Provincial Individual EA
Proposed Terms of Reference for the Côté Gold Project

Prepared for:
IAMGOLD Corporation

Prepared by:
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Project Number:
TC121522

CÔTÉ GOLD PROJECT
PROVINCIAL INDIVIDUAL ENVIRONMENTAL ASSESSMENT

PROPOSED TERMS OF REFERENCE

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FORWARD LOOKING INFORMATION

This document contains "forward-looking information" as defined in applicable securities laws (referred to herein as "forward-looking statements"). Forward looking statements include, but are not limited to, statements with respect to the cost and timing of the development of the Côté Gold Project, including the exercise of the economic parameters of the Project; the success and continuation of exploration activities; estimates of mineral resources; acquisitions of additional mineral properties; the future price of gold; government regulations and permitting timelines; estimates of reclamation obligations that may be assumed in connection with the exercise of the economic parameters of the Project; requirements for additional capital; environmental risks; and general business and economic conditions. Often, but not always, forward-looking statements can be identified by the use of words such as "plans", "expects", "is expected", "budget", "scheduled", "estimates", "suggests", "continues", "forecasts", "projects", "predicts", "intends", "anticipates" or "believes", or variations of, or the negatives of, such words and phrases, or statements that certain actions, events or results "may", "could", "would", "should", "might" or "will" be taken, occur or be achieved. Inherent in forward-looking statements are risks, uncertainties and other factors beyond the Company's ability to predict or control. These risks, uncertainties and other factors include, but are not limited to, the assumptions underlying the document not being realized, future gold prices, changes in cost of labour, supplies, fuel and equipment, changes in equity markets, actual results of current exploration, changes in Project parameters, exchange rate fluctuations, title risks, regulatory risks and uncertainties with respect to obtaining necessary surface rights and permits or delays in obtaining same, and other risks involved in the gold exploration and development industry, as well as those risk factors discussed in the section entitled "Description of Business-Risk Factors" in IAMGOLD Corporation' 2012 Annual Information Form. Forward-looking statements are based on a number of assumptions which may prove to be incorrect, including, but not limited to, the availability of financing for the Company's exploration and development activities; the timelines for the Company's exploration and development activities on the IAMGOLD Property; the availability of certain consumables and services; assumptions made in mineral resource estimates, including geological interpretation grade, recovery rates, and operational costs; and general business and economic conditions. Forward looking statements involve known and unknown risks, uncertainties and other factors which may cause the Company's actual results, performance or achievements to be materially different from any of its future results, performance or achievements expressed or implied by forward-looking statements. All forward-looking statements herein are qualified by this cautionary statement. Accordingly, readers should not place undue reliance on forward-looking statements. The Company undertakes no obligation to update publicly or otherwise revise any forward-looking statements whether as a result of new information or future events or otherwise, except as may be required by law.

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GLOSSARY

AANDC	Aboriginal Affairs and Northern Development Canada
AANTC	Algonquin Anishinabeg Nation Tribal Council
ABA	Acid base accounting
Aboriginal	In the context of the Côté Gold Project, includes both First Nation and Métis people
the Agency	Canadian Environmental Assessment Agency
AMEC	AMEC Environment & Infrastructure
ANFO	ammonium - nitrate/fuel oil
ARD	acid rock drainage
asl	above sea level
BHFN	Brunswick House First Nation
CC	Cambrian College
CCME	Canadian Council of Ministers of the Environment
CEAA, 2012	Canadian Environmental Assessment Act, 2012
CEP	Consultation and Engagement Plan
CEQG	Canadian Environmental Quality Guidelines
cm	centimetres
CO_2	carbon dioxide
COSSARO	Committee on the Status of Species at Risk in Ontario
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
dBA	A-weighted decibels
DFO	Department of Fisheries and Ocean
doré bar	Product of a gold mine consisting of semi-pure alloy of gold and silver
EA	Environmental Assessment
ELC	Ecological Land Classification
EIS	Environmental Impact Statement
FEC	Forest Ecosystem Classification
FN	First Nation
FWCA	Fish and Wildlife Conservation Act
GACC	Gogama Area Citizens Committee
GHGs	greenhouse gases
GDP	gross domestic product
GLSB	Gogama Local Services Board
GSCC	Greater Sudbury Chamber of Commerce
GSDC	Greater Sudbury Development Corporation
ha	hectare
HCB	Habitat Conservation Banking
IBA	Impact Benefit Agreement
IPCC	In-pit crushing and conveying
km	kilometre
km/h	kilometres per hour
kV	kilovolt
L	litres

L_{eq}	loudness equivalent
MAA	Ministry of Aboriginal Affairs
m	metre
m^3	cubic metres
m^3/yr	cubic metres per year
m^3/d	cubic metres per day
m^3/s	cubic metres per second
mg/kg	milligrams per kilogram
mm	millimetre
Mm^3	million cubic metres
MBCA	Migratory Birds Convention Act
MCA	Mesomikenda Cottagers Association
MCFN	Missanabie Cree First Nation
MFN	Mattagami First Nation
MTCS	Ministry of Tourism, Culture and Sport
MTFN	Matachewan First Nation
MMER	Federal Metal Mining Effluent Regulations
MNDM	Ministry of Northern Development and Mines
MNO	Métis Nation of Ontario
MNR	Ministry of Natural Resources
MODFLOW	Modular Finite-Difference Groundwater Flow Model
MOE	Ministry of the Environment
MRA	Mine Rock Areas
MTO	Ministry of Transportation
MOU	Memorandum of Understanding
Mt	million tonnes (metric)
NO	mono-nitrogen oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
OEB	Ontario Energy Board
NPC	Noise Pollution Control
PAAC	Participation Agreement Advisory Committee
PAG	potentially acid generating
PCB	polychlorinated biphenyl
PM	particulate material
$PM_{2.5}$, PM_{10}	particles less than 2.5 or 10 micrometers in diameter
ppb	parts per billion
ppm	parts per million
PSQG LEL	Provincial Sediment Quality Guideline lowest effect levels
PWQO	Provincial Water Quality Objectives for the protection of aquatic life
RSFD	Resource Stewardship and Facility Development
SAR	Species at Risk
SARA	Species at Risk Act
SARO	Species at Risk in Ontario
SO_2	sulphur dioxide
TCC	Timmins Chamber of Commerce

TEDC	Timmins Economic Development Corporation
TK	Traditional Knowledge
TLU	Traditional Land Use
ToR	Terms of Reference
Tpd or t/d	metric tonnes per day
TMF	Tailings Management Facility
UTM	Universal Transverse Mercator
WSC	Water Survey of Canada
°C	degrees Celsius
µg/g	Micrograms (one-millionth of a gram) per gram
µg/m^3	Micrograms (one-millionth of a gram) per cubic metre

1.0 IDENTIFICATION OF PROPONENT

IAMGOLD is a leading mid-tier gold producer with six operating gold mines (including current joint ventures) on three continents. In the Canadian province of Québec, the Company also operates Niobec Inc., one of the world's top three producers of niobium, and owns a rare earth element resource close to its niobium mine. IAMGOLD's growth plans are strategically focused on certain regions in Canada and select countries in South America and Africa.

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2.0 IDENTIFICATION OF HOW THE ENVIRONMENTAL ASSESSMENT WILL BE PREPARED

2.1 Provincial Requirements

IAMGOLD entered into a Voluntary Agreement with the Ontario Ministry of the Environment (MOE) to conduct a Provincial Individual Environmental Assessment (EA) for the Côté Gold Project that will meet the requirements of the Ontario *Environmental Assessment Act*.

The Province of Ontario does not require assessment of mining projects in their entirety. Several individual aspects of the Côté Gold Project were however, anticipated to require completion of Provincial EA process(es), including:

- the construction and operation of a 230 kilovolt (kV) transmission line of approximately 160 kilometre (km) length (Individual EA for Permanent Power Supply);
- temporary diesel generation of between one and five megawatts of power (Class EA per the Electricity Projects Regulation, Ontario Regulation 116/01);
- disposition of Crown resources, potentially related to Crown lands (such as work on streambeds/shorelands) and potential effects on species at risk (SAR; Class EA for Ministry of Natural Resources (MNR) Resource Stewardship and Facility Development Projects) for the Project site as well as the transmission line; and
- a landfilling site or dump with a total waste disposal volume of more than 40,000 cubic metres (Ontario Regulation 101/07).

The Provincial Individual EA will integrate these processes into one single comprehensive EA document. The EA will be completed in accordance with Section 6.1(2) of the Ontario *Environmental Assessment Act*; and will consider the whole Côté Gold Project and not just those aspects having Provincial EA requirements.

The EA report that will be prepared as part of the EA process is intended to conform to the approved Terms of Reference (ToR), and will include as a minimum:

(a) a description of the purpose of the undertaking;

(b) a description of and a statement of the rationale for,

  (i) the undertaking,

  (ii) the alternative methods of carrying out the undertaking, and

  (iii) the alternatives to the undertaking;

(c) a description of,

  (i) the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly,

  (ii) the effects that will be caused or that might reasonably be expected to be caused to the environment, and

(iii) the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment, by the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking;

(d) an evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking; and

(e) a description of any consultation about the undertaking by the proponent and the results of the consultation (Ontario *Environmental Assessment Act*).

2.2 Federal Requirements

In addition to the Provincial Individual EA process, the design of the Côté Gold Project as currently understood will require completion of a Federal EA, pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA, 2012).

