



Treasury Metals
Revised EIS Report
Goliath Gold Project
August 2017



APPENDIX II

DRAFT FISHERIES COMPENSATION STRATEGY AND PLANS



NOTE TO READER APPENDIX II

In April 2015, Treasury Metals submitted an Environmental Impact Statement (EIS) for the proposed Goliath Gold Project (the Project) to the Canadian Environmental Assessment Agency (the Agency) for consideration under the Canadian Environmental Assessment Act (CEAA), 2012. The Agency reviewed the submission and informed Treasury Metals that the requirements of the EIS Guidelines for the Project were met and that the Agency would begin its technical review of the submission. In June 2015, the Agency issued a series of information requests to Treasury Metals regarding the EIS and supporting appendices (referred to herein as the Round 1 information requests). The Round 1 information requests included questions from the Agency, other federal and provincial reviewers, First Nations and other Aboriginal peoples, as well as interested stakeholders. As part of the Round 1 information request process, the Agency requested that Treasury Metals consolidate the responses to the information requests into a revised EIS for the Project.

Appendix II to the revised EIS (Draft Fisheries Compensation Strategy and Plans) summarizes the objectives of a potential offset strategy for fisheries habitat overprinted or impacted by the proposed Project. The framework provides a starting point for subsequent permitting discussion associated with potential Fisheries Act Section 35 Authorization requirements, and offset requirements that may be required under the Metal Mining Effluent Regulations (MMER) Schedule 2 amendment process.

As part of the process to revise the EIS, Treasury Metals has undertaken a review of the status for the various appendices. The status of each appendix to the revised EIS has been classified as one of the following:

- **Unchanged:** The appendix remains unchanged from the original EIS, and has been re-issued as part revised EIS.
- **Modified:** The appendix remains relatively unchanged from the original EIS, and has been re-issued with relevant clarification.
- **Re-written:** The appendix has been substantially changed from the original EIS. A re-written appendix has been issued as part of the revised EIS.
- **Discarded:** The appendix is no longer required to support the EIS. The information in the original appendix has been replaced by information provided in a new appendix prepared to support the revised EIS.
- **New:** This is a new appendix prepared to support the revised EIS.

The following table provides a listing of the appendices to the revised EIS, along with a listing of the status of each appendix and their description.



| List of Appendices to the Revised EIS | | |
|---------------------------------------|------------|---|
| Appendix | Status | Description |
| Appendix A | Modified | Table of Concordance |
| Appendix B | Unchanged | Optimization Study |
| Appendix C | Unchanged | Mining Study |
| Appendix D | Re-written | Tailings Storage Facility |
| Appendix E | Unchanged | Traffic Study |
| Appendix F | Re-written | Water Management Plan |
| Appendix G | Discarded | Environmental Baseline |
| Appendix H | Unchanged | Acoustic Environment Study |
| Appendix I | Unchanged | Light Environment Study |
| Appendix J | Unchanged | Air Quality Study |
| Appendix K | Unchanged | Geochemistry |
| Appendix L | Discarded | Geochemical Modelling |
| Appendix M | Unchanged | Hydrogeology |
| Appendix N | Unchanged | Surface Hydrology |
| Appendix O | Discarded | Hydrologic Modeling |
| Appendix P | Unchanged | Aquatics DST |
| Appendix Q | Re-written | Fisheries and Habitat |
| Appendix R | Re-written | Terrestrial |
| Appendix S | Re-written | Wetlands |
| Appendix T | Unchanged | Socio-Economic |
| Appendix U | Unchanged | Heritage Resources |
| Appendix V | Unchanged | Public Engagement |
| Appendix W | Unchanged | Screening Level Risk Assessment |
| Appendix X | Re-written | Alternatives Assessment Matrix |
| Appendix Y | Unchanged | EIS Guidelines |
| Appendix Z | Unchanged | TML Corporate Policies |
| Appendix AA | Modified | List of Mineral Claims |
| Appendix BB | Unchanged | Preliminary Economic Assessment |
| Appendix CC | Unchanged | Mining, Dynamic And Dependable For Ontario's Future |
| Appendix DD | Re-written | Aboriginal Engagement Report |
| Appendix EE | Unchanged | Country Foods Assessment |
| Appendix FF | Unchanged | Photo Record Of The Goliath Gold Project |
| Appendix GG | Modified | TSF Failure Modelling |
| Appendix HH | Unchanged | Failure Modes And Effects Analysis |
| Appendix II | Unchanged | Draft Fisheries Compensation Strategy and Plans |
| Appendix JJ | New | Water Report |



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1.0 PURPOSE

Treasury Metals Incorporated (Treasury) is proposing to develop the Goliath Gold Project (the Project) and associated infrastructure near Dryden, Ontario. Treasury has been exploring the Project site since 2008 and has completed more than 370 diamond drill holes totaling approximately 119,000 meters. The Project is located within the Kenora Mining Division and is approximately 4 km northwest of the village of Wabigoon, 20 km east of Dryden and 2 km north of the TransCanada Highway 17 and within the Hartman and Zealand townships (Figure 1, Figure 2). Treasury proposes to construct, operate, and eventually decommission a new gold mine and is currently conducting engineering studies to confirm and determine the technical and economic aspects of the Project.

The current mine layout places most required mine related facilities in close proximity to the proposed open pit, and to the extent possible, on private lands owned by Treasury Metals. The Project footprint will cover approximately 188 ha during the maximum of extent of operations with 133 ha or 71% of the footprint on Treasury private lands.

