

**Waste Management Plan  
Celibeta, Fort Liard and Pointed  
Mountain  
Northwest Territories  
July 2020**



Suite 2800, 421 7<sup>th</sup> Avenue SW  
Calgary, AB T2P 4K9  
Ph: (403) 290-3600  
Fax: (403) 262-7994

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## Glossary

**Dangerous Goods** Any product, substance or organism included by its nature or by the *Transportation of Dangerous Goods Regulations* (TDGR) in any of the classes listed in the schedule provided in the *Transportation of Dangerous Goods Act* (TDGA) [Transportation of Dangerous Goods Act (Canada)]

Class 1: Explosives, including explosives within the meaning of the *Explosives Act* (Canada).

Class 2: Gases; compressed, deeply refrigerated, liquefied or dissolved under pressure.

Class 3: Flammable and combustible liquids.

Class 4: Flammable solids; substances liable to spontaneous combustion and substances that on contact with water emit flammable gases.

Class 5: Oxidizing substances; organic peroxides.

Class 6: Poisonous (toxic) and infectious substances.

Class 7: Radioactive materials and prescribed substances within the meaning of the *Atomic Energy Control Act* (Canada).

Class 8: Corrosives.

Class 9: Miscellaneous products, substances or organisms that are considered by the Lieutenant Governor in Council to be dangerous to life, health, property or the environment when transported and are prescribed to be included in this class.

**Drilling Waste (not including seismic shot hole drilling waste)** A mixture of water, drill cuttings, drilling mud, additives and various other wastes that are specifically related to the drilling activity.

**Grey Water** The liquid resulting from the treatment of sewage.

**Hazardous Waste** A contaminant which is a dangerous good that is no longer used for its original purpose and is intended for storage, recycling, treatment or disposal. Materials that do not meet the criteria in schedules I, III or IV, or the standards for dioxins and furans, of the Guideline for Industrial Waste Discharges in the NWT.

A hazardous waste does not include a contaminant that is:  
(a) household in origin,

- (b) included in class 1, Explosives or class 7, Radioactive materials of TDGR,
- (c) exempted as a small quantity,
- (d) an empty container, or
- (e) intended for disposal in a sewage system or by land filling that meet the applicable standards set out in schedules I, III or IV of the Guideline for Industrial Waste Discharges in the NWT.

<b>Household Hazardous Waste</b>	Common everyday products that people use in and around their homes including paint, paint thinner, herbicides, and pesticides that, due to their chemical nature, can be hazardous if not properly disposed.
<b>Kitchen Waste</b>	In this document, kitchen waste is composed of foodstuff, paper products, plastic film wrapping, <i>etc.</i>
<b>Non-hazardous Waste</b>	Wastes that do not fall into the “Hazardous Waste” category.
<b>Produced Water</b>	Any water that is produced to the surface along with oil or gas.
<b>Run off</b>	In this document, excessive rain or snowmelt can produce overland flow to retention ponds.
<b>Sewage</b>	Human excrement, water borne human excretion or the water-carried wastes from liquid or non-liquid culinary purposes, washing, cleansing, laundering, food processing or ice production.
<b>Testing Required</b>	Occasionally, laboratory analysis may be required to fully characterize and classify a waste product.



## 1. Introduction

Paramount Resources Ltd. (Paramount) holds mineral rights in the Liard and Celibeta areas under several Significant Discovery Licences and Production Licences. Additionally, Paramount has surface rights at these locations and Pointed Mountain. These rights were acquired through several different corporate transactions, including but not limited to, oil and gas rights sales, farm-ins and purchases from other oil and gas companies. Most recently through the acquisition of the assets of Apache Canada Limited, Paramount gained interest and operatorship of Celibeta H-78, along with the former Pointed Mountain field. Because of the acquisition of these rights, and numerous subsequent regulatory approvals, Paramount is an operator of oil & gas and reclamation activities in the Liard, Celibeta and Pointed Mountain areas of the Northwest Territories. Paramount divides the Liard area into three project areas: Liard West, Liard South and Liard East. It is important to note that the projects are built and are in states of suspension, decommission or abandonment. Activity in recent time has been minimal. In appendix A of this document is an as-built map for each project area, which show all the project components. Below is an overview of the project areas.

### 1.1 Liard West

Paramount Resources Ltd. (Paramount) is the operator of the Fort Liard West Project. The Project is situated in the NT, roughly 35 km north of the BC / NT border. From the Fort Liard Project area, Fort Nelson, BC is located approximately 200 km to the south, Trout Lake, NT is located roughly 150km to the east and Nahanni Butte, NT is located approximately 100km to the north. The hamlet of Fort Liard, NT is located within the Project area.

The Fort Liard West Project encompasses all-season and winter access roads; well sites, pipelines, valve sites and gas dehydration facilities; a water disposal well at O-80; a repeater site; camp, decking and staging sites; and various borrow pits and sumps. Six natural gas wells (Paramount *et al* K-29A, 2K-29, 3K-29, M-25, 2M-25 and F-25a) on three lease sites (K-29, M-25 and F-25) are tied-in to a 37.2km main pipeline that connects the K-29 lease site to a facility at the abandoned/reclaimed BP Pointed Mountain plant site. The M-25 lease site is linked to the F-25 plant site via a 1.4 km pipeline lateral and the F-25 plant is linked to the main pipeline via a 3.3 km pipeline lateral. When active, produced water from wells on the K-29 and F-25 leases is transported via pipeline to an injection well located at O-80.

All project components have been built and the wells and pipelines in the Liard West Project are suspended, deactivated and/or decommissioned. Activity in the area has been limited in recent times to suspension activities, maintenance of access and monitoring. Future plans for the Liard West Project currently are undetermined and depend on future economic and political developments.

### 1.2 Liard South

Paramount Resources Ltd. (Paramount) is the operator of the Liard South Project, which encompasses winter access roads; well sites, pipelines and processing facilities; barge, camp and decking sites; and various borrow pits, sumps and other clearings. Three wells (F-36, O-35 and N-01) were tied-in to the pipeline system, the main stem of which runs 26km from well site F-36 to a compressor station in British

Columbia (Maxhamish d-36-I) and is known as the Shiha Pipeline (see Appendix A for Fort Liard South As-built 2017 map). This trans-border pipeline is operated by Shiha Energy Transmission Ltd., a partnership between the Acho Dene Koe First Nation and Paramount.

Poor economic conditions (low gas production rates and market value) prompted Paramount to temporarily suspend production late in 2007 and then to formally deactivate the project in April 2008 (according to National Energy Board (NEB) miscellaneous order MO-09-2008, which allows the deactivation of the pipeline until such time as the NEB approves its reactivation). In the 2016-2017 winter season Paramount abandoned several wells and removed facilities from various locations in the project area. Currently, the Liard South Project is not operating except for on-going monitoring.

### 1.3 Liard East

Paramount Resources Ltd. (Paramount) is the operator of the Fort Liard East Project. The Liard East Project encompasses existing well sites, access, borrow pits, campsites, and sumps. The Liard East wells are not tied and in and have never produced. Liard East is comprised of seven well sites and associated infrastructure located at N-65, O-15, C-76, F-66, J-76, B-41, and C-02. No new drilling, production or other means for potential land disturbance are envisioned.

### 1.4 Celibeta

As a result of an acquisition in 2017, Paramount is the operator of the Celibeta, NWT Project, which will encompass a winter access road and well site. The well was drilled in 1959-1960 and further suspension work was completed in 1990. The well has never been tied-in and has never produced. Inspections of the well have been taking place via helicopter since 2013. Paramount has reviewed the historical files and has not been able to determine the original access or the access used in 1990. Paramount has scouted access along existing cutlines. It is anticipated the access will be approximately 32.5 km from Paramount's existing access in Liard East (MV2013A0013). In the winter season of 2019-2020 the well was abandoned, and reclamation activities were undertaken.

### 1.5 Pointed Mountain

As a result of an acquisition in 2017, Paramount is responsible for former Pointed Mountain Gas Field. The field is located west of the Liard River within the Liard Range of the Franklin Mountains, approximately 30 km northwest of Fort Liard, NWT (Figure 1). The Site is located on Crown land and is an area of interest to the Acho Dene Koe First Nation (ADK). It includes decommissioned and abandoned components including a Plant Site, Airstrip, six gas well sites (A-1, A-2, A-3, A-4, B-1, and B-2), a disposal well, five water supply wells, pipelines and associated rights of way. Roads which provide access to the various locations have not yet been decommissioned and reclaimed. A network of groundwater monitoring wells are in place to provide monitoring results, which have been included in annual reports on the site. Equipment and material are transported to the Site via the barge landing or helicopter on the north side of the Liard River.

## 2. Environmental Overview

### 2.1 Terrain, Soil and Permafrost

The Project areas occur within the Liard Plains MB Ecoregion; immediately to the south and east lies the Liard Upland MB Ecoregion and, further to the west, the Central Mackenzie Plain Boreal Northern Cordilleran (Ecosystem Classification Group 2007). In the Project areas local terrain, soils and vegetation are directly representative of the Liard Plains MB Ecoregion, and to varying degrees the adjacent Liard Upland. In general, the Liard Plain MB Ecoregion exhibits one of the warmest climatic conditions in the NT. Productive deciduous, mixed-wood and conifer forests occur on the broad low-lying alluvial terraces of the Liard River (Ecosystem Classification Group 2007). Meander scrolls have developed on the Liard River floodplain, indicating an environment of active deposition and change. East of the Liard River plain are the gently undulating lacustrine deposits and lacustrine veneers of the Trout Uplands.

Soils of the Liard Plain, mainly poorly drained Regosols, are relatively young, due to ongoing deposition by the Liard River. Gleysols and Luvisols occur with lacustrine and till materials, while Organic soils occur under wetlands (Ecosystem Classification Group 2007). Permafrost is uncommon and is defined as being discontinuous sporadic.

Terrain, soils and permafrost in the Project areas have experienced relatively low levels of impacts prior to clearing and development undertaken for previously approved Project components; these include well leases, pipeline right-of-ways, access roads, sumps, camps and other facilities. Typical sources of potential impacts included contamination resulting from spills and/or poorly managed waste; altered, local terrain features (surface topography, site elevation, drainage patterns) resulting from soil movement; soil erosion resulting from the removal of vegetative ground cover; and disruption of permafrost resulting in slumping and erosion.

### 2.2 Vegetation

Vegetation characteristic of the Liard Plain MB Ecoregion reflects the relatively warm climate and moist, rich site conditions (Ecosystem Classification Group 2007). Willow shrublands occur on recently flooded areas along the Liard River. Drier upland sites on alluvial terraces contain mixed deciduous and mixed wood forest of trembling aspen, balsam poplar and white spruce. Forest understories are often lush, and include species such as low-bush cranberry, prickly rose, red osier dogwood, dwarf red raspberry, meadow-horsetail and other herbs. On low-lying areas, rich willow-sedge fens occur.

### 2.3 Water and Aquatic Species

In the Liard Plain Ecoregion, water covers approximately 5% of the total land base, with the Liard River being the dominant aquatic feature (Ecosystem Classification Group 2007). Numerous ponds, channel marshes, and fens occur along the Liard River plain. The Muskeg River and Rabbit Creek, along with numerous other small permanent and intermittent streams, drain into the Liard Plain MB Ecoregion from

the adjacent Liard Upland and Trout Upland ecoregions. Small shallow lakes occur in undulating areas, mainly in the south half of the Ecoregion.

Both ground and surface water have the potential to be impacted through changes in water quality and water volumes. Primary sources of impacts may include spills and/or releases, soil erosion, and water withdrawal from specified lake sources. Water withdrawals, and the effects and management of withdrawals, will continue to be addressed and managed as part of the new Type-B Water Licenses. To mitigate the ongoing risk of impacts from erosion, spills, and releases, Paramount will continue to employ specific industry best management practices and applicable mitigation measures outlined in the Fort Liard EPP and the associated Project Spill Contingency Plan.

## 2.4 Wildlife

Wildlife species that occur in the region encompassing the Project area are those adapted generally and/or more specifically with the topography, hydrologic systems and vegetation communities occurring in the Liard Plain and Liard Upland ecoregions. Characteristic mammal species include moose, black bear, beaver, fox, wolf, lynx, marten, mink, snowshoe hare, wolverine, weasel and red squirrel. To a lesser degree species such as woodland caribou occur throughout the region. Common bird species include bald eagles, hawks, falcons, chickadees, northern shrike, redpolls, ravens, Canada jays, woodpeckers, sandhill cranes, grouse and owls. Common fish species include northern pike, grayling, walleye, burbot, suckers, whitefish, and a number of species of forage fish (i.e. minnows).

Overall, wildlife species' habitats and populations have been exposed to relatively low levels of impacts from approved developments that comprise the existing Projects. Sources of impacts have included the clearing and construction for well leases, the battery site, access roads, sumps, camps and other facilities.

### 3. Regulatory Framework

Managing oil and gas wastes in the NWT is challenging, due in part to the complex regulatory regime. Minimal waste facilities add to the complexity: if waste must be moved outside of the NWT for disposal, the regulatory regime becomes even more complex (see CAPP, 2009). In the past for the Liard project area Paramount received oil and gas approvals from the National Energy Board (NEB). Since devolution and the creation of the Oil and Gas Regulator for Oil and Gas Operations (“OROGO”) in the NWT, Paramount receives oil and gas approvals from OROGO. The Mackenzie Valley Land and Water Board (MVLWB) regulates the use of land and water and the deposit of waste through the issuance of Land Use Permits (LUPs) and Water Licences (WLs).