The Federal "Regulation Designating Physical Activities" identifies the physical activities that constitute the designated projects that could require completion of a Federal EA. The following sections may apply to the Côté Gold Project:

- Section 7: “The construction, operation, decommissioning and abandonment of a structure for the diversion of 10,000,000 m^3/a or more of water from a natural water body into another natural water body...”. However, it should be noted that most waters will be realigned and not diverted.
- Section 8: "The construction, operation, decommissioning and abandonment of a facility for the extraction of 200,000 m^3/a or more of ground water..."
- Section 15 (b): “The construction, operation, decommissioning and abandonment of a metal mill with an ore input capacity of 4,000 t/d or more.”
- Section 15 (c): "The construction, operation, decommissioning and abandonment of a gold mine, other than a placer mine, with an ore production capacity of 600 t/d or more."

IAMGOLD submitted a Project Description to the Canadian Environmental Assessment Agency (the Agency) on March 15, 2013 which has now been accepted. On May 10, 2013, the Agency determined that a Federal EA is required and issued the draft Environmental Impact Statement (EIS) Guidelines, which identify the scope of the EA required for the Project.

2.3 Federal – Provincial Integration

IAMGOLD is working with the Provincial and Federal approvals agencies to integrate the EA processes to meet the needs of each *Act*, while minimizing duplication of effort and associated Project delays. As the Federal EA requirements apply, the MOE and the Agency, as well as IAMGOLD will attempt to coordinate public consultation activities in order to minimize the effort required by stakeholders to be effectively engaged. These efforts are aimed at minimizing

duplication and unnecessary delays. This coordination will be directed by the *Canada-Ontario Agreement on Environmental Assessment Cooperation*.

The ToR, if approved, and the final EIS Guidelines on issuance, will together define the content requirements for the EA document. IAMGOLD and the government agencies are attempting to the extent practical, to align the timing of the decision on the Proposed ToR by the Ontario Minister of the Environment, with the issuance of the final EIS Guidelines by the Agency.

It is fully expected that a single body of information will be used to inform both the Provincial and Federal EA processes, culminating in a single EA document. The content of the EA document will be guided by both the approved ToR and the EIS Guidelines. Concordance table(s) will be provided within the EA document to demonstrate how the EA document meets both the approved ToR and the EIS Guidelines. After IAMGOLD issues the final EA report, the Provincial Individual EA and the potential Federal EA processes will continue in a parallel manner, to the extent possible, according to the regulated requirements.

A draft EA document will be provided for review, comment, and conformity review (to the ToR and EIS Guidelines) by government agencies and Aboriginal groups prior to submission for public comment.

3.0 PURPOSE OF THE UNDERTAKING

The purpose of the undertaking is to produce doré bars for sale and provide a return on investment to shareholders of IAMGOLD, by constructing and operating a gold mine (the Côté Gold Project). The Project is located in the Chester and Neville Townships, District of Sudbury, in northeastern Ontario, approximately 20 kilometres (km) southwest of Gogama, 130 km southwest of Timmins, and 200 km northwest of Sudbury (see Figure 1).

This Proposed ToR provides the framework for completing a Provincial Individual EA for the overall Côté Gold Project.

Project coordinates are as follows:

- Centroid of the proposed open pit is: Universal Transverse Mercator (UTM) 5266765 E, 429629 N (NAD 1983 UTM Zone 17N); latitude/longitude (degrees – minutes – seconds), -81° 56' 6.995" W, 47° 33' 1.757" N (decimal degrees: -81.9353, 47.5506); and
- Transmission line start and end points: northern start point: UTM 480350 E, 5367883 N, latitude/longitude - 81° 15' 56.890" W, 48° 27' 49.606" N (decimal degrees: -81.2658027576034, 48.4637793619889), end point at the Project site: UTM 429041 E, 5268146 N, latitude/longitude - 81° 56' 35.890" W, 47° 33' 46.277" N (decimal degrees: -81.9433028149413, 47.5628548089158).

4.0 DESCRIPTION AND RATIONALE OF THE PROPOSED UNDERTAKING

4.1 Description of the Undertaking

The undertaking is defined as the construction and development of a gold mine and associated facilities at the Côté Gold Project site totalling approximately 6,700 hectares (ha) to produce doré bars for sale. The preliminary site layout proposes to place the required mine-related facilities in close proximity to the open pit, to the extent practicable. Open pit mining operations will occur at a rate of approximately 60,000 tonnes of ore per day (tpd). For contingency purposes, a nominal 20% additional ore throughput should be considered above the planned output. Overburden, mine rock and low grade ore extracted from the open pit will be stored in nearby stockpiles. Mining operations will be supported by development of an explosives manufacturing and storage facility. Initial construction power will be provided by the existing connection to the Provincial electrical grid, supported by diesel power generator(s) (less than 5 MW required). Permanent power will be provided through a dedicated connection to a 230 kV transmission line, originating from a substation located within the City of Timmins.

The Project is located in the Chester and Neville Townships, District of Sudbury, in northeastern Ontario, approximately 20 km southwest of Gogama, 130 km southwest of Timmins, and 200 km northwest of Sudbury (see Figure 1). The area is mainly characterized by gentle hills, forests, lakes and rivers. The site is located on two main subwatersheds, the Mollie River system and the Mesomikenda River system. Additionally, the intercontinental watershed divide is located south of the Project property, with the nearest boundary located more than 3.5 km southwest from the proposed open pit location. Land use in the area consists of recreational activities by locals and tourists, including fishing, camping and hunting. It is also extensively used for sustainable harvesting of timber.

Mineral exploration of the Côté Gold Project site has been carried out since about 1900 by various companies and government agencies and has continued sporadically to the present time. More concerted mineral exploration efforts were conducted in the early 1940's and from the early 1970's to about 1990. Since its discovery in 2010, extensive diamond drilling activities have been undertaken to delineate the Côté Gold deposit. As of November 4, 2012, the Côté Gold drillhole database contains results of 293 diamond drillholes for a total of 158,047 m. As the site is an active exploration area, there are a number of exploration-related facilities, such as drill pads and associated equipment used to define the current mineral resource, as well as to investigate soil and groundwater conditions.

Photographs of the Côté Gold Project site and related aspects are provided in Appendix A.

The major proposed Project components are expected to include:

- open pit;
- ore processing plant;
- maintenance garage, fuel and lube facility, warehouse and administration complex;
- construction and operations accommodations complex;

- explosives manufacturing and storage facility (emulsion plant);
- various stockpiles (low-grade ore, overburden and mine rock);
- aggregate extraction with crushing and screening plants;
- tailings management facility (TMF);
- on-site access roads and pipelines, power infrastructure and fuel storage facilities;
- potable and process water treatment facilities;
- domestic and industrial solid waste handling facilities (landfill);
- water management facilities and drainage works, including watercourse realignments; and
- transmission line and related infrastructure.

The preliminary description of the Project below is provided in order to assist in the ToR review and should not be considered finalized. The description will be finalized through the EA process and ongoing engineering studies. These activities are being carried out in parallel and are linked in such a way that the EA provides input into the engineering studies and vice-versa. The current description represents the preferred Project components based on preliminary planning studies. A range of alternatives for major components will be examined in detail as part of the EA process. A conceptual site plan has been included to facilitate consultation on this ToR (see Figure 2). The study areas for the Project are described in Section 6.1. It is recognized that the undertaking as currently understood and described briefly below (and more comprehensively in the Project Description) may change as a result of the Provincial and Federal EA processes, including the required review of alternatives. An updated and more detailed site and infrastructure plan will be provided in the EA document.

Ore processing will be carried out by conventional methods using a combination of gravity separation and cyanidation for gold recovery, followed by in-plant cyanide destruction. Tailings will be stored in a constructed TMF. A high proportion of the ongoing ore processing plant water requirement will derive from open pit dewatering, as well as runoff collected from the various stockpile areas, augmented by water recycled from the TMF, although there may also be a need for a freshwater make-up (likely from Mesomikenda Lake). Excess site water will be discharged to either Mesomikenda Lake or Bagsverd Creek. Such discharge will meet applicable Federal and Provincial effluent discharge requirements, and will be protective of receiving water aquatic life. If required additional water treatment will be implemented to achieve the discharge requirements.

A maintenance garage, warehouse and administration complex will be developed adjacent to the ore processing plant. Non-hazardous domestic solid wastes will likely be deposited in an on-site landfill, unless a suitable off-site landfill with sufficient capacity can be found. Hazardous solid and liquid waste will be hauled off-site by licensed contractors to licensed storage/disposal facilities. Opportunities to recycle some of the hazardous waste, such as used oil, will be investigated. Domestic sewage will be treated using a package sewage treatment plant or

equivalent. The construction and operations workforce is expected to be housed within an on-site accommodations complex, with some people commuting from Gogama and Mattagami First Nation.

The current local watercourses, lakes and flow directions in the vicinity of the Project are shown in Figure 3. The Côté Gold Project will overprint several water features. These include Côté Lake, a portion of Three Duck Lakes, a portion of Clam Lake, as well as parts of the Mollie River/Chester Lake and Bagsverd Creek in the case of the preferred TMF location (see Figure 2). As a consequence, Three Duck Lakes, Clam Lake, the Mollie River and Bagsverd Creek will need to be realigned. Habitat compensation will be required for the lakes/streams affected by the open pit. Fish will be moved prior to temporary or permanent displacement of aquatic habitat. Compensation measures for lost habitat (stream, lakes and possible ponds) will be conducted to maintain the fish communities within and functionality of the existing habitats. The objective of habitat compensation measures will be to create habitat that meets the biotic and abiotic habitat requirements of the resident fish species, including Yellow Perch, Northern Pike and possibly Walleye. Consideration with respect to spawning, nursery and over wintering habitat will be incorporated into the compensation design, as appropriate.

