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# **Victoria Mine Project – Project Description Report Summary**

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47VP-047700-003-RPT-0008

May 1, 2019

## SUMMARY

### General Project and Proponent Information

FNX Mining Company Inc. (FNX), a wholly owned subsidiary of KGHM International Ltd. (KGHM) is proposing to develop the Victoria Mine Project (46°25'N latitude, 81°23'W longitude) (the Project) which is located approximately 35 kilometres west from the City of Greater Sudbury, within the Sudbury Basin in northeastern Ontario. The Project is comprised of an underground copper-nickel mine with recoverable platinum group elements. The Project is highly compatible with the existing land use in the City of Greater Sudbury, as it is consistent with historical and current mining projects and activities in the Sudbury Basin.

With facilities in Europe, North America and South America, KGHM is an industry leader in the extraction and processing of copper ore resources worldwide. The company's global portfolio also includes molybdenum, palladium and nickel. KGHM has an experienced and knowledgeable management team with broad expertise in mining operations, from exploration and extraction, to development and closure. KGHM is committed to minimizing adverse environmental impacts and ensuring that socio-economic benefits to local communities are realized.

The principal contact information for the Project proponent is provided in Table A-1 below.

**Table A-1: Project Proponent and Principal Contact Information**

<b>Project Name:</b>	Victoria Mine Project
<b>Proponent:</b>	FNX Mining Company Inc.
<b>Proponent Address:</b>	1010 Lorne Street, Unit 2 Sudbury, ON P3C 4R9
<b>Company Website:</b>	<a href="http://www.kghm.com">http://www.kghm.com</a>
<b>President and Chief Executive Officer:</b>	Michal Holaczuk President and CEO KGHM International
<b>Principal Contact:</b>	Vanessa Felix Victoria Project Environmental Coordinator <a href="mailto:Vanessa.Felix@ca.kghm.com">Vanessa.Felix@ca.kghm.com</a> 705-885-1535 x2009

The mineral rights for the Project property consist of five contiguous registered parcels of land that were acquired by FNX from Inco Ltd. (now Vale Canada Limited, or Vale) in 2003 to allow for further exploration, development and mining operations to be conducted on the Project property (Table A-2). The five parcels cover a total area of 519.18 ha. Vale, and to a minor extent Carman Construction, own the surface rights of the Victoria Property (Table A-3). Mineral resources of the Project are estimated at 13.6 million tonnes (indicated 500,000 tonnes, inferred 13.1 million tonnes) with average grade 2.6% Cu, 2.7% Ni and 8.3 g/t of TPM.

**Table A-2: Victoria Property – Mining Rights**

PIN Number	Parcel Number or Deed of Land	Area (ha)
Pt of PIN 73382-0791 (LT)	Pt of Parcel 19824 "A" SWS	252.08
PIN 73382-0346 (LT)	Parcel 1240 SWS	1.64
PIN 73382-0793 (LT)	Parcel 483 SWS	91.44
PIN 73382-0795 (LT)	Parcel 8283 SWS	42.90
PIN 73382-0801 (LT)	Deed-Instrument 151	131.12
<b>Total</b>	<b>5</b>	<b>519.18</b>

**Table A-3: Victoria Property – Surface Rights**

PIN Number	Parcel Number or Deed of Land	Owner	Area (ha)
Pt of PIN 73382-0792 (LT)	Pt of Parcel 19824 "A" SWS	Vale	251.17
PIN 73382-0345 (LT)	Parcel 1239 SWS	Vale	1.64
PIN 73382-0364 (LT)	Parcel 4949 SWS	Vale	2.57
PIN 73382-0794 (LT)	Parcel 483 SWS	Vale	88.87
PIN 73382-0796 (LT)	Parcel 8283 SWS	Vale	42.90
PIN 73382-0802 (LT)	Deed-Instrument 151	Vale	128.44
PIN 73382-0552 (RA)	Deed-Instrument 141	CCI	2.65
PIN 73382-0365 (LT)	Pt of Parcel 4951 SWS	CCI	0.85

PIN Number	Parcel Number or Deed of Land	Owner	Area (ha)
PIN 73382-0650	Pt of Parcel 4951 SWS	CCI	0.06
<b>Total</b>	<b>6</b>		<b>519.18</b>

Exploration and mining activities have occurred intermittently in the Project area of the Sudbury Basin since the 1880s. FNX has a life of mine off-take agreement with Vale, where mine product (ore) will be transported to Vale’s Clarabelle Mill in Copper Cliff (also in the City of Greater Sudbury) for processing. Third party owned and operated trucks will deliver the mine product via truck to the Clarabelle Mill in Copper Cliff for processing. No material modifications are required to existing off-site facilities (including tailing storage facilities) for the purpose of receiving and processing mine product (ore) or waste rock from the proposed Victoria Mine Project.

The Project will be funded entirely by KGHM. There is no proposed or anticipated Federal financial support associated with the Victoria Project development, operation or closure. There are no federal lands required for the Project. There are no planned facilities or activities associated with the Victoria Project on Federal lands of any type, including First Nations Reserve lands.

Project Location and Access

The Project site is located at 46°25’N latitude, 81°23’W longitude, and lies in Denison Township, within the City of Greater Sudbury. It is accessed via Municipal Road #4 (formerly Hwy 658), which runs north from provincial Highway 17.

Regional Setting

The Victoria site is situated within proximity to a number of features including: the Vermilion and Spanish River watersheds; Atikameksheng Anishnawbek and Sagamok Anishnawbek First Nations reserves; the Town of Whitefish; Fairbank Provincial Park; provincial and municipal roads (e.g. Highway 17, Fairbanks Road East); an existing transmission line corridor; and various seasonal and/or permanent resident buildings to the north and south of the site (refer to Figure A-1 below).

The area is zoned M4 – Mining Industrial by the City of Greater Sudbury.

The Project area is located in the western portion of the Sudbury Basin that also provides recreational land use opportunities such as fishing, hunting, berry picking and snowmobiling.

The Project is located in the Ontario Shield Ecozone and Georgian Bay Ecoregion and within Wildlife Management Unit 39. The Project is located approximately 5 kilometres from the nearest protected area; Fairbanks Provincial Park. Forest communities in the environmental assessment area are typical of the Great lakes/St. Lawrence forest region. There are no rare plant communities, wildlife concentration areas, or provincially significant wetlands within the Project site.

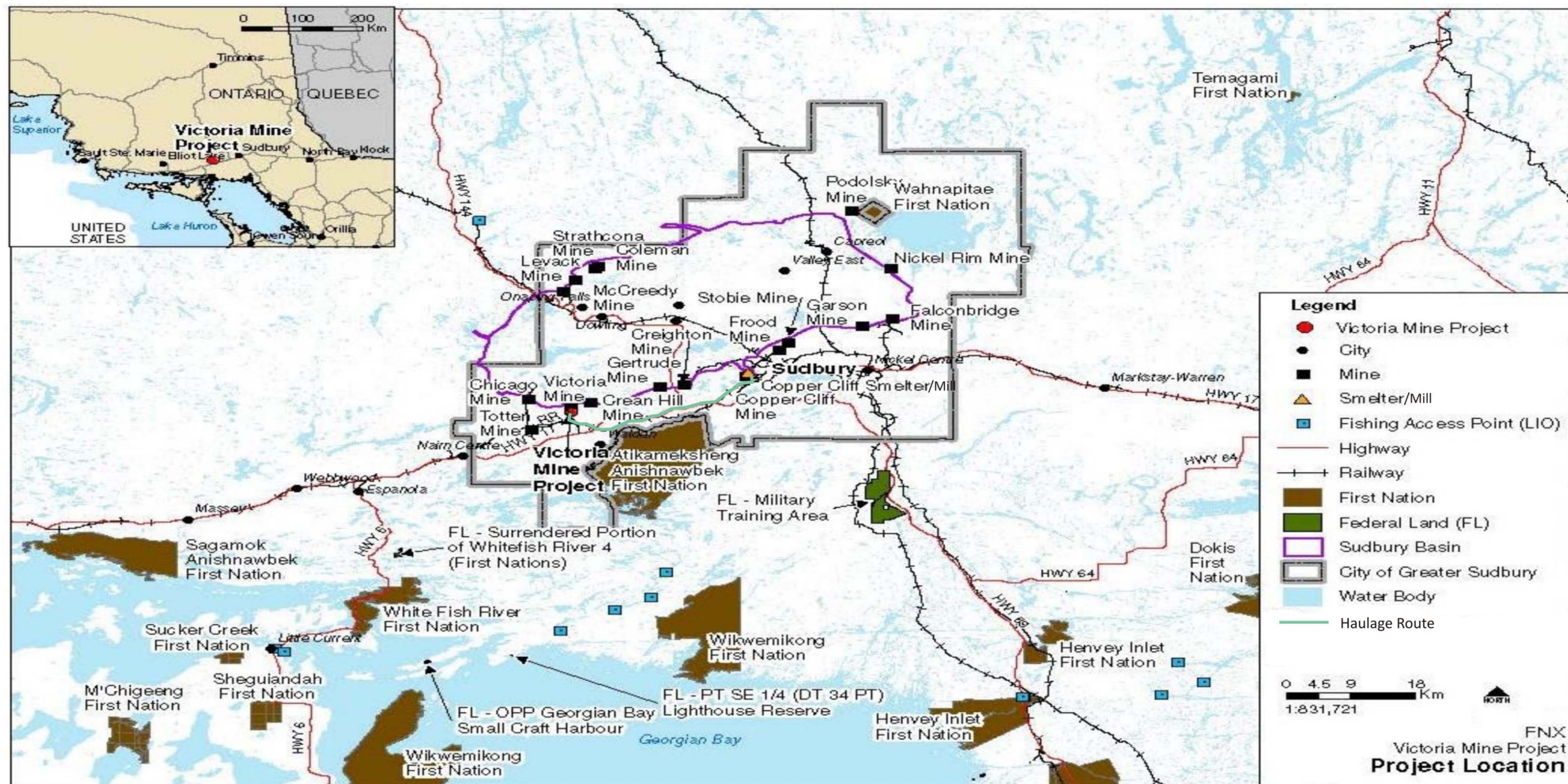


Figure A-1: Victoria Project Location

### Project Activities and Components

The development of the Victoria site will occur in two phases; an advanced exploration phase followed by the production phase depending on the results of the advanced exploration activities. Advanced Exploration activities were initiated in 2014, with bulk sample collection expected to occur in 2023. Extraction of the bulk sample is included in the Advanced Exploration phase. The bulk sample will be extracted at a rate of 330 tonnes per day via ore silling using development jumbo drills.

Physical works and activities associated with each phase are presented in Table A-4 and Table A-5. The scope of the Project for consideration by CEAA in conducting a screening and deciding whether an environmental assessment is required comprises operation of some advanced exploration infrastructure (during mine production) that will be in place in advance of the Mine Project, as well as construction and operation of infrastructure associated with the producing mine as described in Table A-5.