#### 3.1 Assessment Processes

The Liard South, East and West fields have been the subject of a number of Environmental Assessment processes prior to licencing and permitting of activity. Assessment processes were conducted on Liard East, West and South. Some of the assessment processes were conducted prior to Paramount becoming the operator of a field: however, Paramount has assumed the outcomes and the responsibilities associated with those assessment processes since it has become the operator of a field. Examples of assessment processes are *Environmental Assessment of the Ranger Oil Ltd., Canadian Forest Oil Ltd. and Chevron Canada Resources Ltd. P-66/N-61/K-29 Gas Wells and Pipeline Tie-in Fort Liard, NT and Paramount Resources Ltd. Liard East Exploratory Drilling EA00-003*. A number of the assessment processes are documented on the Mackenzie Valley Environmental Review Board’s public registry at <http://reviewboard.ca/registry/>. The Celibeta well was drilled and suspended prior to the implementation of the Mackenzie Valley Resource Management Act (MVRMA). The Pointed Mountain project was also developed prior to the implementation of the MVRMA.

#### 3.2 Regulatory Approvals

Table 1 below lists Paramount’s current LUPs and WLs for the Liard Project Area and the pending LUP and WL for Celibeta. Given the current state of the projects (built and in some instances decommissioned and/or suspended/abandoned) the scope of the LUPs and WLs are very limited. Activities contemplated include maintenance, access, suspensions and abandonments, reclamation and remediation. It is important to note that OROGO is the regulator for the down-hole activities of suspension and abandonment: however, surface use, waste disposal and water use for these activities is within the jurisdiction of the MVLWB.

**Table 1: Current LUPs and WLs**

Liard South	Liard West	Liard East	Celibeta	Pointed Mountain
MV2016A0010	MV2013A0012	MV2013A0013	MV2018A0022	MV2014X0011
MV2016L1-0002	MV2013L1-0002	MV2013L1-0003	MV2018L1-0005	

## 4. Waste Management Strategy

Poor waste management practices can result in direct or indirect adverse environmental effects and can pose health and safety risks to employees and members of the general public. Furthermore, poor waste management practices can ultimately result in substantial financial and legal liabilities. To prevent poor waste management practices and minimize potential adverse effects to environment, health and safety, Paramount Resources Ltd. (Paramount) has developed this Waste Management Plan (WMP), which falls under Paramount's Health, Safety and Environment Policy (Appendix 2).

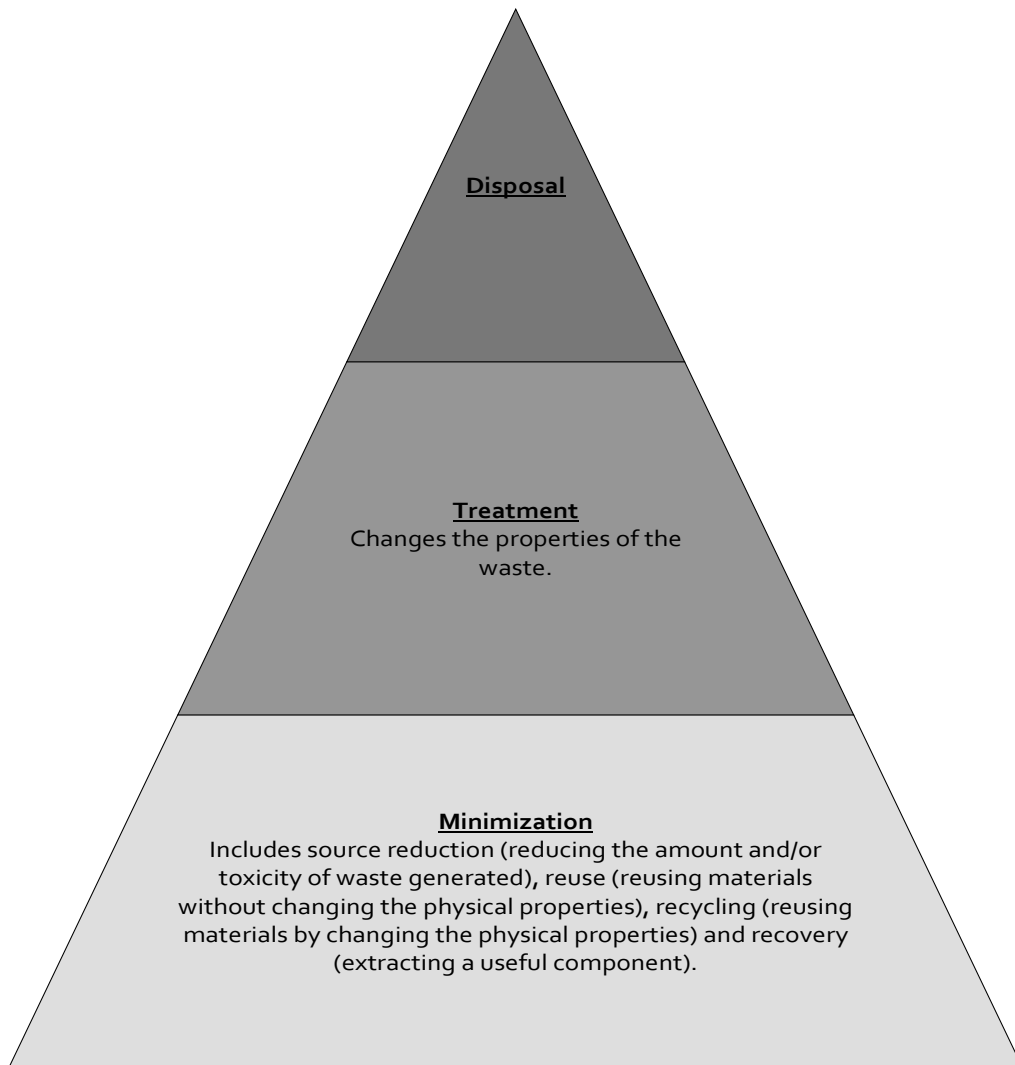
The basis of Paramount's waste management system is the waste management hierarchy (Figure 1). The overriding principle of the waste management hierarchy is the reduction, if not the elimination, of both the volume and toxicity of waste. In the waste management hierarchy, disposal is the least preferred waste management option. Disposal also involves the greatest potential liability.

### 4.1 Waste Minimization

Waste minimization includes source reduction (reducing the amount and/or toxicity of waste generated). In some cases, reduction at the source will not yet be technically possible or economically feasible. Therefore, opportunities for reuse (reusing materials without changing the physical properties), recycling (reusing materials by changing the physical properties) and recovery (extracting a useful component) will be investigated for all wastes that are unavoidably generated.

The concept of waste minimization is a cornerstone to the Environmental Protection Plan: waste that is not generated need not be managed. Waste that is generated but is of the lowest possible volume and/or toxicity, can be managed most cost-effectively. Potential benefits to a waste minimization program are:

- increased revenue;
- reduced costs of operating, materials, waste management and disposal,
- energy, and facility cleanup;
- improved operating efficiency;
- reduced regulatory compliance concerns;
- reduced potential for both civil and criminal liability; and
- enhanced public perception of the company and the industry as a whole.



**Figure 1:** The waste management hierarchy presents options to minimize the amounts and hazard of waste.

## 4.2 Waste Treatment and Disposal

Waste treatment is any method, technique, or process that changes the physical, chemical, or biological character of a waste. Treatment renders the waste less hazardous and, therefore, recyclable or safer to transport, store, and dispose of. Treatment should be investigated for any waste that is unavoidably generated and that cannot be reused, recycled or recovered. Waste disposal generally is the discharge, deposition, injection, dumping or placing of any waste into or on land, water or air. Table 2 describes various waste treatment and disposal options.

### 4.3 Waste Characterization and Classification

Waste characterization is the assessment of the physical, chemical and toxicological characteristics (e.g., properties) of the waste. Refer to and Directive 58: Oilfield Waste Management Requirements for the Upstream Petroleum Industry (AER, 1996); Waste Profile Sheets (CAPP, 2006) and Oilfield Waste Management in the Northwest Territories (CAPP, 2009) to assist with the characterization of common waste. Once a waste has been characterized, it can be classified into one of two classes: hazardous waste and non-hazardous waste (Figure 2).



**Table 2: Treatment / Disposal Options for the Fort Liard Project.**

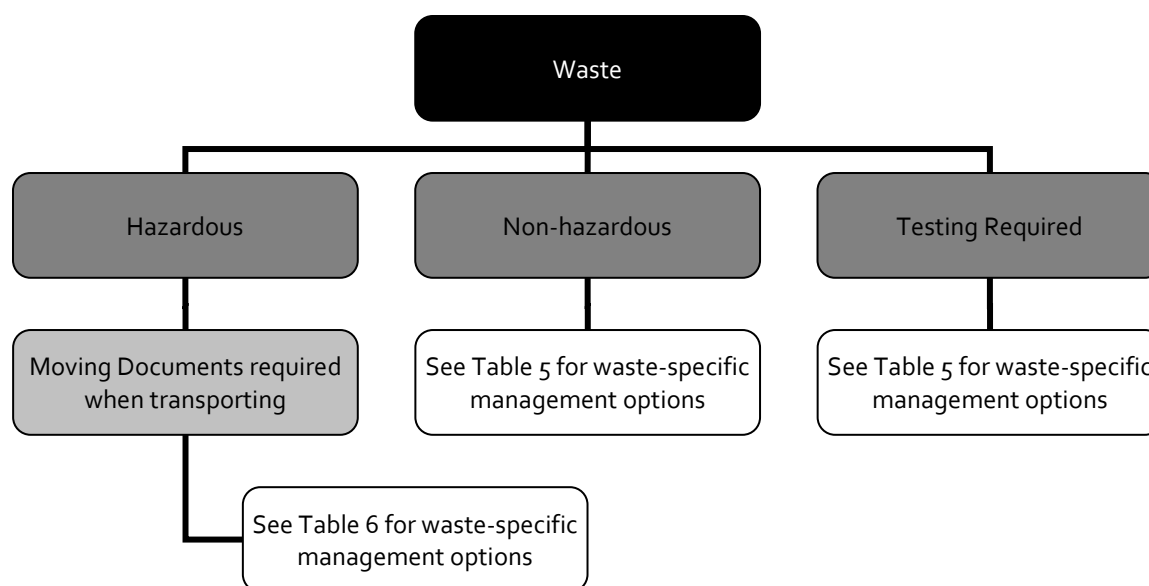
Option	Class <sup>1</sup>	Description <sup>1</sup>
<b>Disposal Well</b> – A disposal well means the technology of placing fluids deep underground, in porous formations of rocks, through wells or other similar conveyance systems. The fluids may be water, wastewater or water mixed with chemicals. MV2013A0012 and MV2013L10002	<b>Class Ia</b>	Wells used for the disposal of oilfield or industrial waste streams
	<b>Class Ib</b>	Wells used for the disposal of produced water, specific common oilfield waste streams, and waste streams meeting specific criteria
	<b>Class II*</b>	Wells used for the injection or disposal of produced water or brine equivalent.
	<b>Class III</b>	Wells used for the injection of hydrocarbons, inert or other gases into a reservoir matrix for storage, enhanced recovery, or disposal purposes
	<b>Class IV</b>	Wells used for the injection of fresh water or steam.
<b>Landfill</b> – A landfill is a waste management facility at which waste is disposed by placing it on or in land. MV2013A0012, MV2013L1-0002, MV2013A0013, MV2013L1-0003, MV2014X0011, MV2016A0010, MV2016L1-0002, MV2018A0022 and MV2018L1-0005	<b>Class I</b>	Class I Landfills meet minimum standards for disposal of oilfield wastes and possess the following attributes: <ul style="list-style-type: none"> <li>• 2 liners of which at least one is a synthetic liner,</li> <li>• a leachate collection and removal system,</li> <li>• a leak detection system between the 2 liners, and</li> <li>• a groundwater monitoring system</li> </ul>
	<b>Class II</b>	A landfill for the disposal of waste, not including hazardous waste
	<b>Class III</b>	A landfill for the disposal of inert waste
<b>Retention Ponds*</b> MV2013A0012, MV2013L1-0002, MV2013A0013, MV2013L1-0003, MV2014X0011, MV2016A0010, MV2016L1-0002	<b>NA</b>	Natural or man-made pond in which grey water / runoff is held for evaporation, percolation, or stabilization.
<b>Sewage Sumps*</b> MV2013A0012, MV2013L1-0002, MV2013A0013, MV2013L1-0003, MV2016A0010, MV2016L1-0002	<b>NA</b>	Natural or man-made pit dug to contain sewage / grey water.
<b>Drilling Sumps*</b> MV2013A0012, MV2013L1-0002, MV2013A0013, MV2013L1-0003, MV2016A0010, MV2016L1-0002	<b>NA</b>	An impermeable pit dug to contain drilling wastes. The pit is dug in low permeable material.