Initial construction power will be provided by the existing connection to the Provincial electrical grid, supported by diesel power generator(s) (less than 5 MW required). Permanent power will be provided through a dedicated connection to a 230 kV transmission line, originating from a substation located within the City of Timmins.

4.2 Key Project Phases

The approximate duration of the key Côté Gold Project phases are as follows:

- permitting/planning: 4 years[1];
- construction: 2 years;
- operations: 15 years; and
- closure: 2 years.

4.2.1 Construction Phase

A significant amount of work will be required over a relatively short period of time to complete Project feasibility and engineering studies and to obtain the necessary environmental approvals, to commence Project construction in the first quarter of 2015, in order to commence mine and process plant commissioning in the third quarter of 2016 (all assuming Project approvals are obtained).

Construction materials will be brought to site using existing roads. Other means of transportation are currently not envisaged to be used.

[1] Planning and permitting activities timelines are approximate and may overlap with the construction phase.

Primary construction phase activities will include:

- procurement of material and equipment;
- movement of construction materials to identified laydown areas and site;
- expansion of existing environmental protection and monitoring plan(s) for construction activities;
- construction of additional site access roads;
- construction of dams and water realignment channels/ditches for the development of the open pit, as well as the construction of the TMF;
- construction/placement of “compensatory” fish habitat within channels realignments works authorized to offset the loss of lake habitat;
- dewatering of Côté Lake to allow for the pre-stripping of the open pit;
- stripping of overburden and initiation of open pit mine development;
- development of aggregate source(s) anticipated to be principally for concrete manufacture, foundation work and TMF dam filter zones;
- establishment of site area drainage works, including pipelines from freshwater/recycled water sources;
- development and installation of construction facilities including laydown, camp facilities, augmenting electrical substation capacity and other related construction infrastructure;
- construction of associated buildings and facilities, fuel bay, sewage plant and landfill;
- preparation of on-site mineral waste handling facilities, including the TMF dams; and
- construction and energizing of a 230 kV feeder transmission line including on-site electrical substation.

An accommodation complex, with a capacity to host approximately 1,200 workers, will be constructed at the start of construction to be used during the construction and operations phases. This accommodation complex will be fully equipped with a kitchen and recreation area.

Other construction activities will be sequenced according to manpower and equipment availability and site conditions. Certain activities, such as those involving working in wet or poorly accessible terrain, are best carried out under frozen ground conditions. Construction activities will be staged with input from government agencies to minimize effects on environmental aspects, such as fish spawning and bird nesting seasons.

4.2.2 Operations Phase

During the Project operations phase, overburden, mine rock and ore will be extracted from the pit for stockpiling or, for ore, transported directly to the process plant primary crusher for sizing. Sized ore will be processed in the processing plant to recover the gold and produce doré bars

for periodic transportation by road off-site by secure means. Typically, for a project of this size, the final product is shipped off by truck once per week.

As the operations phase continues, the open pit will become progressively deeper, and related overburden and mine rock stockpiles, as well as the TMF, will become larger and higher.

Solid and liquid wastes/effluent will be managed to ensure regulatory compliance. Environment-related activities that will be carried out during the operations phase are anticipated to include:

- ongoing management of chemicals and wastes;
- water management/treatment;
- air quality and noise management;
- environmental monitoring and reporting;
- follow up environmental studies; and
- progressive site reclamation, where practical.

4.2.3 Closure Phase

Closure of the Côté Gold Project will be governed by the Ontario *Mining Act* and its associated Regulations and Codes under Ontario Regulation 240/00. The Ontario Mining Act requires that a closure plan be filed for any mining project before the Project is undertaken, and that financial assurance be provided prior to substantive development to ensure that funds are in place to carry out the Closure Plan. Additionally, IAMGOLD intends to fulfill the requirements of Ontario Regulation 240/00 of the Ontario Mining Act in the case of temporary suspension or inactivity.

The objective of closure is to reclaim the Project site area to a naturalized and productive condition on completion of mining. The terms naturalized and productive are interpreted to mean a reclaimed site without infrastructure (unless otherwise negotiated), that while different from the existing environment, is capable of supporting plant, wildlife and fish communities; and other applicable land uses.

It is expected that the active phase of reclamation/closure of the Project site will take approximately two years to complete after operations cease, although there will be open pit flooding, environmental monitoring and, potentially, effluent quality management thereafter.

Conventional methods of closure are expected to be employed at the Project site, as described in the following sections. Revegetation will be carried out using non-invasive native plant species.

4.2.3.1 Open Pit

It is planned that the open pit will be flooded to create a pit lake either passively through natural groundwater and precipitation inputs, and/or by active filling of the open pit, using runoff pumped from the mine rock stockpile(s) and/or alternate sources (seasonal freshwater inputs or recycled water from the TMF), and/or by partially breaching some of the realignment embankments established during the construction phase.

Other measures to be taken to reclaim the open pit may, or are likely, to include:

- removal of all infrastructure and equipment within the open pit;
- removal or stabilization of drainage channels and water management structures created as a result of mining operations;
- revegetation of the non-flooded overburden slopes within the open pit to a stable condition and to facilitate riparian habitat along the pit lake margins;
- construction of a permanent overflow spillway to safely convey runoff from flood events;
- construction of a boulder fence around the perimeter of the open pit and a barricade for the ramp during or following active mining operations to ensure safety until the pit is flooded; and
- development of a spillway or channel to allow the pit lake to eventually overflow to the Three Duck Lakes/Mollie River system.

4.2.3.2 Mine Rock, Overburden and Low Grade Ore Stockpiles

The exterior slopes of the mine rock and overburden stockpile (mine rock area (MRA)) will be graded and stabilized, where required, to ensure long term stability and drainage. The top surface of the MRA will be partially vegetated with native species to expedite the growth of indigenous plants and trees and minimize surface erosion. Revegetation planning will also aim at minimizing visual effects on local cottagers. It is expected that progressive reclamation of the MRA will be carried out during operations, as much as practicable, to minimize the amount of reclamation required at the time of closure. Any residual low grade ore will be stabilized in the same fashion as the MRA.

4.2.3.3 Tailings Management Facility

The closure concept for the TMF was developed to: promote long-term chemical and physical stability, minimize erosion, maximize progressive reclamation activities, provide long-term environmental protection, and minimize long-term maintenance requirements. Initial assessment indicates that the tailings will not be potentially acid generating. Additional geochemical testwork is underway to determine the geochemical characteristics of the tailings.

At the end of the operations phase the TMF will be drained of accumulated water. The tailings beaches will then be contoured to ensure that any precipitation will drain naturally and minimize erosion. An overflow spillway through one or more dams will be constructed, with discharge to a

downstream overflow discharge channel(s), and from there to Bagsverd Creek and/or Mesomikenda Lake.

The tailings beach will be covered with coarse mine rock to prevent erosion, which in turn will be partially covered with overburden and revegetated with native species. Perimeter ditches will be left in place and protected from erosion, if/as needed.

4.2.3.4 Dewatering Infrastructure

Pumps, pipelines and associated equipment used for open pit dewatering during the operations phase will be removed from the pit and sold for re-use/recycle or disposal either at the on-site demolition landfill (see below) or at external licensed facilities.

4.2.3.5 Aggregate Sources

There are currently two aggregate pits (designated as Category 9 – Aggregate Pit on Crown Land, “Pit above Water” - under the Aggregate Resources Act) permitted within the Project site. If quarries or additional pits are required and developed during the construction and/or operations phases, these, as well as the already existing aggregate sources, will be progressively rehabilitated and reclaimed according to Provincial approvals and standards.

4.2.3.6 Removal and Disposal of Buildings, Infrastructure and Machinery

A dedicated on-site demolition landfill is expected to be developed for the disposal of non hazardous demolition wastes (such as concrete, steel, wall board and other inert materials) generated during closure. It is expected that this demolition landfill will be developed within a non-acid generating MRA or within an approved landfill site.

Salvageable machinery, equipment and other materials will be dismantled and taken off-site for sale or reuse. There will be no polychlorinated biphenyl (PCB) – containing equipment at the site. Gearboxes or other equipment, containing hydrocarbons that cannot be cleaned, will be removed from equipment and machinery and transported off-site for disposal at a licensed facility.

Above-grade concrete structures will be broken and reduced to near grade, as required. Concrete structures and affected areas will be in-filled, contoured, and covered with overburden, as needed, and revegetated with native species.

4.2.3.7 Petroleum Products, Chemicals and Explosives

Petroleum products and chemicals will ultimately be removed from the site. Empty tanks will be sold as scrap or reused off-site, or cleaned to remove any residual fuel/chemicals and deposited within the demolition landfill. An environmental site investigation will be conducted at the end of operations or early in the closure phase. Soils found to exceed acceptable criteria will be remediated on site or hauled off-site to an approved disposal facility.

The explosives stockpile will be depleted towards the end of operations and any remaining explosives will be either detonated on site or removed from site by an authorized transportation service provider.

4.2.3.8 Roads, Pipelines and Power Lines

Site roads will be scarified, edges sloped as appropriate, and revegetated with native species when no longer required to support final reclamation, long term site management and/or environmental monitoring programs. Safety berms, if any, along the perimeter of haul roads will be levelled. Culverts will be removed in accordance with provincial guidelines and roads will be breached to allow natural drainage. The Chester EACOM road is expected to remain in place following closure due to continued access of forest harvest areas within the 100 year Forest Management Plan.