**Table A-4: Physical Works and Activities Associated with Advanced Exploration**

Infrastructure, Facility or Activity	Ongoing Use During Mine Project	Change in Building Size or Footprint Area
Site Access Road	Yes	No
Temporary Utilities (power, water)	No	N/A
Natural Gas Pipeline	Yes	No
Potable Water Treatment Plant	Yes	No
Water Distribution Pumphouse and Service/Fire Water Tank	Yes	No
Waste Water Treatment Plant	Yes	No
Mine Water Pond	Yes	No
Sewage Treatment System	Yes	No
Ventilation Shaft Headworks and Hoisting Facilities	Yes	No
Shaft Development (sinking of Ventilation Shaft ) to 1860 Level	Yes	No
Adit Portal	Yes	No

Infrastructure, Facility or Activity	Ongoing Use During Mine Project	Change in Building Size or Footprint Area
Fuel and Lubricant Storage and Distribution Buildings	Yes	Yes, increase of 250 m <sup>2</sup>
Gatehouse and Security (Entrance) Fencing	Yes	No
230 kV Substation, Transmission line and E-House	Yes	No
Site Administration and Construction Trailers	No	N/A
Overburden Storage Areas	Yes	No
Construction and Operation of Potentially Acid Generating Waste Rock Storage Area #1 (PAG 1)	Yes	No
Laydown/Staging Area/Parking Lot	Yes	No
Lateral Development along 1400 Level Required for Delineation Drilling and Extraction of Bulk Sample	Yes	No
Extraction of Bulk Sample (rate of 330 tonnes/day)	No	N/A

Waste rock will only be added to PAG 1 during the Advanced Exploration phase. No waste rock will be added to PAG 1 (and its dimensions and capacity will not increase) during the proposed mine project. A section of fencing was installed at the site entrance during the Advanced Exploration Stage. This fencing runs parallel to Fairbank East Road and extends along a portion of the Northeastern boundary of the Victoria Project Site. This fencing will remain in place during the Mine Project. Figure A-2 illustrates the location of the fencing. The amount of fencing will not change during the Mine Project.

The main physical works associated with the Mine Project are described below and are summarized in Table A-5.

The main physical works and activities associated with the Victoria Mine Project include:

- Operation (during mine production), decommissioning and abandonment of components constructed during Advanced Exploration including: Site Access Road, Natural Gas Pipeline, Potable Water Treatment Plant, Water Distribution Pumphouse



and Service/Fire Water Tank, Waste Water Treatment Plant, Mine Water Pond, Sewage Treatment System, Ventilation Shaft Headworks and Hoisting Facilities, Adit Portal, Fuel and Lubricant Storage and Distribution Buildings, Gatehouse and Security (Entrance) Fencing, 230 kV Substation and E-House, Overburden Storage Areas and Laydown/Staging Area/Parking Lot;

- Construction and operation of a second rock storage area approximately 8.7 hectares in size (including haulage road) for mineralized (PAG) rock referred to as PAG 2. The total area of the waste rock storage area is 7.5 hectares and the total area of the haulage road is 1.2 hectares. The PAG 2 waste rock storage area will be located 1.5 kilometres northwest of the main Project site and will consist of a waste rock storage pad and water collection pond to collect runoff from the footprint of the potentially acid generating waste rock stockpile. Collected water will flow to the adjacent collection pond and ultimately be piped to the Waste Water Treatment Plant for treatment, prior to release to the environment or re-used as process water. Prior to construction of PAG 2 waste rock pad, a haulage road to the pad will be required. Construction of the haulage road includes land clearing, grubbing, and rough grading with clean fill. Construction of PAG 2 includes land clearing and grubbing the PAG 2 footprint, importing clean fill, placing and compacting fill in the PAG 2 area to form the base of the pad and the berms, creating sumps to collect water, installation of piping along haulage road to pipe water from sumps to the Mine Water Pond and installation of a geomembrane liner to create a watertight containment area;
- Construction of a plant to produce paste backfill ground support material for placement in mined out areas. The plant will be situated in the area already disturbed by exploration and PAG rock from PAG Pad 1 and 2 will be used to produce backfill to provide additional support to the mine workings;
- Removal of waste rock from PAG 1 for use as backfill underground. Once all rock has been removed from PAG 1, the waste rock pad liner will be removed and reclamation of the pad footprint including grading and re-vegetation of the area will take place;
- Construction and Operation of the Ethel Lake control structure and a pump house for water supply. The Ethel Lake control structure and pumphouse will be located east of Fairbanks East Road, at Ethel Lake on the eastern side of the Victoria Property. The Project will require supplementary water to support shaft sinking and production activities, and maintain flow requirements in Fairbank Creek. The control structure will be installed in order to raise the level of Ethel Lake by approximately 0.5 metres. Outflow to Fairbank Creek will be controlled to ensure minimum flow requirements are achieved. The pumphouse will be installed to supply raw water via pipeline to the main Victoria Site;
- Underground mine development utilizing existing ventilation shaft and surface infrastructure for mine product (ore) and rock movement including hoisting;

underground development utilizing two shafts and surface infrastructure (two headframe complexes including hoist houses, collar houses and hoisting equipment);

- Underground ventilation and dewatering of work areas as key elements of mitigating potential workplace hazards;
- Various enclosed facilities for mine product (ore) and rock crushing and handling. The crushing system will be located in an enclosed area east of PAG 1 and immediately northwest of the backfill plant. It will include three portable crushers (one jaw crusher and two cone crushers) working in series to reduce the mine waste rock from PAG 1 and PAG 2 to 6-millimetre aggregate to feed the grinding circuit located inside the backfill plant. The 6-millimetre product will be transferred into a storage bunker having a total storage capacity of 13,000 tonnes. The crushers will be enclosed in an unheated, sound insulated building. Dust containment enclosures along with a 64,000-cubic metre per hour (m<sup>3</sup>/h) bag house dust collector will help to minimize the dust effects. On average, 1,800 tonnes of material will be processed by this system on a daily basis;
- Use of existing temporary overburden stockpile locations. These stockpiles were established during exploration and will be used for site remediation activities to meet closure plan expectations;
- Various office, administration, warehousing, maintenance, general storage and employee parking facilities;
- Fuel storage facilities: The fuel storage system is comprised of diesel fuel oil and gasoline storage on surface and diesel fuel oil storage underground. The primary purpose of the diesel fuel distribution system will be to transfer fuel in a batching process from surface to underground fuel bays, while also dispensing fuel on surface with a local dispensing pump:
  - ◆ The Surface Fuel System will consist of one Diesel Fuel Delivery System, comprising one 50,000-litre storage tank and 1,475-litre batch tank equipped with two distribution pumps each; and one Gasoline Fuel Dispensing System comprising one 1200-litre Gasoline Fuel Tank equipped with one dispensing pump;
  - ◆ The Underground Fuel System will consist of one shaft pipeline routed from the surface 50,000-litre storage tank through the existing adit and down the Main Shaft; four intermediate transfer stations comprising 475-litre storage tank equipped with fire suppression and one transfer pump each; four 6,000-litre diesel fuel storage tanks located within the main levels fuel bays; one 2,275-litre permanent satellite fuel station and two 2,275-litre temporary satellite fuel stations to be relocated as required to support development;
- Sewage treatment facilities designed to accommodate up to 250 people working on site or 30 m<sup>3</sup> of waste per day. The sewage treatment system will process all sewage-related waste generated on site. The system will be approximately 4,000 m<sup>2</sup> in size and

will consist of an equalization tank, septic tanks, effluent tank, biofilters, septic bed, and odour control units. The approximate footprint of the facility will be 30 metres by 20 metres. The system will not tie into the municipal sanitary sewage system operated and maintained by the City of Greater Sudbury. Sewage will be directed from washrooms and shower facilities on site to a passive septic system near the parking lot. It will then be pumped through a series of peat moss filters into a prepared subsurface tile bed;

- Waste water (site and mine water/effluent) treatment facility;
- The procurement of goods and services;
- A construction labour force of approximately 72 direct hires, plus approximately 200 to 300 indirect contractor employees;
- An operations labour force of 397 direct hires;
- Physical decommissioning including demolition of buildings, removal of the headframe and removal of the Ethel Lake Control Structure;
- Removal of PAG Pad 2 liner and reclamation of the pad footprint including grading and re-vegetation of the area;
- Removal of all machinery and equipment not essential for compliance or the enhancement of environmental security. Surface equipment will be dismantled and removed for possible salvage or reuse;
- Post closure monitoring including groundwater monitoring, surface water monitoring, biological monitoring, physical stability monitoring and all other monitoring as required by the filed Victoria Mine Production Closure Plan.

Project components located outside of the main Project site but still lying within the Victoria property boundaries include the overburden stockpiles, 230 kV transmission line, PAG 2 (second potentially acid generating waste rock stockpile), natural gas line, and the Ethel Lake water control structure and pumphouse. Figure A-2 provides the general layout for the entire Project.

A 230 kV transmission line running to the Victoria property has been installed by Hydro One to provide electrical power to the Victoria Mine Project. A natural gas transmission pipeline has been installed to site, by Union Gas, to supply the Project.

The underground mine will consist of a main shaft, a ventilation shaft and an adit, and underground supporting infrastructure including, but not limited to, maintenance facilities, refuge stations, ballast and shotcrete delivery systems, and explosive and detonator magazines.

The proposed maximum mine production rate is 3,500 t/d with an estimated maximum overall production capability of 5,500 t/d of ore and waste rock. Mine Product (ore) and

waste rock will be hoisted to surface where it will be moved from the shaft to the loadout building via crushing and sampling processes, and eventually to the loadout building for transport. Ore will be loaded into trucks for shipment to Vale’s Clarabelle Mill. Waste rock will be transferred from the loadout building to trucks for transport to the PAG 2 waste rock storage pad.

**Table A-5: Physical Works and Activities Associated with the Mine Project**

Infrastructure, Facility or Activity
Operation (during mine production), decommissioning and abandonment of components constructed during Advanced Exploration including: Site Access Road, Natural Gas Pipeline, Potable Water Treatment Plant, Water Distribution Pumphouse and Service/Fire Water Tank, Waste Water Treatment Plant, Mine Water Pond, Sewage Treatment System, Ventilation Shaft Headworks and Hoisting Facilities, Adit Portal, Fuel and Lubricant Storage and Distribution Buildings, Gatehouse and Security (Entrance) Fencing, 230 kV Substation and E-House, Overburden Storage Areas and Laydown/Staging Area/Parking Lot
Construction and operation of the Potentially Acid Generating Waste Rock Storage Area #2 (PAG2) and Access Road
Construction and Operation of the Ethel Lake Water Control Structure and Pumphouse
Underground Mine Development
Main Shaft Development
Underground Ventilation
Main Shaft Headworks and Hoisting Facilities
Mine Product Hauling by Third Party Owned and Operated Trucks to Vale's Clarabelle Mill
Rock Crushing and Handling Facilities
Office, Warehousing, Maintenance Buildings
Removal of rock from PAG 1, crushing and grinding of rock for use in paste backfill process
Operation of Paste Backfill Plant, distribution of backfill underground
Removal of PAG 1 waste rock pad, reclamation of pad footprint including grading and revegetation
Physical decommissioning including demolition of buildings, removal of the headframe and removal of the Ethel Lake Control Structure, removal of gatehouse and fencing

**Infrastructure, Facility or Activity**

Dismantling of surface equipment, Removal of machinery and equipment

Post closure monitoring including groundwater monitoring, surface water monitoring, biological monitoring, physical stability monitoring and any other monitoring as required by the filed Victoria Mine Production Closure Plan.

