Little Fox Lake Fuel wood

Timber Harvest Plan

within the

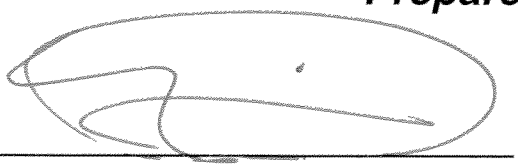
Whitehorse Planning Area

FOREST MANAGEMENT BRANCH

ENERGY MINES AND RESOURCES

YUKON GOVERNMENT

Prepared: July 2012



July 18, 2012

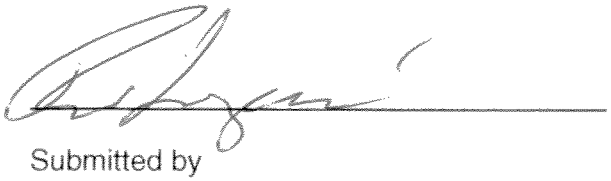
Approved by

Date

Lyle Dinn

Director

Forest Management Branch



July 18/2012

Submitted by

Date

Robert Legare

Area Forester, Whitehorse

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Executive Summary

The objective of the Little Fox Lake Fuel Wood Timber Harvest Plan (THP) is to continue to provide Whitehorse and the surrounding communities with a supply of fire killed fuel wood. This plan represents the second phase of harvesting opportunities in the Fox Lake burn area. The plan was developed under the direction provided in the *Forest Resources Act* and *Regulation*.

Fox Lake has been a traditional harvest area for Whitehorse's fuel wood since the 1998 wildfire. This THP proposes harvesting activities across 2,057 ha and to a maximum volume of 92,565 m^3.

1.0 Introduction

1.1 Background

The Little Fox Lake Fuel Wood THP is located north of Whitehorse at kilometer 260 on the North Klondike Highway. The THP area is the traditional territories for Little Salmon Carmacks First Nation, Kwanlin Dun First Nation, and the Ta'an Kwach'an Council. The THP area has fire killed spruce stands from the 1998 Fox Lake fire. The volume includes both standing dead and blown down. There are some scattered spruce and aspen seedlings throughout the area, and a general grass, herb, and shrub layer. The estimated average volume is 45m³/ha.

1.2 Eco-region and Drainages

This THP is located within the Lebarge Plateau eco-district (Southern Lakes Pelly Mountains Eco-regions, EBA, Nov. 2003) or the Yukon Central Plateau eco-region, and Yukon headwaters drainage. Forests are found below continuous tree line or lowland shrub communities. Balsam poplar are predominantly found along fluvial systems in the eastern portions of this zone. Forests are mostly white spruce, and lodgepole pine. Aspen is common and most likely associated with disturbance. Subalpine fir can be found at the higher elevations in this zone but is not common. Black spruce is uncommon in this eco-region. Soils are predominantly tills (brunisols) on rolling topography.

1.3 Socio-economic Values

Whitehorse is home to approximately 26,418 people (June 2010). The major economic drivers in the area are government and the service industry. The burning of wood for heat is still a very important heating method in Yukon. The gathering and use of fuel wood is a culturally and economically significant within the Yukon Territory. The forests in the Whitehorse region provide significant ecological and aesthetic values, cultural and heritage values, recreational values, and other non-timber values. Whitehorse's forests can sustain a vibrant, small-scale forest industry that provides timber for local markets, energy, economic opportunity, and employment for the region's residents. Many of the residents of Whitehorse rely on fuel wood harvesting as an economical heating alternative throughout the winter. There is a well-developed fuelwood industry centered on the Whitehorse area.

2.0 Planning Area Description

The total area identified is 2,057 ha with approximately 92,565m³ (see Table 1). Other fuel wood harvesting opportunities will be identified through additional operating units as the project progresses.

TABLE 1: Operating Unit Description

Operating Units	Estimated Volume/ Hectare (m^3/ha)	Slope (%)	Aspect	Block Size (ha)	Total Volume Available for Harvest(m^3)	Species	Average Stem Height (m)
1	45	25	E	1,470	66,150	Spruce	16
2	45	16	W	298	13,410	Spruce	15
3	45	10	S	289	13,005	Spruce	19
				2,057	92,565		

Note: This is an estimated volume; areas may have higher/lower volume.

2.1 Wildlife

All site plans and operational development must be consistent with current wildlife standards[1] available from Forest Management Branch (FMB). These standards were developed to ensure well thought-out and balanced planning occurs with respect to wildlife and forest resources. Throughout the preliminary reconnaissance and consultation, no significant wildlife concerns were noted. This area does not conflict with any fish or wildlife management plans.

Moose, black and grizzly bears use the area, however this area is outside any recognized caribou ranges. Elk also use this area. Wildlife use is increasing as the available cover and forage increases. There will be a minimum of 10% snag retention within harvest blocks for wildlife and coarse woody debris.

TABLE 2: Summary of Key Management Objectives – Wildlife

O.U #	**Management Objectives to Note** *All site plans and operational development must be consistent with the Yukon Forest Resources Act, Wildlife Features Standard.*
1	10% snag retention within harvest blocks for wildlife and coarse woody debris
2	10% snag retention within harvest blocks for wildlife and coarse woody debris
3	10% snag retention within harvest blocks for wildlife and coarse woody debris

[1] YUKON FOREST RESOURCES ACT, Wildlife Features Standard.

