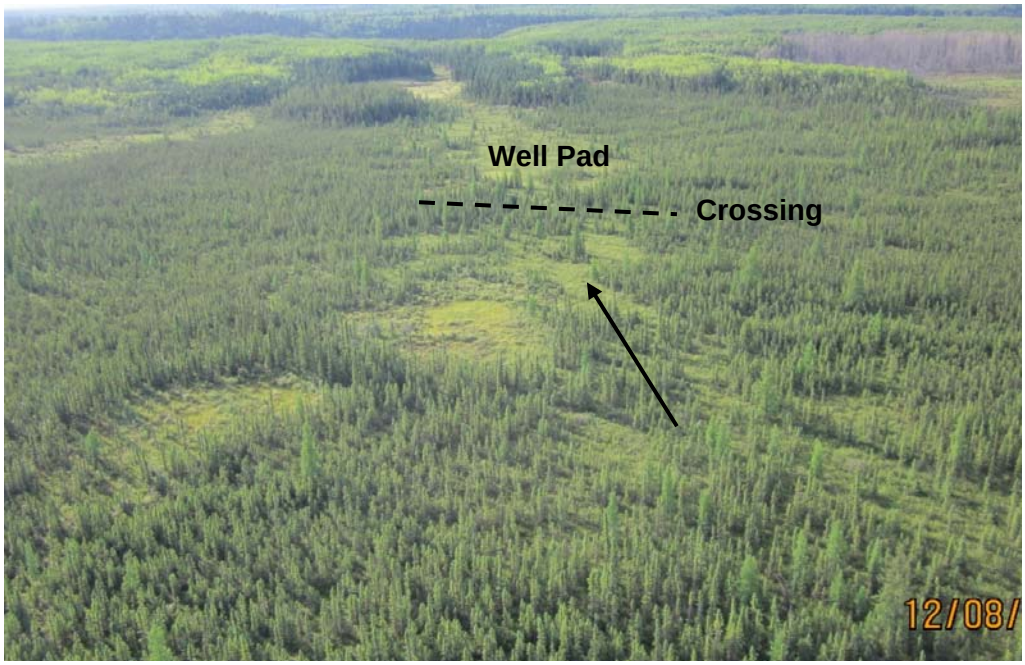


Photo 6 Drainage 20 looking south

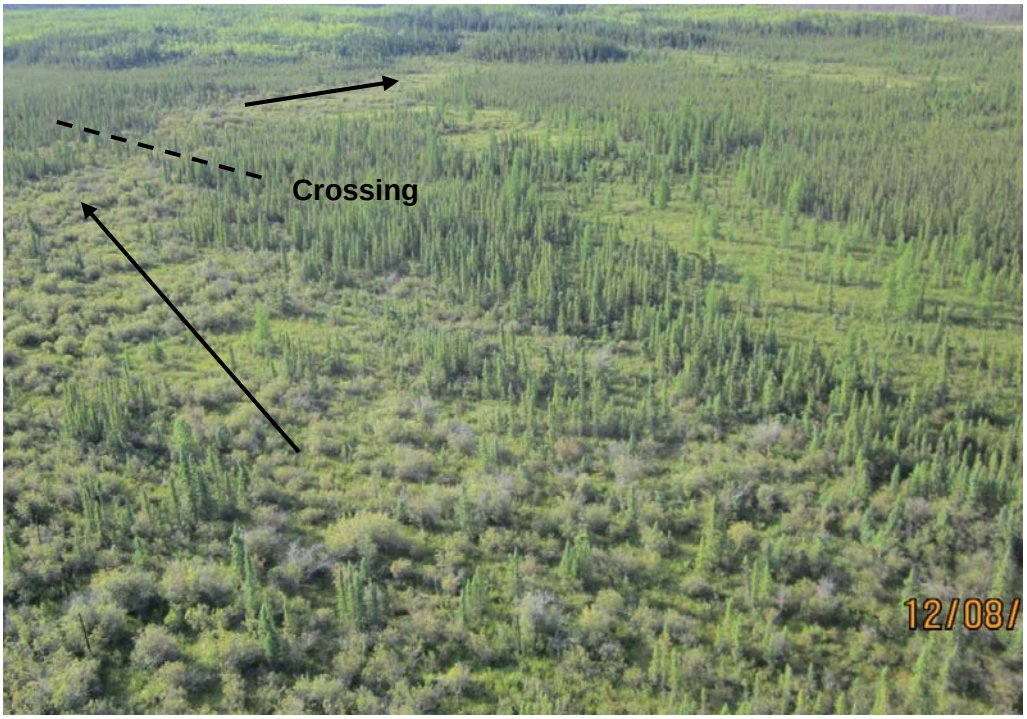


Photo 7 Drainage 21 looking south

Photo 8 Drainage 22 looking south west of Well Pad

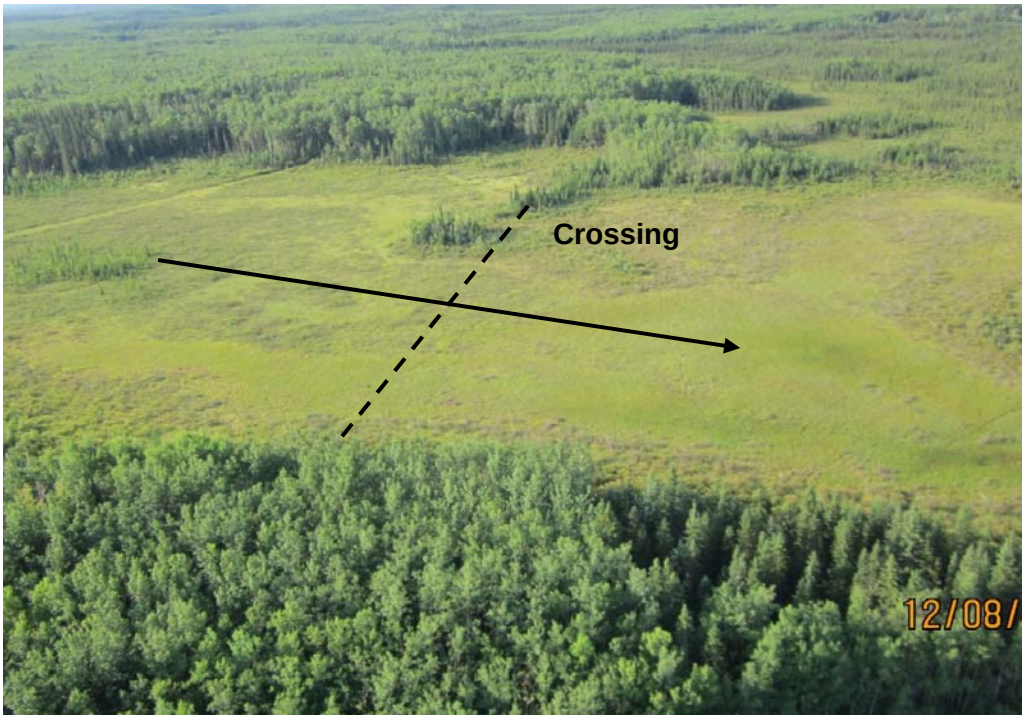


Photo 9 Drainage 23 looking southwest