The shaft, hoisting and ventilation infrastructure, as well as waste storage, various building and key processes like sewage treatment and wastewater collection and treatment plants will be in place and functioning in advance of commencing production. Figure A-3, Table A-6 and Table A-7 provide a comparison of the proposed site disturbance during exploration and advanced exploration activities, and the expected site disturbance associated with the Victoria Mine Project.

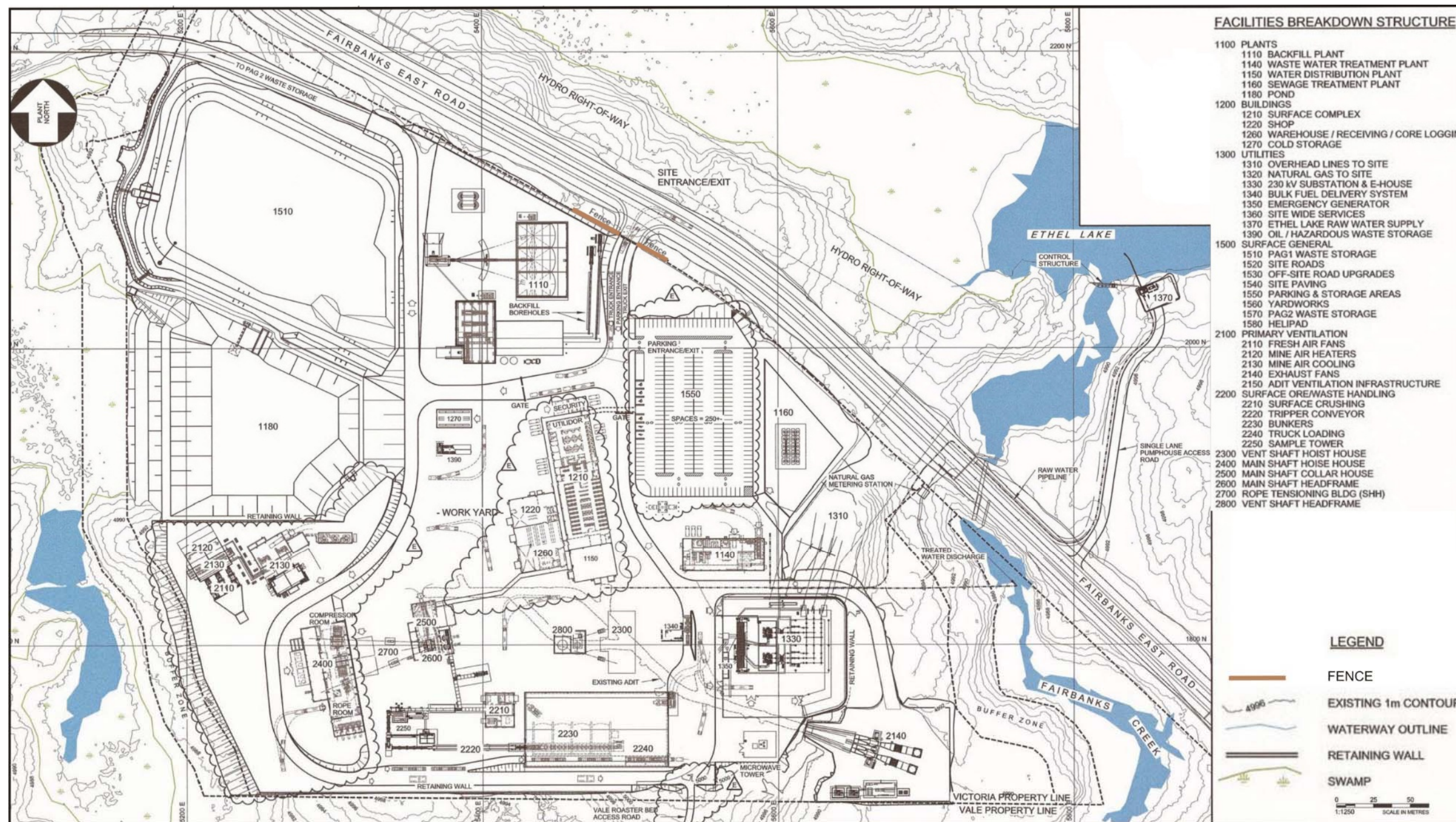


Figure A-2: Victoria Mine Project General Arrangement of Overall Site

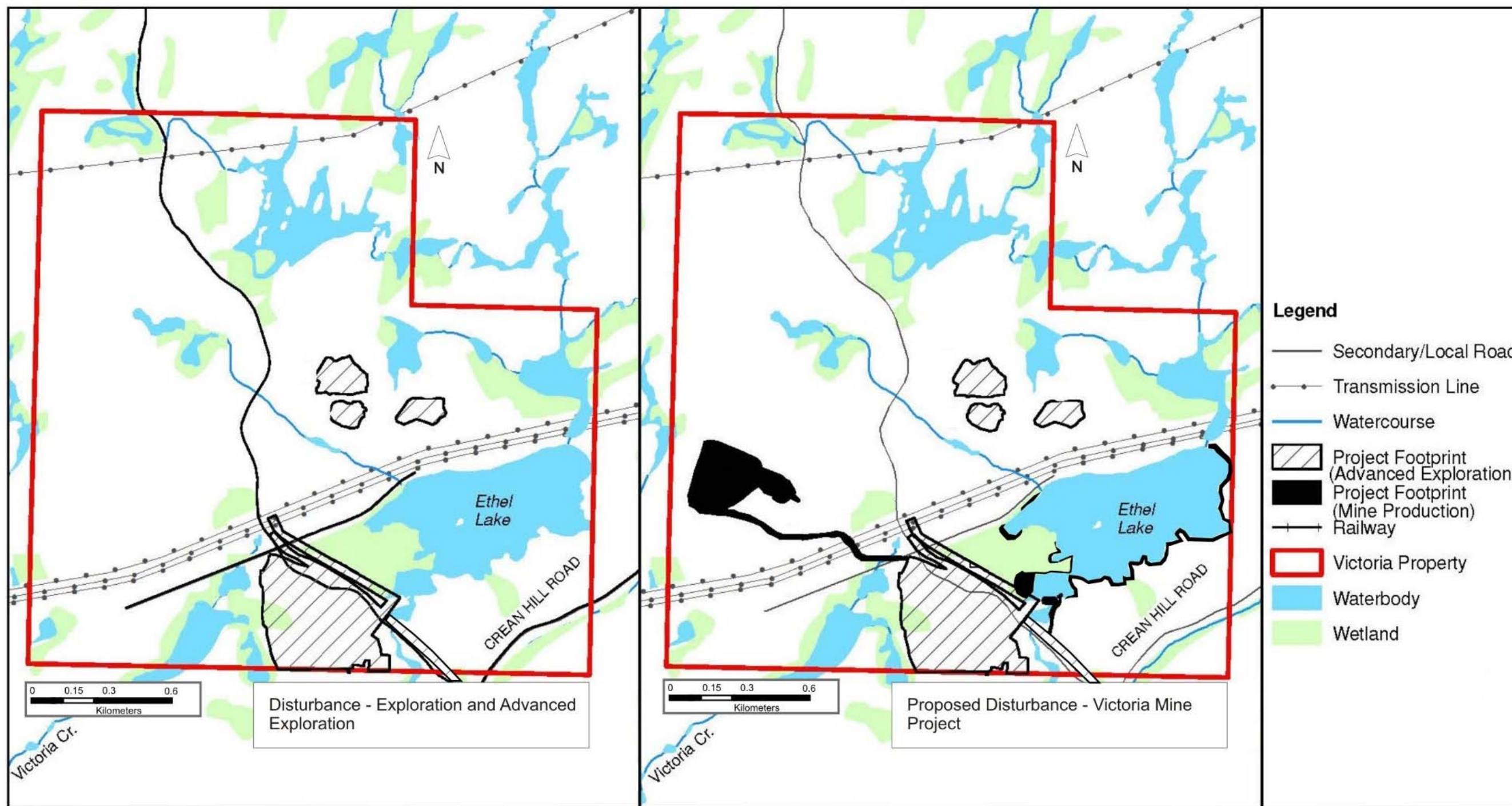


Figure A-3: Expected Site Disturbance Comparison

**Table A-6: Infrastructure and Building Sizes – Exploration and Advanced Exploration**

Development Area	Approximate Building Size (m <sup>2</sup> )	Approximate Area (ha)	Capacity (m <sup>3</sup> )
Overburden Storage Areas		6.5	
Site Access Road		2.5	
230 kV Transmission Line		3	
230 kV Substation	150		
Natural Gas pipeline			
General Site Area:		22	
Ventilation Shaft Headworks and Hoisting Facilities	1,394		
Gatehouse and Security (Entrance) Fencing			
Crushing and Loading	300		
Mine Water Pond	22,720		43,400
Offices and Storage	0		
PAG 1 Waste Rock Storage Area		2.4	195,000
Dry	225		
Fuel and Storage	250		
Core Shack	-		
Miscellaneous	200		
<b>Total "Footprint" (ha)</b>		<b>36</b>	



**Table A-7: Proposed Infrastructure and Building Sizes – Victoria Mine Project**

Development Area	Approximate Building Size (m <sup>2</sup> )	Approximate Area (ha)	Capacity (m <sup>3</sup> )
Ethel Lake Flooded Area		2.5	
PAG 2		8.71	673,000
Main Shaft Headworks and Hoisting Facilities	3,289		
Crushing and Loading	5,500		
Mine Water Pond	22,720		43,400
Offices and Storage	7,000		
Dry	1,400		
Fuel and Storage	500		
Core Shack	961		
Miscellaneous	200		
Backfill Plant	2,000		
Ethel Lake Control Structure Road and Pumphouse Pad		3	
<b>Total Additional Footprint (ha)</b>		<b>14.2</b>	

<sup>1.</sup> The PAG 2 Area of 8.7 ha includes the haulage road which has an area of 1.2 ha. The area of the PAG 2 waste rock storage pad (not including the road) is 7.5 ha.