2.2 Riparian and Water Resources

All site plans and operational development must be consistent with current riparian management standards [2] available from Forest Management Branch. The *Forest Resources Act* standards address riparian management guidelines. The closest stream is an unnamed creek located west of the Klondike Highway and parallel to the OU 1 eastern boundary and flows north from Little Fox Lake (see Appendix 1 Map).

Five small streams in OU 1 run down into the unnamed creek (see Appendix 1).

Another small stream is within OU 3 (see Appendix 1).

TABLE 3: Summary of Key Management Objectives – Riparian

O.U #	**Management Objectives to Note** *Required to identify all stream and lake classes and apply the Riparian Management Area Zones according to the FMB riparian management standards.*
1	The following riparian areas have been identified on map. (see Appendix 1) • Five small streams • Unnamed creek along eastern boundary and flows north from Little Fox Lake There may be other stream classes not identified in the THP. When developing the site plan a walk thru of the proposed harvest block will identify any other streams and ephemeral draws that may require application of riparian standards.
2	The following riparian areas have been identified on map. (see Appendix 1) • One small stream There may be other stream classes not identified in the THP. When developing the site plan a walk thru of the proposed harvest block will identify any other streams and ephemeral draws that may require application of riparian standards.
3	No riparian areas have been identified on map. (see Appendix 1) There may be other stream classes not identified in the THP. When developing the site plan a walk thru of the proposed harvest block will identify any other streams and ephemeral draws that may require application of riparian standards.

[2] YUKON FOREST RESOURCES ACT, Riparian Management on Streams and Lakes.

2.3 Visual Impacts

Visual impacts are low. Although much of the area is on slopes, harvesting is all within burnt stands and not in established green forest. Harvest blocks will be irregular in shape and there will not be complete removal of the stand structure. This will minimize the visual contrast of the harvested blocks. Folds in the land and an established "green up" of shrubs and herbs will soften the visual impact. There are nearby residences on east side of Little Fox Lake and a YG Department of Environment wildlife viewing station at km 272 on the Klondike Highway. Reserve buffers as per the FMB riparian management standards will be applied on the west side of Little Fox Lake which will reduce any residential visual impacts and site plan design will be required to minimize impacts on the intent of the viewing station.

TABLE 4: Summary Key Management Objectives- Visual Impacts

O.U #	**Management Objectives to Note** *All harvesting occurs within burnt stands and not established green forest, thus visual impact is low.*
1	All blocks will be irregular shaped blocks with variable retention (10% snags) to minimize contrast of harvested blocks. Residential visual impacts along east side of Little Fox Lake will be further reduced by applying Riparian Management Area Zone on west side of Little Fox Lake. Wildlife viewing site at pull-out at KM 272 , visual impacts will be minimized by site plan design on harvest blocks at north end of OU 1.
2	All blocks will be irregular shaped blocks with variable retention (10% snags) to minimize contrast of harvested blocks. No other special considerations.
3	All blocks will be irregular shaped blocks with variable retention (10% snags) to minimize contrast of harvested blocks. No other special considerations.

2.4 Heritage and Archaeological Sites

Yukon Archaeological Sites Inventory and Yukon Historic Sites Inventory did not identify any known historic or archaeological sites within the updated Fox Lake THP.

This area has never been systematically surveyed. Because the area has been burned over, above ground features such as caches or cabins likely no longer exist and would not be a concern. Much of the area is rugged terrain and archaeological potential is limited. The Heritage Branch has no concerns with the THP area east of the Klondike Highway (OU 2). The larger area (OU 1) on the west side of Little Fox Lake has elevated potential along the lake, and the unnamed creek. The small streams in OU 1 are not a significant concern. Heritage concerns on these areas will be addressed through the riparian buffer. It has been identified by the Heritage Branch that there is heritage potential within 100 meters along Little Fox Lake or unnamed creek.

All season access will be considered for OU 1, if the proposed all season access is within 100 meters of Little Fox Lake or the unnamed creek then an archeological assessment will be completed in conjunction with the YESSA screening.

TABLE 5: **Summary Key Management Objectives- Heritage and Archaeological Sites**

O.U #	**Management Objectives to Note** *Archaeological potential is limited. Much of the area is rugged terrain and above ground features such as caches or cabins likely no longer exist due to fire.* *Heritage potential along Little fox lake and unnamed creek parallel to OU 1.*
1	Archeological assessment will be required prior to harvesting if all season access is created within 100 meters of Little Fox Lake or along the unnamed creek. Note no archeological assessment required if harvesting in winter only.
2	Note no archeological assessment required for all season harvesting.
3	Note no archeological assessment required for all season harvesting.

2.5 Soil Conservation

All harvesting operations must follow current FMB soil conservation standards. These standards will ensure that the integrity of soils is maintained. Harvesting will only be permitted during summer if soil conditions are not sensitive to displacement, erosion or compaction. New access will also need to be constructed. Due to fine textured soils and diverse conditions present, this will need to be closely monitored by operators to ensure that they are within the soil conservations standards set by the FMB.