The Project is designed to:

- Use well known, conventional and environmentally sound mining techniques and technologies used commonly in northern environments;
- Minimize overall footprint;
- Minimize associated potential effects;
- Manage water effectively and efficiently;
- Mitigate or compensate for effects on biological habitat; and
- Accommodate effective planning for final closure and site abandonment, rendering the site suitable for other compatible land uses and functions.

Development of the site will include an open pit, mine rock and overburden stockpiles/storage, a tailings storage facility, processing plant, mine water management components (including polishing pond, seepage collection ponds, drainage ditches), explosive storage facility, and local roads. The mine components as described will result in the unavoidable harm to fish and fish habitat and infilling of waters frequented by fish which requires the development and implementation of offsets (compensation) pursuant to the *Fisheries Act*.

In 2014 a cooperative approach was initiated with the Ontario Ministry of Natural Resources and Forestry (OMNRF), and subsequently with Fisheries and Oceans Canada (DFO) to form the basis of a fish habitat offset framework to be developed. Treasury Metals will be required to submit an offsetting plan to demonstrate that the measures and standards will be fully applied to first avoid, then mitigate, and finally offset any residual *serious harm to fish* that are part of or support commercial, recreational or Aboriginal fisheries. The local fish species sampled within the LSA may not represent or support commercial, recreational, or Aboriginal value, and therefore may not be of interest to DFO, and there is only inconclusive evidence to support the potential presence of large bodied fish species (e.g. Northern Pike, Walleye). In consultation with DFO, Treasury will conduct field sampling to verify the presence or potential of such species within the LSA prior to concluding discussions or agreements regarding offsetting for possible serious harm to fish.

The goal of this document therefore is to summarize the objectives of a potential Goliath Gold Project offset strategy in a manner that explains the separation between potential *Fisheries Act* Section 35 Authorization requirements and offset requirements that may be associated with the Metal Mining Effluent Regulations (MMER) Schedule 2 amendment process.

Through consultation with other industry leaders, Treasury Metals understands that the impacts and offsetting measures associated with the *Fisheries Act* Section 35 to fish habitat and fisheries must be separated into distinct documentation from the impacts and offsets associated with mine waste deposition into natural water frequented by fish pursuant to MMER Schedule 2 requirements. Therefore, based on the methodology described, two No Net



Loss Plans (NNPL) will be prepared and submitted to DFO to address the overall offset strategy that may be required (subject to further field study and consultations with DFO) for the Goliath Gold Project. Overall summary of mine components with consideration to the regulatory authority is detailed in Table 1.

Table 1 Summary Breakdown of Project Components with Consideration under MMER Schedule 2 or Fisheries Act Section 35(2)

| Mine Feature or Component | MMER Schedule 2 Consideration | Section 35(2) <i>Fisheries Act</i> Consideration |
|--|-------------------------------|--|
| Open Pit | | X |
| Plant Site/Ancillary Facilities | | X |
| Overburden Stockpile | X | |
| Road Crossings, Pipeline Crossings, Intakes, Outlets | | X |
| Flow Reduction | | X |
| Watercourse Realignment | | X |
| Laydown Area | | X |
| Collection Ponds | | X |
| Tailings Storage Facility | X | |



GOLIATH GOLD PROJECT
DRYDEN, ONTARIO, CANADA

LOCATION OF GOLIATH GOLD PROJECT
(PROVINCIAL SCALE)

FIGURE 1 REV.00

SCALE: 10 000 000

TREASURY METALS INC.