The proposed Mine Project will result in an increase of 14.2 hectares of disturbed area. The increase of 14.2 hectares represents the increase required by the following: Ethel Lake Flooded Area (2.5 ha), Ethel Lake Control Structure Road and Pumphouse Pad (3 ha), PAG 2 Pad and access road (8.7 ha) as shown in Figure A-3.

#### Project Phases and Schedule

Advanced Exploration activities began at the Project site in 2013 and are scheduled to be completed in 2024. The collection of the bulk sample is scheduled for 2023, followed by full mine construction, with full mine (commercial) production expected to begin in 2031,

depending on results from the bulk sample extraction and metallurgical testwork. Once operational (2031), the mine life will extend to late 2042.

Physical decommissioning will take place until from 2042 to 2045, followed by a five-year monitoring period extending to the end of 2050. A more detailed Project schedule is provided in Table A-8.

**Table A-8: Victoria Mine Project - Overall Project Schedule**

Activity	Start Date	Finish Date
Exploration Activities	April 2008	December 2012
Indigenous Consultation for/During Advanced Exploration	November 2009	July 2024
Engineering for Advanced Exploration	March 2011	March 2012
Provincial Permitting for Advanced Exploration	March 2012	October 2014
Advanced Exploration Phase	May 2013	July 2024
Basic Engineering for Mine Infrastructure	April 2014	December 2015
<b>Federal Environmental Assessment (EA):</b>		
Initial Submission of Project Description Report	April 2017	June 2017
Revised Submission of Project Description Report	May 2019	July 2019
Determination if a Formal EA is Required	May 2019	
Detailed Engineering for Mine Infrastructure	January 2017	July 2019
Indigenous Consultation for Mine Production	January 2016	January 2031
Provincial Permitting for Mine Production	January 2016	October 2023
Mine Construction	July 2024	
Commercial Production	February 2031	
Indigenous Consultation during Life of Mine	February 2031	October 2042
Life of Mine	February 2031	October 2042
Indigenous Consultation during Mine Closure	October 2042	October 2045
Mine Closure	October 2042	October 2045

## Main Activities by Project Phase

### Construction Phase

Main activities associated with the development and construction phase of the Victoria Project include:

- The Victoria Project will utilize existing infrastructure and facilities associated with the advanced exploration program as much as practical. Main activities associated with the development and construction phase include:
  - ◆ Procurement of materials and equipment;
  - ◆ Development and implementation of environmental protection and monitoring plans for construction (continuing through all project phases);
  - ◆ Movement of construction materials to laydown areas on site;
  - ◆ Construction labour, vegetation clearing; earthworks (excavation and piling of earth), dewatering, grubbing and disposal, infilling with suitable clean granular material to provide sufficient drainage; final grading;
  - ◆ Paving of main site footprint to minimize dust and efficiently direct all runoff to designated low points for collection and storage in existing mine water pond;
  - ◆ Atmospheric emissions from noise and dust;
  - ◆ Construction of paste backfill plant and systems and other buildings;
  - ◆ Construction of the Ethel Lake control structure;
  - ◆ Construction of main shaft headworks and hoisting facility and development of main shaft:
  - ◆ Construction of PAG 2 waste rock storage area including:
    - Land clearing and grubbing haulage road to PAG 2, rough grading with clean fill;
    - Land clearing and grubbing of PAG 2 footprint area;
    - Importing clean fill, placing and compacting clean fill into the PAG 2 area to form the base of the pad and berms;
    - Installation of a geomembrane liner in the PAG 2 area to create a watertight containment area;
    - Creation of sumps to collect water, installation of piping along the haulage road to pipe water to connect to the Mine Water Pond;
  - ◆ Rock storage and handling;
  - ◆ Fuel and hazardous materials storage and handling;

- ◆ Water use, collection, treatment and discharge;
- ◆ Underground ventilation;
- ◆ Vehicle and equipment use;
- ◆ Solid waste disposal;
- ◆ Sewage treatment and disposal; and
- ◆ Progressive reclamation.

Construction activities will be sequenced according to manpower and equipment availability and site conditions. Sequencing of activities will consider environmental aspects such as fish spawning windows and bird breeding seasons.

#### Operations Phase

Main activities associated with the operations phase include:

- Operations labour;
- Vehicle and equipment use;
- Water management including dewatering, collection, use of water, treatment and discharge;
- Mine product extraction, crushing and movement of mine product and waste rock, waste rock and mine product hauling to Vale Copper Cliff facilities;
- Underground ventilation;
- Underground backfill (ground support);
- PAG waste rock storage and handling; rock and mine product hauling to Vale Copper Cliff facilities;
- Transferring of runoff from PAG2 to the Mine Water Pond;
- Fuel and hazardous materials storage and handling;
- Environmental monitoring and reporting;
- Air quality and noise management;
- Solid waste disposal and sewage treatment and disposal; and
- Progressive site reclamation, where practical.

#### Decommissioning and Abandonment Phase

All project components will be decommissioned and all land will be reclaimed. Main activities associated with the decommissioning and abandonment phase include:

- Progressive rehabilitation;
- Physical decommissioning including demolition of buildings, removal of the headframe and removal of the Ethel Lake Control Structure
- Removal and rehabilitation of PAG 2 Storage Area;
- Removal of all machinery and equipment not essential for compliance or the enhancement of environmental security. Surface equipment will be dismantled and removed for possible salvage or reuse;
- Post closure monitoring including groundwater monitoring, surface water monitoring, biological monitoring, physical stability monitoring and all other monitoring as required by the filed Victoria Mine Production Closure Plan;
- Closure of the Victoria Project site will occur on completion of production mining. Closure and post closure activities will occur in accordance with the Victoria Mine Production Closure Plan which will meet the *Ontario Mining Act* and its associated regulations and will be filed before the production phase begins. Financial assurance will be provided by FNX with the closure plan at the time of filing;
- Closure activities will be governed by the *Ontario Mining Act* and its associated regulations and codes, and are expected to include:
  - ◆ Openings to underground will be sealed with engineered caps; and
  - ◆ Revegetation consisting of grading, spreading of seed and hydroseeding.

### Reclamation

FNX is committed to conducting appropriate reclamation throughout the mining life cycle to return the mine site to a diverse and viable ecosystems that will serve the need of post-mining land use. The objectives of site reclamation includes re-establishing conditions which permit the land to return to a similar pre-mining land use. For each project component, reclamation plans will address potential environmental effects, the final end use of the land and the long term physical and chemical stability of the reclaimed component.

### Processing

There are no mineral processing facilities (no mill) no tailings or tailings management areas and no smelting or refining associated with the Project. FNX has a life of mine off-take agreement with Vale, where mine product (ore) will be transported to Vale's Clarabelle Mill in Copper Cliff (also in the City of Greater Sudbury) for processing. Third party owned and operated trucks will deliver the mine product via truck to the Clarabelle Mill. All mine product is to be processed and managed by Vale as specified in the off-take agreement. No material modifications are required to existing off-site facilities (including

tailing storage facilities) for the purpose of receiving and processing ore (mine product) or waste rock from the proposed Victoria Mine Project.

Transportation of the mine product will be conducted by third party owned and operated haul trucks, who are responsible for the care and control of the trucks and their contents along the proposed haul route shown in Figure A-1.

#### Waste Management

Wastes will be generated throughout the life of the Project and will include non-hazardous wastes, hazardous and liquid wastes as well as waste rock. Solid, non-hazardous wastes will be source separated and transported by licensed carriers to an approved off-site disposal facility. Recycling wastes will be transported to an approved off-site recycling center. All hazardous and liquid industrial wastes will be stored within containment areas and will be stored and managed in accordance with regulatory requirements. The transportation of hazardous and liquid industrial wastes will be conducted by licensed carriers and be transported to an approved off-site disposal facility, in accordance with regulatory requirements.

Primary point source air emissions are expected to be generated by the fuel fired equipment, including heaters, generators, and mine ventilation equipment. The Project does not include a process plant, hence primary process air emissions are expected to be much lower than fuel combustion emissions. The Project will consume natural gas for heating, diesel for surface and underground activities, and gasoline for surface vehicles and equipment. Secondarily, upstream emissions will also be generated from grid electricity production.

Fugitive dust emissions will be produced by a number of Project activities during both the construction and production phases including movement of equipment and vehicles on site roads; mine product (ore) and waste rock handling and processing activities; dust from mine product, waste rock, topsoil and overburden stockpiles and movement of mine product and waste rock offsite. Fugitive dust emissions will be produced during the decommissioning and abandonment phase due to physical decommissioning and equipment removal. Dust control measures will include the following:

- Use of water, calcium or magnesium chloride to roads and stockpiles, wet sprays used during drilling;
- Using dust collectors and equipment enclosures or covers at material transfer points;
- Containing material handling and processing activities within covered buildings;
- Applying a vegetative cover to overburden and topsoil stockpiles, and minimizing drop heights at stockpiles;
- Restricting the hours of off-site mine product and waste rock haulage;

- Ensuring the use of covered mine product and waste rock haul trucks for off-site transport;
- On-site speed limits and enforcement of those limits within Victoria property boundary, and use of a sweeper or vacuum truck on site;
- Adjusting or limiting mine product or waste processing or stockpiling activities during high winds, or when the wind direction will cause dust to leave the site boundary;
- Wind fencing, where appropriate, when enclosed operations are not possible, to reduce loss of finer particles from material storage piles and crushing operations;
- Operational controls, such as curtailing certain activities when winds are blowing towards receptors, to reduce off-property impacts.

Greenhouse gas emissions (GHG) associated with diesel fuel and other fuel sources are anticipated to be minimal as the principal stationary power source for both construction and production is by transmission line. The greatest potential for the generation of greenhouse gases is through the use of heavy equipment, generators, or vehicles fuelled by diesel, gasoline or propane during all project phases, and by trucks transporting the mine product during production. As demonstrated in Table A-9, GHG emissions from the construction, operation and decommissioning and abandonment phase activities at Victoria Mine are expected to be very small (<0.05%) compared to province of Ontario and Canada-wide totals and future targets.

**Table A-9: Comparison to Provincial and National Emission Totals and Targets**

		Construction	Operation	Decommissioning and Abandonment
	GHG emissions (ktCO <sub>2</sub> eq/yr)	20.2	25.5	5.7
Emissions-Intensive and Trade-Exposed Industries <sup>1</sup>	76,000	0.026%	0.034%	0.0075%
Ontario Provincial Total <sup>1</sup>	170,000	0.011%	0.015%	0.0034%
Canadian National Total <sup>1</sup>	732,000	0.003%	0.004%	0.0008%
Canadian 2020 Target <sup>1</sup>	620,000	0.003%	0.0035%	0.0009%
Canadian 2030 Target <sup>1</sup>	522,000	0.004%	0.0049%	0.0011%

<sup>1</sup> National Inventory Report 1990-2014: Greenhouse Gas Sources and Sinks in Canada, Part 1 Executive Summary, Environment and Climate Change Canada.

