

## **EXECUTIVE SUMMARY**

Tyhee Development Corp is a publicly traded mining Company engaged in the exploration and development of mineral properties in North America and internationally. Tyhee NWT Corp (Tyhee) is a wholly owned subsidiary of Tyhee Development Corp. Tyhee NWT Corp owns and will construct and operate the Yellowknife Gold Project (YGP).

### **Proposed Mine Plan**

The YGP mine plan is based on mining by underground open stope methods using trackless equipment. Access from surface will be via a decline from which level drifts will be driven to the ore zones. The ventilation system will incorporate the exhaust method whereby fresh air is pulled through the portal and other surface openings and vented to surface via raises. Water and compressed air, required to facilitate mining, will be piped from surface to the underground stopes and headings. Any excess water underground will be collected in a sump, pumped to surface and then to the tailings containment area.

The YGP will produce approximately 525,000 tonne per year of ore, which will be transported to surface and processed in the mill at a rate of approximately 1500 tonnes per day.

It is currently estimated that approximately 175,000 tonnes of waste rock will be extracted each year. It is planned to use this material as backfill. To minimize impacts on surface, the use of non-acid generating waste rock as construction material will be optimized, however, due to availability, crushed rock construction material may be extracted from quarries on surface. Any material that is brought to surface would be stored in an appropriate waste rock dump that would be engineered to minimize impacts. Monitoring of waste dump seepage would be included in the design and operation of the waste dump location.

### **Site Preparation and Construction**

Site preparation will consist of upgrading the access roads within the property to all weather roads with culverts installed where appropriate. Additional roads will be constructed to the waste disposal area(s), process plant site and explosives magazines.

The estimated quantities of sand and gravel are 100,000 tonnes for buildings, roads and associated structures. The estimated sand and gravel requirements for the tailings containment area at Winter Lake are approximately 25,000 tonnes and, 15,000 tonnes of clay type material, respectively.

### **Processing**

The proposed plant process flow sheet incorporates conventional crushing and grinding. Slurry from the grinding circuit slurry will pass through a gravity concentrator to recover the free gold. Cyclone overflow slurry will then be fed to the flotation circuit to recover coarse gold and associated sulphide minerals to the flotation concentrate. The gold in the flotation concentrate will be leached and recovered in a conventional carbon-in-leach circuit using dilute cyanide solution. Activated carbon adsorbs the dissolved gold and is recovered by screening. The gold is eluted from carbon conventional carbon stripping technology and recovered by electrowinning onto steel fibre cathodes. The stripped carbon will be regenerated and returned to the carbon-in-leach circuit to recover more gold.

The slurry from the cyanide leach circuit will be treated using the Caro's Acid or Inco SO<sub>2</sub>/Air process to detoxify the remaining cyanide. The treated cyanide leach slurry will be added to the uncontaminated flotation tailings and pumped by pipeline to Winter Lake, the proposed tailings containment area. Gold recovered from both the gravity and leach circuits will be smelted on site and shipped as Dore bars for refining.

### **Acid Rock Drainage**

Humidity cell test work (to identify potential ARD concerns) on selective samples of low-grade ore (potentially waste) was completed and maintained neutral values with concentrations of metals considered low. Further humidity cell test work on waste rock is planned. The potential for metal leaching from the waste rock test work will be completed and made available for review during the review process.

### **Tailings**

The proposed and preferred location for tailings disposal is Winter Lake. Reclaim water will be optimized from Winter Lake. This area has an estimated storage capacity of

approximately 2 million cubic metres (5 million tonnes) and can be expanded. The quantity of tailings that are expected to be produced over the 8-year mine life is 1.5 million cubic metres (4.2 million tonnes).

All process tailings will be deposited into Winter Lake. Construction of a dam on the outlet of Winter Lake will act as the control structure. All process tailings will be pumped and deposited sub-aqueous into Winter Lake. Reclaim water will be optimized from Winter Lake and pumped back to the process plant. During the feasibility study and detailed design phases, tailings management strategies will be developed further and included in the projects' overall Environmental Management System (EMS) which will be part of projects' final EIS.

### **Solid and Hazardous Waste**

Solid wastes generated will be managed in accordance with Canadian regulations and issued licences or permits. In the absence of specific regulations, the project will utilize international guidelines and best management practices.

All solid non-combustible and non-hazardous waste will be disposed of in an approved onsite location. Combustible waste and kitchen refuse will be incinerated. Waste oil will be burned in a waste oil burner.