DESIGN: AT 06 FEB. 2014
 GIS: AT 20 FEB. 2014
 CHECK: XX 12 SEP. 2014

LEGEND

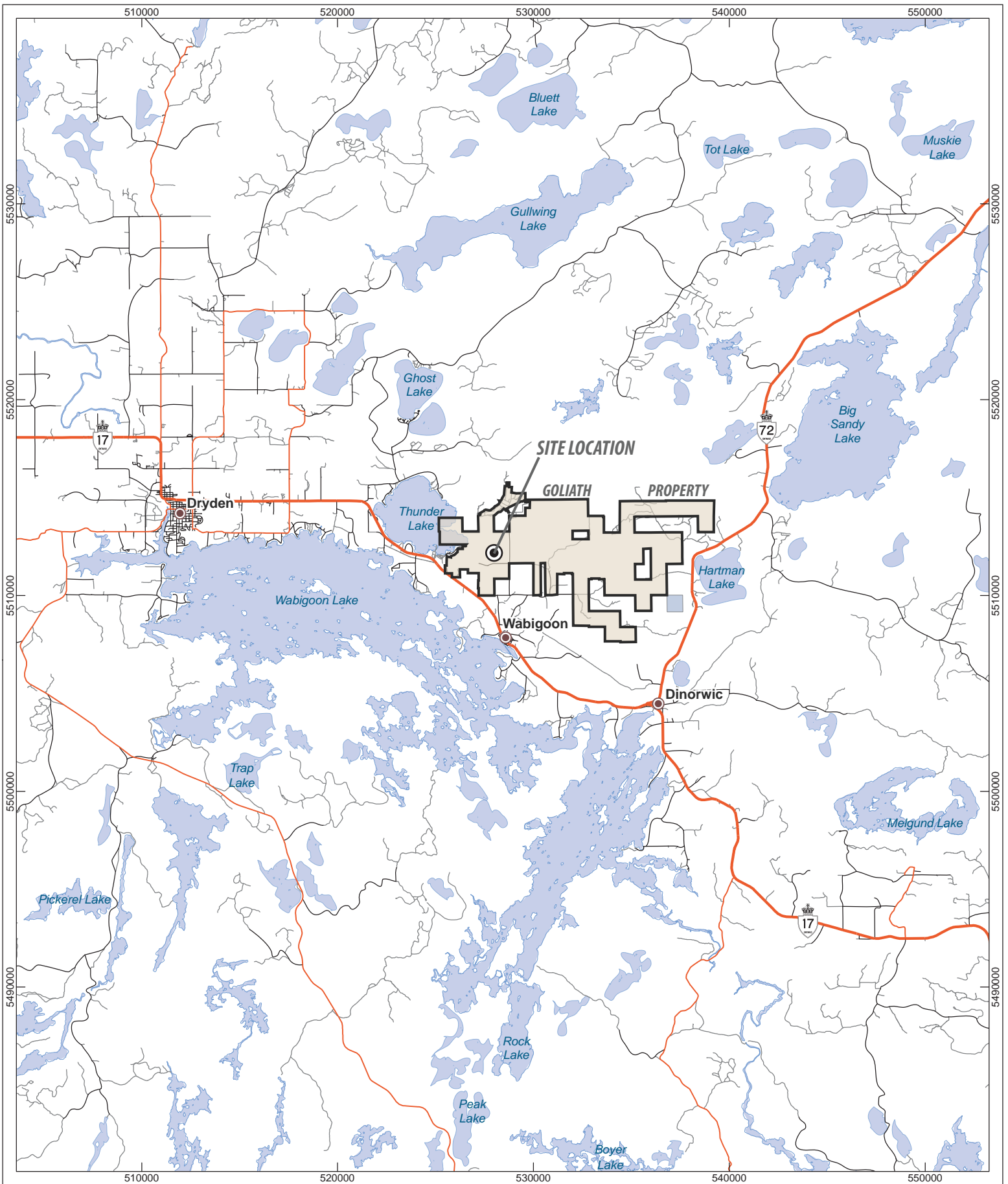
- Populated Area
- 📍 Goliath Gold Project Indicator
- Highway/Major Roadway
- ▭ Major Waterbody
- ▭ Canada
- ▭ United States

N

0 100 200 300
 Kilometers

REFERENCE
 Data by Treasury Metals Inc.
 Projection: NAD83 UTM Zone 15N





GOLIATH GOLD PROJECT
 DRYDEN, ONTARIO, CANADA

SCALE: 250 000

TREASURY METALS INC.

LOCATION OF GOLIATH GOLD
 PROJECT (LOCAL SCALE)

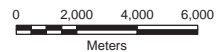
DESIGN: AT 06 FEB. 2014
 GIS: AT 20 FEB. 2014
 CHECK: AT 12 SEP. 2014

FIGURE 2

REV.00

LEGEND

- Populated Area
- Goliath Gold Project
- Waterbody
- Project Site
- Arterial Road
- Highway
- Local Road
- Recreational Road