There will be a number of pipelines at the site including water intake, water discharge, tailings management and water management pipelines. Buried pipelines that are not removed will be sealed and left in place, or purged if needed, dismantled and disposed of in the on-site demolition landfill.

On-site power lines and associated equipment that have no salvage value will be dismantled and deposited in the on-site demolition landfill. Other power equipment and materials, including oil-filled transformers, will be taken off-site for sale or reuse.

4.2.3.9 Site Drainage and Water Structures

The new alignment of the Mollie River and Bagsverd Creek systems will naturalize over the life of the Project and will become permanent channels, which are expected to remain, for the most part, after closure. The dams/dykes associated with the realignment channels/ditches require further evaluation, as the engineering designs and closure plan progress, to determine final optimal water elevations for closure. Modifications to these structures (e.g., breaching and/or lowering and/or spillway construction) may be required for long-term water management post closure. Once the pit lake is naturalized, it will incorporate the original Côté Lake footprint, and will be part of the Mollie River watershed.

4.2.3.10 Waste Management

At the end of reclamation activities, on-site landfill(s) will be capped and revegetated with native species consistent with the remainder of the site.

4.2.3.11 Off-site Facilities

The transfer of ownership of the 230 kV transmission line to the local utility for care and maintenance and/or potential reuse will be evaluated at the end of the Project . Should the transfer to the local utility prove itself not feasible, it will be dismantled. Reclamation would include removal and recycling/reuse of electrical equipment. Poles would be removed or cut at grade, and either reused or disposed of.

4.3 Rationale for the Undertaking

IAMGOLD is a publicly traded company that proposes to develop and operate the Côté Gold Project in order to provide shareholders with a reasonable return on investment. The underlying rationale for the Côté Gold Project is the strong demand for gold in the global marketplace. With gold prices at sustained high levels, the economics of the Côté Gold Project are expected to be such that IAMGOLD can successfully produce gold and provide shareholders with value.

The Côté Gold Project is expected to provide benefit to the local area and region. Northeastern Ontario has a long history of leadership in mining and the region's economic strategy has a goal in developing the area as a hub for mining services and technologies that can be applied on a global scale (Canadian Chamber of Commerce, 2013). The development of the Project will help support this strategy through a period of economic uncertainty which has seen a slow-down in exploration and development in the mining sector (HRSDC, 2013).

The Côté Gold Project is expected to be a positive economic influence on the region providing construction and permanent employment opportunities for a large number of people. Approximately 1,200 people will be required during site construction of the Côté Gold Project and there is expected to be approximately 500 full time permanent positions during operations.

The final description of the proposed undertaking and the rationale therein, will be provided in the EA.

5.0 DESCRIPTION OF AND RATIONALE FOR ALTERNATIVES

5.1 Background

The Ontario *Environmental Assessment Act* makes reference to both "alternatives to" a proposed undertaking, and "alternate methods" of carrying out a proposed undertaking. As a matter of general policy and practice, alternatives will only be brought forward into the EA if they are likely to satisfy the following questions (adapted from MOE, 2009a).

- Do they provide a viable solution to the problem or opportunity to be addressed?
- Are they proven technologies *at the scale required*?
- Are they technically feasible *at the scale required*?
- Are they consistent with other relevant planning objectives, policies and decisions?
- Are they consistent with Provincial government priority initiatives (for example, waste diversion, energy efficiency, source water protection, reducing greenhouse gas emissions)?
- Could they affect any sensitive environmental features (for example, Provincially significant wetlands, prime agricultural area, endangered species habitat, floodplains, archaeological resources, built heritage)?
- Are they practical, financially realistic and economically viable?
- Are they within the ability of the proponent to implement?
- Can they be implemented within the defined study area?
- Are they appropriate to the proponent doing the study?
- Are they able to meet the purpose of the (Ontario) *Environmental Assessment Act*?

In addition to the above considerations, an alternative is considered unacceptable if any of the following criteria are met:

- the alternative cannot adequately meet the needs of IAMGOLD;
- the alternative cannot be financially supported by IAMGOLD (causes an unacceptable return on investment). Cost-effectiveness is measured within the context of capital costs, operational costs, maintenance costs, and closure/reclamation costs; or
- the alternative would result in substantive and unnecessary disruption to the physical, biological[2] or human environment[3] when compared with other viable alternatives.

[2] For the purpose of this EA, the natural environment is broken down into physical and biological environment.

[3] For the purpose of this EA, the human environment includes the economic, social, cultural and built environments, as defined in the *Environmental Assessment Act*.

5.2 Alternatives Assessment and Evaluation Methodology

5.2.1 Performance Objectives

The assessment of alternatives will be carried out at a level sufficient to distinguish the relative merits of the different alternatives methods. A comparative evaluation of feasible alternative methods will be conducted. The advantages and disadvantages of each method will be assessed within the EA based on a series of performance objectives, evaluation criteria and indicators, to define the preferred alternative, excluding those unique circumstances where this level of comprehensive evaluation is unwarranted.

Performance objectives are meaningful attributes that are essential for the Côté Gold Project success, and provide a basis for distinguishing between individual alternatives. The following performance objectives (or a subset thereof, as appropriate, for any given alternative) will be used in the evaluations of alternatives:

- cost-effectiveness;
- technical applicability and/or system integrity and reliability;
- ability to service the site effectively;
- effects to the physical and biological environments;
- effects to the human environment, including Aboriginal and treaty rights, cultural heritage resources (including archaeological, built heritage and cultural heritage landscape resources) and traditional land use; and
- amenability to reclamation.

For each performance objectives, a series of evaluation criteria will be selected to better describe and assess each alternative. Consideration will also be given to potential benefits in the evaluation of the alternatives.

5.2.2 Evaluation Criteria and Indicators

Proposed criteria and indicators for the assessment of alternatives are detailed below. Criteria and indicators presented in this ToR may evolve through the EA process, following further analysis and input from the various stakeholders. Proposed criteria and indicators are provided in the tables that follow, along with applicable performance objectives.

Potential data sources for the assessment of alternatives indicators are provided below. Further data sources will be added as the EA progresses.

- Baseline studies carried out in the Project area;
- Municipal, Provincial and Federal guidelines, reports, websites and other sources;
- Statistic Canada Census data;

- Property owners, business owners, municipal agencies, tourism associations and other stakeholders; and
- Aboriginal communities.

5.2.2.1 Cost-effectiveness

Cost-effectiveness relates to overall Côté Gold Project costs, including capital, operation, maintenance, and closure/reclamation costs. Each aspect of the Côté Gold Project has cost implications and thus cost-effectiveness is a performance objective common to all aspects. The evaluation criteria and indicators are presented in Table 5-1.

Table 5-1: Cost-Effectiveness Evaluation Criteria and Indicators

Criteria	Indicators for the Assessment of Alternatives
Côté Gold Project financing	• Investor attractiveness or risk
Return on investment	• Provides a competitive or acceptable return on investment
Financial risk	• Provides, or is associated with, a preferred, manageable or acceptable financial risk

Performance will be determined as follows:

- Preferred: Facilitates a competitive return on investment and present manageable or acceptable financial risk.
- Acceptable: Facilitates an acceptable return on investment and present manageable or acceptable financial risk.
- Unacceptable: Cannot be financially supported by the Côté Gold Project as it does not facilitate an acceptable return on investment and does not present manageable or acceptable financial risk to the Project.

5.2.2.2 Technical Applicability and/or System Integrity and Reliability

"Technical applicability" and "system integrity and reliability" are used interchangeably, as appropriate to the issue, to describe the suitability or expected performance of a given alternative. The evaluation criteria and indicators are presented in Table 5-2.

Table 5-2: Technical Applicability Evaluation Criteria and Indicators

Criteria	Indicators for the Assessment of Alternatives
Available technology	• Used elsewhere in similar circumstances, and is predictably effective with contingencies if and as required • New technologies supported by pilot plant or strong theoretical investigations or testing, with contingencies if and as required

Performance will be determined as follows:

- Preferred: Predictably effective with contingencies if the alternative does not perform as expected.
- Acceptable: Appears effective based on theoretical considerations; contingencies are available if the alternative fails to perform as expected.
- Unacceptable: Effectiveness appears dubious or relies on unproven technologies.

5.2.2.3 Ability to Service the Site Effectively

This performance objective is relevant for those aspects of the Côté Gold Project dealing with the provision of consumables or access to the Côté Gold Project site. The reliable (guaranteed) supply of consumables, such as fuel, is critical to the uninterrupted operation of the mine. The evaluation criteria and indicators are presented in Table 5-3.

Table 5-3: Ability to Service the Site Effectively Evaluation Criteria and Indicators

Criteria	Indicators for the Assessment of Alternatives
Service	• Provides a guaranteed supply to the site with manageable potential for supply disruption, and/or contingencies available
Accessibility	• Accessible land base or infrastructure needed to support component development and operation

Performance will be determined as follows:

- Preferred: Provides a guaranteed access/supply to the site with a low risk of interruption.
- Acceptable: Provides the required access/supply to the site with contingencies in the event of disruptions.
- Unacceptable: Cannot reliably provide sufficient access/supply, or involves an unacceptable level of risk without contingencies.