Waste disposal of hazardous material will be in an approved manner either on site or in an approved off-site facility specially designed to handle that type of waste.

### **Sewage**

Sewage wastes from the operation will be processed through a packaged sewage treatment plant. Treated sewage will be combined with the mill tailings and deposited into Winter Lake.

### **Water Use**

The expected fresh water requirements for the operation are:

Mill	100,000	m <sup>3</sup> /year (make up water)
Camp	22,538	m <sup>3</sup> /year
Mine	10,000	m <sup>3</sup> /year

The water source for both process and potable water will be Giauque Lake. Any mine water pumped from underground will be pumped to Winter Lake. The use of reclaim water from the tailings containment area will be optimized.

### **Water Releases**

It is planned to release water from the Winter Lake Tailings Containment Area to the downstream environment on an annual basis. Any water released from the tailings containment area would meet MMER discharge criteria.

### **Power Plant**

The average power is estimated at 6.25 MW with a peak demand of 7.8 MW. Power will be generated on site using diesel powered generating units. The power plant will be strategically located to deliver power requirements to the operation.

### **Airstrip**

Tyhee has used the existing airstrip during their exploration programs and expect to have continued access until DIAND completes its reclamation activities at the historical Discovery Mine. Discussions with DIAND's Contaminated Sites Office are ongoing and subject to the outcomes of these discussions, the construction of a project specific airstrip may be required. Should this be the case, Tyhee proposes to develop an airstrip at the esker to the south of the present site.

### **Change house, Compressor House, Offices, Warehouse and Maintenance Shops**

A Change house, for use by all personnel to shower and change into street clothes, will be located close to the portal for easy access. The mine maintenance shop, mine warehouse, fuel tank (for the mine and other facilities) and main offices will be located in close proximity to the mine entrance.

### **Fuel Storage**

The YGPs' annual fuel storage requirements are estimated at 12 million litres. All fuel tanks (welded in place) will be placed in an engineered and lined enclosure capable of holding 110% of the capacity of the largest tank. Appropriate spill response equipment will be stored at the tank farm facility.

**Explosives Storage**

The explosives storage facility with a current estimate of 600,000 kilograms will be placed in facilities that comply with the Table of Distances designated in the NWT, WCB regulations and any requirements by Natural Resources Canada (NRCan)

**Roads**

The present road layout at the site will be utilized and additional roads developed to provide access to the surface facilities. Quarried rock or clean NAG crushed waste rock will be used in roadway construction with finer dressing material possibly coming from the local esker.

**Camp**

The camp will be located along the access road from the mine portal to the mill. The camp will be sized to accommodate approximately 130 persons.

**Winter Road**

Tyhee plans to utilize the current winter road access to the YGP area from the Bluefish Power Station on Prosperous Lake. Tyhee has used this access in the past and will continue to use this access to move equipment and supplies for exploration activities in 2005 and continue in 2006 and beyond for construction and operation of the YGP.

**Human Resources**

The total mine workforce to be employed is estimated at 237. It is anticipated that the mine will operate 350 days per year and the process plant 365 days per year. The crew schedule will be 2 weeks on and 2 weeks off, working 12 hour shifts. Management and technical personnel may be on a varied schedule.

**Project Schedule**

Further engineering and Pre-feasibility studies will be completed by September, 2005. The plant construction commences April 2007 for completion by March 2008. Site facilities such as power supply, waste disposal facilities, camp, fuel supply, explosive magazines, offices, warehouse and shops and associated surface facilities are expected to commence April 2007 and be completed by March 2008.

Pre-production development is scheduled to commence June, 2007 with full production being achieved in February 2008. Initial mining of the stopes will commence prior to the mill being commissioned so that sufficient ore will be available for the commissioning and continued operation of the mill.

### **Existing Environment**

The YGP study area (~14,475 ha) is located within the Tazin Lake Upland Ecoregion of the Western Taiga Shield Ecozone. It is characterized by cool summers and cold winters and has a sub-humid, high boreal ecoclimate. Upland areas are dominated by bedrock exposes, while lowlands are covered by organic deposits. Dystric Brunisols are the dominant upland soils and Organic Cryosols are found in poorly drained, peat-filled depressions. Trembling aspen, jack pine, and white and black spruce dominate upland areas, while stands of tamarack and black spruce dominate poorly drained fens and bogs.