Option	Class <sup>1</sup>	Description <sup>1</sup>
<p><b>Bioremediation</b> – is the break down of oilfield wastes to carbon dioxide and water using natural biological processes.</p> <p>MV2013A0012, MV2013L1-0002, MV2013A0013, MV2013L1-0003, MV2014X0011, MV2016A0010, MV2016L1-0002, MV2018A0022 and MV2018L1-0005</p> <p>***Not currently approved, except under MV2014X0011 would be submitted as a technique under Closure and Reclamation Plan for each Licence/Permit, subject to Plan approval by the MVLWB</p>	<b>Bio-cell*</b>	Bio-cells are constructed to optimize the air exchange for aerobic degradation and provide a method of controlling the moisture and nutrient requirements of the microorganisms. Bio-cells can be constructed as sub-grade containment areas in the earth's surface or pre-constructed containment devices.
	<b>Bio-pile*</b>	Bio-piles operate on the same principles as bio-cells, but they are constructed above grade on the earth's surface.
	<b>Land Farming*</b>	Land farming is process of mixing contaminated soil or subsoil with topsoil to augment the degradation process.
	<b>Mulching*</b>	Mulchers use a powerful rotating head to grind trees to "mulch".
	<b>Biodegradation Facility</b>	A type of oilfield waste management facility where oilfield wastes are biologically degraded in a contained and controlled environment, whether it is in an impermeable cell structure (biocell) or piled on an impermeable liner (biopile).
<p><b>Thermal Treatment</b> – is an effective method for removing organic components in oilfield waste. The treatment may involve destruction, recovery or reduction of the contaminants and/or waste material in which it is found.</p> <p>MV2013A0012, MV2013L1-0002, MV2013A0013, MV2013L1-0003, MV2016A0010, MV2016L1-0002, Incineration allowed for paper, cardboard and untreated wood. Other materials require authorization by Inspector</p> <p><b>Mobile Thermal Treatment Units</b></p> <p>***Not currently approved, except under MV2014X0011, would be submitted as a technique under Closure and Reclamation Plan for each Licence/Permit, subject to Plan approval by the MVLWB</p>	<b>Campsite Incinerators*</b>	Campsite incinerators have a burning capacity of less than 90.7 kg/hr and are used to dispose of only kitchen waste.
	<b>Open Burning*</b>	Open burning of select wastes (See Appendix 1 for details) may be suitable, as no economical recycling exists. The <i>Forest Protection Act</i> (NWT) requires that anyone wishing to start or kindle a fire during the closed season (May 1 to September 30) within a forested area must obtain a Permit to Burn from the local Renewable Resource Officer
	<b>Mobile Thermal Treatment Units* (Thermal Desorption)</b>	Thermal desorption removes harmful chemicals from soil and other materials (like sludge and sediment) by using heat to change the chemicals into gases. These gases are collected with special equipment. The dust and harmful chemicals are separated from the gases and disposed of safely. The clean soil is returned to the site.
	<b>Fixed Thermal Treatment Facility</b>	Operated at waste management facilities

Option	Class <sup>1</sup>	Description <sup>1</sup>
<b>Recycling Depots/Facilities</b> MV2013A0012, MV2013L1-0002, MV2013A0013, MV2013L1-0003, MV2014X0011 MV2016A0010, MV2016L1-0002, MV2018A0022 and MV2018L1-0005	<b>Recycling Depots/Facilities</b>	The physical properties of various materials are changed at recycling facilities. Often, materials are accepted at depots for sorting and holding prior to delivery at facilities.
	<b>Vendor Programs</b>	Vendors may accept used containers (e.g., propane tanks) for reuse and/or recycling.

**Notes:**

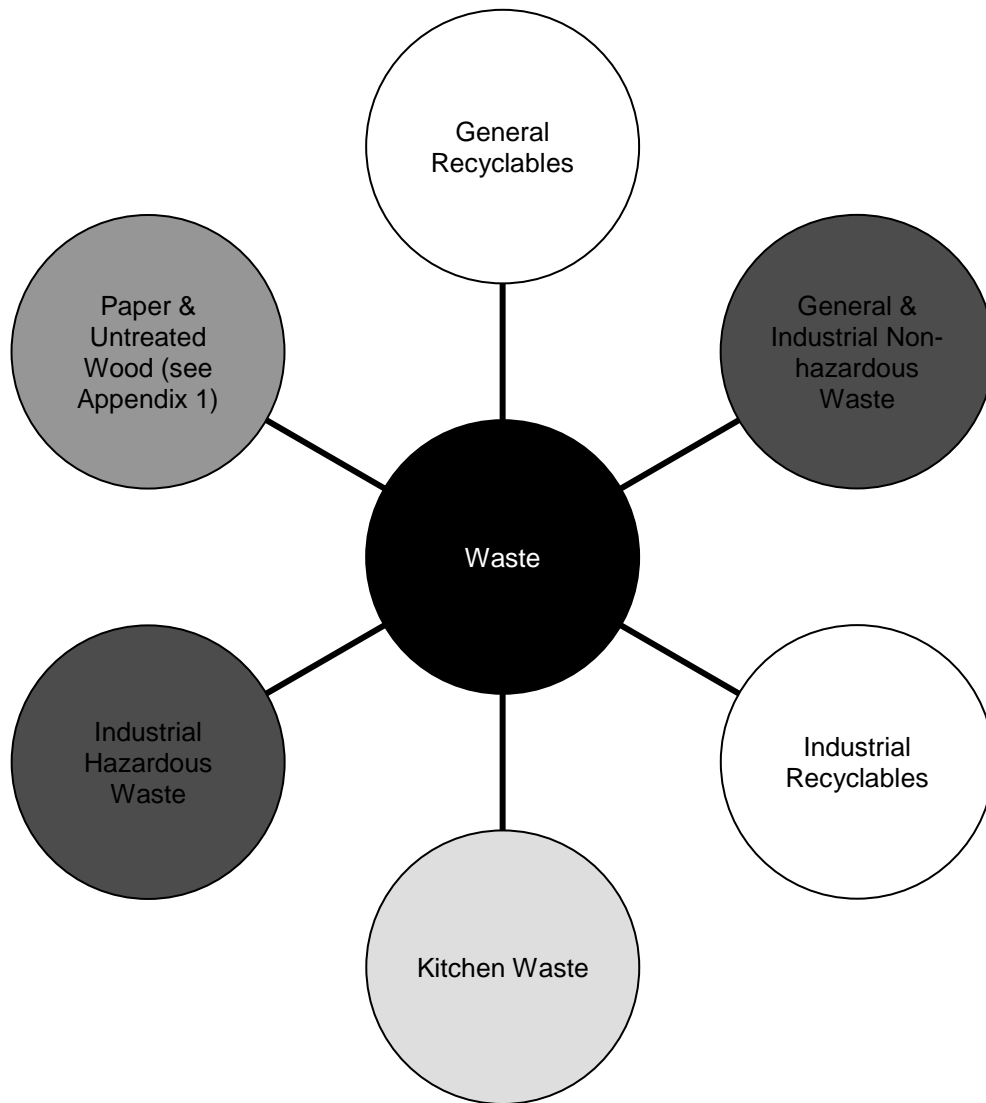
- \* Potential local waste treatment / disposal option.
- <sup>1</sup> Classes and Descriptions are According to Alberta Regulation.







**Figure 2:** Waste identification, classification and segregation flowchart.

## 4.4 Waste Segregation

Waste segregation is an important step towards minimizing waste, as it prepares the waste for further processing. Through waste segregation, recyclable wastes can be separated from disposable wastes and hazardous wastes can be separated from non-hazardous wastes, which is important as hazardous waste is always more difficult to manage. Waste segregation will create a variety of options, other than disposal, resulting in environmentally conscious waste management. Ultimately, these options will allow Paramount to reduce waste disposal costs. Figure 3 and Table 3 illustrate Paramount's segregation strategy and provides insight into how waste will be processed.



**Figure 3:** Segregation diagram for generated waste (see table 2 for details).

<b><u>LEGEND</u></b>	
	Recycled at appropriate and approved facilities (see Table 3)
	Incinerated locally
	Open Burned locally with a Permit (or alternatively incinerate locally)
	Disposed at appropriate and approved facilities (see Table 3)

**Table 3: Waste Segregation Details**

Container Label		Container Type*	Details
General & Industrial Non-hazardous Waste	Various	L&P Disposal Ltd. Receptacles	Food wrappers ( <i>e.g.</i> , cans, jars, rigid plastic, <i>etc.</i> ), untreated wood; non-hazardous absorbents, <i>etc.</i>
	Kitchen Waste	Temporary waste receptacles	Foodstuff, paper products, plastic film wrapping, <i>etc.</i>
	Untreated Wood	Temporary stockpiles	Excess slash, construction material, <i>etc.</i>
General Recyclables	Beverage Containers	L&P Disposal Ltd. Receptacles	Ready-to-serve drinks, except milk and milk products ( <i>i.e.</i> , pop, juice, bottled water and sports drinks)
	Plastic Grocery Bags	L&P Disposal Ltd. Receptacles	Keep clean and dry in a big disposal bag.
	Various	L&P Disposal Ltd. Receptacles	Household hazardous waste [aerosol paint/sprays; acetone; air fresheners (aerosol); ammonia; all-purpose cleaners; antifreeze; barbecue starters; batteries (household and vehicle); brake fluid and lining; butane refills; degreasers; car waxes/polishes; disinfectants; furniture polish/wax; gasoline; drain cleaners; insecticides; kerosene; lacquers; nail polish and remover; oven cleaners; paint thinners; photographic chemicals; paint and varnish; rust remover; turpentine; smoke detectors; spa and pool chemicals; waxes; wood preservatives/finishes]; cell phones; electronics; ink cartridges; milk jugs and cartons and tires
Industrial Hazardous Waste	--	RBW Waste Management Ltd. Receptacles	Filter and rag waste; contaminated soil; samples and/or containers; catalysts and desiccants
Industrial Recyclables	Plastic	L&P Disposal Ltd. Receptacles	#2 HDPE milk jugs and natural and oil jugs
	Scrap Metal	L&P Disposal Ltd. Receptacles	--

Container Label		Container Type*	Details
	Used Oil	Above ground disposal tanks; L&P Disposal Ltd. Receptacles	--
	Used Oil Filters	L&P Disposal Ltd. Receptacles	--

**Notes:**

- \* L&P Disposal Ltd. Receptacles = Paramount's General Waste Contractor
- \* RBW Waste Management Ltd. Receptacles = Paramount's Industrial Hazardous Waste Contractor

## 4.5 Waste Storage

Because of local treatment/disposal and access limitations, waste may need to be stored for long periods while awaiting transport to appropriate and approved facilities. Therefore, storage areas and containers become important considerations. General principles for the storage of non-hazardous waste are listed below.

1. The regular collection, grading and sorting of waste contribute to good housekeeping practices.
2. Placing scrap containers near where the waste is produced encourages orderly waste disposal and makes collection easier. The location of the stockpiles should not interfere with work but they should still be readily available when required.
3. Storing kitchen waste in a manner likely to attract wildlife is a violation of the NWT *Wildlife Act*. The following recommendations will minimize the attraction of carnivores to a camp:
  - Kitchen wastes should be incinerated daily. If kitchen wastes must be stored, airtight, sealed containers to prevent wildlife from being attracted to odors must be used.
  - All food in the camp should be stored in the kitchen or in a building attached to the kitchen, to ensure that there is only one area where food odors occur.
  - All grey water pits should utilize a grease trap, have lime added to them every second day and be covered to minimize odors and the potential attraction of carnivores.
  - No wildlife should be purposefully encouraged to habituate to human presence (*i.e.*, do not feed wildlife).
4. All waste receptacles should be clearly labeled and in good condition, not leaking and protected from the weather.
5. Inspect waste receptacles weekly and note any deterioration or corrosion in an inspection log. Clean-up any messes immediately.

General principles for the storage of hazardous waste are listed below [from the *Guideline for Hazardous Waste Management* (GNWT, 2017)].

1. Drainage into and from a waste storage site should be controlled to prevent spills or leaks from leaving the site and to prevent run off from entering the site.

2. Access to a waste storage site should be controlled. Only persons authorized to enter and trained in waste handling procedures should have access to the waste storage site.
3. Waste storage sites should have emergency response equipment appropriate for the waste stored on site. Furthermore, hazardous waste storage sites are expected to meet all local bylaw and zoning requirements. It is recommended that the local Fire Chief be advised of the storage facility and its content for emergency planning and response purposes.
4. Where long term storage of hazardous waste is required, quantity requirements (see Schedule I *Guideline for the General Management of Hazardous Waste in the NWT*) should be recognized. If quantity requirements are exceeded, the hazardous waste storage site should be registered in accordance with Section 3.4 of *Guideline for the General Management of Hazardous Waste in the NWT*.
5. Be sure that waste storage containers are compatible with chemical waste. Use containers that are made of or lined with materials which will not react with, and are otherwise compatible with, the waste to be stored. The original containers should be used, where possible.
6. Be sure that waste storage containers are sound, sealable and not damaged or leaking. Regular inspections for signs of leaks or deterioration should be performed and recorded.
7. Any container used to store hazardous waste must be labeled according to the requirements of the *Work Site Hazardous Materials Information System* (WHMIS) of the Safety Act (2006) or the relevant Transport Authority, if transport is planned.
8. Waste containers must be closed at all times, except when being filled. Do not leave funnels in the containers.
9. Maintain a record of the type and amount of waste in storage.

#### 4.6 Determining Destinations for Waste

Since local treatment and disposal options are limited, distance and shipping become the key considerations when determining the best waste management options. Table 4 lists waste management facilities currently closest to the Fort Liard, NWT Project area that may be used by Paramount.