5.2.2.4 Effects to the Physical and Biological Environments

The “physical and biological environments” referred to in this performance objective is a broad term used to describe the air, bedrock, soil/overburden, water (surface and ground) and biological organisms/communities. The assessment of alternatives within the EA will also consider potential positive effects. Potential climate change scenarios will be considered, where applicable. The evaluation criteria and indicators are presented in Table 5-4.

Table 5-4: Effects to the Physical and Biological Environments Evaluation Criteria and Indicators

Criteria	Indicators for the Assessment of Alternatives
Effect on air quality and climate	• Attainment or maintenance of air quality point of impingement standards, or scientifically defensible alternatives • Emission rates of greenhouse gases
Effect on fish and aquatic habitat	• Attainment or maintenance of surface water quality guidelines for the protection of aquatic life, or where pre-Project water quality does not meet the Provincial Water Quality Objectives, it shall not be degraded further • Maintenance or provision of fish habitat • Maintenance of fish population • Maintenance of water flows or conditions suitable for fish passage • Maintenance of groundwater flows, levels and quality
Effect on wetlands	• Attainment or maintenance of water quality guidelines for the protection of aquatic life, or where pre-Project water quality does not meet the Provincial Water Quality Objectives, it shall not be degraded further • Area, type and quality (functionality) of wetlands that would be displaced or altered • Maintenance of wetland connectivity
Effect on terrestrial species and habitat	• Area, type and quality (functionality) of terrestrial habitat that would be displaced or altered • Potential for noise (or other harm and harassment) related disturbance • Maintenance or provision of plant dispersion and wildlife movement corridors • Maintenance of wildlife population
Effect on SAR	• Sensitivity level of involved species (Endangered, Threatened, Special Concern) • Area, type and quality of SAR territories or habitat that would be displaced • Potential for noise (or other harm and harassment) related disturbance • Maintenance or provision of wildlife movement corridors

Performance will be determined as follows:

- Preferred: Minimizes adverse effects to the physical and biological environments without additional mitigation.
- Acceptable: Minimizes adverse effects to the physical and biological environments with additional mitigation.
- Unacceptable: Likely to cause significant adverse effects to the physical and biological environments that cannot reasonably be mitigated.

5.2.2.5 Effects to the Human Environment

The potential for negative human environment effects is evaluated where appropriate for the alternatives for the various aspects of the Côté Gold Project. Human environment criteria

include a wide range of community, economic, social, land use, Aboriginal and treaty rights, and cultural heritage indicators as noted in Table 5-5. IAMGOLD acknowledges that there are Provincial Standards and Guidelines for Conservation of Provincial Heritage Properties that could apply should the Côté Gold Project involve properties that the Government of Ontario owns or controls that have cultural heritage value or interest. The assessment of alternatives within the EA will also consider potential positive effects. The evaluation criteria and indicators are presented in Table 5-5.

Table 5-5: Effects to the Human Environment Evaluation Criteria and Indicators

Criteria	Indicators for the Assessment of Alternatives
Effect on local residents and recreational users	• Maintenance of property values • Maintenance or improvement of income opportunities • Maintenance or provision of local access • Attainment of noise by-law guidelines, and /or background sound levels if already above the guidelines • Non-interference with water well supply systems • Non-interference with surface water drinking supply • Potential for general disturbance and adverse affects on aesthetics • Potential for adverse health and safety effects
Effect on infrastructure	• Maintenance or provision of local and regional access • Maintenance and reliability of power supply systems • Maintenance and reliability of pipeline systems
Public health and safety	• Attainment or maintenance of air quality point of impingement standards, or scientifically defensible alternatives • Maintenance or attainment of the quality of drinking water supply systems • Managing the potential for adverse electromagnetic exposure • Maintaining safe road traffic conditions that are within the domain of IAMGOLD control • Maintenance or provision of health services
Effect on local businesses and economy	• Maintenance or improvement of local business and economic opportunities (including commercial bait harvesters and trappers) • Continued access to areas used for natural resource harvesting by tourism operators
Effect on tourism and recreation	• Maintenance or improvement of tourism and recreational opportunities
Regional economy	• Maintenance or improvement of the regional economy
Effect on government services	• Maintenance or improvement on the capacity of existing health, education and family support services
Effect on resource management objectives	• Consistency with established and planned resource management objectives such as Bear Management Areas and Sustainable Forest Management units
Excessive waste materials	• Limiting the generation of unnecessary waste materials • Potential for material to be recycled/reused.

Criteria	Indicators for the Assessment of Alternatives
Effect on built heritage resources including archaeology, built heritage and cultural heritage landscapes	• Destruction of any, or part of any, built heritage resources, cultural heritage landscapes, heritage attributes or features • Alteration that is not sympathetic or is incompatible, with the historic fabric and appearance of cultural heritage resources • Shadows created that alter the appearance of a built heritage resource, cultural heritage landscape, heritage attribute or change the viability of a natural feature or plantings, such as a garden • Isolation of a built heritage resource or heritage attribute from its surrounding environment, context or a significant relationship • Direct or indirect obstruction of significant views or vistas within, from or of built heritage resources or cultural heritage landscapes • A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces • Avoidance of damage to archaeological resources, built heritage resources or cultural heritage landscapes, or document heritage values if damage or relocation cannot reasonably be avoided
Effect on archaeological resources	• Land disturbances (such as a change in grade that alters soils and drainage patters that adversely affect an archaeological resource)
Effects on First Nation reserves and communities	• Maintenance or improvement of First Nation reserve and community conditions (subject to the limitations of Company capacity and community members' personal choice)
Effect on spiritual, ceremonial, and cultural heritage, and archaeological sites	• Avoidance of damage or disturbance to known spiritual, ceremonial, cultural heritage and archaeological sites; or implement other forms protection/preservation supported by local First Nations and Métis
Effects on traditional land use	• Maintain access to traditional lands for current traditional land uses, except as otherwise agreed to with local First Nations and Métis
Effects on Aboriginal and Treaty Rights	• Avoid infringement of Aboriginal and Treaty Rights, except as otherwise agreed to with local First Nations and Métis

Performance will be determined as follows:

- Preferred: Minimizes adverse effects to the human environment without additional mitigation and provides positive effects.
- Acceptable: Minimizes adverse effects to the human environment with additional mitigation.
- Unacceptable: Likely to cause significant adverse human environment effects that cannot reasonably be mitigated.

5.2.2.6 Amenability to Reclamation

This performance objective relates to the decommissioning or reclamation of the Côté Gold Project and associated infrastructure (if any). The evaluation criteria and indicators are presented in Table 5-6.

Table 5-6: Amenability to Reclamation Evaluation Criteria and Indicators

Criteria	Indicators for the Assessment of Alternatives
Effect on public safety and security	• Avoidance of safety and security risks to the general public
Effect on environmental health and sustainability	• Attainment or maintenance of air quality point of impingement standards, or scientifically defensible alternatives • Attainment or maintenance of water quality guidelines for the protection of aquatic life, or where pre-Project water quality does not meet the Provincial Water Quality Objectives, it shall not be degraded further • Restoration of passive drainage systems • Provision of habitats for vegetation and wildlife species, including SAR
Effect on land use	• Provide opportunities for productive land uses following the completion of mining activities • Provide for an aesthetically pleasing site

Performance will be determined as follows:

- Preferred: Causes disturbance to the physical, biological and human environments that requires limited reclamation.
- Acceptable: Causes disturbance to the physical, biological and human environments that requires moderate to extensive reclamation.
- Unacceptable: Mitigation of disturbance to the physical, biological and human environments is not practical or feasible.

5.2.3 Identification of the Preferred Alternative

The alternatives are given an overall or summary evaluation, taking all of the performance objectives into consideration. There are two general approaches to summary evaluations in EA processes. One approach is to give numerical values to individual performance objectives, based on application of the appropriate criteria, and then to sum these values to arrive at an overall index. This approach typically requires some form of weighting to take into account the varying importance of the different performance objectives. Weighting factors have to be carefully justified and are often open to interpretation. In addition, the numerical approach may result in two or more very different alternatives that have the same, or very similar, overall index values; when intuitively it is clear that one alternative better meets environmental, and health and safety requirements; and is technically superior to the other. Numerical evaluations may not be readily transparent during public review and consultation processes.

The second approach, and the one proposed herein to be used for the Côté Gold Project EA, is to rely on a comparative evaluation of the overall advantages and disadvantages of a method as demonstrated through the performance descriptions (that is whether an alternative is preferred, acceptable or unacceptable for each performance objective). Using this method, and with the knowledge that all performance objectives are essential to the decision process; an alternative is rejected if it attains an unacceptable rating for any single performance objective.

This approach with minor variations, has been used successfully by AMEC for alternative assessments for a number of other mining project-related EAs in Ontario, that were subsequently approved or are currently within the approvals process by the Ontario Minister of the Environment or Federal Minister of the Environment as applicable. These include:

- Aquarius Project (Federal EA pursuant to the *Canadian Environmental Assessment Act*);
- Victor (Diamond) Project (Federal EA pursuant to the *Canadian Environmental Assessment Act*);
- Detour Lake Project (Federal EA pursuant to the *Canadian Environmental Assessment Act;* two Provincial Individual EAs pursuant to the Ontario *Environmental Assessment Act*, and one Class EA pursuant to the Ontario *Environmental Assessment Act*); and
- Rainy River Project (a coordinated Federal and Provincial EA pursuant to the *Canadian Environmental Assessment Act, 2012* and the Ontario *Environmental Assessment Act*, respectively).