A portion of the waste rock generated from the Project is characterized as potentially acid generating (PAG) and FNX has developed a precautionary approach to its management that includes engineered pads for the placement of potentially acid generating waste rock. Surface storage of waste rock is temporary as all rock will be used for underground backfill for ground support purposes. Waste rock will be separated into non-acid generating (NAG) and PAG waste rock. NAG rock will be used as on-site construction material and potentially as surface backfill material. PAG rock will be stored and used as underground backfill material as outlined above. FNX has developed a comprehensive waste management plan to manage all wastes produced at the Project site.

The primary sources of noise emissions during construction will include open air heavy equipment operation and blasting. During the production phase noise emissions will be generated by the mine ventilation fans, materials handling and blasting and other process facilities. The mine ventilation fans, compressor plant, refrigeration plant, backfill plant, crusher, and vacuum truck were identified as the major source of noise emissions during operations.

Noise sources during the decommissioning and abandonment phases will be expected to derive from heavy equipment operation related to demolition of buildings and removal of the headframe, removal of the Ethel lake control structure and post closure activities.

A community noise monitoring study was completed that determined the existing background levels around the Project site, in an effort to develop a project design goal for noise. Based on the rural nature of the area surrounding the Project, the nearest noise receptor being greater than one kilometre from the site, and the low levels of existing background noise, a project design goal for noise was set to 'below any provincial noise requirement, and quieter than the already existing sound levels at the nearest residences, most of the time'.

The major source of noise emissions during operations will be abated to reduce the potential adverse effects to local residents, cottagers and the public.

During the life of the mine, water that has contacted potentially acid generating or potentially metal leaching mine products will be collected and conveyed to the Mine Water Pond. The majority of this water will be recycled for use in the underground workings and surplus impacted water will be treated by the waste water treatment plant on an as-needed basis prior to discharge to Fairbank Creek. Treated water will meet effluent discharge limits and all other permit requirements.

The Mine Water Pond will have sufficient storage capacity to accommodate all impacted water requiring treatment by the Wastewater Treatment Plant. The pond will provide adequate storage volume to manage run-off from site catchment areas, capture large



storm inflows, hold a reserve volume for Wastewater Treatment Plant upset conditions, hold contingent water for underground process water supply during upset conditions, and provide sufficient dead storage for decant pump operations. The pond is equipped with an emergency spillway and a concrete decant structure or reclaim system, head wall for the inlet pipe, under drainage system, and leakage detection and collection system. The emergency spillway will be installed in the northwest corner of the pond to pass the inflow design flood volumes which correspond to a 1-in-200-year, 24-hour storm event without overtopping and eroding the embankments.

### Physical and Biological Setting

The Victoria Property is bisected by two major watersheds; the Vermilion River watershed to the east and the Spanish River watershed to the west. The Fairbank Creek watershed, which includes Ethel Lake, is located immediately east of the site, with Fairbank Creek flowing southward and eastward into the Vermilion River. To the northwest are wetland complexes that flow south into an unnamed wetland and stream that drains southwest to Victoria Creek and ultimately to the Spanish River.

Approximately 66% of the Project footprint lies within the Spanish River watershed, which is approximately 150 hectares in size upstream from the Project. The main feature of this watershed is a beaver impoundment immediately adjacent to the western boundary of the Project site. Water from this impoundment flows through a series of wetland complexes that drains southwest to Victoria Creek and the Spanish River. The Spanish River is located approximately 11 kilometres downstream from the Project site.

The remainder of the Project site (approximately 34%) is in the Fairbank Creek watershed, which is approximately 5,000 hectares in surface area upstream from the Project site and includes Fairbank Lake. From Fairbank Lake, Fairbank Creek flows approximately six kilometres before draining into Ethel Lake. The outflow from Ethel Lake flows south for approximately five kilometres, before turning east to flow for an additional seven kilometres before draining into the Vermilion River in the Town of Whitefish.

Surface water quality in Ethel Lake is generally good with some exceedances of nickel, copper, cobalt, and zinc PWQO's at various depths. Monitoring indicates fairly low metal concentrations in Fairbank Creek relative to the PWQO's, with results generally equivalent to the upstream control sites. Baseline surface water quality in Fairbank Creek is good with infrequent exceedances for copper and nickel. Monitoring sites downstream experience more frequent exceedances of copper, nickel and aluminum. Victoria Creek typically has higher concentrations of metals than Fairbank Creek and drains into the Spanish River.

The Project is located in the Ontario Shield Ecozone and Georgian Bay Ecoregion, and within Wildlife Management Unit 39. Forest communities in the environmental

assessment area are typical of the Great Lakes/St. Lawrence forest region. The dominant community types include poplar-white birch and poplar-white birch-white spruce-balsam fir mixed wood stands. There are no rare plant communities or wildlife concentration areas within the environmental assessment area based on data obtained from the MNRF Land Information Ontario (LIO) environmental datasets.

The area of the Project includes a mix of natural and disturbed areas comprising wetlands, forests, meadows and rock barren communities. The diversity of vegetation communities throughout the environmental assessment area provides suitable habitat for a variety of upland and semi-terrestrial aquatic wildlife species.

Wetlands within the environmental assessment area are predominately shallow or meadow marsh communities, although swamp communities and to a lesser extent, fens, have also been documented. Beaver activity throughout the environmental assessment area is high and appears to have influenced the creation of most of the wetlands in the environmental assessment area. All wetland communities within the environmental assessment area are common and no provincially significant wetlands (PSWs) have been identified.

Wildlife in the area is typical of Northern Ontario and includes common mammal species such as Moose, Black Bear, Whitetail Deer, Marten, Mink, Long-Tailed Weasel, Snowshoe Hare, Raccoon, Red Fox, Lynx, Wolf and Beaver.

A total of 75 bird species have been identified in the area of the Project. Common birds include the Canada Goose, Great Blue Heron, Common Loon and American Crow.

One bird species, the Eastern Whip-poor, listed as Threatened under the *Endangered Species Act* was identified on the Victoria Project's footprint during the early exploration phase, resulting in the Project obtaining an Overall Benefit Permit (SU-C-001) which is valid for the life of the Mine Project.

Snapping Turtle, a species designated as Special Concern by the *Endangered Species Act*, was identified on the proposed Victoria Mine Project footprint. Two snapping turtles were documented along the northern shoreline of Ethel Lake during a 2013 survey (EcoTec 2013).

During a regional survey, five species designated as Special Concern by the *Endangered Species Act* (Eastern Milksnake, Bald Eagle, Golden-Winged Warbler, Canada Warbler and Common Nighthawk) and one species identified as Threatened (Blanding's Turtle) were identified outside of the proposed Victoria Mine Project Footprint.

DFO has determined that there are no federal species at risk or their habitats present in the Project area, therefore no additional approvals are required for the Project under the federal *Species at Risk Act*.

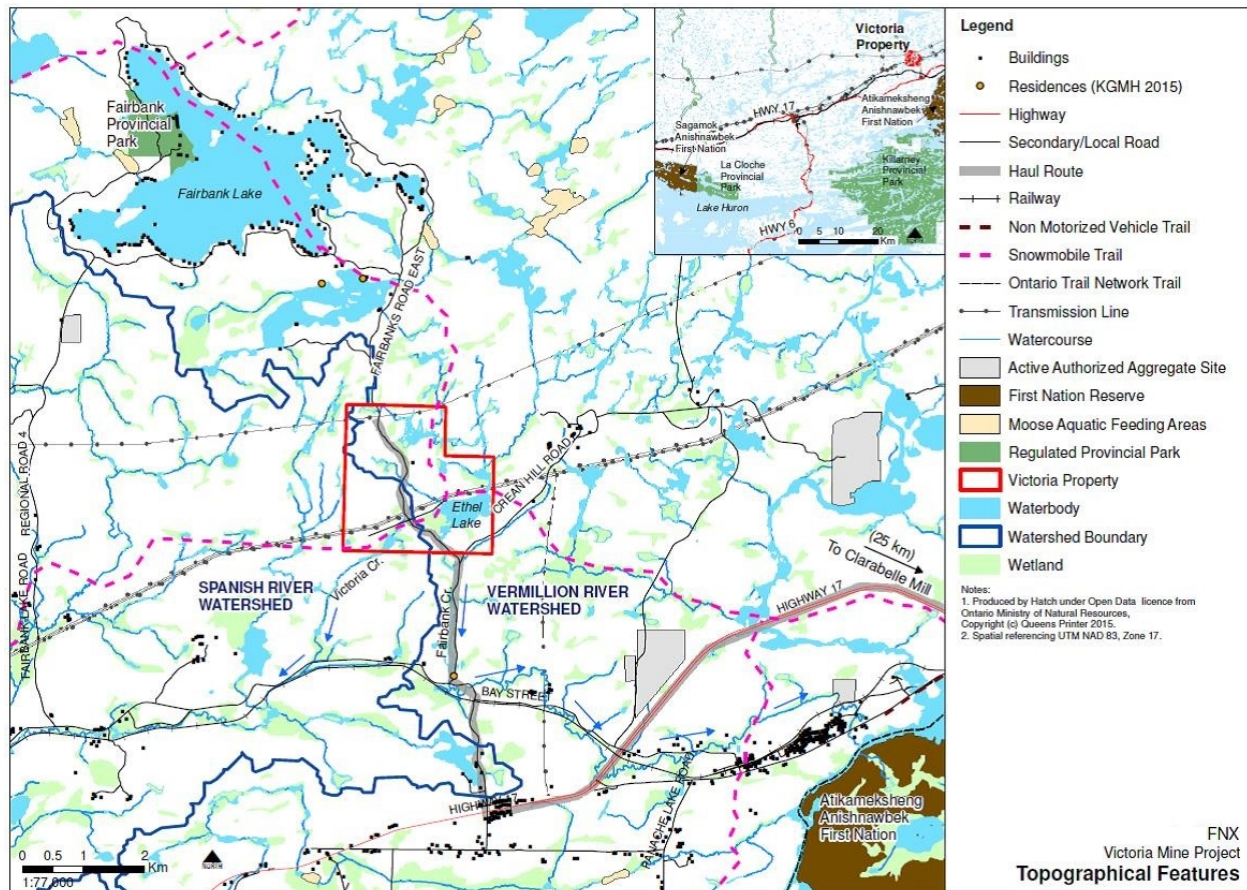
### Proximity to Other Users

There are no planned facilities or activities associated with the Victoria Project on:

- Federal lands of any type, including First Nations Reserve lands;
- Provincial Parks or Conservation Reserves;
- Areas of Natural and Scientific Interest;
- Provincially Significant Wetlands;
- Provincial Forest Reserves; or other
- Provincially-protected lands.