#### 4.7 Waste Transporting and Tracking

##### 4.7.1 Waste Contractors

Transportation means will be carefully selected and checked with respect to health, safety and environment (HSE) requirements. Transporters of waste will be provided with instructions on how to handle emergency situations. When using waste contractors, the following details will be verified.

- Contracts with waste contractors contain appropriate provisions regarding HSE.
- Equipment provided for the storage and transport of wastes, such as waste bins or containers and trucks, are in good working order prior to being accepted by Paramount.
- Waste materials transferred to contractors are packaged and labeled appropriately.
- Shipping documentation is completed in accordance with approved procedures and rests with Paramount at the end of the project.
- Waste consignments reach the specified final disposal site and are disposed of at an approved facility.
- Transportation costs and tipping fees are a major component of the waste management program and require close monitoring and control.

#### 4.7.2 Trucking

At its most efficient, trucking occurs on a “back haul” when goods have been transported to Fort Liard. The ideal situation is to take advantage of the back haul. Therefore, anyone responsible for arranging the transport of goods to Fort Liard will be responsible for arranging a back-haul load. The Operations Manager (see Appendix 4 for contact information) can be consulted for assistance in identifying back haul loads.

#### 4.7.3 Tracking Hazardous and Non-Hazardous Waste

Paramount’s hazardous waste generator registration number is NTG 000104. The Federal Transportation of Dangerous Goods Act and Regulations (TDG) identify requirements for the transportation of dangerous goods. According to these regulations, Paramount is responsible for the safe handling and transport of all hazardous material. It is Paramount’s responsibility to ensure that anyone involved in the handling, offering for transport or transporting dangerous goods must be trained and certified or working under the direct supervision of a trained and certified individual.

#### **MOVEMENT DOCUMENTS**

When completed, project produced Movement Documents provide:

- detailed information on the types and amounts of wastes being shipped;
- a record of various firms or individuals involved in the shipment; and
- information on the treatment storage, and/or disposal of wastes when they reach their final destination.

A Movement Document must be used for all shipment of hazardous wastes as defined in the province or territory of destination or origin and Interprovincial Movement of Hazardous Waste Regulations. Paramount will utilize Movement Documents for non-hazardous wastes as well.

Movement Document completion instructions are provided in Figure 4 and Table 4 as well as on the reverse side of each Movement Document. Further assistance in completing a Moving Document may be obtained by referring to the DRAFT - Instructions for Completing Each Item on the Movement Document (Environment Canada, 2017) or by contacting the Motor Carrier Services of the GNWT Department of Transportation.

#### **MOVEMENT DOCUMENT DISTRIBUTION**

All Movement Documents must be tracked through their cycle by the waste generator. Movement Documents must be kept on file for a minimum period of two (2) years.

- Consignor (i.e., Paramount) forwards copy 1 (white) to the appropriate territorial authority and retains copy 2 (green).
- The carrier takes copies 3, 4, 5 and 6 with the shipment to give to consignee/receiver (i.e., facility).
- The consignee completes part C and forwards copy 3 (yellow) to the appropriate authority.
- The consignee gives copy 4 (pink) to the carrier, retains copy 5 (blue) and forwards copy 6 (brown) to the consignor. The consignor forwards a photocopy of copy 6 (or faxes copy 6) to Paramount’s Environmental Specialist, HSE Department (see Appendix 5 for contact information). Once the HSE Department receives a photocopy of copy 6, information is entered and stored in a database for Paramount’s use.



## 5. Waste Specific Management Options

Management options for wastes generated by the oil and gas sector in the Northwest Territories are very limited because of little to no waste infrastructure. Therefore, waste generated by the Fort Liard Project is primarily treated or disposed off-site and secondarily treated or disposed on-site (Table 5).

**Figure 4** Movement Document Completion Instructions

**MOVEMENT DOCUMENT / MANIFEST**  
**DOCUMENT DE MOUVEMENT / MANIFESTE**

- This Movement document/manifest conforms to all federal and provincial transport and environmental legislation.  
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport.

**SAMPLE FOR ILLUSTRATION ONLY**

Movement Document / Manifest Reference No.  
N° de référence du document de mouvement/manifeste

2486089-2

A Generator / consigneur Producteur / expéditeur				B Carrier Transporteur				C Receiver / consignee Réceptionnaire / destinataire			
		<div style="background-color: red; color: white; width: 20px; height: 20px; margin: auto;"></div>		Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial						<div style="background-color: red; color: white; width: 20px; height: 20px; margin: auto;"></div>	
Company name / Nom de l'entreprise						Company name / Nom de l'entreprise					
Mailing address / Adresse postale City / Ville Province Postal code / Code postal						Mailing address / Adresse postale City / Ville Province Postal code / Code postal					
E-mail / Courriel électronique Tel. No. / N° de tél.						E-mail / Courriel électronique Tel. No. / N° de tél.					
Shipping site address / Adresse du lieu de l'expédition						Vehicle / Véhicule Registration No. / N° d'immatriculation					
City / Ville Province Postal code / Code postal						Trailer - Rail car No. 1 Remorque - wagon					
Intended Receiver / consignee Réceptionnaire / destinataire prévu						Port of entry / Point d'entrée International use only					
<div style="background-color: red; color: white; width: 20px; height: 20px; margin: auto;"></div>						Port of exit / Point de sortie International use only					
Mailing address / Adresse postale City / Ville Province Postal code / Code postal						Carrier Certification: I certify that I have received waste or recyclable material from the generator / consigneur for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.					
E-mail / Courriel électronique Tel. No. / N° de tél.						Name of authorized person (print): Nom de l'agent autorisé (caractères d'imprimerie):					
Receiving site address / Adresse du lieu de l'expédition						Tel. No. / N° de tél.					
City / Ville Province Postal code / Code postal						Year / Année Month / Mois Day / Jour Signature:					
Receiving site address / Adresse du lieu de destination						Date received / Date de réception Time / Heure					
Year / Année Month / Mois Day / Jour						AM PM					
If waste or recyclable material to be transferred, specify intended company name / Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire						Registration No. / Provincial ID No. N° d'immatriculation / d'id. provincial					
						<div style="background-color: red; color: white; width: 20px; height: 20px; margin: auto;"></div>					
Prox. code Code prov.	Shipping name Appellation réglementaire	Class / Classe Sub. classe(s) Classification	UN No. Numéro	Packing / Risk gr. Gr. d'emballage	Quantity shipped Quantité expédiée	Units Lor / ou kg	Packaging / Container No. / N°	Phys. state État physique			
(1)											
(2)											
(3)											
(4)											
(5)											
(6)											
Notice No. N° de notification	Notice Line No. N° de ligne de la notification	Shipment Envoi	Of / De	D or R code Code D ou R	C code Code C	H code Code H	Y code Code Y	National code in country of origin Code national dans le pays d'origine	Export Expédition	Import Importation	Customs code(s) Code(s) de douanes
(7)											
(8)											
(9)											
(10)											

MOE 04-1917 (07/07)

**Table 4: Movement Document Completion Instructions**

BOX #	Box label	Instructions for Box Entries		
1	Generator & Registration No.	Paramount Resources Ltd. Suite 2800 421 7 <sup>th</sup> Avenue SW Calgary, AB T2P 4K9 Telephone No.: 403.290.3600	Registration No.: NTG000104	
2	Intended Receiver	Water Treatment Plants Tervita Energy Services Newalta Corporation	See waste facility brochures below.	
3	Provincial Code	See Table 5		
4	Shipping Name			
5	Class			
6	UN No.			
7	Packing Risk Group			
8	Quantity Shipped and Units	Enter the quantity of waste being shipped in metric units. Indicate the units used as with either kilograms (kg) or litres (L). If the exact amount of waste is not known enter "est." Before the number for an estimated amount.		
9	Packaging	Enter the number of individual packages used to ship waste in the column head "No."		
		Enter the codes for the type of packaging used in the shipment in the column headed "Codes".	Code	Container
			01	Drum
			02	Tank
			03	Bulk (e.g., Vac Truck, End Dump, etc.)
			04	Carton
			05	Bag
			06	Roll off or lugger
		07	Other (e.g., pail, palette, etc.)	
10	Physical state	Enter the physical state of the waste as solid (s), liquid (l) or gas (g).		

**Table 5 Paramount Resources Ltd. NWT Abandonment Waste Stream and Waste Management Plan.**

*Because of the small volume of various wastes which may be generated during this activity, a combination waste bin will be provided, and a specialized waste management contractor will handle disposal of the contents at the end of the project*

Waste	Storage	NWT Classification	BC Classification	AB Classification	AER Code	Shipping Name	Class	UN #	Packing Group	Disposal
Aerosol Cans (flammable)	Waste Bin-HAZ	HAZ	HAZ	DOW	WSTCGS	AEROSOLS, flammable	2.1	UN1950	-	Turnkey management of HAZ waste provided by contractor
Aerosol Cans (non-flammable)	Waste Bin-HAZ	HAZ	HAZ	DOW	EMTCON	AEROSOLS, non - flammable	2.2	UN1950	-	Turnkey management of HAZ waste provided by contractor
Barrels, Pails (Completely Empty)	Waste Bin	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Batteries (Dry Cell)	General Recyclable – Various [see <i>Guideline for the Management of Waste Batteries</i> (GNWT, 1998) for recommendation]	Non-HAZ	Non-HAZ	Non-DOW	BATT	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Batteries (Dry Cell)		HAZ	HAZ	DOW	BATT	Batteries, dry, containing potassium hydroxide solid, electric storage	8	UN3028	III	Turnkey management of non-HAZ waste provided by contractor
Boiler Blowdown Water (contaminated with HAZ material - dependent on boiler chemicals)	Steel Tank	HAZ	HAZ	DOW	BLBDWT	Environmentally hazardous substance, liquid, N.O.S.	9	UN3082	III	Service rig contractor to arrange transport & disposal at licenced facility in BC or AB
Boiler Blowdown Water (non-contaminated with HAZ material)	Steel Tank	Non-HAZ	Non-HAZ	Non-DOW	BLBDWT	-	-	-	-	Surface discharge where water is sufficiently cooled that it does not materially affect the snow/ice cover
Cardboard	Stockpile	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Incinerate daily
Cement Returns	Retarded or diluted in steel tank	Non-HAZ	Non-HAZ	Non-DOW	Cement	-	-	-	-	Transport & disposal at licenced facility in BC or AB
Chemicals (inorganic)	Original Containers	HAZ	HAZ	DOW	INOCHM	Dependent on specific waste characteristics (consult TDG Regulations)				Contact Chemical Waste Exchange
Construction and Demolition Material (uncontaminated)	Stockpile	Non-HAZ	Non-HAZ	Non-DOW	CONMAT	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Contaminated Debris and Soil (Chemical/Solvent/Oil/Produced Water)	Contact Paramount Environmental Dept				SOILCH SOILCO SOILPW	Dependent on specific waste characteristics (consult TDG Regulations)				Contact Paramount Environmental Dept for approved landfill location
Corrosion Inhibitor/Oxygen Scavenger Solutions	Original Containers	HAZ	HAZ	DOW	CORINH	Dependent on specific waste characteristics (consult TDG Regulations)				Turnkey management of HAZ waste provided by contractor
Filters – Lube Oil	Waste Bin-HAZ	HAZ (depending on flash point and BTEX content)	HAZ (depending on flash point and BTEX content)	DOW (depending on flash point and BTEX content)	FILLUB	Environmentally Hazardous Substance, Solid N.O.S. (lead)	9	UN3077	III	Turnkey management of HAZ waste provided by contractor
Filters – Reverse Osmosis (Granular Activated Carbon, Silica Sand)	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	FILWTT	Filters (Media) - Water Treatment	-	-	-	Turnkey management of non-HAZ waste provided by contractor

Waste	Storage	NWT Classification	BC Classification	AB Classification	AER Code	Shipping Name	Class	UN #	Packing Group	Disposal
Grease Cartridges (Completely Empty)	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Hydraulic and Transmission Oil	Waste Bin- non HAZ				HYDOIL	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Kitchen Waste	Temporary Waste Receptacle	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Incinerate daily
Incinerator (kitchen waste)	General & Industrial non- HAZ Waste	Non-HAZ	Non-HAZ	Non-DOW	INCASH	-	-	-	-	Turnkey management of non-HAZ waste (ash) provided by contractor
Lead Based Products (Pipe Dope/Greases)	Waste Bin-HAZ	HAZ	HAZ	DOW	LDDOPE	Dependent on specific waste characteristics (consult TDG Regulations)				Turnkey management of HAZ waste provided by contractor
Lubricating Oil (Hydrocarbon and Synthetic)	Above ground disposal tanks; L&P Disposal Receptacles	Non-HAZ (unless containing heavy metals such as Vanadium or Lead	Non-HAZ (unless containing heavy metals such as Vanadium or Lead	Non-HAZ (unless containing heavy metals such as Vanadium or Lead	LUBOIL	-	-	-	-	Turnkey management of HAZ waste provided by contractor
Metal (Scrap) (uncontaminated)	Industrial Recyclable – Scrap Metal	Non-HAZ	Non-HAZ	Non-DOW	SMETAL	-	-	-	-	Recycle location - TBD
Mud Sacks – Completion/Abandonment	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Pipe Dope Containers/Brushes (Completely Empty & Dry)	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	EMTCON	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Sewage (Temporary Camps)	Sewage Sump or Storage Tank	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Lime treatment and mix-bury-cover
Thread Protectors – Casing/Tubing	Waste Bin- non HAZ	Non-HAZ	Non-HAZ	Non-DOW	THPROT	-	-	-	-	Turnkey management of non-HAZ waste provided by contractor
Water - Contaminated Produced (Including Brine Solutions)	Storage Tank				WATER					Transport & disposal at licenced facility in BC or AB
Wash Fluids - Water	Steel Tank	Testing Required			WSHWTE	Environmentally Hazardous Substance	9	UN3082	III	Transport & disposal at licenced facility in BC or AB
Water - Grey (Temporary Camp)	Sewage Sump or Grey water holding tank	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Lime treatment and mix-bury-cover or, as required, water is sampled, analyzed and, decanted to the surrounding environment, if suitable (see Appendix 2)
Water – Uncontaminated (surface run off, remediated)	Storage Tank	Testing Required			-	-	-	-	--	Surface discharge of water within lease boundary. Water will be released back to the environment in accordance with AER Directive 055 criteria.