This methodology has also been utilized for a number of other mining-related undertakings which were subject to a proponent-driven Class EA process under the Ontario *Environmental Assessment Act* related to the Electricity Projects Regulation, that were reviewed by Federal and Provincial government agencies, other stakeholders and Aboriginal groups at the time.

The alternative which receives the greatest number of preferred ratings is not necessarily the best, or most preferred, overall alternative. The relative importance of the individual performance objectives needs to be considered as well. It may be that one or two performance objectives are more important and override all other objectives, so long as a minimum rating of acceptable is attained for the less important objectives and the relative importance assigned to performance objectives is supported by Provincial and Federal regulatory agencies. The final evaluation of alternatives is therefore a reasoned process, in which the basis for the final selection of alternatives is easily understood at all levels.

The evaluation of alternatives will be undertaken in consideration of comments received and the results of consultation and discussions with the general public, Aboriginal communities and government reviewers. Information collected during this engagement will help to determine the choice of alternatives considered and the relative importance of the individual performance objectives.

The EA will also consider an evaluation of the advantages and disadvantages to the environment of the undertaking and the alternatives methods of the undertaking, as required by the Provincial *Environmental Assessment Act*.

5.3 Alternatives Methods for the Project

5.3.1 Identification of Alternatives

Alternatives will be identified and selected for assessment only if they satisfy the IAMGOLD requirements for employee, local residents and Aboriginal health and safety, and environmental protection. All mining operations pose some unavoidable on-site safety risks, as do other industrial operations. IAMGOLD is cognizant of this and will place an emphasis on worker health and safety, and training programs.

Alternatives for the Côté Gold Project have been considered with respect to the following Project components:

- mining;
- minewater management;
- mine rock and overburden management;
- ore processing;
- process effluent treatment;
- tailings management;
- water supply;
- water discharge;
- watercourse realignments;
- site infrastructure positioning;
- aggregate supply;
- solid waste management and domestic sewage treatment;
- power supply and routing; and
- mine closure.

A preliminary screening of potential alternatives was completed for the Project components above. This initial screening considered such aspects as: technical applicability, ability to service the site effectively, potential effects to the physical, biological and human environments, cost effectiveness and amenability to reclamation (see Section 5.2.2). This preliminary screening is reflected in the descriptions of alternatives that follow.

There is the potential that other alternatives may arise through ongoing engineering studies, or the EA process and related consultation/engagement activities.

Additionally, an assessment will be carried out to compare three Project alternatives:

- the “do nothing” scenario to the Project;
- delay the Project until circumstances are more favourable; and
- proceed with the Project in the near term, as planned by IAMGOLD.

This assessment will be carried out at a level sufficient to distinguish the relative merits of the different Project alternatives.

5.3.2 Mining

The available alternatives for mining of the Côté Gold orebody are open pit mining; underground mining; and a combination of open pit and underground mining.

Open pit mining is typically used for:

- large low-grade deposits;
- deposits where the ore is distributed more or less evenly over a large area;
- deposits that are close to the surface or outcrop; and
- deposits where the rock is not suitable for underground mining.

Underground mining is typically used for:

- deeper-lying deposits;
- high-grade deposits;
- vein or seem-type deposits; and
- settings where land access is limited.

A combination of underground and open pit mining is used for deposits where the upper portion of the orebody can be mined by open pit but with increasing depth, the removal of overburden and mine rock makes this mining method uneconomical, so deeper parts are then sometimes mined underground.

The Côté Gold Project proposes to mine a large low-grade deposit which is disseminated more or less consistently close to the surface, it is therefore most amenable to a high tonnage open pit mine.

Using open pit mining for this Project will result in the loss of Côté Lake and will require realignment of some of the surrounding surface waters. The use of underground mining would likely reduce these disturbances. However, as outlined above, underground mining is neither economical nor technically suitable under the geological conditions encountered at the Côté Gold site. Other potential effects to the physical and biological environments due to open pit

mining can be minimized by positioning the MRA close to the open pit and by developing higher stockpiles, thereby reducing the overall Project site footprint.

The selected alternative for the Côté Gold Project is open pit mining. Other alternatives will not be assessed as part of the EA.

5.3.3 Minewater Management

In order to limit freshwater requirements, the Côté Gold Project is considering an integrated minewater management approach. With this approach, water from the open pit will be pumped to the processing plant for use as process water; or pumped in whole or in part to a separate dedicated minewater pond located north of the open pit. Minewater will be pumped from the open pit using sumps, with the potential for supplementary well field pumping and/or collection ditches.

The minewater management alternatives potentially applicable for this Project include:

- development of a separate minewater treatment and management system; or
- development of an integrated minewater treatment with stockpile catchment and TMF operations.

Minewater from the sump(s) is expected to contain suspended solids from general mining and earthmoving activities; ammonia residuals from ammonia-based explosives; and residual hydrocarbons from heavy equipment operation. Leaching of the exposed bedrock within the open pit may also potentially contribute minor quantities of metals to the mine water. In-pit sump(s) will provide for preliminary suspended solids removal. Ammonia residuals will be managed at source through best management practices for explosives handling and through extended effluent aging in the mine water pond(s) and/or ultimately the TMF, prior to any discharge to the environment.

A key objective of the Project is to recycle as much of the on-site water as practicable. Therefore, the alternative to develop a separate minewater treatment and management system will not be assessed in the EA.

5.3.4 Mine Rock and Overburden Management

The Project development is expected to generate approximately 20 million tonnes (Mt) of overburden and 850 Mt of mine rock. Based on the current design, approximately 40 Mt of mine rock is expected to be used in various forms of Project site construction, mainly for TMF dam and road maintenance/construction. The remainder of the overburden and mine rock will be stockpiled for permanent disposal at the site, with a portion of the overburden used for final site reclamation activities. The MRA is currently expected to serve as storage for both mine rock and overburden.

The available alternative methods for mine rock and overburden storage and management that cannot be re-used in construction are:

- place and manage the mine rock and the overburden in areas adjacent or proximal to open pit; or
- establish a temporary stockpile location, with mine rock and overburden retained in the open pit during operations and/or returned to the open pit at closure.

Establishing a temporary stockpile location for returning the large amounts of overburden and mine rock generated during the construction and operations phases into the open pit upon closure would be cost excessive, thereby rendering the Project uneconomic. This alternative will not be assessed in the EA.

With regards to the location of the MRA, IAMGOLD has conducted a detailed alternative assessment process, as required by the Federal Metal Mining Effluent Regulations (MMER) for overprinting of waters frequented by fish (Environment Canada, 2011). The results of this alternatives assessment are presented in Appendix B. The principal criteria for selection of MRA locations and design were the following:

- areas within reasonably close proximity to the open pit to minimize the overall Project environmental footprint, to reduce greenhouse emissions and to achieve economic efficiencies of operation;
- limit the number of stockpiles – fewer but larger stockpiles can be managed more efficiently;
- areas with suitable foundation conditions;
- minimize adverse effects on visual aesthetics by limiting stockpile height;
- areas within a safe distance from water bodies, creeks and fish habitats;
- position stockpiles in a manner such that drainage from the stockpiles can be suitably collected and managed in accordance with MMER and Provincial environmental approval requirements;
- minimize potential adverse effects to aquatic and terrestrial habitats, including potential adverse effects to SAR; and
- land tenure and existing/potential land uses, including proximity to existing residences/cottages as potential noise receptors.

Initially, the results of the alternatives assessment had narrowed the MRA locations to three areas to the northeast, southeast and south of the open pit. As part of ongoing engineering design and in response to comments received from stakeholders, it is now planned that only one MRA in the south of the open pit will be developed for the Project (see Figure 2). This change results in a more cost-efficient operating plan, and reduces potential effects on Mesomikenda Lake cottagers.

5.3.5 Gold Recovery

Various methods are theoretically available for liberating gold from gold-bearing ores, but only a limited number of alternatives are viable and proven at a commercial scale. Methods such as mercury amalgamation, aqua regia gold dissolution and ammonium thiosulphate (or thiosulfate) dissolution are not considered viable alternatives. The historic use of mercury amalgamation has caused serious environmental pollution concerns in some gold mining camps and is no longer used in the industry. Aqua regia is a mixture of concentrated hydrochloric and nitric acids which is commonly used in small scale operations for recovering gold from scrap metal and other such sources, but it is not a commercially viable method for recovering gold from large scale gold ore processing facilities. Thiosulphate-based gold recovery technologies are being investigated for gold ore processing, but is it not currently developed to an industrial scale due operational limitations.

As a result, the only potentially applicable, commercially viable methods for recovering gold from Côté Gold Project ores are cyanidation, gravity concentration and flotation concentration. Cyanide is one of the few chemicals that will dissolve gold from gold ores at commercial scale. Cyanide is combined with alkaline earth metals, typically sodium, potassium or calcium, with sodium cyanide being the typical reagent. Cyanide is toxic and its handling requires extreme care to protect both workers and the environment. Cyanide use is the industry standard for gold processing and safe procedures for cyanide handling and subsequent detoxification are well established and internationally recognized.

Alternatives potentially available for recovering gold from the ore at the Côté Gold Project are the following:

- Whole ore cyanidation;
- Gravity recovery;
- Flotation concentrate recovery; and
- Combination of non-cyanide and cyanide recovery.