TABLE 6: Summary Key Management Objectives- Soils Conservation

O.U #	**Management Objectives to Note** *Harvesting will only be permitted during summer if soil conditions are not sensitive to displacement, erosion or compaction.*
1	Fine textured soils exist with OU 1. Soil Conservation Standard will be used to help determine season of harvest during Site Plan development and approval.
2	Fine textured soils exist with OU 2. Soil Conservation Standard will be used to help determine season of harvest during Site Plan development and approval.
3	Fine textured soils exist with OU 3. Soil Conservation Standard will be used to help determine season of harvest during Site Plan development and approval.

2.6 Traditional Land Users

No traditional land uses such as hunting and berry picking areas were identified while developing the THP. There are three registered trapping concessions within the THP; RTC 217 is active, while RTC 223 and RTC 224 are both vacant.

TABLE 7: Summary Key Management Objectives- Traditional Land Users

O.U #	**Management Objectives to Note** *No traditional land uses such as hunting and berry picking area were identified while developing the THP.* *One out of three registered trapping concessions within the THP; RTC 217, is active.*
1	No special considerations
2	No special considerations
3	No special considerations

3.0 Silviculture

3.1 Harvesting

Harvesting activities identified in the site plan needs to address the management objectives described in the Little Fox Lake THP (see Section 2, 3, and 4). Harvesting activities including season of operability, harvest system, block design and other operational details will be described in the site plan.

3.2 Reforestation

Due to the intensity of the 1998 Fox Lake fire there are minimum green spruce retention remaining adjacent or within the operating units. Regeneration surveys of the older operating units of the Fox Lake commercial planning area have shown minimal restocking. This includes white spruce, black spruce and aspen with some scattered lodgepole pine. Management objectives for stocking standards and acceptable tree species for reforestation of the operating units will be considered and will be set when site plans are approved.

All green coniferous residual stands must be retained in block design. Aspen stands locations adjacent or within blocks must be identified.

All block designs must follow FMB protection of natural regeneration standards.

The schedule for a post-harvest establishment survey(s) will be outlined as part of the site plan for each harvest block. Natural regeneration is the preferred option with planting being used to supplement natural regeneration when directed by FMB.

TABLE 8: Summary Key Management Objectives- Reforestation

O.U #	Management Objectives to Note
	Management objectives for stocking standards and acceptable tree species for reforestation of the operating units will be considered and will be set when site plans are approved. *When approved, all block designs must follow FMB protection of natural regeneration standards.* *Primary reforestation is natural regeneration.* *Secondary reforestation is planting when directed by FMB.*
1	All green coniferous residual stands must be retained in block design. Aspen stands locations adjacent or within blocks must be noted. Post-harvest surveys to be completed within 10 years after completion of harvesting.
2	All green coniferous residual stands must be retained in block design. Aspen stands locations adjacent or within blocks must be noted. Post-harvest surveys to be completed within 10 years after completion of harvesting.
3	All green coniferous residual stands must be retained in block design. Aspen stands locations adjacent or within blocks must be noted. Post-harvest surveys to be completed within 10 years after completion of harvesting.

3.3 Site Plans

Site plans, which are part of the cutting permit, will address the following operational details; soils, season of operability, slopes and special concerns, stand and site conditions, roads and landings descriptions, riparian buffers, management objectives, site prescription, and the reforestation plan.

The operational details are provided in the site plan. This is completed in advance of the cutting permit. The cutting permit and site plan will address the details of the harvest blocks including operator specific requirements, block locations, design, and fuelwood volume within the designated operating units.

4.0 Access Management Considerations

New road access will be required to reach the OUs identified in this THP. When approved, standards for road construction and decommissioning will apply to all roads within the THP. Any new road development may trigger an assessment by the Yukon Environmental and Socio-economic Assessment Board.

The approved site plan will dictate when harvesting may occur and any seasonal access requirements and constraints. Access corridors have been identified within the THP (see Appendix 1). Depending on final design and construction plans, various types of roads may be considered. Note; alternative routes can be identified by the proponent. All access routes need to be approved within the site plan. FMB will consider a road strategy that minimizes the road density, environmental impacts and provides efficient access to timber within the THP.

Two proposed locations have been identified that could support a constructed creek crossing of the unnamed creek and a proposed ice bridge could be considered for crossing Little Fox Lake. All final watercourse crossings will be subject to meeting all legislative requirements such as those under the *Waters Act* and other Department of Fisheries (DFO) authorizations.

Gates are planned to be used to protect roads from damage during wet weather, to allow for the management of wildlife and to ensure public safety.

TABLE 9: Summary Key Management Objectives- Access Management

O.U #	**Management Objectives to Note**
	Access corridors have been proposed within the THP (see Appendix 1 Map). Alternative routes can be identified by proponent. All access routes need to be approved with site plan. *FMB will consider a road strategy that minimizes the road density, environmental impacts and provides efficient access to timber within the THP.* *All new road development will trigger an assessment by the Yukon Environmental and Socio-economic Assessment Board.* *Gates are planned to be used to protect roads from damage during wet weather, to allow for the management of wildlife, and to ensure safety.* *The final design and construction plans would support either winter or dry weather roads.*
1	Two proposed locations have been identified that could support a constructed creek crossing of the unnamed creek and a proposed ice bridge could be considered for crossing Little Fox Lake. (see Appendix 1)
2	Proposed access is dry or frozen conditions. (see Appendix 1)
3	Proposed access is wetland crossing frozen conditions only. (see Appendix 1) Alternative routes can be identified by the proponent. All access routes need to be approved within the site plan.