Wood, untreated (e.g., Dimensional Lumber, Wooden Pallets, Wooden Packing Crates, etc.)	Stockpile	Non-HAZ	Non-HAZ	Non-DOW	-	-	-	-	-	Open burn (according to a “Permit to Burn” from the Forest Management Division, Environment and Natural Resources, GNWT)
DOW:	Dangerous Oilfield Waste	HAZ:	Hazardous							
Packing Group:	A group in which dangerous goods are included based on the inherent danger of the dangerous goods.									
Packing Group I	indicates great danger									
Packing Group II	indicates medium danger									
Packing Group III	indicates minor danger									

## 6. References

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## Appendix 1: Project Maps



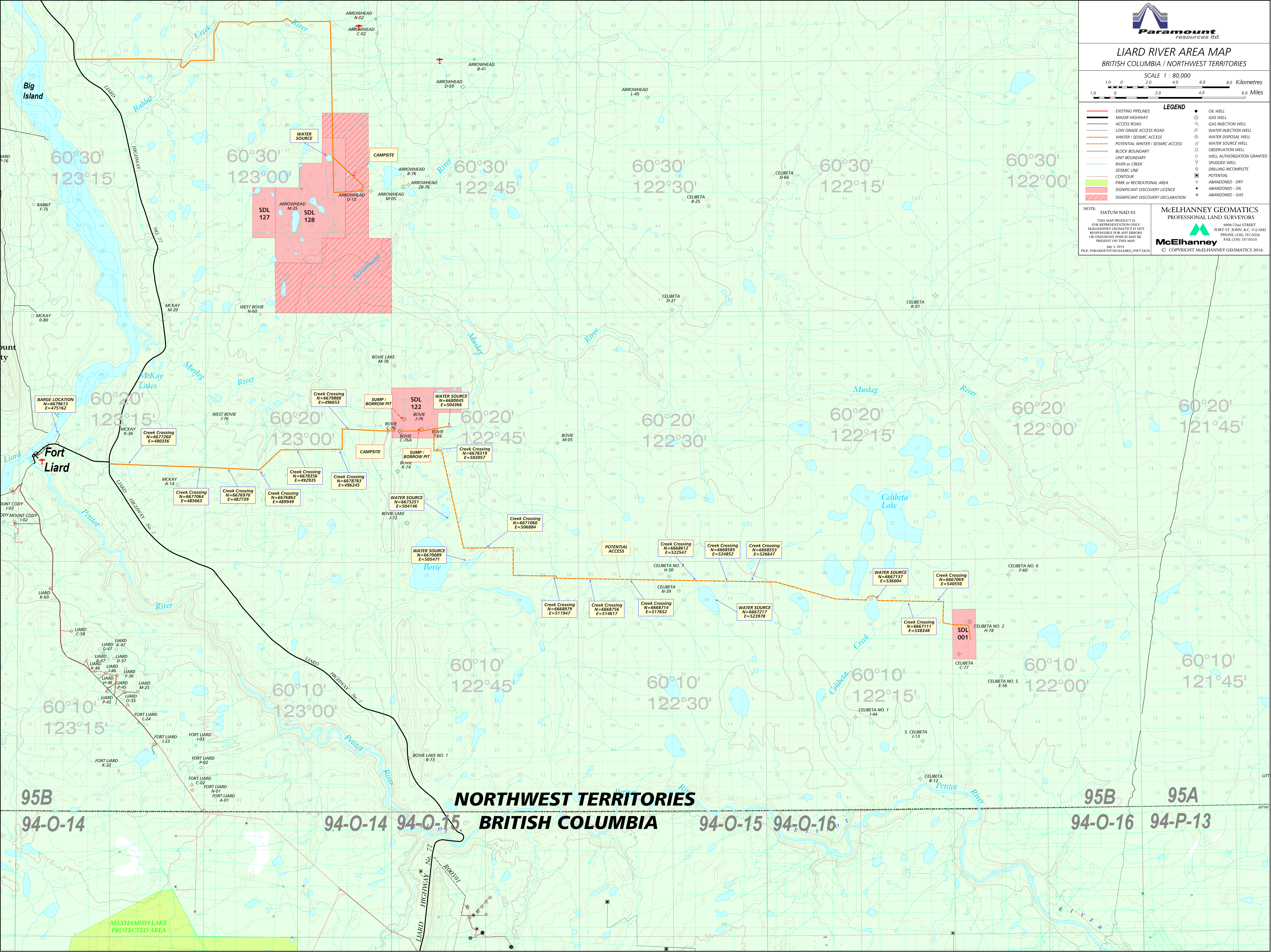
**LIARD RIVER AREA MAP**  
BRITISH COLUMBIA / NORTHWEST TERRITORIES

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1.0 0 2.0 4.0 6.0 Miles

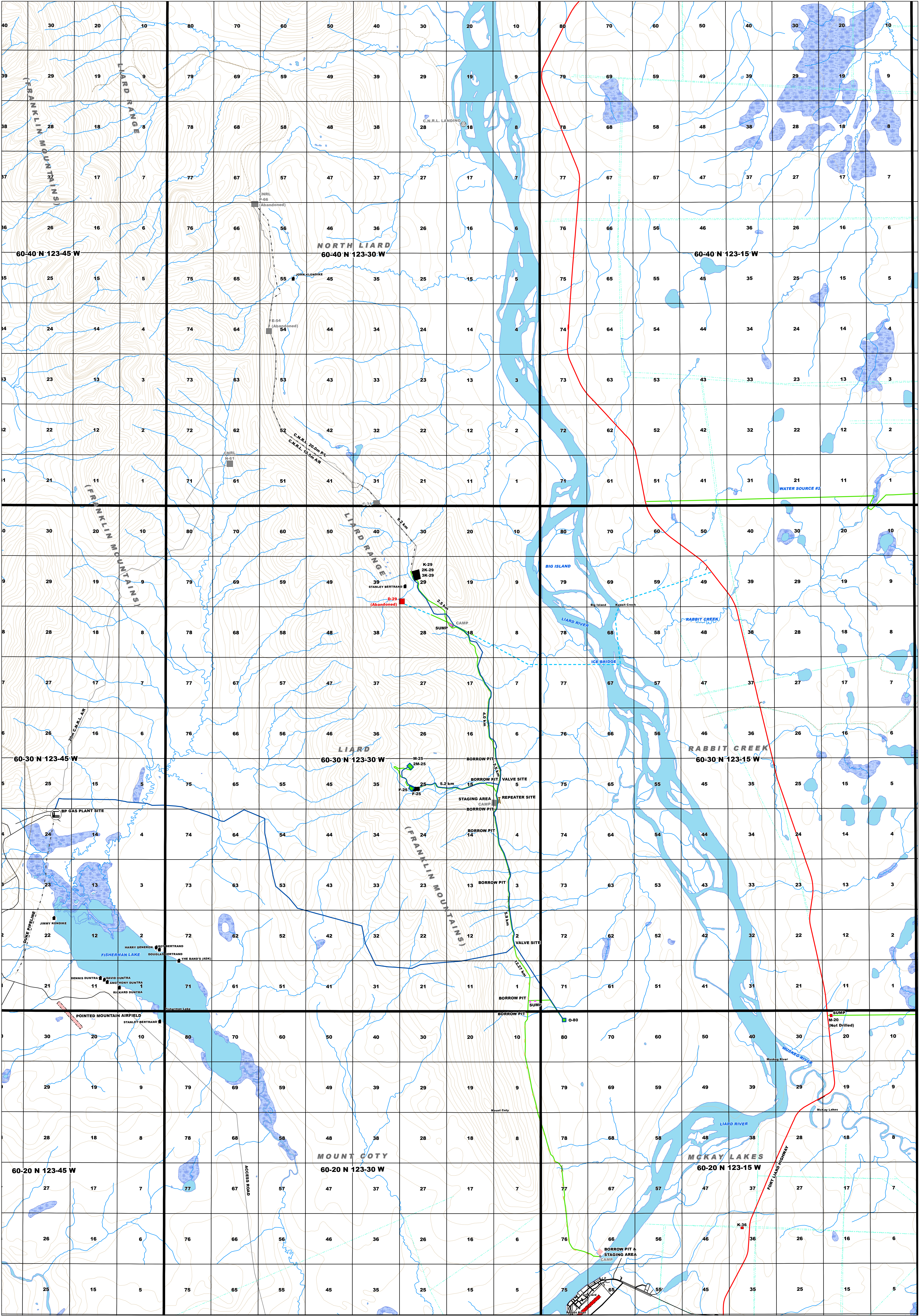
- LEGEND**
- |                                   |                            |
|-----------------------------------|----------------------------|
| EXISTING PIPELINES                | OIL WELL                   |
| MAJOR HIGHWAY                     | GAS WELL                   |
| ACCESS ROAD                       | GAS INJECTION WELL         |
| LOW GRADE ACCESS ROAD             | WATER INJECTION WELL       |
| WINTER / SEISMIC ACCESS           | WATER DISPOSAL WELL        |
| POTENTIAL WINTER / SEISMIC ACCESS | WATER SOURCE WELL          |
| BLOCK BOUNDARY                    | OBSERVATION WELL           |
| UNIT BOUNDARY                     | WELL AUTHORIZATION GRANTED |
| RIVER or CREEK                    | SPRUDDLED WELL             |
| SEISMIC LINE                      | DRAWING INCOMPLETE         |
| CONTOUR                           | POTENTIAL                  |
| PARK or RECREATIONAL AREA         | ABANDONED - DRY            |
| SIGNIFICANT DISCOVERY LICENCE     | ABANDONED - OIL            |
| SIGNIFICANT DISCOVERY DECLARATION | ABANDONED - GAS            |

NOTE: DATUM NAD 83  
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July 5, 2018  
FILE: PARAMOUNT\2018\LIARD\_NWT.DGN

**McElhanney GEOMATICS**  
PROFESSIONAL LAND SURVEYORS  
8808-72nd STREET  
FORT ST. JOHN, B.C. V1J 6M2  
PHONE (250) 767-0336  
FAX (250) 767-0310  
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**As-Built Map**  
**FORT LIARD WEST**  
2013  
Northwest Territories  
NAD 1983 UTM Zone 10N

**Legend**

Cabins	<b>Transportation</b>	<b>Leases</b>	<b>Battery</b>	Watercourse
Seismic	Fort Liard Highway	Built	Built	String Bog
Airstrip	Old Paramout Ice Road	Built - Tied-in	Built - Tied-in	Waterbody
Built	Road	Foreign	Foreign	Wetland
Foreign	Trail	Reclaimed	Reclaimed	Contours
<b>Gathering System</b>	Access Built	Gas Plant	Borrow Pit	
Built	Access Foreign	Camp	Borrow Pit	
Not Used	Bridge	Other	Other	
Not Built	Barge	Built	Decking Site - Built	
Foreign		Foreign		