5.3.5.1 Whole Ore Cyanidation

Whole ore cyanidation refers to the process whereby the ore is crushed and ground prior to being leached with cyanide. Cyanide leaching can occur in vats, or it can be applied to crushed, stockpiled ore placed on large outdoor leach pads referred to as heap leaching. Heap leaching is almost always practiced in warmer climates such as in Nevada, and particularly for some ore types where gold is concentrated on surface fracture planes. This process has received limited, primarily experimental use in Canada and is not suited to cold climate environments. Vat leaching is common in Canada, it is better suited to the Canadian climate and also easier to manage from an environmental perspective.

In whole ore vat leaching, cyanide dissolves gold in accordance with the following reaction:

$$4Au^{o} + 8\ NaCN + 2\ H_2O = O_2 \rightarrow 4\ Na[Au(CN)_2] = 4\ NaOH$$

Sodium cyanide is stable in solution at pH values above 10. At lower pH values cyanide will begin to volatilize to the atmosphere as cyanide gas. Lime is used in the leach circuit to maintain an elevated pH. Gold dissolved with cyanide is recovered by adsorption onto activated carbon.

Cyanide (CN) is comprised of one carbon (C) atom and one nitrogen (N) atom, and is inherently unstable (except at high pH) and is easily destroyed. For example, if cyanide solutions are discharged to tailings ponds, cyanide will volatilize to the atmosphere as low concentration cyanide gas (HCN). Once it enters the atmosphere, HCN will react with hydroxyl (OH-) radicals and oxygen in the presence of sunlight (photolysis) through a series of reactions, to form carbon monoxide and nitrous oxide. Cyanide is also easily oxidized (destroyed) by chemical means such as by sulphur dioxide addition to form the much less toxic compound cyanate (CNO). CNO will further degrade in tailings ponds to ammonia and carbon dioxide. The use of cyanide in ore processing is easily managed for worker safety using industry standard methods and protocols, and easily detoxified either within the process plant or through volatilization in tailings ponds.

5.3.5.2 Gravity Recovery

Gold has a very high specific gravity compared to the ore host rock. This gravity differential can be used to separate free gold from the host rock. To separate the free gold the ore is first crushed and ground to free up the gold particles. The ground ore in a water slurry is then passed over shaking tables or similar apparatus to concentrate the gold particles through gravity separation. Gravity separation is a common gold recovery method, and for some placer deposits[4] can be used as the sole method for gold recovery. For more conventional hard rock gold mining, gravity separation is typically only capable of recovering a portion of the gold hosted in the ore.

5.3.5.3 Flotation Concentrate Recovery

Flotation concentrate recovery is a third method of gold recovery. This process involves crushing and grinding the ore to a very find grind (finer than that used for gravity concentration or whole ore cyanidation), followed by the use of flotation chemicals and air in a sequence of water vats, to preferentially float a gold-bearing sulphide concentrate. In the order of 10 to 15% of the ore feed will typically be recovered as a gold-bearing flotation concentrate. Cyanidation is then required to separate the gold from the concentrate. Cyanidation can be accomplished on-site or off-site, depending on the availability of external processing sites and costs. Flotation concentrate production with off-site gold recovery is not commonly practiced except occasionally for some small scale operations where other larger nearby mills are available to receive custom ores and concentrates. AMEC is only aware of one such small scale operation in Ontario; the Aquarius Mine in Timmins which operated for a brief period during the late 1980s and early 1990s.

Power demands are high with the flotation concentration process, because of the need to achieve very fine grinds necessary for efficient flotation. The total amount of cyanide used to

[4] Natural accumulation of valuable minerals formed by gravity separation during sedimentary processes.

leach the flotation concentrate is often not that different from the total amount of cyanide needed to leach whole ore. In some cases the total amount of cyanide needed to leach the flotation concentration can be greater than that required to leach whole ore.

5.3.5.4 Combination of Non-cyanide and Cyanide Recovery

A combination recovery method is commonly practiced within a single process plant in the mining industry. For example, gravity concentration is frequently coupled with cyanidation of all remaining ore and of the gravity concentrate itself. For simplicity, this process is herein referred to as gravity concentration coupled with whole ore cyanidation, since virtually all components of the ore feed and including the gravity concentrate are subject to cyanidation. Gravity concentration may also be used with flotation concentrate recovery followed by cyanidation of the concentrates. Extensive metallurgical testing is carried out to determine the best combination of methods that will achieve optimal recovery and costs. As gravity concentration is a comparatively low cost operation, it is almost always used in combination with whole ore cyanidation or flotation concentration, to improve overall gold recovery.

5.3.5.5 Selected Gold Recovery Method

Gravity concentration and flotation concentration individually are uneconomic and are therefore not considered further. The combined processing alternative of gravity concentration in combination with flotation concentration recovery and cyanidation is not cost competitive, offers no other major advantage that cannot be more effectively offset by other means, and is therefore also not considered further. It is possible to undertake whole ore cyanidation without gravity concentration but this alternative reduces Project economics, and confers no advantage, environmental or otherwise. This alternative is therefore also not considered further. The selected alternative, from an economic point of view, is a combination of non-cyanide and cyanide recovery (gravity concentration coupled with whole ore cyanidation).

From an environmental point of view gravity separation on its own would be the preferred alternative. However, only a small portion of the gold can be recovered with this method, which would make this Project uneconomical. However, the use of combination of gravity separation combined with cyanidation requires the least amount of cyanide compared to the other alternatives (i.e., flotation, cyanidation or a combination thereof). It should be noted that cyanide will be recycled and destroyed prior do discharge (see Section 5.3.1.5).

5.3.6 Process Effluent Treatment

One of the two by-products of gold production is process effluent, which together with the tailings, are conveyed to the TMF. As described in Section 5.3.5, cyanide will be used to recover gold from the ore. Cyanide levels in process effluent are such it is required to either treat cyanide-laden process effluent or to store process effluent in the TMF to allow for natural degradation of cyanide, prior to discharge to the environment.

Process effluent treatment methods potentially applicable to the Project include:

- in-plant cyanide recycling and destruction using the SO_2/Air process;
- process effluent discharge to the TMF with natural degradation for the destruction of cyanide; and
- process effluent discharge to the TMF with natural degradation for the destruction of cyanide, with supplemental hydrogen peroxide destruction of residual cyanide.

In-plant SO_2/Air treatment involves the destruction of cyanide and metallo-cyanide complexes through oxidative processes, with cyanide being converted to cyanate, and metals liberated through cyanide oxidation being subsequently precipitated as insoluble metal hydroxides. Cyanate formed through this process reacts with water (hydrolyzes) within the TMF to form ammonia and carbon dioxide. The SO_2/Air treatment process is a more costly alternative compared to the other available options, but has the advantage of discharging a low strength cyanide solution to the TMF. The SO_2/Air treatment system has the additional advantage of being able to treat slurries, as opposed to just clear solutions. Metal hydroxide precipitates formed during the treatment process thereby have the opportunity to adsorb onto tailings solids, which improves their settling performance in the TMF. This adsorption process typically results in lower metals concentrations in the final effluent compared with that achieved using other treatment technologies considered herein. Post treatment effluent aging in the TMF pond further reduces residual cyanide and heavy metal concentrations in the final effluent. This process is most commonly used at locations where surface waters and people would be severely impacted in case of accidental releases of tailings. Alternative treatment techniques include the use of Caro's acid and the Combinox process.

Natural degradation has been used successfully at some Ontario gold mines where the process effluent is particularly suited to this treatment technology due to low concentrations of associated metals and especially nickel; and where sufficient effluent retention capacity is available for extended effluent aging and batch discharging. Based on AMEC's experience, the use of natural degradation alone is likely to be viewed by investors as not being a best available technology. Lack of investor confidence can jeopardize overall Project financing and scheduling. This alternative also presents a greater overall environmental risk. This alternative is therefore not considered further in the EA.

Hydrogen peroxide oxidation treatment is similar in concept to SO_2/Air cyanide oxidation, except that hydrogen peroxide is used as the oxidizing agent to convert cyanide to cyanate. The hydrogen peroxide process can also be used to breakdown metallo-cyanide complexes, similar to the SO_2/Air process.

The hydrogen peroxide process has been shown to work well on clear solutions, but is generally much less effective on effluent tailings slurries discharged directly from the process plant. The result is that hydrogen peroxide is generally used in combination with natural degradation, where the tailings slurry is first discharged to a TMF and after the slurry solids have settled, the remaining clear solution is treated with hydrogen peroxide, often with a loss of a significant

portion of the available cyanide through natural degradation during the intervening period. Weak acid dissociable metallo-cyanides are also removed with use of hydrogen peroxide.

It is currently anticipated that SO_2/Air treatment will be used. However, as environmental and engineering studies progress, Caro's acid and hydrogen peroxide treatment as well as the Combinox process will be further investigated and will be included in the assessment of alternatives.

5.3.7 Tailings Management

The Project will process an estimated 60,000 t/day of ore. Rejects from this processing (tailings) will comprise the total of this weight, minus recovered gold, which is an estimated 330 Mt of tailings over the expected Project life. The tailings slurry will be treated in the process plant to destroy cyanide and to render any associated dissolved heavy metals into solid phase, before being discharged to a TMF for further effluent treatment (extended aging) and permanent storage of the tailings solids. Once in the TMF, the tailings solids will settle out.

A comprehensive assessment of mineral waste management alternatives consistent with the alternatives assessment requirements associated with the Federal MMER and in accordance with the Guidelines for the Assessment of Alternatives for Mine Waste Disposal (Environment Canada, 2011) is provided in Appendix C.

Tailings management deposition methods potentially applicable to the Project include:

- tailings slurry (with tailings thickened prior to leaving the process plant with a conventional thickener to a 50% solid content);
- thickened tailings (60% solid content); and
- paste thickened tailings (68% solid content).