5.0 Appendices

Appendix 1: Update of Fox Lake Commercial Fuelwood Planning Area Timber Harvest Plan Fuelwood Area Map

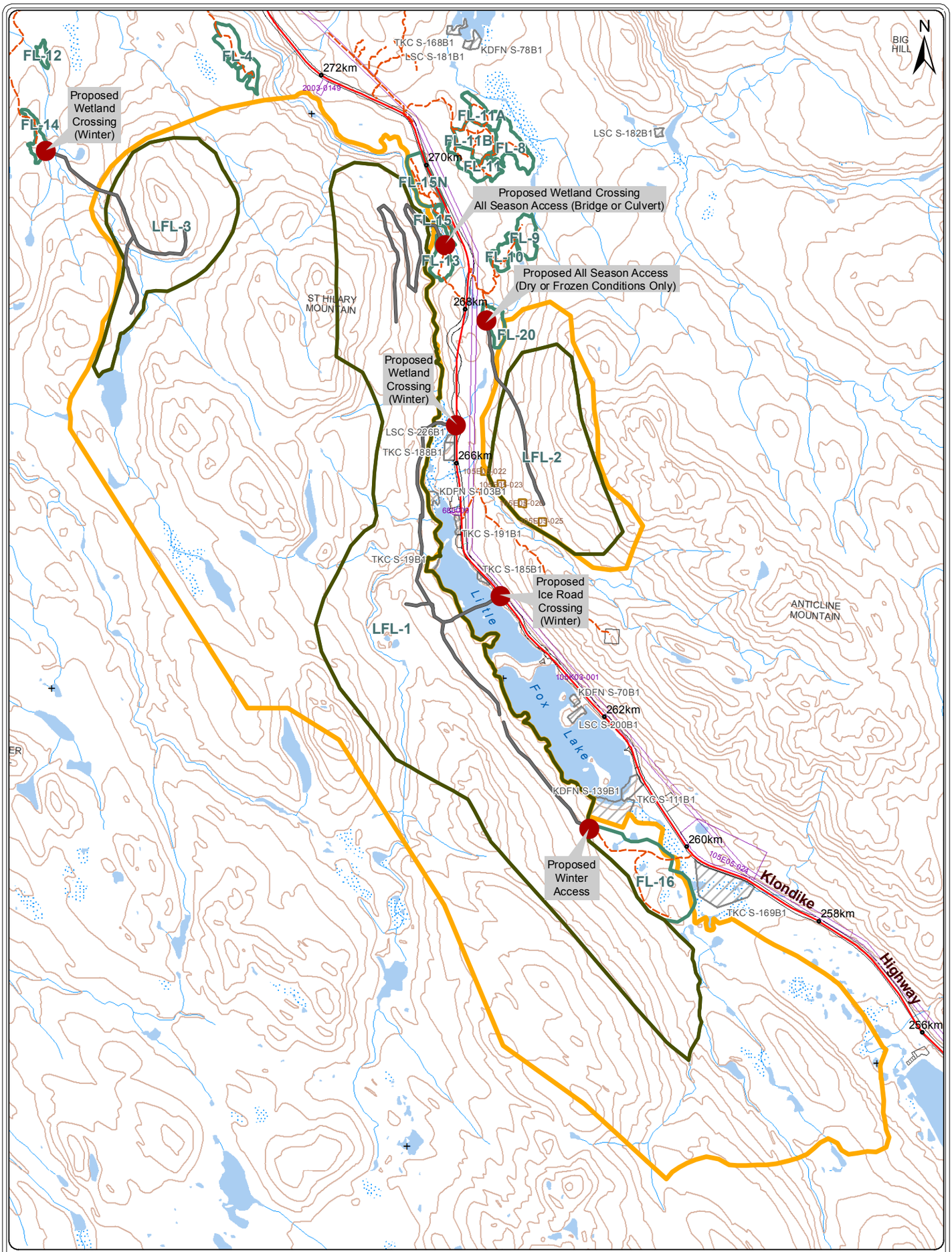
Appendix 2: Fox Lake Overview Map

Appendix 3: Representations

Appendix 4: Stream Assessment, No Name Creek - Fox Lake burn EDI, October, 2007

Appendix 1:

Map of Little Fox Lake Fuelwood Timber Harvest Plan



2011 Little Fox Lake Fuelwood Timber Harvest Plan Area

Southern Lakes District

For more timber harvest information
Web: www.emr.gov.yk.ca/forestry
Phone: 1.867.456.3999

Date: November 28, 2011

0 1 2
Kilometers

1:60,000 Yukon Albers NAD 83

Forestry spatial data managed and maintained by the Forest Management Branch, Yukon Government. All other spatial data provided by Geomatics Yukon.