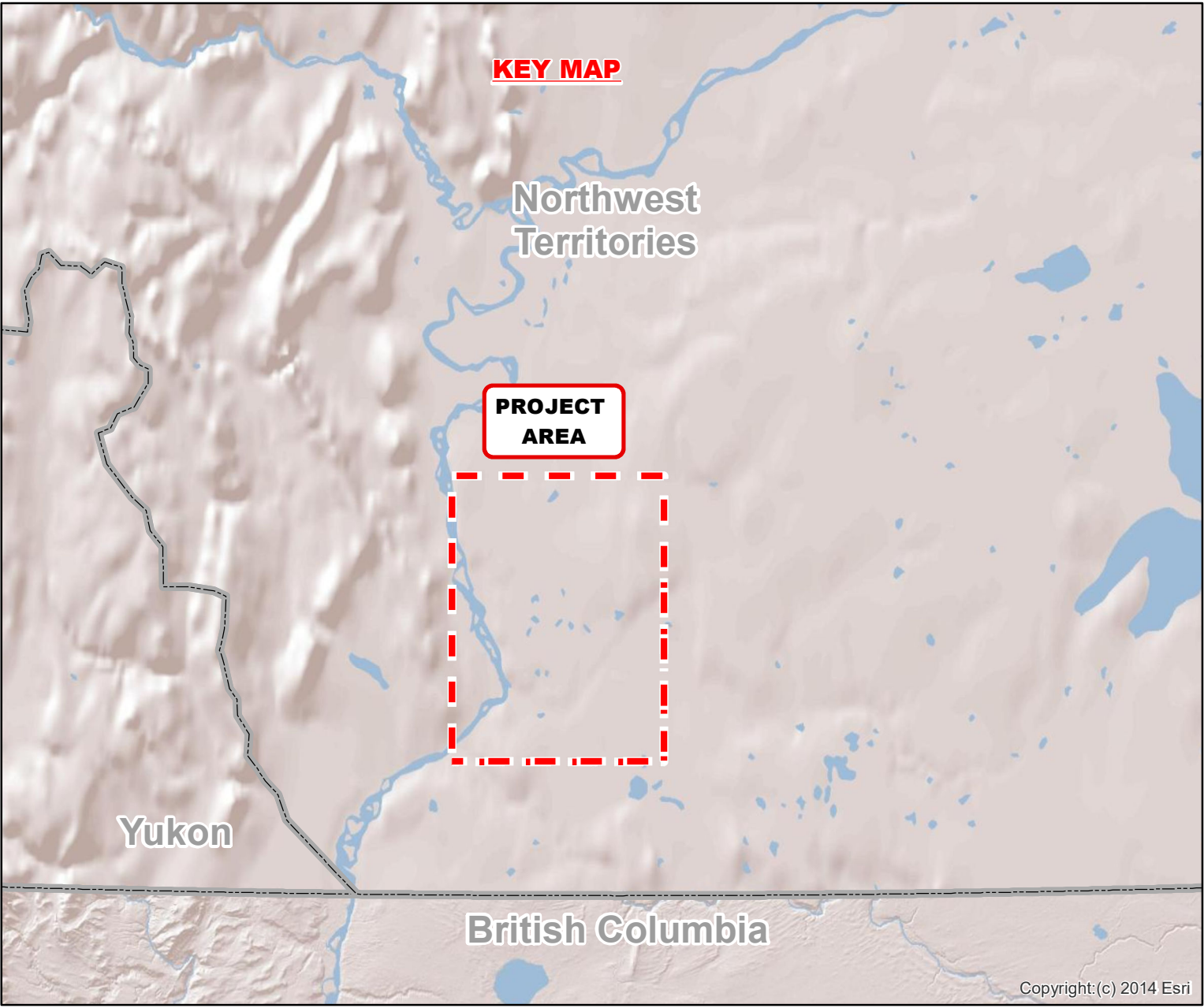
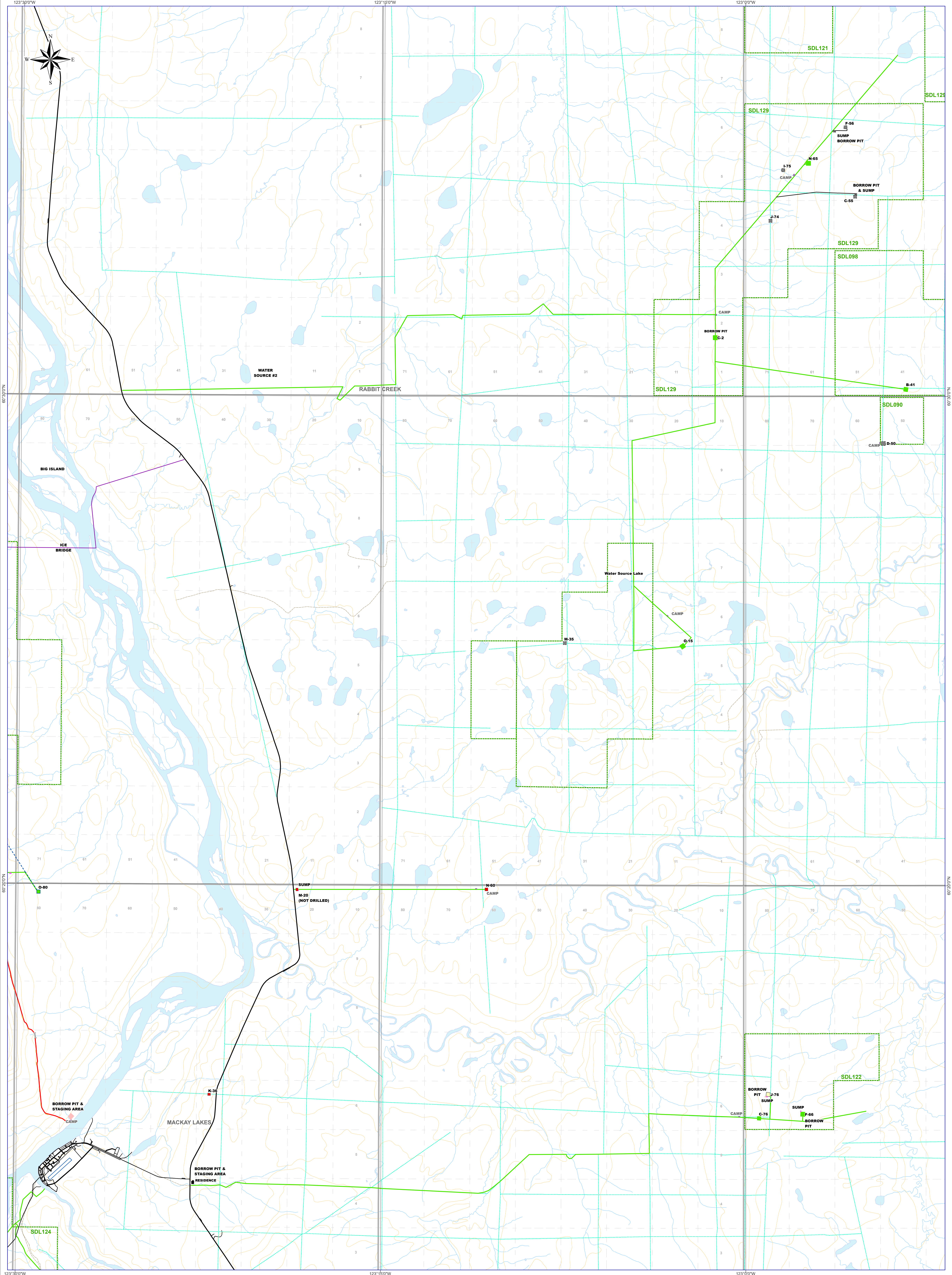
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1:50,000

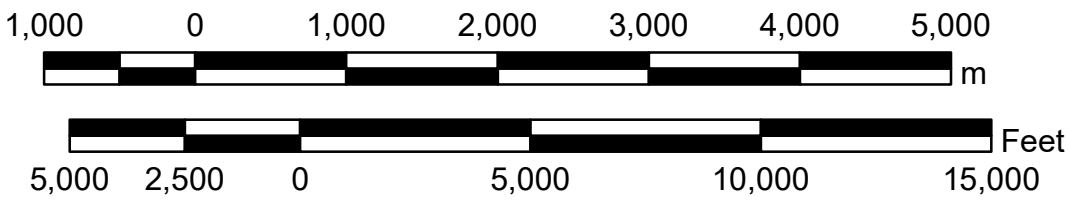
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Projection: NAD 1983 UTM Zone 10N





OVERVIEW MAP SHOWING  
**FORT LIARD EAST**  
As-Build June 2009

60°40', 123°15' Sec.78 to 60°20', 122°45' Sec.33  
**NORTHWEST TERRITORIES**



Scale: 1:50,000

- Legend**
- Seismic
  - Airstrip
  - Airstrip (Foreign)
  - Pipeline R/W
  - Pipeline R/W Foreign
  - Winter Access Road
  - All Season Access Road
  - Access Road - (Foreign)
  - Fort Liard Highway
  - Old Paramount Ice Road
  - Road
  - Trail
  - Significant Discovery Licence
  - Contour
  - Abandoned
  - Built
  - Built - Tied-in
  - Foreign
  - Reclaimed
  - Suspended
  - Bridge

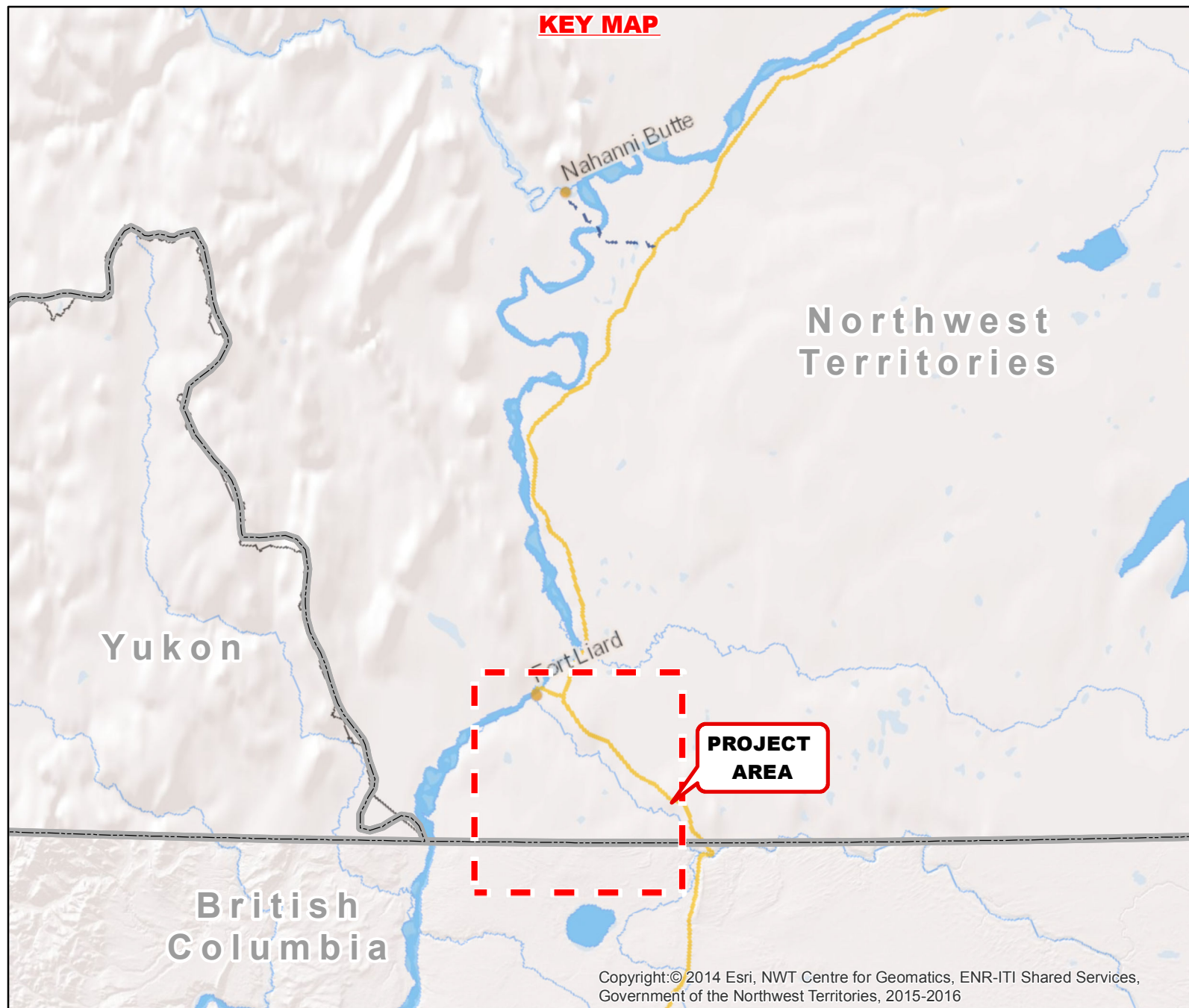
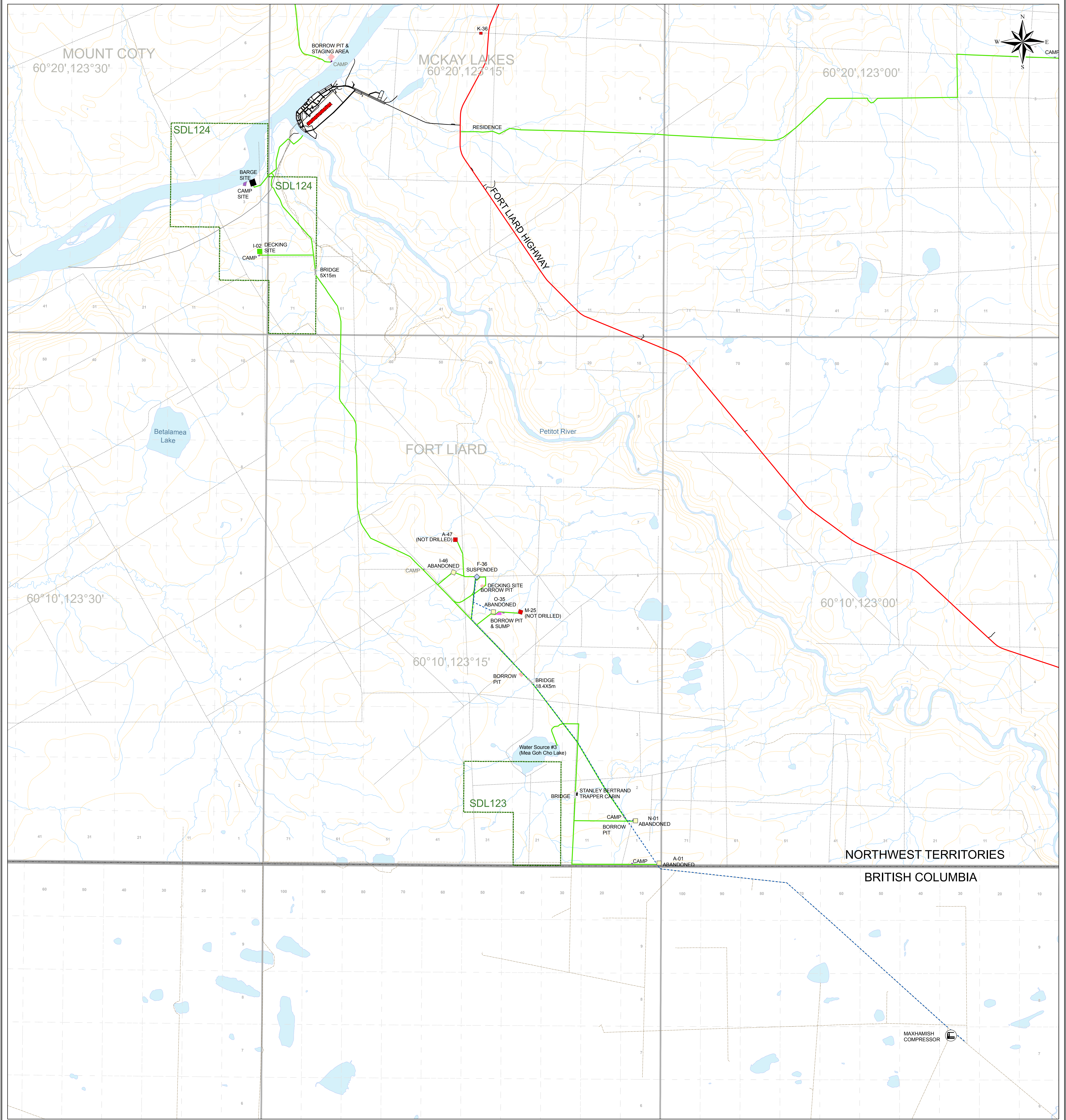
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REVISION	DESCRIPTION	DRAWN BY	DATE
00	Original Map Created as 050399G01_2009.dwg	WGT	2006-06-13
06	Updated Map Title	BPV	2009-06-03
07	Status of J-76 changed to 'Abandoned'	AJB	2020-04-01