REFERENCE

Data by Treasury Metals Inc.
 Projection: NAD83 UTM Zone 18N





2.0 BACKGROUND

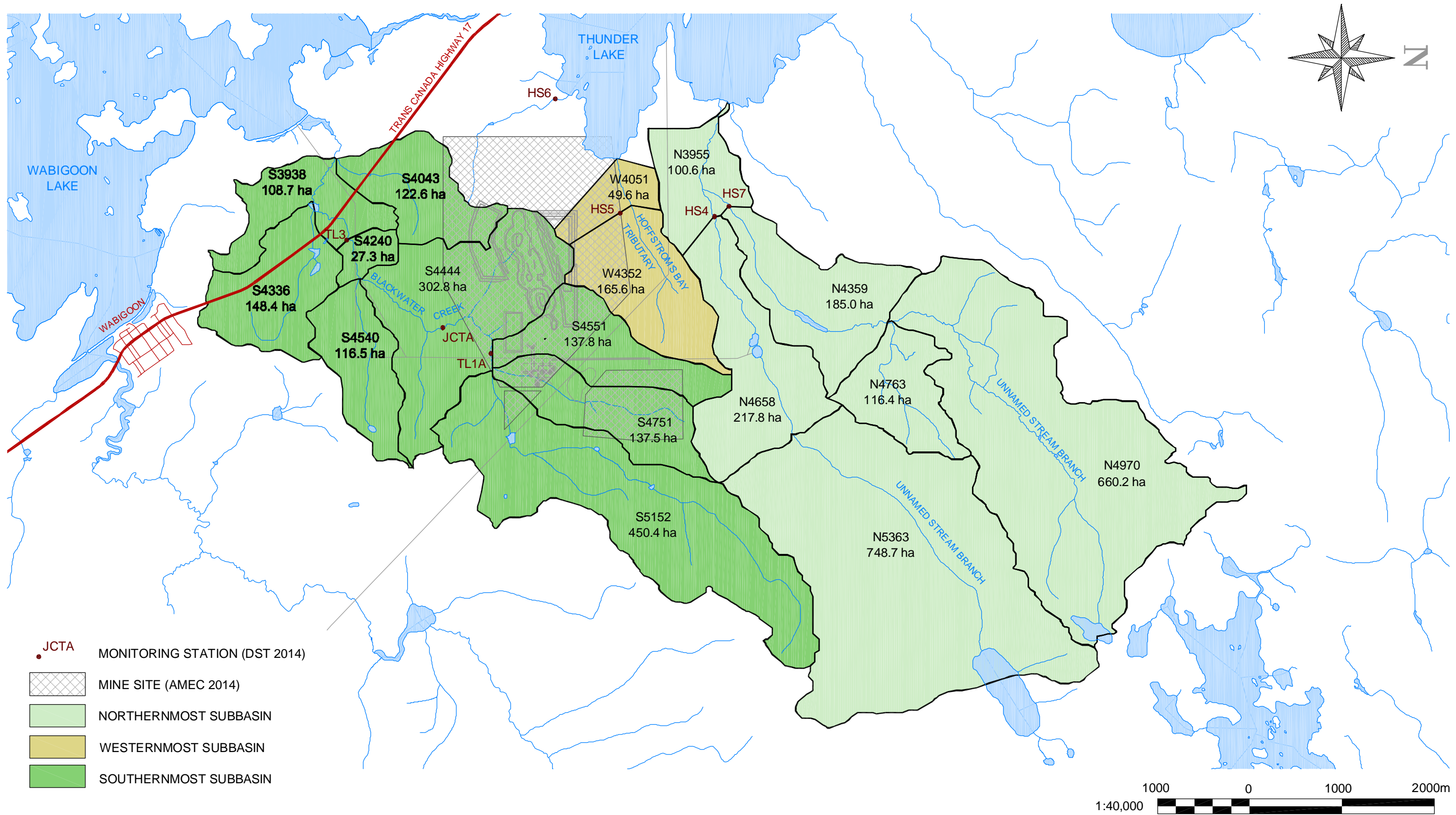
2.1 REGIONAL AREA

The project site is located within the Lake Wabigoon Ecoregion (Ecoregion 4S) which extends from the northern portion of the Lake of the Woods east to Lac Seul and Dryden. The climate in ecoregion 4S is cool and dry with warm, moist summers and cold winters. The vegetation of ecoregion 4S is predominantly mixed forest (25%), sparse forest including peat lands (24%), and coniferous forest (14%). Water makes up about 24% of the area. This ecoregion is within the Lower English River Section in the Boreal Forest Region. Mixed stands of boreal forest species, such as trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), and white spruce (*Picea glauca*) make up much of the forest cover, on well drained sites. Jack pine (*Pinus banksiana*), balsam fir (*Abies balsamea*), and white birch (*Betula papyrifera*) are common typically on well-drained soils but are also prevalent on and around bogs and other wetlands. Extensive peat lands with black spruce (*Picea mariana*), tamarack (*Larix laricina*), eastern white cedar (*Thuja occidentalis*), willow (*Salix spp.*), and speckled alder occupy low lying, poorly drained sites. Red and white pine (*P. resinosa* and *P. strobus*) communities are restricted to warmer than average sites.

From a regional perspective the project is within Fisheries Management Zone (FMZ) 5. Management zones are geographic regions characterized by similar ecological, physical, social, and economic attributes. FMZ 5 covers an area of 44,360 km² extending from the Manitoba border in the west, to the boundaries of Quetico Provincial Park in the east. The zone extends north from the US border to the Dryden area and Wabigoon River watershed. Within the FMZ 5 boundary there are 5000 lakes over 10 ha in size and thousands of kilometers of river and stream habitat. A total of 23% of the FMZ 5 area is permanent water, and additional 7% is wetland. Zone 5 is within the Nelson River primary watershed. Most of the land base in Zone 5 drains west through the Rainy River Lake of the Woods system to Lake Winnipeg and the Nelson River to Hudson Bay. Thunder and Wabigoon Lakes are located in the northern limit of FMZ 5, and drain northwest through the Wabigoon River into the English River.

Lakes typical of FMZ 5 are characterized by low productivity, small size and deep water. These clear lakes represent one of two general fish community types found in the region, a cool water community, with the other community type being cold water. Cool water communities are most often found in highly productive, shallow water lakes, such as Wabigoon Lake, and are characterized by fish species with optimum growth occurring between 15°C and 25°C. Common sport fish in cool-water communities include Walleye (*Sander vitreus*), Northern Pike (*Esox lucius*), Smallmouth Bass (*Micropterus dolomieu*), and Muskellunge (*Esox masquinongy*). Thunder Lake is representative of a cold water fish community. Cold water communities are found in clear, cold, deep water lakes and support fish species with optimal growth temperatures below 15°C.

Lake Trout (*Salvelinus namaycush*), and Lake Whitefish (*Coregonus culpeaformis*) are common sport fish in cold-water lakes. The fish community structure can be diverse in cold-water lakes and may contain species that are more commonly associated with cool-water lakes such as Walleye, and Northern Pike, both of which occur in Thunder Lake.



- JCTA MONITORING STATION (DST 2014)
- MINE SITE (AMEC 2014)
- NORTHERNMOST SUBBASIN
- WESTERNMOST SUBBASIN
- SOUTHERNMOST SUBBASIN



B (17" x 11")

| | | | | | | | | | |
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| NO. | | DATE | DESCRIPTION | PREPARED | REVIEW | DESIGN | AUTHORIZE | AUTHORIZED BY: | CLIENT DRAWING NO. |
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|---------------------------|-----|----------------------------|----------|----------------------|
| CLIENT | | TREASURY METALS Inc | | |
| DRAWING DESCRIPTION | | | | |
| WATERSHED ANALYSIS | | | | |
| FIGURE 3 | | | | |
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| REVIEWED BY: | KJM | SCALE: | 1:40,000 | 1493900200-DWG-C0001 |
| | | | | REV. A |