Yukon Energy, Mines and Resources

Forest Management Branch Yukon Territory

Project Specific Features

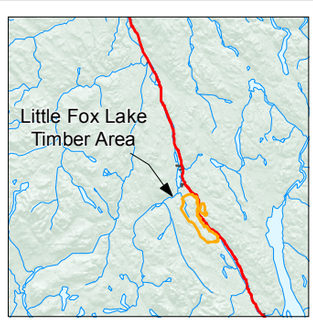
- Proposed Access Point
- Proposed Access Roads
- Existing Access Roads
- Permanent Sample Plot
- Proposed Operating Units
- Operating Units
- Timber Harvest Plan Area (Located in Fox Lake Burn)

First Nation Administration

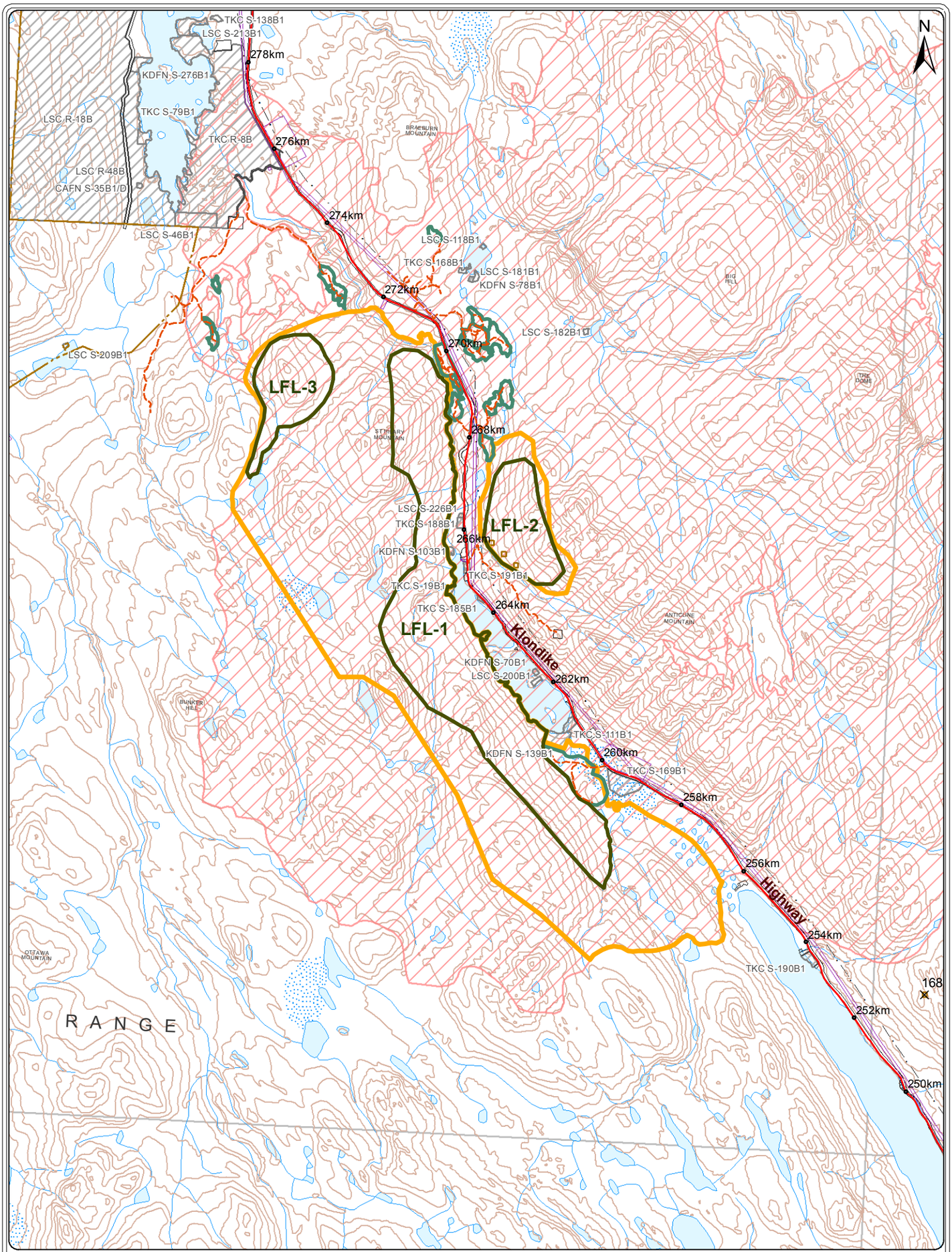
- A: Surface and Subsurface Rights
- B: Surface Rights
- FS: Fee Simple
- Unsurveyed Interim Protected

Land Administration

- Agricultural Land Applications
- Agricultural Land Dispositions
- Land Applications - Active
- Land Dispositions
- Land Licenses
- Notations
- Surveyed Easements
- Surveyed Land Parcels



Appendix 2: Fox Lake Overview Map



2011 Little Fox Lake Fuelwood Timber Harvest Plan Area Overview

Southern Lakes District

For more timber harvest information
Web: www.emr.gov.yk.ca/forestry
Phone: 1.867.456.3999

Date: December 19, 2011

0 1 2
Kilometers

1:100,000 Yukon Albers NAD 83

Forestry spatial data managed and maintained by the Forest Management Branch, Yukon Government. All other spatial data provided by Geomatics Yukon.