There are no residences on the Victoria Project Site. The closest structures to the site are permanent or seasonal cottages in the Fairbanks Lake area, located approximately 2 kilometres northwest of the Project. Approximately 5 kilometres south of the Property, at the junction of Fairbank Lake Road and Highway 17, is the community of Denlou.

The closest First Nation Reserve is the Atikameksheng Anishnawbek First Nation Reserve, located 7.6 kilometres southeast of the Project. The Sagamok First Nation Reserve is located 45 kilometres west of the Project. Additional topographical features are included in Figure A-4.



**Figure A-4: Topographical Features**

Potential Effects on Indigenous Peoples from Changes to the Environment

The closest First Nation Reserve to the Victoria Project is the Atikameksheng Anishnawbek First Nation Reserve, located 7.6 kilometres southeast of the Project. The Sagamok First Nation Reserve is located 45 kilometres west of the Project (Figure A-1). There are no anticipated direct effects from the Victoria Project on First Nation Reserve Lands.

Indigenous Communities have reported traditional usage of the lands in the region around the Victoria Project for hunting large and small game, fish harvesting, plant gathering, road access, trapping and occupancy, while the lands closely surrounding the Project area itself have also been used for bird harvesting, harvesting of plants and natural materials, cultural practices and camping.

To accommodate Indigenous Groups' traditional use of the lands and resources in and surrounding the Victoria Project Area, FNX will provide conditional access to these areas for traditional activities throughout the life of the mine. Access will be conditional upon the area to be accessed being deemed safe. The Access Management Plan will be developed and in use by the end of 2019. The plan will protect the health and safety of those practicing traditional gathering activities, the public and Victoria Project personnel.

Local animal and fish populations and archaeological resources are not anticipated to be meaningfully affected by the Victoria Project. The ability for Indigenous peoples to hunt, trap, fish, gather plants and carry out cultural practices will be not be comprised as conditional access will be provided throughout the life of the mine.

The Project will generate considerable local and regional economic activity during the Construction and Operation phases, resulting in positive benefits from potential economic opportunities including employment opportunities, business and contracting opportunities, and training and skills development.

After mining ceases and the site is reclaimed to pre-project conditions to the extent possible, conditional access will continue to be provided for traditional land use. The access management plan will be reviewed during closure planning to ensure that access will continue to be provided while protecting the health and safety of those requesting access.

#### Regional Environmental Studies and Assessments

FNX conducts environmental assessments of its projects and activities as part of its overall approach to risk mitigation. Environmental assessment improves engineering design and helps proponents strive to avoid adverse environmental effects or reduce such effects to reasonable or acceptable levels. Several environmental assessments have been conducted to date including a Class Environmental Assessment for minor transmission facilities; Ontario Environmental Approval (Category B Project) on diesel generation facilities (electrical facilities); assessment under the Ontario Energy Board regarding the installation of a natural gas pipeline to the Victoria Mine; and preliminary Species at Risk Habitat Screening by the City of Greater Sudbury for road upgrades that have been made to the Victoria site. .

The Sudbury region recently underwent a thorough regional ecological and human health risk assessment into the 100+ years of mining and minerals processing that has occurred in the Sudbury Basin (the Sudbury Soils Study or Sudbury Area Risk Assessment). The study was a comprehensive scientific and technical investigation into a 40,000 km<sup>2</sup> area of former and current mining and minerals processing areas which included the Victoria properties, to evaluate the state of the ecological conditions and risks to human health, plants and wildlife. The study focused on Chemicals of Concern (CoCs) and while the study did conclude that there are elevated levels of CoCs in plant

communities in the Project area, the levels are not a concern and will have little risk to area residents. The contribution of metals to the environment as a result of emission to air and water, are expected to be very minimal compared to the overall metals content in the regional environment.

Regulatory Framework and Project Permitting

The proposed mine production rate of 3,500 t/d falls under Provision 16 in the schedule to the Regulations Designating Physical Activities which designates the *“construction, operation, decommissioning and abandonment of a new (a) metal mine, other than a rare earth element mine or gold mine, with an ore production capacity of 3 000 t/day or more.”*

Project activities to date have been supported by a comprehensive understanding of environmental baseline conditions as a result of baseline studies, modeling and test work. Project activities, which are subject to federal and provincial regulatory requirements, will require a range of environmental permits, authorizations and approvals (outlined in Table A-10 below). The Species At Risk (SAR) Permit number SU-C-001-12 (May 2012) under Clause 17(2) of the *Endangered Species Act (ESA) 2007* is included in Table A-10 as it is valid for the life of the Project and will apply to activities associated with the producing mine. FNX has consulted with Indigenous groups and the public on many of these and continues to consult on other permits, authorizations and approvals it is seeking for the Project.

**Table A-10: Authorizations and Permits for Mine Production**

Authorization or Permit	Responsible Ministry	Applicable Act / Regulation	Associated Facility, Infrastructure or Activities	Target Date to Obtain Approval
Mine Production Closure Plan	Ministry of Northern Development and Mines (Provincial)	<i>Mining Act, R.S.O. 1990 c.M.14, O. Regulation 240/00 – Mine Development and Closure</i> Under Part VII of the Act	Lateral underground development, PAG 2, Ethel Lake, backfill plant, all additional permanent surface infrastructure to support mine production.	January 2022
Environmental Compliance Approval for Industrial Sewage - Amendment	Ministry of the Environment and Climate Change (Provincial)	<i>Environmental Protection Act, R.S.O. 1990, Section 20.2 of Part II.1</i>	Amendment required for any additional regulated infrastructure, (Ethel Lake, PAG 2) that is not currently approved for advanced exploration	September 2022
Environmental Compliance Approval for Air - Amendment	Ministry of the Environment and Climate Change (Provincial)	<i>Environmental Protection Act, R.S.O. 1990, Section 20.2 of Part II.1</i>	Amendment for production and update emission sources and rates to ensure air shed boundary sufficient	September 2022
Permit to Take Water	Ministry of the Environment and Climate Change (Provincial)	<i>Ontario Water Resources Act, R.S.O. 1990, Section 34.1</i>	Required for Ethel Lake water taking	September 2023

Authorization or Permit	Responsible Ministry	Applicable Act / Regulation	Associated Facility, Infrastructure or Activities	Target Date to Obtain Approval
17(2)(c) Permit	Ministry of Natural Resources (Provincial)	<i>Endangered Species Act, 2007</i>	Disturbance of Whip-poor-will habitat	Obtained in 2012
Work Permit	Ministry of Natural Resources (Provincial)	<i>Lakes and Rivers Improvement Act, R.S.O. 1990, c.L.3</i>	Required for construction of Ethel Lake water control structure	September 2023
Shoreline Alteration/ Development Permit	Conservation Sudbury [Nickel District Conservation Authority] (Municipal)	<i>Conservation Authorities Act, R.S.O. 1990, c. C.27, Section 28, Ontario Regulation 156/06 Nickel District Conservation Authority; Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses</i>	Required prior to construction of Ethel Lake water control structure and pumphouse	October 2023

FNX considers that the various existing legislative and regulatory processes that have been an integral part of Project development and Project planning to date are adequate to meet the environmental assessment and sustainability planning needs of the Project.



Potential Environmental Effects

The existing regulatory and legislative processes enabled FNX to fully consider the potential for adverse environmental effects by performing an analysis on Project Valued Components (VCs). The environmental analysis for the Project included: closely related projects and activities associated with the past decade of exploration on the Project site; and other projects and activities in the vicinity of the Project site. The VCs used in this analysis included: Atmospheric Environment, Surface Water Quality, Groundwater Quantity, Fish and Fish Habitat, Terrestrial Habitat, Archaeological Resources, Residents and Recreational Land Use, Community Services and Infrastructure, and Employment and Business. For each VC where residual adverse environmental effects are predicted, the adverse environmental effect is further described in terms of some fundamental indicators of sustainability including: probability of occurrence (likelihood); effect on ecosystem function and integrity; and the sustainable use (capacity) of renewable resources to meet present and future needs. Definitions for these sustainability ratings are shown in Table A-11. This approach is consistent with the three steps outlined for determining whether environmental effects are adverse, significant and likely (CEA Agency 2015). The residual adverse environmental effects summary table for each VC also includes a cross-reference to key federal legislation as appropriate.

The results of the analysis on VCs are provided in Table A-12.

**Table A-11: Definitions for Probability of Occurrence, Effect on Ecosystem Function and Integrity and Sustainable Use of Renewable Resources for Residual Adverse Environmental Effects**

Rating	Probability of Occurrence	Effect on Ecosystem Function and Integrity	Sustainable Use (Capacity) of Renewable Resources to Meet Present and Future Needs
High	An environmental effect is probable and there is no uncertainty based on previous scientific research/experience.	Residual adverse environmental effects may result in severe ecosystem changes that result in large scale changes in resource management practices/ planning and land use.	Previous research/experience indicates that the environmental effect on the VC would not reduce biodiversity or the capacity of resources to meet present and future needs.

Rating	Probability of Occurrence	Effect on Ecosystem Function and Integrity	Sustainable Use (Capacity) of Renewable Resources to Meet Present and Future Needs
Moderate	An environmental effect may occur but there is some uncertainty based on previous scientific research/experience.	Residual adverse environmental effects may result in temporary changes in resource management practices and land use.	Previous research/experience indicates that the environmental effect on the VC may, to a certain extent, reduce biodiversity or the capacity of resources to meet present and future needs.
Low	An environmental effect has a small probability of occurring and there is little uncertainty based on previous scientific research/experience.	Residual adverse environmental effects will not result in noticeable change to ecosystem components. Changes may be similar to natural variability.	Previous research/experience indicates that the environmental effect on the VC would reduce biodiversity or the capacity of resources to meet present and future needs.
Nil	An environmental effect has no probability of occurring and there is no uncertainty based on previous scientific research/experience.	Anticipated adverse environmental effects area small and may not be detectable.	Previous research/ experience indicates that the environmental effect on the VC would eliminate biodiversity or the capacity of resources to meet present and future needs.
Unknown	There is insufficient research, experience, Indigenous knowledge to predict the likelihood of an environmental effect occurring.	There is insufficient knowledge to predict an ecosystem effect.	There is insufficient research/experience to indicate whether the environmental effect on the VC would reduce biodiversity or the capacity of resources to meet present and future needs.

### Potential Changes Related to Federal Legislation

The Project does not expect to impact on key areas of federal authority including freshwater fish and fish habitat and minor areas of migratory bird habitat as defined under the *Fisheries Act* and the *Migratory Birds Convention Act*, respectively (refer to Table A-13). Mitigation of any potential adverse environmental effects for all VCs will be accomplished through engineering design, technically proven mitigation measures and comprehensive management plans and procedures that have been developed by FNX.