2.2 LOCAL AREA

Local creek systems within the Local Study Area (LSA) are tributaries of Blackwater Creek, and tributaries to Thunder Lake. The creeks on site are small, typically less than 5 meters in average width and less than 1 meter in depth. Watershed analysis has identified 17 sub-basins, with the largest being 749 ha, the smallest being 27 ha, and an overall area of 3,796 ha. The drainage is divided into 3 streams:

- Unnamed stream to Thunder Lake (northernmost);
- Hoffstrom's Bay Tributary to Thunder Lake (westernmost); and
- Blackwater Creek to Wabigoon Lake (southernmost) (See Figure 3)

Flow features of LSA creeks are described as low gradient, low flow systems. Characteristics of these local creek systems include single to braided channeling; with instream cover consisting primarily of submergent and floating macrophytes and undercut banks. Cover within these systems is present in most depth strata, but noticeably reduced in the greater depth categories. The substrate within the local creek systems is primarily composed of fine particles as well as cobble at some locations. In addition densely vegetated (grass, sedge) floodplains, and frequent natural impounds are seen within the local study area primarily on Blackwater Creek.

Fish communities within the affected creek habitats are typical warm water and cool water baitfish (minnows), and other small bodied species considered common and widespread within the region. No known aquatic species at risk (SAR) inhabit the local study area.

Fish locally present in the LSA include:

- Brook Stickleback (*Culea inconstans*)
- Fathead Minnow (*Pimephales promelas*)
- Finescale Dace (*Phoxinus neogaus*)
- Northern Redbelly Dace (*Phoxinus eos*)
- Pearl Dace (*Semotilus margarita*)
- White Sucker (*Catostomus commersonii*)
- Blacknose Shiner (*Notropis heterolepis*)
- Brassy Minnow (*Hybognathus hankinsoni*)
- Central Mud Minnow (*Umbra limi*)
- Iowa Darter (*Etheostoma exile*)
- Creek Chub (*Semotilus atromaculatus*)

In addition to the baitfish fish species listed above, previous surveys of Blackwater Creek have provided evidence of potential spawning habitat for Northern Pike, and Walleye. Active beaver dams are scattered throughout Blackwater Creek and inactive beaver lodges are also present. Beaver dams periodically block upstream fish movements, but no permanent obstructions to fish passage are present. Therefore potentially both Northern Pike, and Walleye could be present within the stream. As noted earlier, Treasury intends to conduct further field sampling to confirm whether large bodied fish are present, permanently or seasonally, in Blackwater Creek within the LSA.

Throughout the development of the Goliath Gold Project the team at Treasury Metals has been exploring options and alternatives to mitigate the minor potential effects to fish habitat from the Goliath Gold Project. Despite the best efforts to avoid and minimize impacts, losses to fish habitat will occur. This necessitates the need or requirement to provide measures to offset these losses. Project impacts are restricted to the LSA creeks within the immediate vicinity of the site. The impacts are limited to the Blackwater Creek catchment area, including Blackwater Creek Tributary #2 and Blackwater Creek Tributary #1. There are no direct or meaningful indirect effects expected to local creek systems or the Wabigoon Lake watershed outside of this immediate catchment area.