Yukon
Energy, Mines and Resources
Forest Management Branch

Project Specific Features

- Existing Access Roads
- Permanent Sample Plot
- Proposed Operating Units
- Operating Units
- Timber Harvest Plan Area
- 1998 Fox Lake Burn

Land Administration

- Agricultural Land Applications
- Agricultural Land Dispositions
- Land Applications - Active
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- A: Surface and Subsurface Rights
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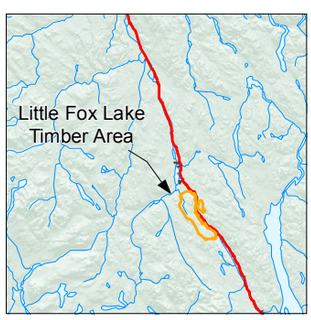

Appendix 3: Representation Summary

Little Fox Lake Fuel Wood Timber Harvesting Plan

Prepared: February 9, 2012.
Prepared by: Whitehorse Area Forester

A total of three comments were received during the notification period on the Little Fox Lake Fuel Wood Timber Harvesting Plan held from December 20, 2011 to January 23, 2012.

The following table contains a summary of the comments received, with responses to the comment and how the comment has been addressed.

Topic	Name/ Organization	Recommendation	Consultation Recommendation Response	How comment/s have been addressed.
2.0 Planning Area Identification: Section 2.2 Riparian and Water Resources	John Ryder Environmental Affairs, Yukon Government	Support for the application of the Forest Management Riparian Standards for wetlands, lakes and streams in THP region as adequate measures to conserve ecological values.	FMB will continue to ensure all projects developed within this THP are adhering to the FMB Riparian Standards.	All FMB standards will be used to guide the development of the specific projects and their associated site plans.
		A riparian reserve zone buffer of 60 m should be maintained around Little Fox Lake, which is a special management water body under the Yukon Fishing Regulations, and of significant recreational value.	FMB will continue to ensure all projects developed within this THP are adhering to the FMB Riparian Standards.	All FMB standards and applicable legislation will be used to guide the development of the specific projects and their associated site plans.
3.0 Silviculture: Section 3.1 Harvesting		With respect to the identification of future fuel wood harvesting areas and operating units,	FMB will continue to ensure all	All FMB standards will

Topic	Name/ Organization	Recommendation	Consultation Recommendation Response	How comment/s have been addressed.
		Environment encourages the implementation of a patch cut approach in the THP area, with maintenance of leave areas between patches. A patchwork harvest system would allow for breaks between intensely harvested areas; this would provide refuge and forage opportunities for moose and other ungulates, allow for nest sites to remain undisturbed, and would maintain local food availability for wildlife within areas undergoing regeneration.	projects developed within this THP are adhering to the FMB Wildlife Features Standard and the THP Operating Guidelines.	be used to guide the development of the specific projects and their associated site plans.
		Environment notes that patches remain clear in many areas of the THP following the Fox Lake fire, but there is a large stretch of forest west of Little Fox lake that provides contiguous habitat for wildlife.	This area is not within the Little Fox Lake THP.	The Little Fox Lake THP is where fire kill fuel wood harvesting opportunities will be focused.
2.0 Planning and Area Identification: Section 2.3 Visual Impacts		Environment has an established wildlife viewing site and pull-out at Km 272 of the Klondike Highway. The viewing station, interpretive panels and a hiking trail have been established	The North end of OU #1, the east side of OU#3 and the access	Site plan design will be developed to minimize the

Topic	Name/ Organization	Recommendation	Consultation Recommendation Response	How comment/s have been addressed.
		here for visitors to interpret the Fox Lake fire and forest regeneration. Maintenance of undisturbed viewing opportunities is of concern given the close proximity of the THP region (northern extent) adjacent the wildlife viewing site. Environment recommends that current and future operating units in the northern portion of the THP area be planned to avoid fuel wood harvesting activities within the view scape of the km 272 viewing station.	development associated with projects in this area are important areas for fire-kill fuel wood harvesting. Block design and access layout will need to weigh view scape concerns with the operational footprint associated with specific projects submitted by proponents in these areas.	impact to view scape associated with the viewing station at km 272 of the Klondike Hwy.
2.0 Planning and Area Identification: Section 2.1 Wildlife		With regards to the maintenance of trees with cavities, Environment does not anticipate that harvesters will desire to harvest trees with cavities, but where these are identified during site planning and harvest block planning by FMB it is recommended they be maintained for cavity nesting birds.	FMB license holders are advised of their obligation to meet the requirements of the *Migratory Bird Act*.	All FMB standards will be used to guide the development of the specific projects and their associated site plans.
4.0 Access Management Considerations:		The proposed new winter road access across creeks and Little Fox Lake likely requires a water license to conduct activities (particularly where new access routes likely require bank training, contouring and/or modification	FMB license holders are advised of their obligation to meet the requirements of the	All project proponents will be required to meet these requirements if