The Project is not expected to have any residual adverse environmental effects on marine fish and fish habitat or any aquatic species with special conservation status, as defined under the *Fisheries Act* and the *Species at Risk Act*, respectively.

A single discharge from the Project site to Fairbanks Creek is planned at the same location as is currently being used during the Advanced Exploration Phase. All effluent discharged will meet all regulatory requirements and project specific environmental approvals. Potential environmental effects to fish and fish habitat such as reduced surface water quality, and fish mortality will be mitigated to acceptable levels by using engineered design and mitigation measures. In order to minimize potential effects of In-water construction due to increased turbidity, cofferdams will be used to isolate in-water work areas, all water from cofferdam dewatering activities will be collected and treated (as required), and sediment and erosion control measures, such as silt curtains, will be used as needed. Project works have been designed to avoid adverse effects associated with contact water seeping into the receiving environment from mine facilities, and meet the Design Guidelines for Sewage Works 2008. The PAG 2 rock storage containment pad will be lined with a geomembrane with non-woven geotextile placed directly above and below the geomembrane. The geomembrane will be contained within sand bedding layers above and below the geomembrane and surrounded by perimeter berms. A water collection system will pump impacted water collected on the pad to the Mine Water Pond. The Mine Water Pond will be contained within compacted granular embankments and have a double liner with a 60 millimetre High-Density Polyethylene (HDPE) geomembrane or equivalent. Seepage collection ditches will be lined and seepage monitoring wells will be installed.

A Request for Review of *Fisheries Act* Authorization requirements for the Ethel Lake Control Structure was submitted by FNX to DFO in 2016. DFO reviewed the Victoria Mine Project activities against subsection 35(1) of the *Fisheries Act* which prohibits activities that would cause serious harm to fish, and against sections 32, 33 and 58 of the *Species at Risk Act* that are related to adverse impacts on listed aquatic species at risk. DFO determined that there are no federal species at risk or their habitats present in the Project area, therefore no additional approvals are required for the Project under the federal *Species at Risk Act*. DFO has also determined that the Project activities will not cause serious harm to fish or fish habitat providing that 1) the mitigation plans proposed by KGHM are carried out, and 2) KGHM adheres to the DFO's mitigation plans. The

mitigation plans that will be implemented by the Victoria Mine Project to prevent serious harm to fish or fish habitat include:

- Construction of a control structure and spillway that includes a gate chamber with a low-level outlet pipe and valve on the outlet of Ethel Lake, all upstream of the existing historical Vale owned dam;
- Use of a temporary coffer dam, and turbidity curtains and bypass channel to isolate the construction area;
- Installation of a screened pump intake that is designed to meet the DFO's Freshwater End-of-Pipe Fish Screen Guideline for pumping rates of approximately 0.02m<sup>3</sup>/s, and to prevent the entrapment of any fish with anguilliform (eel-like) swimming mode;
- Maintaining the flows in Fairbank Creek at all times during the construction and operating periods of the new control structure to prevent dewatering and stranding of fish;
- Avoiding in-water construction and the use of explosives during the fish spawning period of April 1 to July 15;
- Following the DFO's guidelines for explosives use in or near Canadian fisheries waters, with the exception of maintaining overpressures less than 50 kPa instead of the 100 kPa that are identified in the guideline;
- Use of effective measures to prevent deleterious substances such as oil and fuel, sediment, concrete, concrete wash water, etc. from entering the water throughout the construction and operation periods of the new control structure; and
- Conducting a fish rescue when constructing the coffer dams to ensure all fish are removed from areas that are to be dewatered, and return them unharmed to Ethel Lake.

With the implementation of these mitigation measures, the DFO determined that the Project will not cause serious harm to fish or fish habitat and will not require a formal approval under the *Fisheries Act*. The letter received from the DFO outlining their decision is included in Appendix F of the Environmental Effects Analysis (Appendix A).

No direct effect on migratory birds covered by the *Migratory Birds Convention Act* is anticipated other than that associated with localized habitat removal. Clearing of vegetation and other similar work activities in migratory bird habitat are proposed to be completed outside of the active breeding season.

There are no Federal lands in the vicinity of the Victoria Project Site. No changes to Federal lands inside or outside of Ontario, nor inside or outside of Canada, are expected as a result of the Victoria Project.

**Table A-12: Potential Environmental Effects of the Proposed Mine Compared to Cumulative Effects of the Project in Combination with Other Projects**

Valued Component	Residual Environmental Effect	Significance <sup>1</sup>	Probability of Occurrence (Likelihood) <sup>2</sup>	Effect on Ecosystem Function and Integrity <sup>2</sup>	Sustainable (Capacity) Use of Renewable Resources <sup>2</sup>	Relevant Legislation <sup>3</sup>
<b>Project Effects</b>						
<b>Atmospheric Environment</b>	Reduced air quality and increased noise levels.	Not Significant	Moderate	Low	High	Canadian Ambient Air Quality Standards
<b>Surface Water Quality</b>	Overall increase in turbidity, nutrients and metals, above background concentrations but remaining within regulatory criteria.	Not significant	High	Moderate	Moderate	N/A
<b>Groundwater Quantity</b>	Reductions in Groundwater Quantity due to groundwater extraction for supply water and dewatering.	Not significant	High	Low	Moderate	N/A
<b>Fish and Fish Habitat</b>	Alterations to Fish and Fish Habitat utilization due to habitat changes associated with Ethel Lake Control structure and water taking.	Not Significant	High	Low	High	<i>Fisheries Act, Section 35(2)(b)</i>
<b>Terrestrial Habitat</b>	Wildlife disturbance and mortality (e.g., avoidance of area, changes in behaviour and movement, vehicle collisions, human-wildlife interactions) and habitat loss and alteration.	Not significant	High	Low	High	<i>ESA, 2007, SARA, MBCA, FWCA</i>
<b>Archaeological Resources</b>	Potential disturbance or destruction of Archaeological Resources through chance finds or unplanned events.	Not Significant	Low	Unknown	Unknown	<i>Ontario Heritage Act, CEAA 2012</i>
<b>Residents and Recreational Land Use</b>	Risk to public safety as a result of increased traffic on local roadways effects to the use and enjoyment of residential and recreational properties due to changes in the atmospheric environment; the availability of surface water and groundwater resources (including potential increases in contaminants, such as mercury being released into the water bodies).	Not significant	Moderate	Low	High	N/A
<b>Community Services and Infrastructure</b>	Traffic alters established traffic patterns and volumes and may result in delays in traffic on regional public roads.  Increased demands on fire response and emergency medical services due to vehicle and general traffic accidents, forest fire, fall of ground or mine rescue.	Not significant	High	Low	High	N/A
<b>Cumulative Effects</b>						
<b>Atmospheric Environment</b>	Overall reduced air quality and increased noise levels.	Not Significant	Moderate	Low	High	Canadian Ambient Air Quality Standards
<b>Surface Water Quality</b>	Overall increased degradation of Surface Water Quality for potential downstream water users from increases in turbidity, nutrients and other contaminants.	Not significant	High	Moderate	Moderate	N/A
<b>Groundwater Quantity</b>	Overall increased groundwater takings in the immediate area may reduce the total amount of groundwater available to other users.	Low	Low	Moderate	N/A	

Valued Component	Residual Environmental Effect	Significance <sup>1</sup>	Probability of Occurrence (Likelihood) <sup>2</sup>	Effect on Ecosystem Function and Integrity <sup>2</sup>	Sustainable (Capacity) Use of Renewable Resources <sup>2</sup>	Relevant Legislation <sup>3</sup>
<b>Fish and Fish Habitat</b>	The Project, when combined with recreational fishing in Ethel Lake or Fairbank Creek may result in an increase in fish mortality.	Not Significant	Low	Low	High	<i>Fisheries Act, Section 35(2)(b)</i>
<b>Terrestrial Habitat</b>	Increased instances of wildlife disturbance and mortality (e.g., avoidance of area, changes in behaviour and movement, vehicle collisions, human-wildlife interactions) and habitat loss and alteration.	Not significant	High	Low	High	<i>ESA, 2007, SARA, MBCA, FWCA</i>
<b>Archaeological Resources</b>	The Project, in combination with other projects and activities causing ground disturbance, may result in increased potential disturbance or destruction of Archaeological Resources through chance finds or unplanned events.	Not Significant	Low	Unknown	Unknown	<i>Ontario Heritage Act, CEAA 2012</i>
<b>Residents and Recreational Land Use</b>	The Project in combination with other projects in the area may contribute to increased access restrictions to local recreational areas; compound the reduction in the use and enjoyment of lands in the vicinity of the Project due to emissions (air and noise) to the atmospheric environment; and further increase the volume of traffic on local roadways and alter surface water or groundwater quality or quantity.	Not significant	Moderate	Low	High	N/A
<b>Community Services and Infrastructure</b>	<p>The project in combination with other projects and activities may increase effects to established traffic patterns, and volumes and may result in additional delays in traffic on regional public roads.</p> <p>Increased demands on fire response and emergency medical services due to Construction vehicle and general traffic accidents, forest fire, fall of ground or mine rescue.</p>	Not significant	High	Low	High	N/A

## Notes:

1. The rating of significance for adverse residual environmental effects are those predicted effects remaining after the application of mitigation.
2. Sustainability factors are described for all predicted adverse residual environmental effects in Appendix A, Chapter 5.
3. Key federal legislation references as appropriate for relevant predicted adverse environmental effects.

**Table A-13: Project Environmental Effects Associated with Key Areas of Parliamentary Legislative Authority (*Canadian Environmental Assessment Act* Section 5 and Sections 17 to 19 of the *Prescribed Information for The Description of Designated Project Regulations*)**

<i>Canadian Environmental Assessment Act 2012</i>			
Key Areas of Parliamentary Legislative Authority	Context	Environmental Effects	Comments
5. (1) For the purposes of the Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are	Victoria Mine Project is considered a project at this stage of overall project scope.	N/A	N/A
(a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:	N/A	N/A	N/A
(i) fish and fish habitat as defined in subsection 2(1) of the <i>Fisheries Act</i> ,	Freshwater fish and fish habitat will be affected.	Reduced habitat quality due to reduced surface water quality; habitat modifications in Ethel Lake; fish mortality due to release of contaminants.	Engineering design and technically proven mitigation measures will reduce environmental effects to acceptable levels. Emergency response measures will address any contingent situations regarding spills. No marine fish and fish habitat will be affected.
(ii) aquatic species as defined in subsection 2(1) of the <i>Species at Risk Act</i> ,	No aquatic species with special conservation status are present in project area.	N/A	FNX has developed a detailed baseline on fisheries and aquatic resources.
(iii) migratory birds as defined in subsection 2(1) of the <i>Migratory Birds Convention Act, 1994</i> , and	Underground mine with minimal surface "footprint". Minor areas of habitat for migratory birds to be affected.	Alteration to habitat.	Engineering design and technically proven mitigation measures will reduce environmental effects to acceptable levels. Clearing of vegetation and other similar work activities in migratory bird habitat are proposed to be completed outside of the active breeding season.
(iv) any other components of the environmental that are set out in Schedule 2;	N/A	N/A	FNX will continue to routinely monitor the <i>CEA Act</i> and Schedule 2 for changes and updates.
(b) a change that may be caused to the environment that would occur	N/A	N/A	N/A
(i) on federal lands,	Project is not expected to have any environmental effects on federal lands.	N/A	Project comprises and underground mine with localized reduction in air quality (dust and noise) that should attenuate to ambient conditions in close proximity to the project site and haulage routes.
(ii) in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out, and	Project is not expected to have any trans boundary environmental effects in other provinces.	N/A	Project comprises and underground mine with localized reduction in air quality (dust and noise) that should attenuate to ambient conditions in close proximity to the project site and haulage routes. As well, any potential adverse environmental effects associated with reduced water quality or quantity and subsequent environmental effects on fish and fish habitat, fisheries or downstream water users are expected to occur only in close proximity to the project site.