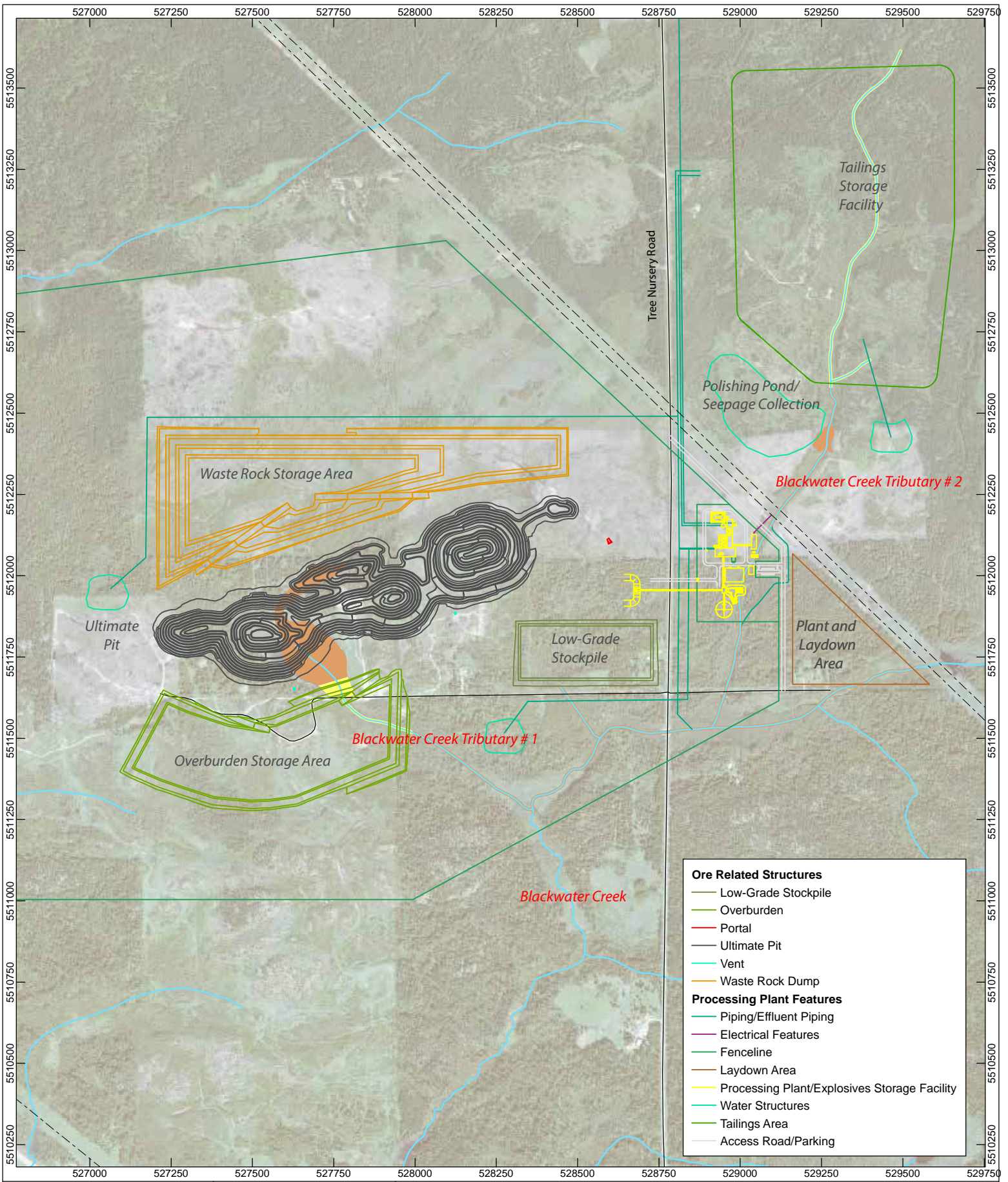


3.0 ENVIRONMENTAL EFFECTS

Development of the Goliath Gold Project will result in impacts to local creeks due to direct habitat loss, habitat modifications and indirect effects. Habitat modifications include: channel realignment and culvert replacement; indirect effects include flow reduction due to loss of tributaries to Blackwater Creek, site drainage, and potential for increased contaminants of concern due to traffic increase.

The general arrangements of site features that will result in direct habitat loss or overprinting are displayed in Figure 4. The potential impacts to the aquatic environment and fish habitat include:

- Direct loss of habitat from the infilling, and destruction of portions of the creeks in the immediate footprint of the mine site infrastructure. Direct footprint of the mine site infrastructure includes the development of the Tailings Storage Facility (TSF), open pit, underground portal, explosives storage facility, mine rock storage areas (overburden stockpile, waste rock storage area, low-grade ore stockpile), processing plant, and other infrastructure associated with mine development (road development, pipeline development, electrical infrastructure);
- Alteration of habitat due to realignment of site watercourses to accommodate Project infrastructure, in addition to collection of water on site (site water management) for processing plant usage; and
- Indirect effects due to flow reductions to Blackwater Creek resulting from runoff collection on site and groundwater inception (open pit, and underground workings).



GOLIATH GOLD PROJECT
 DRYDEN, ONTARIO, CANADA

ALTERED/DISPLACED WATERS
 FREQUENTED BY FISH
 (SECTION 35(2), SCHEDULE 2 IMPACTS)

FIGURE 4

SCALE: 15 000

TREASURY METALS INC.

DESIGN: MP 20 FEB. 2015
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 REVIEW: XX ADD DATE

- Utility Line
- Roadway
- Waterbody
- Watercourse
- Section 35 Impacts
- MMER Schedule 2 Impacts

Ore Related Structures

- Low-Grade Stockpile
- Overburden
- Portal
- Ultimate Pit
- Vent
- Waste Rock Dump

Processing Plant Features

- Piping/Effluent Piping
- Electrical Features
- Fenceline
- Laydown Area
- Processing Plant/Explosives Storage Facility
- Water Structures
- Tailings Area
- Access Road/Parking

REFERENCE

Data by Treasury Metals Inc.
 Projection: NAD83 UTM Zone 15N



3.1 DIRECT HABITAT LOSS (INFILLING AND FLOW DIVERSION/REDUCTIONS)

3.1.1 Habitat Loss (Infilling)

Blackwater Creek (Blackwater Creek Tributary #1 and Blackwater Creek Tributary #2) will be directly impacted due to Project development. The remaining portions of Blackwater Creek Tributary #2 not directly impacted by mine development (infilling) will require diversion to avoid flows from interacting with development as seen in Figure 4. This figure and associated table are based on the current Project design, although minor changes are possible. The impacted waterbodies and realignments are expected to result in serious harm to fish due to losses of their supporting habitats present in the creeks, and the potential reduction of downstream productivity due to reductions or losses in the transport of food and nutrients, and as such are considered to potentially require offsetting within the NNLP.

3.1.2 Flow Diversion/Reductions

Overall flow reduction or increase will be a function of the site water management plan and its treatment water delivery via pipeline to Blackwater Creek. Over the course of the mine life, all water captured (with the exception of evaporation, void space loss within deposited tailings, and water used for dust suppression) will be collected and used for production and subsequently treated before being returned to Blackwater Creek. Overall flow reduction or increase will be dependent on natural precipitation factors, and the overall stage of Project development. Based on the current design, flow reduction due to mine infrastructure development (open pit, processing plant, and tailings storage facility) to Blackwater Creek Tributary #1 and Blackwater Creek Tributary #2 is anticipated.

The conversion of portions of the watershed from a natural state to an active mine site will make the ground more impervious and eliminate evapotranspiration wherever vegetation is removed. The hydrologic effect of the development is that the sub-basin will allow more precipitation to runoff and will more efficiently route water off site. As the NNLP is developed, this change in flow will be quantified in terms of fish and fish habitat and the overall effects will be determined.