Topic	Name/ Organization	Recommendation	Consultation Recommendation Response	How comment/s have been addressed.
		adjacent to water bodies to construct access ramps). FMB should consult the *Waters Act and Regulation* to identify potential water license triggers associated with the proposed THP.	*Waters Act*.	triggered.
4.0 Access Management Considerations:		Environment Yukon, Parks Branch holds a campground reserve notation (map attached; parcel # 680009) between Little Fox Lake and the Klondike Highway. Although the campground reserve is currently undeveloped and is outside the THP area, the FMB should be aware of its existence should additional access or route planning be desired in the general area. Any use of the campground reserve (i.e. for access to operating units within THP area) may require a park permit. If access through the reserve is desired by the FMB, staff should contact Yukon Parks Branch (Gary Vantel, Regional Superintendent, 867-667-5282) for further information and before any access or use is commenced on the reserve.	FMB will notify impacted project proponents of this requirement.	All project proponents will be required to meet these requirements if triggered.
3.0 Silviculture: Section 3.3 Site Plans		When water crossing routes are planned and ground-truthed, beaver dams should be identified and avoided.		All proponents will be required to identify the location of beaver dams and proposing mitigations

Topic	Name/ Organization	Recommendation	Consultation Recommendation Response	How comment/s have been addressed.
				when planning water crossing routes.
3.0 Silviculture: Section 3.2 Reforestation		The THP states that "*Natural regeneration is the preferred option with artificial regeneration being used to supplement natural regeneration when necessary*." The impact of the Fox Lake fire to soil and vegetation was extensive and regeneration after 15 years has been very slow. Environment supports and encourages FMB to implement a progressive artificial regeneration/reforestation program to assist in regeneration of the area; areas of particular interest are LFL-1 and LFL-2.	FMB has a silviculture plan for the Fox Lake fire and Little Fox Lake THPs. The field assessments schedules will be used to determine priority areas for reforestation activities.	The approved site plan will confirm the reforestation plan for the impacted project area.
3.0 Silviculture: Section 3.2 Reforestation		A natural regeneration of the forest in riparian reserve zone buffer areas will benefit biodiversity more than old trunk removal and associated disturbance.		The approved site plan will confirm the reforestation plan for the impacted project area.
3.0 Silviculture: Section 3.3 Site Plans	Water Resources Branch-John Ryder contact	Possible need for a water license to construct the proposed ice bridges across Little Fox Lake and other streams/water bodies in the area. Please consult the *Waters Act and Regulation* for potential triggers.		All project proponents will be required to meet these requirements if triggered.

Topic	Name/ Organization	Recommendation	Consultation Recommendation Response	How comment/s have been addressed.
3.0 Silviculture: Section 3.3 Site Plans	Rob Smith, Sr. Habitat Biologist Ecosystem Management Branch, DFO	Any project road construction that would trigger YESAB will provide DFO to review it specifically with regards to water crossings. DFO has operational statements for Ice Bridges and Snow Fills can be found at www.pac.dfo-mpo.gc.ca/habitat/os-eo/icebridge but it does not include alteration of watercourse beds or banks so DFO would require this level of detail to complete its assessment. Three creek crossings appear to be fish bearing and one of these does not appear to be a good crossing location. DFO prefers Clear Span Bridges which can be found at www.pac.dfo-mpo.gc.ca/habitat/os-eo/cs-bridge-ponts-pl-eng . If culverts are proposed they would likely require an authorization under Section 35 of the *Fisheries Act* along with significant project detail including design for fish passage and fish habitat compensation. The DFO habitat management project review application form is available at www.pac.dfo-mpo.gc.ca/habitat/index-eng. This form should also be attached to YESAB project applications in order to expedite the review process.		All project proponents will be required to meet these requirements if triggered.

Appendix 4: Stream Assessment
No Name Creek, Fox Lake burn
EDI, October 2007

EDI ENVIRONMENTAL DYNAMICS INC.
Natural Resource Consultants

Whitehorse Office: 402 Hawkins Street, Whitehorse, Yukon Territory Y1A 1X8 Phone (867) 393-4882 Fax (867) 393-4883

October 26, 2007

Scott Cole
Practices Forester Forest Management Branch (K-918)
Energy, Mines and Resources Yukon Government
Box 2703 Whitehorse, YT
Y1A 2C6

Dear Scott:

Re: Stream Assessment within the Fox Creek Burn

As you are familiar, you and I visited some potential stream crossings of Little Fox Creek (local name; watershed code 800-8636-303-362) on October 18, 2007. The main purpose of the site visit was to determine suitable road crossing sites from a fish and fish habitat perspective.

Little Fox Creek flows out of the north end of Little Fox Lakes (there are two lakes joined by a short channel) and flows north/northwest for approximately 12 km into Braeburn Lake. FISS (2007) documents the presence of Arctic grayling (*Thymallus arcticus*), lake trout (*Salvelinus namaycush*) and burbot (*Lota lota*) in Little Fox Lake. Braeburn Lake has documented lake trout, Arctic grayling, northern pike (*Esox lucius)*, lake whitefish (*Coregonus clupeaformis*) least cisco (*Coregonus sardinella*), and whitefish (general; FISS 2007[a]).

No fish distribution information could be found specifically on Little Fox Creek. Fish sampling was not part of this study; however, given the known species distribution upstream and downstream, it is assumed that Arctic grayling, juvenile burbot and slimy sculpin[b]

(*Cognatus cognatus)* would be the most likely species to use Little Fox Creek. It should be noted that inconsistent channelization and beaver activity may actually limit the distribution of fish in the creek; however, this was not investigated.