### ***Ecological Land Classification***

From baseline data collected in 2004 twenty-two ecosystem types were classified within the Yellowknife Gold Project (YGP) study area. Fourteen of these were naturally vegetated, three were classified as water, four were anthropogenic and one was cloud. Spruce-lichen (SL) was the dominant ecosystem type covering 33% of the YGP study area. Jack pine-lichen was second covering 19.5%. Treed bog was the most dominant wetland type covering 8.5%. There were eight naturally vegetated ecosystem types of restricted distribution, each covering less than 1% of the area. Dry Coniferous Woodland was the most abundant broad unit, with Burns second in abundance.

### ***Aquatic Life***

Fish were collected from Eclipse Lake, Nicholas Lake, Brien Lake and Narrow Lake. No fish were collected in Round Lake or Winter Lake. Northern pike was the most widely distributed species in the study area. Lake whitefish was the most abundant species with the collection of 5 fish from Eclipse Lake and 74 fish from Narrow Lake. The collection of lake trout was limited to Eclipse Lake (11 fish) and Nicholas Lake (9 fish). Other species collected in nets included three lake cisco in Eclipse Lake and two burbot, one from both Eclipse and Nicholas Lakes.

The six lakes surveyed within the YGP study area ranged in size from 11.5 ha to 258 ha and had a bathymetric depth ranging between 1.5 (Winter Lake) to 55 m (Eclipse Lake)

in depth. Round Lake and Winter Lake were shallow and have large sections of the lakes freeze to the bottom during winter. Eclipse Lake and Nicholas Lake were observed to support a complex diversity of habitat types, including steep and vegetated shorelines, rocky shoals and islands, deep water, boulder fields and multiple embayments. Both lakes provided important habitat attributes for the spawning, rearing and over-wintering of northern pike, lake trout and lake whitefish. Brien Lake and Narrow Lake were limited in their habitat availability for fish and were primarily comprised of a single elongated basin supporting a single deep lake section and extensive shed wetland vegetation, at both ends of each of the lakes.

Samples of composite tissue collected from fish within the YGP study area, resulted in the highest values of mercury and arsenic observed in tissue from a large trout captured in Eclipse Lake. The trout (age 34+ years) was observed to contain mercury levels (4.09 mg/kg), eight times the Health and Welfare Canada restrictive consumption level of 0.5 ppm. The highest mean levels of arsenic occurred in fish captured in Eclipse Lake. High levels of selenium were observed from Lake Trout in Nicholas Lake. Northern Pike from Brien Lake showed the highest mean concentrations of copper of all fish collected, within the YGP study area. Levels for cadmium, chromium, lead, nickel, silver and zinc were all found in fish tissue samples at levels below detection limits.

Sampling was also conducted on the six lakes for zooplankton and benthic invertebrate communities.

Sediments within Round Lake were shown to have higher values for arsenic, copper, nickel, zinc and phosphorus, in comparison to all other lakes sampled. Brien Lake showed the highest concentration of mercury in sediments, followed by the second highest concentrations of copper and arsenic. Sediment samples collected from Narrow Lake indicated the highest concentrations of chromium of all lakes and supported the second highest concentrations of mercury, nickel, zinc and phosphorus. Levels for chromium were found elevated within all lake sampled in the study area. Winter Lake was found to have the lowest concentrations of arsenic and phosphorus, and the second lowest concentrations of chromium, mercury and zinc. Eclipse Lake was observed to support and lowest concentrations of mercury and copper in sediments, while Nicholas Lake supported the lowest concentrations of nickel and zinc.

## ***Water Quality***

### Nicholas Lake and Eclipse Lake

Nicholas Lake and Eclipse Lake are large oligotrophic lakes with water quality typical of Canadian shield lakes. Both lakes develop a thermocline in the open water season and have low dissolved oxygen near the bottom in late summer. The water is soft and has low major ion concentration with corresponding low TDS and conductivity. The pH of the water is above neutral. Nicholas and Eclipse Lakes had exceedences of the CCME FAL Guidelines for Aluminium, Copper, and Mercury. In addition Eclipse had an exceedence for cadmium. These results were similar to study results from 1990.

### Brien Lake

Brien Lake is a medium sized shallow lake. It develops a thermocline in the summer and has some DO depression. The lake can be considered on the borderline between oligotrophic and mesotrophic. The hardness and TDS are slightly higher than Eclipse and Nicholas. The pH of Brien Lake is slightly alkaline. Brien Lake had exceedences of the CCME FAL guidelines for Aluminium and copper; based on other available data these were concluded to be natural occurrences.