Based on the current design of the Project, all contact water on site will enter treatment and be discharged as per regulatory requirements. The greatest difference to Blackwater Creek during mine operations will occur during periods of low flow, where constant mine effluent will keep the creek running even during periods with little rainfall and during the winter. The additional flow and corresponding increase in channel velocity is not expected to have a detrimental effect on Blackwater Creek, although localized erosion and sediment capture methods may be warranted, and therefore must be characterized within the NNLP.

3.2 ROAD, WATER INTAKES/OUTLETS

All works associated with road crossings (Access Roads, Tree Nursery Road, Norman Road) will be designed using proven best environmental management practices and standard measures to maintain fish passage and as such, potential effects will be entirely mitigatable. All structures will be sized based on the determination of design flows and to facilitate fish passage. All culverts will be designed to allow for natural substrates to develop within the culverts to further promote fish passage.

All potential localized works on or within the banks of water bodies to facilitate infrastructure development are expected to be minor in nature and not result in impacts requiring offset measures. All necessary mitigation and safety measures would be put into effect as per the site water management plan. Banks would be restored and stabilized with permanent vegetation and armored where necessary to support erosion control. All intake/discharge pipes will be designed as per the DFO Freshwater Intake End-of-Pipe Fish Screen guidelines.



3.3 EFFECTS SEGREGATION

It is Treasury's experience that separate offset/compensation plans are required regarding requests for Authorization pursuant to the *Fisheries Act* Section 35(2) and requirements for waterbody designation under the Schedule 2 of the MMER. As per current Project design both Blackwater Creek Tributary #2 and Blackwater Creek Tributary #1 may be subject to designation under Schedule 2 of the MMER. Blackwater Creek Tributary #2 will be infilled due to TSF development, while Blackwater Creek Tributary #1 is infilled due to overburden stockpile development. Through consultation with DFO and regulators Treasury may consider complete stream channel relocation or realignment to eschew applying for MMER Schedule 2 designation and instead, propose to apply offsetting under Section 35(2), if that is deemed necessary pending further field investigations. The current location of the overburden stockpile is subject to final design and it may be possible to relocate the stream channel with appropriately designed habitat features, following further consultation with regulators and the design team.

Table 2 details the area breakdowns and the proposed effects of the Goliath Project as either Section 35 impacts or MMER Schedule 2 impacts. In total, approximately 95204 m² of habitat or waters frequented by fish will be altered or displaced by the Goliath Gold Project. Within the total impact area, 21% (19909 m²) of the affected habitats are subject to MMER inclusion while the remaining 79% (75295 m²) are subject to authorization under Section 35(2) of the *Fisheries Act*. Therefore based on the methodology described, two NNLPs will be prepared and submitted to DFO to address the overall offset strategy for the Goliath Gold Project.



Table 2 Local Creek Habitat Impacts by Mine Component

| Regulation | Mine Feature | Watercourse Length (m) | | | Total Area Impacted (m ²) | | |
|------------------------------------|---|------------------------|-------------------------------|-------------------------------|---------------------------------------|-------------------------------|-------------------------------|
| | | Blackwater Creek | Blackwater Creek Tributary #1 | Blackwater Creek Tributary #2 | Blackwater Creek | Blackwater Creek Tributary #1 | Blackwater Creek Tributary #2 |
| Schedule 2 | Tailings Storage Facility | | | 1272 | | | 13063 |
| | Overburden Stockpile | | 302 | | 6846 | | |
| | Total | 0 | 302 | 1272 | 6846 | 0 | 13063 |
| Fisheries Act Section 35(2) | Open Pit | | 163 | | | 40281 | |
| | Laydown Area | 260 | | | 2617 | | |
| | Plant Site/Ancillary Facilities/Watercourse Realignment | | | 1146 | | | 14456 |
| | Flow Reduction | | | | | | |
| | Remnant Channels | 1123 | 637 | | 11244 | 6697 | |
| | Total | 1383 | 800 | 1146 | 13861 | 46978 | 14456 |
| | Grand Total | 1383 | 1102 | 2418 | 20707 | 46978 | 27519 |



4.0 OFFSET STRATEGY

Offsetting measures can take a variety of forms ranging from localized improvements to fish habitat to more complex measures that address limiting factors to fish production. The choice of appropriate offsetting measures will be guided by threats to fisheries productivity and fisheries management objectives. In some instances, the most desirable offsetting measures may be a replacement of the same type of habitat (in-kind) that is affected by the project. In other situations, better outcomes for fisheries may be achieved by undertaking offsetting in water bodies or for fish species other than those affected by the project. For example, improving access to off-channel habitats or the removal of anthropogenic barriers might be acceptable offsetting measures.