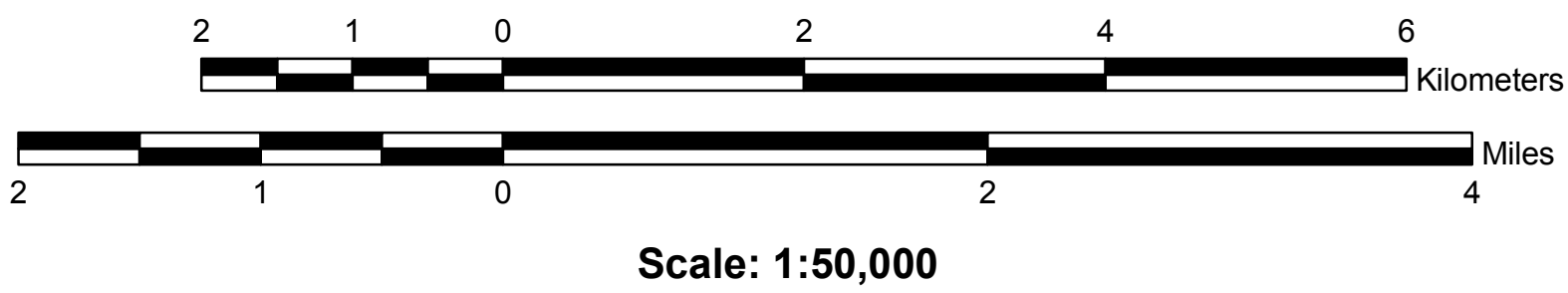
Toll Free: 1-888-454-3031  
www.ugsc.ca





# FORT LIARD SOUTH

As-Build June 2017  
60°20', 123°30" to 60°10', 123°00'  
NORTHWEST TERRITORIES



**Leases**

- Abandoned
- Built
- Built - Tied-in
- Foreign
- Reclaimed
- Suspended

**Facilities**

- Camp - Built
- Camp - Foreign
- Battery - Built
- Sump - Built
- Borrow Pit - Built
- Decking Site - Built

**Legend**

**Gathering System**

- Built
- Not Used
- Not Built
- Foreign

**Access Roads**

- Access Built
- Access Foreign

**Roads**

- Road
- Built
- Foreign

**Structures**

- Bridge
- Gas Plant / Compressor
- Cabins

**Transportation**

- Highway
- Old Paramount Ice Road
- Road
- Trail
- Cut Line

**Boundaries**

- SDL Lands
- Provincial Boundaries
- Contours

**Hydrography**

- Waterbody
- Watercourse

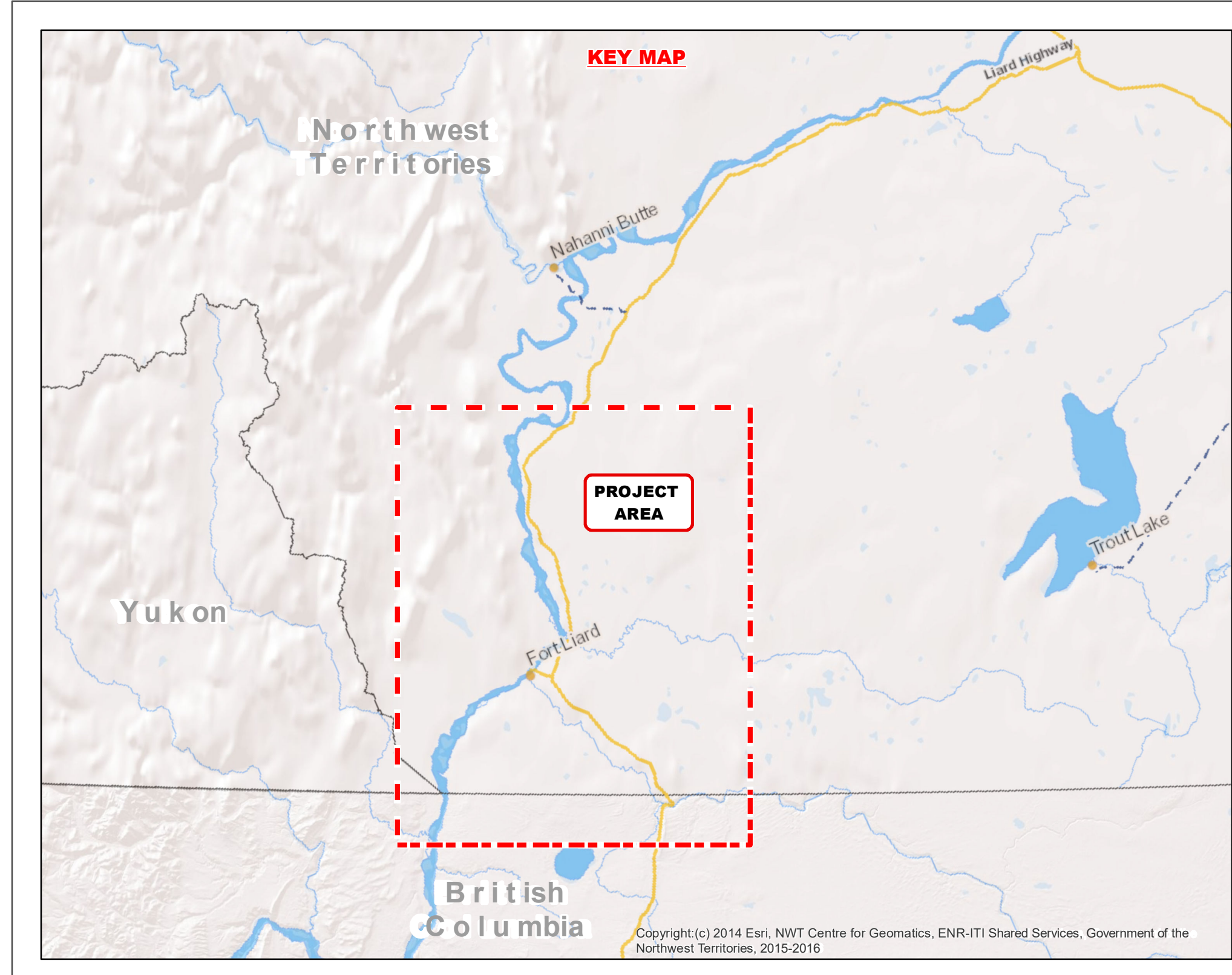
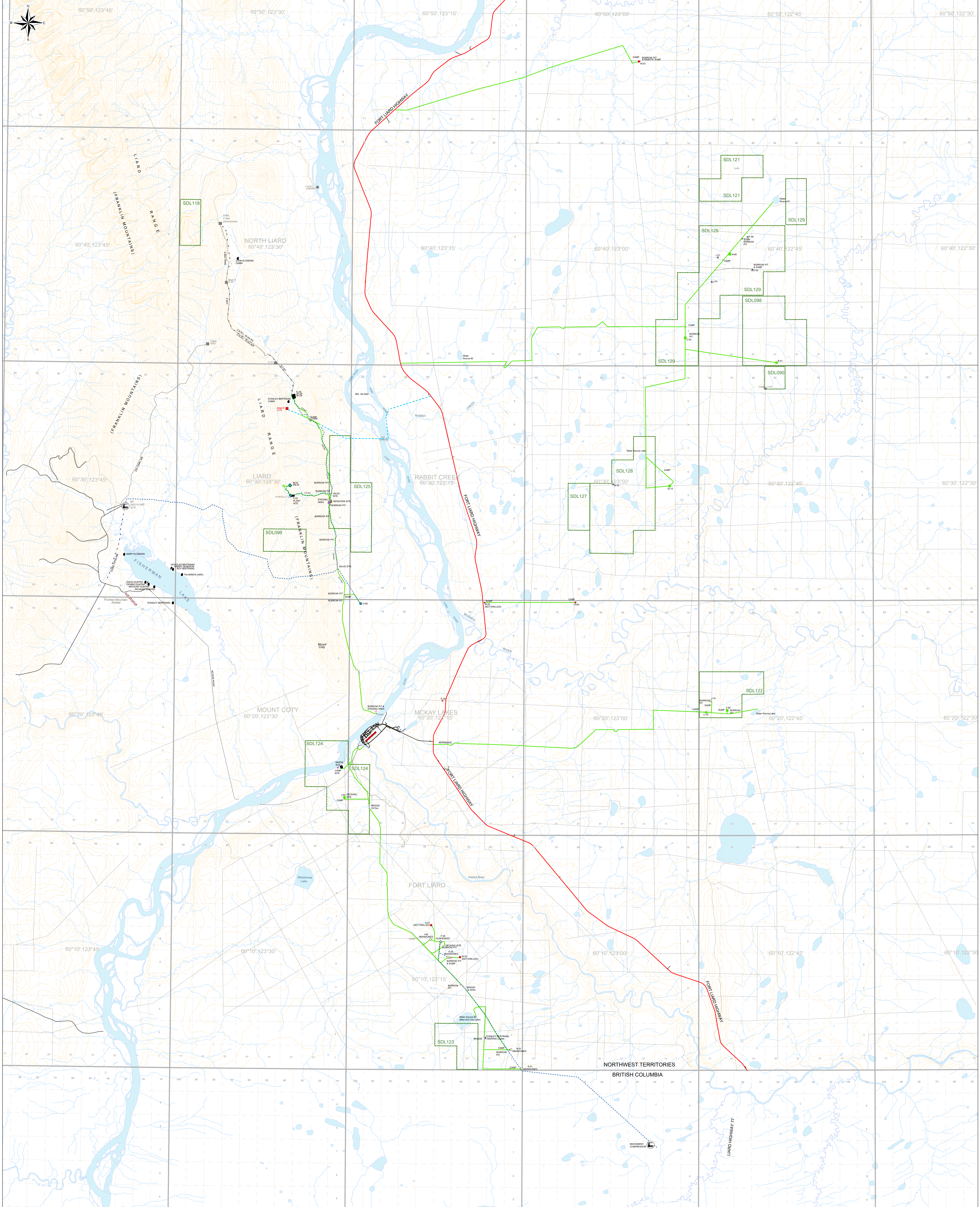
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Job No.: 170347C    MXD No.: 170347-OM-02.mxd    Coordinate System: NAD 1983 UTM Zone 10N

REVISION	DESCRIPTION	DRAWN BY	DATE
00	Original Map Created	KDG	2017-06-27

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OVERVIEW MAP SHOWING

FORT LIARD

As-Build June 2017  
60°50', 123°45" to 60°10", 122°45"  
NORTHWEST TERRITORIES

05

2.5

0

5

10

15

052.50051015Kilometers

5

2.5

0

5

10

52.500510Miles

Scale: 1:75,000

Leases

Abandoned

Built

Built - Tied-in

Foreign

Reclaimed

Suspended

Facilities

Camp - Built

Camp - Foreign

Battery - Built

Sump - Built

Borrow Pit - Built

Decking Site - Built

Legend

Gathering System

Built

Not Used

Not Built

Foreign

Access Roads

Access Built

Access Foreign

Road

Built

Foreign

Bridge

Gas Plant / Compressor

Cabins

Transportation

Highway

Old Paramount Ice Road

Road

Trail

Cut Line

Boundaries

SDL Lands

Provincial Boundaries

Contours

Hydrography

Waterbody

Watercourse

REVISION

00

Original Map Created as 170347-OM-01

KDG

2017-06-28

01

Status of J-76 changed to 'Abandoned'