### Narrow Lake

Narrow Lake is similar to Brien Lake in size and depth. It develops a thermocline in summer with some Dissolved Oxygen depression near the lake bottom. The hardness, and TDS are similar to Brien and higher than Eclipse and Nicholas Lakes. Narrow Lake showed exceedences of the CCME FAL guidelines for Aluminum, Copper and Mercury. These exceedences may be related to the drainage from the tailings from the former Discovery mine which entered Round and then Winter and Narrow Lakes.

### Winter Lake

Winter Lake is a mesotrophic lake that exhibits low Dissolved Oxygen in winter. This is related to its shallow depth. There are indications that it has been impacted by the tailings discharges in the past. These are noted in the higher TDS, and Conductivity and the more frequent exceedences of CCME FAL Guidelines for metals in the lake. These exceedences were for Aluminium and Copper. The pH of the Winter Lake is slightly alkaline.

### Round Lake

Round Lake is a shallow mesotrophic lake that historically been impacted by the deposit of tailings from the former Discovery Mine and the more recently from the disposal of

treated water from the DIAND clay pit. The metal concentrations in Round Lake in 2004 exceeded the CCME FAL Guidelines for aluminium, arsenic, copper and nickel. This was also documented by Gartner Lee and NSMA (2003). The hardness, TDS and Conductivity of the lake were also elevated when compared to other lakes in the YGP Study area.

### ***Wildlife***

The YGP study area lies within the boreal forest of the Taiga Shield Ecozone; however, both boreal and tundra animal species frequent the area. Twenty-six species of mammals may frequent this region. Tundra species, such as barrenground caribou (*Rangifer tarandus groenlandicus*) are typically found within this ecoregion during the winter months, spending the summers on the tundra proper. Other species, such as gray wolf (*Canis lupus*) and wolverine (*Gulo gulo*) are residents of both tundra and boreal forest, and frequent the transitional ecoregion to the north throughout the year. Boreal species such as mink (*Mustela vison*) and beaver (*Castor canadensis*) are also found in the area.

During the wildlife field studies moose populations were estimated to be 1 moose per 27 km<sup>2</sup>. This was considered to be typical for the area. Wildlife observations did not note any endangered species or species of concern in the area.

### **Environmental Effects**

A preliminary assessment of the environmental effects indicate that the development of the YGP could meet all applicable federal and territorial environmental regulations and guidelines including:

- *Fisheries Act, Metal Mining Effluent Regulation, No Net Loss Policy*
- *Chapter E-23 Environmental Protection Act, Asphalt Paving Industry Emission Regulations.*
- GNWT Guideline for Dust Suppression
- Guideline for Ambient Air Quality Standards in the Northwest Territories.

### **Archaeology**

Archaeological assessments were conducted of specific proposed development areas identified on a conceptual plan. Ground reconnaissance was conducted in the vicinity

surrounding the proposed mine on the Ormsby property, the entire perimeter of Round Lake, a possible waste rock storage area west of the mine site, as well as selected portions of the terrain surrounding the Nicholas mine site. Several transects were also walked over a large, broad, rocky ridge extending west from the old Discovery Mine townsite, past the current camp location to the north end of Narrow Lake. Old mining debris and various structural remains associated with the past mining activities were found scattered over this ridge. An esker identified as a possible gravel source southwest of Giauque Lake was also walked. A broad exposed area at the south end was shovel tested, and an old gravel borrow at the north end contained extensive exposures that were closely inspected.

Low level helicopter overflights were completed of the general route for a road between Discovery and Nicholas Lake properties as well as the northern two-thirds of the old winter road between Discovery property and Yellowknife. This provided a good indication of terrain suggestive of archaeological potential where ground reconnaissance will be necessary when routes are finalized. These landforms generally consist of elevated terrain near the larger water bodies.

Heritage resources found were all associated with past mining activities, with one possible exception. Some camp remains found on the south side of Round Lake may relate to aboriginal hunting activities, but this site did not appear to contain any evidence suggestive of a date older than 50 years. Additional archaeological assessments will be required when locations of all ancillary developments have been finalized.

### **Public Consultation**

Throughout the baseline data collection programs, there has been a concerted effort to keep the public, affected First Nations and regulators informed of the project and the development activities. This has included meetings with the Yellowknife Dene Chiefs and their Land and Environment Committee, meetings with the North Slave Metis Alliance Land and Environment Committee and the regulators Mineral Development Advisory Group (MDAG). Information packages on the field activities have also been provided to First Nations.

To date, no issues have been raised that cannot be dealt with during the design phase of the project. Consultation will continue throughout the construction and life of the project.