This stream typically flows in a significant valley with a flat bottom that has notable riparian influence (areas that are seasonally wet). In the portions observed during the field visit, there appears to a variety of habitats present including areas with one defined channel, areas with spread out flow through multiple channels and wetland areas with beaver activity and associated ponding. Note FISS also documents chinook salmon in Braeburn Lake; however, these are likely found only in the outlet stream (Klusha Creek).[b] Although slimy sculpin are not documented in the Little Fox lakes and Braeburn Lake, it is likely they do occur there.

Three crossing sites were evaluated and are described below. It should be noted that crossing sites 1 and 2 access a similar area; therefore, selection of one site eliminates the need for the other.

Crossing Site 1: Downstream Most Crossing Approximately 3.9 km downstream of Little Fox Lake UTM: 8.463,467.6,807,083

At this potential crossing site, the stream has a slow moving straight channel (4.2 m channel width, 0.5% gradient) that flows through a shrub riparian area (photos 1 and 2). The channel appears quite stable with bed material consisting of boulders and fines and stable stream banks.

The stream provides good rearing habitat with abundant cover for fish, dominated by boulders. No spawning gravels were observed in the vicinity of the potential stream crossing site. Approximately 60 m downstream of the crossing site the stream splits into multiple channels. There was also sign of past beaver activity and a potential groundwater source (a rock outcrop) in this downstream location.

Photo 1. Downstream view of the proposed crossing (as marked) and associated riparian area.

The selected crossing site is suitable given that the stream is stable, with no notable critical or unique fish habitat. It also represents the location that would require the shortest distance to cross the riparian area (as opposed to Crossing Site 2). It is a significant distance from the potential groundwater source and multiple channels downstream. As there is rearing habitat at the site, a structure that spans the entire channel and does not disturb the stream banks would be desirable. Approaches should be constructed so that they are stable and do not contribute fine materials to the stream channel during high water events or in the event of flooding and or beaver activity.

Photo 2. Downstream view of proposed stream crossing site.

Crossing Site 2: Approximately 3.7 km downstream of little Fox Lake UTM: 8. 463,548. 6,806,974 (approx)

At this potential crossing site, the stream is spread out in numerous channels over a width of 10-20 m within a seasonally wet shrub dominated riparian area that is approximately 60 m wide (Photo 3). Significant portions of these channels flow underground and as such it is difficult to determine the exact locations of flow throughout this area (Photo 4). The fish habitat in this area is generally not as good as other portions of the stream due to spread out, fast and underground flow; however, it is estimated that fish could migrate through this section to access habitats upstream and downstream. Upstream and downstream of this location the stream had flow concentrated in one main channel.

The proposed crossing alignment would require that the stream be crossed at an angle and thus the road would cover a longer distance in the riparian (70 m; Photo 3). Given the spread out and underground nature of flow in this area it would be extremely difficult to design a crossing that would not impact the flow and water quality in this area. In addition, the dynamic nature of the stream in this area may lead to future erosion problems of any approaches and structures built over this area. Even if the impact on the fish habitat at this crossing site is minimal, the potential impacts on downstream habitats (water quality) could be notable if this crossing site is selected. As such, this crossing location is not as desirable as Crossing Site 1 from a fish and fish habitat perspective.

Photo 3. Upstream view of stream riparian and proposed crossing location (as marked).

Photo 4. Upstream view of one of the multiple channels in the vicinity of the proposed crossing site.

Crossing Site 3: Approximately 0.1 km downstream of Little Fox Lake UTM: 8. 463,768. 6,803,515 (approx)

This potential stream crossing site was located approximately 100 m downstream of Little Fox Lakes. The stream in this location is 4.6 m wide and flows through a low lying area. In this vicinity the stream had good rearing habitat with abundant cover dominated by deep pools and instream vegetation.

Bed material was dominated by cobbles followed by fines. No gravels suited to Arctic grayling spawning were found in this section of the stream. As such this section of stream is likely used for rearing and as a migration corridor for fish using downstream portions of this stream. Given its close proximity to the lake, this section of stream is accessible and thus likely gets significant use by fish populations in the lake (i.e. compared to crossing sites 1 and 2).

From a fish and fish habitat perspective, the stream channel at the proposed location generally has characteristics that are suitable when selecting a crossing location. First, there was no critical habitat observed at the location that would be notable sensitive (i.e. a significant spawning location). Second, the channel is quite straight and appears to be quite stable (i.e. no evidence of significant erosion occurring), so a properly selected and installed crossing structure should not restrict the stream's natural movement. A structure that spans the entire channel and does not impact the stream banks would be most suitable.

A notable concern with this crossing site is that the riparian area on the right bank (looking downstream) of the stream channel is seasonally wet (Photo 6). Construction of approaches in this location will have to ensure that impacts to the water flow and sediment mobilization are addressed. Constructing the approach with coarse material and installation of a culvert in the approach may allow water to flow through this area during high flows.

Photo 5. Downstream view of proposed crossing site.

Photo 6. Downstream view of wet riparian area, some flow noted in gully.

I trust that this letter provides you with the required information regarding these crossings. Should you require additional information please call me at (867) 393-4882.

Sincerely

Patrick Tobler, B.Sc., R.P.Bio. Branch Manager/ Seni