AJB

2020-04-01

Job No.: 200007C

MXD No.: 200007-OM-01.mxd

Coordinate System: NAD 1983 UTM Zone 10N

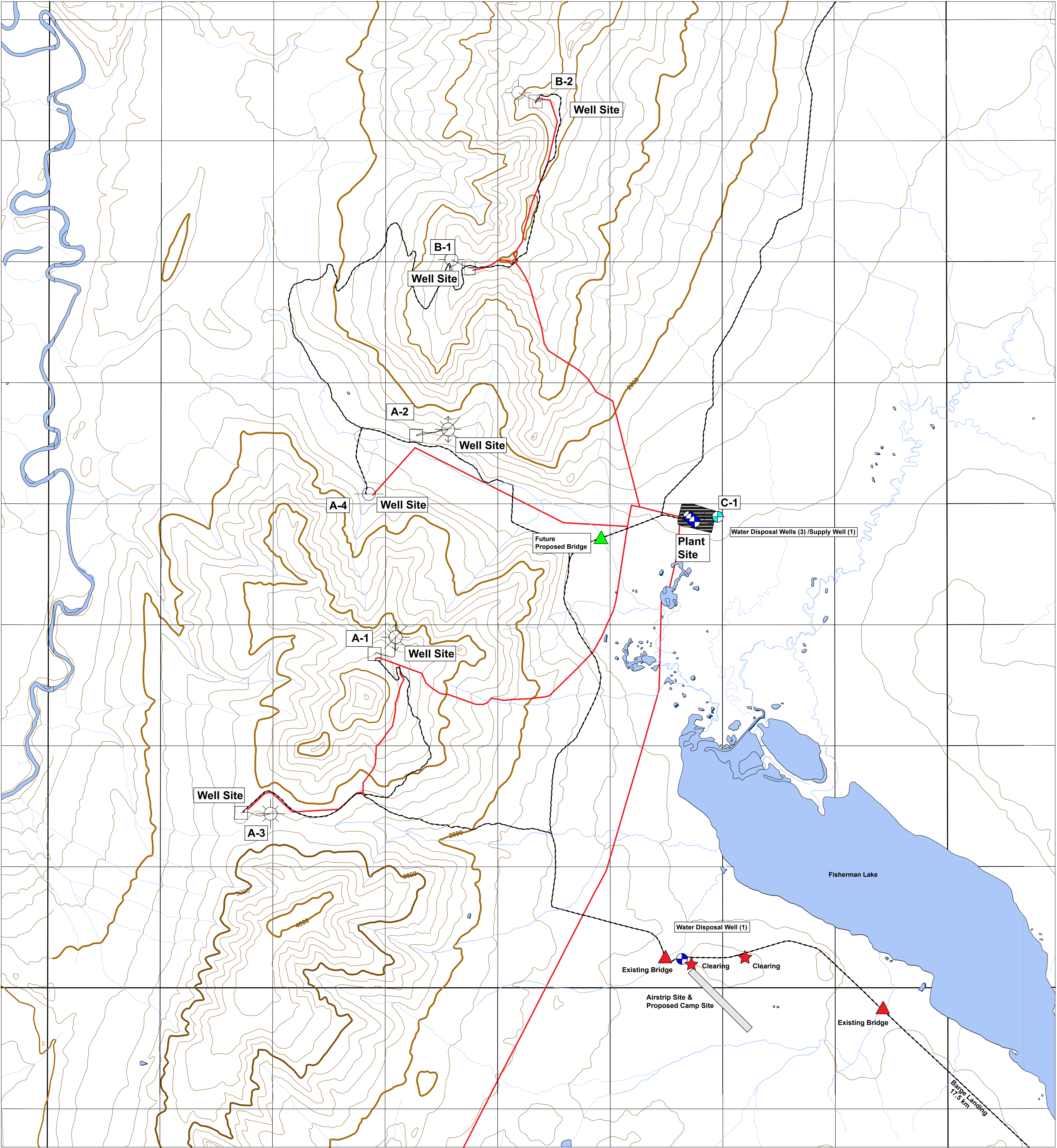
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124°00'W



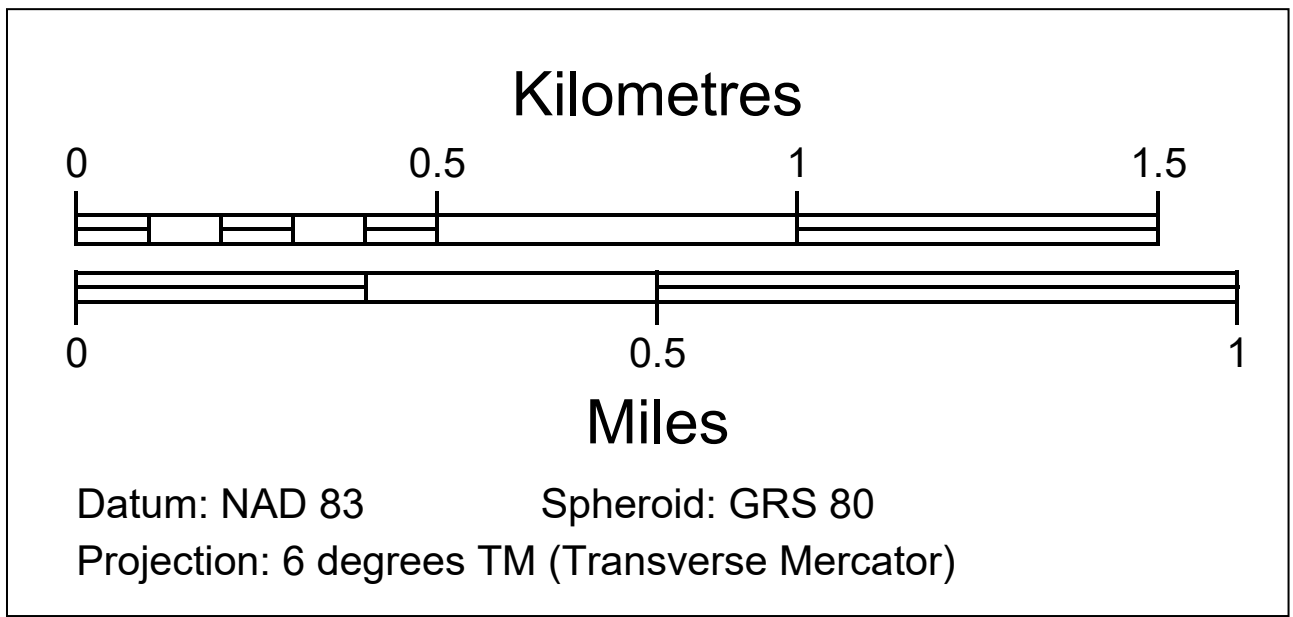
60°20'N

60°20'N

124°00'W

123°50'W

- Existing Bridge
- Future Proposed Bridge
- Disposal Well
- Water Supply Well
- Road
- Paramount Pipeline
- Contours (1000 ft interval)
- Contours (200 ft interval)



Paramount Resources Ltd

## Former Pointed Mountain Gas Field Overview Map

By: RJD Date: 2020/07/07  
Scale = 1:20000 Project: MasterABS



## Appendix 2: Paramount HSE Policy



## Health, Safety and Environment Policy

Paramount Resources Ltd ("Paramount") is committed to a culture where prevention of incidents that may cause harm to people, property loss or an adverse impact on the environment is of the highest importance.

We believe that promoting operational discipline and consistency as detailed in the Paramount Operational Excellence Management System (**POEMS**) is of critical importance in fulfilling our commitments in the areas of health, safety and environmental protection. Our commitments include:

**Worker Health and Safety:** We will endeavor to ensure that all work performed for Paramount is done so in a safe manner by competent workers using appropriate equipment. It is a requirement that work should only proceed once hazards have been identified and appropriate controls put in place to prevent/minimize any potential incidents or loss.

All employees and contractors conducting work for Paramount have the right to stop or refuse work that they consider to be unsafe or environmentally irresponsible without fear of repercussion.

**Environmental Protection:** We are committed to achieving a high standard of environmental stewardship. We ensure that environmental protection is an integral component of our decision making by identifying the potential environmental impacts associated with our activities and taking prudent actions to prevent/minimize these impacts and reduce our environmental footprint.

**Regulatory Compliance:** We are committed to complying with all applicable Federal and Provincial laws and regulations and recognized industry standards and practices. Individuals who violate applicable laws and regulations will be held responsible for their actions.

**Continuous Improvement:** Incidents and potential incidents are reported and analyzed to determine causes and identify corrective actions and shared learnings in order to reduce the risk of recurrence. We review the adequacy and effectiveness of all our policies, processes, programs and procedures on a regular basis to ensure they remain appropriate and up to date.

Paramount believes that its interests and those of its stakeholders, including the communities in which we operate, are best served by diligently applying the principles, practices and procedures set out in POEMS in all of our operations, and we will take steps to ensure that everyone working for Paramount supports and conducts themselves in accordance with this management system.

A handwritten signature in black ink, appearing to read "J.H.T. Riddell", positioned above a horizontal line.

J.H.T. Riddell  
President and Chief Executive Officer



## Appendix 3: Beverage Container Preparation

Container Type	Picture	Instructions
Aluminum Can		Empty container Do not need to crush
Glass Bottle		Remove cap Empty container Leave label on Do not break or crush
Plastic Bottle		Remove cap Empty container Leave label on
Juice Box and Drink Pouch		Empty container Take straw out
Juice Carton		Remove cap Empty container
Bi-metal Can		Empty container Leave label on Do not break or crush
Bag-in-a-Box		Empty container Keep the bag and box together
Large Milk Containers		Remove cap Empty container Rinse container out Squash container
Small Milk Containers		Remove cap Empty container Rinse container out Leave label on

## Appendix 4: Paramount Contact Information

<b>Title</b>	<b>Name</b>	<b>Contact</b>
<b>Completions Field Supervisor</b>	TBD	Telephone: Email:
<b>Completions Supervisor</b>	Richard Bean	Telephone: 403-290-3640 Email: richard.bean@paramountres.com
<b>Road and Bridge Maintenance Supervisor</b>	Bob Raduenz	Telephone: 780-915-6630 Email: kevlan1@telus.net
<b>Construction Supervisor</b>	Tyler Wilson	Telephone: 403-290-6265 Email: tyler.wilson@paramountres.com
<b>Director, HSE</b>	Darren Erdely	Telephone: 403-290-3664 Email: Darren.erdely@paramountres.com
<b>Director, Asset Management</b>	John Hawkins	Telephone: 403-817-5074 Email: john.hawkins@paramountres.com
<b>Environmental Coordinator</b>	Ian Keir	Telephone: 403-817-5077 Email: ian.keir@paramountres.com
<b>Director, Drilling &amp; Completions</b>	Andre Poitras	Telephone: 403-206-3895 Email: andre.poitras@paramountres.com
<b>Manager, Drilling and Completions</b>	Tim Wood	Telephone: 403-290-2919 Email: tim.wood@paramountres.com
<b>Regulatory and Community Affairs Advisor</b>	Terence Hughes	Telephone: 403-206-3859 Email: terence.hughes@paramountres.com
<b>Onsite HSE Advisor</b>	TBD	Telephone: Email:

## Appendix 5: Drilling Sumps

### Glossary

<b>Drill Cuttings</b>	Cuttings of rock and other subterranean materials brought to the surface during the drilling of wellholes. When drill cuttings are brought to the surface, they are mixed with “drilling mud” and “mud additives”. “Drilling waste fluids” are removed from drill cuttings prior to their deposition in a sump.
<b>Drilling Mud</b>	A suspension in water used in rotary drilling, consisting of various substances in a finely divided state (commonly bentonitic clays and chemical additives), introduced continuously down the drill pipe under pressure and through openings in the drill bit, and transported back up in the annular space between the pipe and the walls of the hole to a surface pit or tank, where it is conditioned and reintroduced into the wellbore. It is used to lubricate and cool the bit, carry the cuttings up from the bottom, and prevent blowouts and cave-ins.
<b>Drilling Waste Fluids</b>	A mixture of water, drilling muds, additives, and various other wastes that specifically relate to the drilling activity.
<b>Mud Additives</b>	A mud additive from a toxicant group. Includes bactericides, corrosion inhibitors, defoamers, emulsifiers, foaming agents, lubricants, shale control inhibitors, and surfactants.
<b>Remote Sumps</b>	Remote sumps are located on a standalone site that may receive drilling waste from more than one well.

### Introduction

Remote drilling sumps have been used for the disposal of drill cuttings. Remote areas have been selected to accommodate the prior drilling program. Sumps will be managed going forward according to the *AER Directive 50: Drilling Waste Management (May, 2012)*.

### Final Abandonment and Restoration

The fundamental principle governing restoration is that any restored land must be brought back to either its pre-disturbed state or state equivalent to the adjacent land use. Because Paramount will meet disposal criteria in *AER Directive 50: Drilling Waste Management*, the final reclamation process and objective to restore the site to equivalent land capability should not be impeded.