<i>Canadian Environmental Assessment Act 2012</i>			
Key Areas of Parliamentary Legislative Authority	Context	Environmental Effects	Comments
(iii) outside Canada; and	Project is not expected to have any trans boundary environmental effects outside Canada.	N/A	Project comprises and underground mine with localized reduction in air quality (dust and noise) that should attenuate to ambient conditions in close proximity to the project site and haulage routes. As well, any potential adverse environmental effects associated with reduced water quality or quantity and subsequent environmental effects on fish and fish habitat, fisheries or downstream water users are expected to occur only in close proximity to the project site.
(c) with respect to Indigenous peoples, an effect occurring in Canada of any change that may be caused to the environment on	N/A	N/A	N/A
(i) health and socio-economic conditions,	Health conditions for Indigenous peoples in the project area were adequately addressed in the Sudbury Soils Study. The study included Health Canada oversight.		The Sudbury Soils Study predicted little risk of health effects on Sudbury area residents associated with metals in the environment anglers, hunters and Indigenous people who may consume more local fish and wild game are at no greater risk of health effects due to metals in the environment than the general population.
(ii) physical and cultural heritage,	Projects involving ground disturbances always have the potential to adversely affect sites of physical or cultural importance to Indigenous groups.	Alteration or loss of archaeological or cultural sites.	Environmental baseline conditions indicate low potential for the presence of archaeological or cultural sites. Emergency response plans in place to address contingent situations where chance encounters of previously unidentified sites occur. Extensive and ongoing information exchange and consultation with Indigenous groups as part of negotiations on Impact and Benefit Agreements as well as information sharing with Indigenous groups and continuous improvement processes.
(iii) the current use of lands and resources for traditional purposes, or	All areas in the region offer lands and resources for traditional purposes.	Reduced opportunities for fisheries and angling.	Issues and concerns with respect to the current use of lands and resources or traditional purposes all within the scope of negotiations on Impact and benefits Agreement with Indigenous groups as well as information sharing with Indigenous groups. Environmental baseline conditions indicate that there are no commercial or indigenous fisheries in the project area. The area offers potential for recreational fisheries.
(iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance			Environmental baseline conditions indicate low potential for the presence of historical, archaeological, paleontological or architectural significance in the project footprint area. Emergency response plans in place to address contingent situations where chance encounters of previously unidentified sites occur. Extensive and ongoing information exchange and consultation with Indigenous groups as part of negotiations on Impact and Benefit Agreements as well as information sharing and continuous improvement processes.



<i>Canadian Environmental Assessment Act 2012</i>			
Key Areas of Parliamentary Legislative Authority	Context	Environmental Effects	Comments
(2) However, if the carrying out of the physical activity, the designated project or the project requires a federal authority to exercise a power or perform a duty or function conferred on it under any Act of parliament other than this Act, the following environmental effects are also taken into account:	N/A	N/A	N/A
(a) a change, other than those referred to in paragraphs (1)(a) and (b), that may be caused to the environment and that is directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of the physical activity, the designated project or the project; and	N/A	N/A	Potential environmental effects have been fully considered in relation to blasting and the transportation, handling and storage of hazardous materials and dangerous goods. Thus the project will require authorizations under the <i>Explosives Act</i> and the <i>Transportation of Dangerous Goods Act</i> .
(b) an effect, other than those referred to in paragraph (1)(c), of any change referred to in paragraph (a) on	N/A	N/A	N/A
(i) health and socio-economic conditions;	N/A	N/A	Potential environmental effects in relation to (1)(c) comprise the key environmental effects associated with the project.
(ii) physical and cultural heritage, or	N/A	N/A	Potential environmental effects in relation to (1)(c) comprise the key environmental effects associated with the project.
(iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	N/A	N/A	Potential environmental effects in relation to (1)(c) comprise the key environmental effects associated with the project.

FNX anticipates that the residual adverse environmental effects of the Project in combination with past, present and likely future projects and activities to be not significant within the Project site, and does not anticipate any potential or residual adverse environmental effects to occur on federal lands, or anywhere else beyond Ontario. FNX considers that the Project will contribute substantial economic and employment benefits in the local and regional economy.

#### Indigenous and Public Consultation

The Provincial Ministry of Northern Development and Mines has directed that FNX engage the following Indigenous Groups:

- Sagamok Anishnawbek First Nation;
- Atikameksheng Anishnawbek First Nation; and
- Métis Nation of Ontario.

Well established information sharing and consultation processes exist between FNX and each of the three Indigenous groups potentially affected by the Project including Sagamok Anishnawbek First Nation, Atikameksheng Anishnawbek First Nation, and the Métis Nation of Ontario. FNX has engaged these groups in ongoing confidential consultations about the Project including: awareness of the traditional use of lands and resources that may be of concern; awareness of the use of Indigenous cultural and sensitive areas; establishment of potential Indigenous employment, business opportunities, skills development and training; and where practicable, the use and incorporation of any traditional knowledge provided to improve overall sustainability performance for ongoing exploration activities and the future Victoria Mine. FNX has included any concerns associated with potential adverse environmental effects on potential or established Indigenous or treaty rights into the planning of the environmental effects analysis that has been conducted for the Project.

FNX considers that the various existing legislative and regulatory processes that have been an integral part of Project development and Project planning to date are adequate to meet the environmental assessment and sustainability planning needs of the Project.

Project consultation activities commenced in late 2009 with formal Public Information Sessions commencing in late 2010 to inform Project stakeholders, the public and Indigenous groups of the Victoria Mine. Since 2010, FNX has been actively engaged in consultation activities with potentially affected Indigenous communities and the public (including special interest groups, other local mining operations, and the federal, provincial, and municipal governments). Early consultation with Indigenous communities

focused on formalizing an understanding of cooperation and joint participation during the pending Advanced Exploration and feasibility study stages of the Project. These discussions led FNX to enter into Advanced Exploration Impact Benefits Agreements (IBA) with Sagamok First Nation and Atikameksheng Anishnawbek First Nation in October 2014 and November 2014, respectively. A Memorandum of Understanding between the Métis Nation of Ontario and FNX was signed in April 2015.

FNX has also initiated an information sharing exercise with four additional Indigenous groups as identified in discussions with the Canadian Environmental Assessment Agency. They include Whitefish River First Nation, Wikwemikong First Nation, Wahnapiatae First Nation and Serpent River First Nation.

Comments about the Victoria project from Indigenous Groups to date have often related to employment, training and contracting opportunities. The key issues that FNX has engaged the three Indigenous groups on are:

1. Awareness of the traditional use of lands and resources that may be of concern;
2. Awareness of the use of Aboriginal cultural and sensitive areas; and
3. Establishment of potential Aboriginal employment, business opportunities, skills development and training; and where practicable.

The use and incorporation of any traditional knowledge provided to improve overall sustainability performance for ongoing exploration activities and the future Victoria Mine.

To accommodate Indigenous Groups traditional use of the lands and resources in and surrounding the Victoria Project Area, FNX will provide conditional access for traditional activities throughout the life of the mine. An Access Management Plan will be developed in consultation with Indigenous Groups to facilitate access to areas in and surrounding the Victoria Project Site for traditional usage during the life cycle of the mine. Access will be conditional upon the area to be accessed being deemed safe.

The Access Management Plan will be developed and in use by the end of 2019. The plan will protect the health and safety of those practicing traditional gathering activities, the public and Victoria Project personnel.

Key environment-related interests or comments expressed to date from Indigenous Groups include:

1. Handling and storage of waste rock and management of potentially acidic rock drainage from onsite temporary storage of Potentially Acid Generating waste rock;

2. Management and consumption of surface and groundwater resources, such as stormwater management, runoff from waste rock storage areas, water intake sources for the Project;
3. Potential effects of the Project on water quality, fish and wildlife;
4. Spill prevention and response measures;
5. Interest in training, employment and contracting opportunities; and
6. Environmental monitoring of receiving water bodies and monitoring of Species at Risk.

FNX has been actively engaged in consultation with a number of other stakeholders since 2009 including the following:

- **Special interest groups:** Vermilion River Stewardship Committee; Fairbank Lake Cottagers Association; Walden Sno Runners; Randolph Street Residents; Copper Cliff; Vale Totten Mine; and Sudbury Integrated Nickel Operations (A Glencore Company);
- **Federal Government:** Canadian Environmental Assessment Agency (CEAA); Environment Canada (EC); and Fisheries and Oceans Canada (DFO);
- **Provincial Government:** Ministry of Northern Development and Mines (MNDM); Ministry of Environment and Climate Change (MOECC); Ministry of Natural Resources and Forestry (MNRF); and Ministry of Transportation Ontario (MTO); and
- **Municipal Government:** City of Greater Sudbury; and Ward 2 Walden (Whitefish, Naughton, Lively, Worthington, Copper Cliff).

The list of stakeholders is expected to continue to evolve throughout Project development to reflect varying levels of interest and issues over time. Key comments about the Victoria Project to date received from stakeholders have often related to potential employment and contracting opportunities. There has also been an interest expressed regarding safety and environmental aspects, including:

- Effects of the Victoria Project on water quality;
- Noise and Dust generated during the project;
- Haul Truck traffic and additional traffic on local roads causing a concern for public safety;
- Effect of the Victoria Project on the existing Sudbury Trail Plan.

FNX will continue to engage external stakeholders throughout the life of the Project through a variety of methods including open houses and distribution of FNX newsletters.

Some stakeholders will receive additional engagement/communications based on legal requirements, requests, needs, etc.

Consultation with government stakeholders has been conducted through the Public Information Sessions although predominately to obtain the required permits, approvals and authorizations. An open and transparent dialogue and consultation continues today and will continue over the life of the Project. This ongoing dialogue will inform FNX's sustainability management and planning process, which has been put in place to ensure the maintenance of a healthy environment, safe workplace and strong economy.