DFO applies the following principles in applying offsetting measures for fisheries protection:

- Principle 1: Offsetting measures must support fisheries management objectives or local restoration priorities.
 - o Offsets should be designed so they contribute to the objectives identified in fisheries management plans, where such plans exist. Where such objectives do not exist or where they do not describe restoration priorities, fisheries managers, Aboriginal groups, local organizations and stakeholders may help to identify areas that require restoration or improvement.
 - o In situations where offsets are realized away from the project site, a robust rationale is required and should be communicated to potentially affected parties.
- Principle 2: Benefits from offsetting measures must balance project impacts.
 - o Offsets should be scaled such that they are proportional to the impacts caused by the project. Offsets are more likely to successfully balance losses when they benefit the specific fish populations in the geographic areas that are affected by a proposed development project or activity.
 - o With an “in-kind” approach to offsetting, the habitat that is destroyed or permanently altered is replaced by the same quantity and quality of the same type of habitat, with additional habitat offsetting required to account for uncertainty and time lags. With this approach, balancing the losses to fish and fish habitat caused by a project with the benefits that result from offsetting measures is a straight-forward calculation.
 - o With an “out-of-kind” approach to offsetting, offsetting measures target the factors limiting productivity in a given area by means other than replacing what has been lost. It can be more complicated to measure and compare losses caused by the project with offsetting gains when an out-of-kind approach is adopted, but in some cases greater productivity gains may be achieved through this approach.
 - o Proponents should make all reasonable efforts to avoid time delays between the impacts and the functioning of the offsetting measures. When a time delay is unavoidable, the offset must make up for fisheries productivity that has been lost because of the delay. For example, measures may include building more habitat than is lost so that once the habitat becomes functional it will produce enough fish to make up for the productivity lost during the time lag.
 - o Where the residual harm to fish cannot be adequately offset because of the irreplaceability or vulnerability of the fish or fish habitat, an authorization may not be acceptable and may be refused.
- Principle 3: Offsetting measures must provide additional benefits to the fishery.
 - o Proposed offsets should provide additional benefits to fisheries productivity. This means that benefits to the fishery are caused by offset actions and not by other factors. Fisheries benefits that are being or will be provided by other programs or activities should not be considered offsets.
 - o Proposed offsets should not address environmental damage for which another person or organization is clearly responsible. The restoration of orphaned sites – those with no known



- responsible party or owner or with no possibility of restoration due to company closure, bankruptcy or other similar circumstance – could be considered an appropriate offsetting measure. However, restoration of other sites that are not orphaned would not be considered an appropriate offset because such sites should be cleaned up by the responsible party.
- Principle 4: Offsetting measures must generate self-sustaining benefits over the long term.
 - o Offsets should strive to generate self-sustaining benefits to fisheries productivity. The offset benefits to the fisheries should last at least as long as the impacts from the development project.

Treasury Metals has had initial discussions with Provincial (OMNRF), and Federal (DFO) agencies regarding potential offset options for the Goliath Gold Project. It is proposed that offsetting will be based on the maintenance or improvement of fish productivity where it is determined to provide the most benefit. Treasury Metals believes that Project stakeholders are interested in improvements of the overall health of Wabigoon Lake or the watershed, opposed to direct in-kind improvements on Blackwater Creek. The use of offsite general watershed enhancements as an offset strategy will require acceptance and further development with DFO in terms of how Treasury Metals would achieve the required NNL level. First Nation and local public stakeholders will be informed of the current proposed plan, and invited to comment on its design and goals. General watershed improvements are suited to compensation strategies associated with *Fisheries Act* Section 35(2).

5.0 IMPACT TO OFFSET BALANCE

The overall balance between impacts and offsets has been calculated for the Section 35(2) and the MMER Schedule 2 NNLP separately. No current locations for in-kind offset habitat locations have been selected due to non-finalized Project design, and lack of First Nation and public input into the design of the NNLP.

5.1 MMER SCHEDULE 2 NNLP

The predicted impacts to natural water bodies frequented by fish through the deposition of mine waste are estimated to be approximately 19909 m². This total will be adjusted based on productivity modelling and further consultation with government, First Nation and public stakeholders. Treasury Metals is currently proposing to use in-kind habitat replacement. Current concepts for in-kind offsets consist of improvement of creek channel and pond habitats; location of these improvements will be determined with consultation. Blackwater Creek is limited in its production due to a lack of deep pools that provide for summer and winter refuge during naturally occurring low flow conditions.

5.2 SECTION 35(2) NNLP

Predicted impacts to natural bodies frequented by fish not associated with mine water as such authorized under Section 35(2) of the *Fisheries Act*, represent approximately 75295 m² of habitat loss. This total will be based on the replacement or enhancement of fish productivity following further consultation with government, First Nation and public stakeholders. The total habitat compensation is currently proposed to be achieved through a blended approach where feasible.

5.2.1 Watershed Based Enhancements

This approach, suggested by the local OMNRF, would be focused on reversing long term impacts of slumping and sedimentation of Wabigoon Lake. The specific locations of these sites and where offset activities would be best placed will require consultation with OMNRF, First Nations, and public stakeholders. Restoration techniques may include bank stabilization, and where appropriate, armoring. The proposed strategy would be designed to work with current FMP goals.



Implementation of watershed restoration works would commence during the initial years of the Project, however efforts would not be completed until several years into the Project.

5.2.2 Like for Like Habitat Replacement

Current opportunities for in-kind replacement will be consistent with those presented as part of the MMER Schedule 2 NNLP, if required.

5.2.3 Blended Approach (Preferred)

As discussed through initial engagement with regulators, Treasury Metals believes that local interest is in seeing watershed based improvements (Wabigoon Lake). The feasibility of this approach will require consultation with DFO to ensure that habitat replacement targets are met. In addition, watershed based improvement measures must reflect FMP goals, First Nation interests, and public stakeholder input.

In addition to watershed based opportunities, there is opportunity within the Project property LSA to provide in-kind habitat development within the Blackwater Creek system. The combined effort of both these opportunities would provide the opportunities for an effective balance in support of local fisheries initiatives, and achieving the desired offset quantities under current DFO policies.



6.0 REFERENCES

Canada. Fisheries and Oceans Canada. *Practitioners Guide to Habitat Compensation*. N.p.: n.p., 2002. Web.

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