An initial trade-off study was carried out, as described in Appendix C, which resulted in the selection of tailings slurry deposition as the preferred alternative. The other deposition methods alternatives will not be assessed in the EA.

The principal criteria for selection of the TMF location include the following:

- select a technically and economically feasible alternative and location;
- use natural topography for containment to minimize the construction of dams;
- provide for all tailings storage in a single location;
- position the TMF in a manner such that drainage from the system can be collected and managed in an integrated manner, in accordance with MMER and Provincial environmental approval requirements;

- provide for an optimal operations and reclamation scenario for potential Acid Rock Drainage (ARD) management using passive systems to the extent possible, but with an allowance for contingency chemical treatment if required;
- minimize potential adverse effects to aquatic and terrestrial habitats, including to SAR; and
- land tenure and existing/potential land uses.

The results of the alternatives assessment have narrowed the TMF location to the area to the north of the open pit (see Figure 2). Optimization of this area will be conducted in parallel to the EA process in response to the needs of the Project as well as feedback gathered from the local stakeholders. TMF location alternatives will not be assessed in the EA.

5.3.8 Water Supply

Process water will derive from open pit dewatering, runoff collected from the various stockpile areas and water recycled from the TMF, as described in Section 5.3.1.2. There are a large number of benefits to recycling of water, rather than utilizing entirely fresh water. Nonetheless, a freshwater supply will still be required for potential seasonal water deficits, initial start-up and ongoing processing plant needs, and potable water uses. This freshwater demand is still being developed as part of the overall site water balance.

The location of the water intake is not yet defined and alternative locations will be assessed in the EA. A water intake from Lake Mesomikenda is currently envisaged, which would allow for a reliable source of water from the largest water body in the area and at a relatively short distance from the ore processing plant, which is the main water consumer. The design of the Project's water intake will take into consideration that Mesomikenda Lake is a water-level controlled lake.

It may be possible to derive all or a portion of the potable water needs from well(s), depending on the selected locations for the construction of camp facilities, and the potential effects of open pit and underground dewatering on possible well locations. Potable water, whether taken from wells or the Mesomikenda Lake, will be treated as necessary to ensure drinking water quality standards are met. The option of using groundwater or surface water for potable water needs will be assessed in the EA, including the placement of potential wells or surface water sources.

5.3.9 Water Discharge

As described in Section 5.3.1.7, IAMGOLD will manage the site water such that recycling of water is carried out. Nonetheless, it is expected that some discharge to the environment may be necessary, on a seasonal basis. Excess site water will be discharged from the TMF to either Mesomikenda Lake, or Bagsverd Creek, potentially after a secondary polishing pond and/or additional water treatment, if required. Such discharge will meet applicable Federal and Provincial effluent discharge requirements, and will be protective of receiving water aquatic life. The alternative discharge locations will be assessed in the EA.

5.3.10 Watercourse Realignments

As part of the proposed development of the open pit, Côté Lake will need to be drained. It is expected that portions of Three Duck Lakes, Chester Lake, Clam Lake and the Mollie River system will require dams and watercourse realignments to allow safe development and operation of the open pit. It is currently planned that a portion of Bagsverd Creek will also be realigned to allow development of the TMF.

The currently proposed watercourse realignments are presented in Figure 2. These realignments require further investigation and will be reviewed as engineering studies advance and in discussion with regulators. The principal guidelines for selection of the watercourse realignment arrangement were the following:

- select watercourse realignments with the aim of minimizing the overall Project environmental footprint, while at the same time considering economic efficiency of the Project;
- minimize disturbance of the existing water flow regime and existing aquatic habitat, thereby also minimizing disturbance on existing terrestrial flora and fauna;
- plan for and establish fish habitat compensation;
- minimize disturbance of existing land use;
- minimize water transfer amongst existing subwatersheds; and
- ensure safety of personnel in the open pit and any other Project components in close proximity to any future realignments.

Should further studies and consultation identify the need to define alternative watercourse realignment routes, these alternatives would be further assessed in the EA.

5.3.11 Site Infrastructure

Options for locating the majority of site infrastructure are dictated by the positioning of the open pit, TMF, MRA, geographic constraints (such as avoidance of watercourses as practical) and land ownership. There are, as a result, comparatively few alternatives for the siting of most of the required infrastructure components, given the preference to limit the overall site footprint as practical.

The following buildings and yard areas are currently planned for the Côté Gold Project:

- primary crusher, screen, secondary crusher and run-of-mine stockpile, with associated conveying system;
- ore processing plant;
- maintenance garage, warehouse and administration complex;
- accommodations complex, to be used for both construction and operations phases;

- fuel and lube bay;
- general laydown areas and temporary storage facilities during construction; and
- explosives manufacturing and storage facilities.

On-site processing is typical for large scale, low-grade operations such as the Côté Gold Project, as off-site processing is not economic, and could have substantial environmental implications related to ore transport. Off-site processing of ore is not a reasonable alternative given the grade of the ore and that there are no existing gold ore processing facilities proximal to the Côté Gold Project site. Off-site ore processing will therefore not be considered in the EA.

As shown in Figure 2, the ore processing, maintenance and administrative complexes are proposed to be located in one centralized area northwest of the open pit, positioned far enough away from the open pit perimeter to protect workers and facilities from any potential blast (fly) rock. These facilities will be supported by related transport, piping and power infrastructure as needed. The overall layout has been developed to ensure efficient operating conditions with the least travel distances between the facilities, particularly with respect to ore and mine rock haulage and tailings pumping.

Options for locating the majority of building and infrastructure facilities for the Project are dictated by the positioning of the open pit, the TMF, MRA, and by geographic constraints (foundation conditions in the case of the process plant complex, and regulated separation distances in the case of explosives facilities). The EA will only consider alternatives for maintenance garage, warehouse and administration complex, accommodations complex, fuel and lube bay, general laydown areas and temporary storage facilities during construction and explosives manufacturing and storage facilities. The positioning of connectors (mine site roads, pipelines and the on-site electrical distribution system) is essentially constrained by the location of facilities that they are intended to service. Alternatives to connector locations are therefore not considered.

It is expected that approximately 1,200 construction workers will be accommodated during the construction phase. Options for worker accommodations during the construction phase include an on-site construction camp or off-site residence in one or more of the local communities. If workers were to reside off-site, the primary alternatives for residence would be nearby homes owned by IAMGOLD; or existing residences in Gogama. Other more distant communities do not present a reasonable daily commute. It is possible some combination of these alternatives may be used, and each will be assessed in the EA.

Options for operations phase accommodations include off-site and/or on-site residences. Both of these alternatives for operations phase accommodations will be assessed in the EA. One possibility is to convert the accommodation complex to hold a workforce of approximately 500 full-time personnel.

Explosives needed for the Project development will be prepared in a dedicated explosive manufacturing facility. The positioning of the explosives facilities is prescribed by the *Quantity Distance Principles User's Manual* (Natural Resources Canada, 1995) and is dependent in part on the location of other site facilities. For that reason limited practical alternatives are available. Alternative locations will be described and assessed in the EA.

5.3.12 Aggregates Supply

The majority of aggregate required to develop the Côté Gold Project will be inert mine rock produced incidental to ore extraction. However, experience with other projects in this geographic area has shown that it can be difficult to generate aggregate for concrete and other strictly defined applications. It may therefore be necessary to investigate additional aggregate sources.

There are currently two approved aggregate pits within the Project site. Identification of alternative aggregate supply sources will be assessed in the EA and could include the following options or a combination of the following options:

- overburden/mine rock;
- dedicated on-site aggregate pits; and/or
- commercial off-site aggregate pits.

Consideration of these alternative sources will allow for operational flexibility in terms of timing, availability and quality of materials.

5.3.13 Solid Waste Management and Domestic Sewage Treatment

5.3.13.1 Non-hazardous Solid Waste

Alternatives considered for the management of non-hazardous solid wastes include:

- truck the waste off-site to an existing off-site licensed landfill;
- develop an on-site landfill; and
- incineration.

Use of an incinerator was rejected as being too costly and challenging to obtain environmental approvals. Consideration may be given to controlled burning in accordance with environmental regulations/timing, of clean wood and cardboard waste in order to reduce overall waste volumes for landfilling, especially during construction. The remaining alternatives, trucking the waste off-site to an existing licensed landfill, and/or developing an on-site landfill, will be assessed in the EA.

5.3.13.2 Hazardous Solid Waste

Hazardous solid and liquid waste will be hauled off-site by licensed contractors to licensed storage facilities. Hydrocarbon contaminated soils could potentially be remediated on site using approved methodologies which have demonstrated effectiveness. This will be assessed during future engineering investigations and both of these alternatives will be assessed in the EA.

No on-site alternatives (such as development of an on-site hazardous waste landfill) are considered acceptable to IAMGOLD and meet the IAMGOLD identification criteria for alternatives (Section 5.2.1). Specifically, the potential negative effects on the physical, biological and human environment are considered unacceptable when compared with transporting the material to an existing hazardous waste management facility. As such, development of an on-site hazardous waste management system will not be assessed in the EA.

5.3.13.3 Domestic Sewage

The alternatives currently being considered for domestic sewage treatment at the Côté Gold Project site include:

- septic tank(s) and tile field(s);
- lagoons;
- package sewage treatment plant; and
- trucking domestic sewage off-site.

The package sewage treatment plant may be either a: rotating biological contactor, sequencing batch reactor, or membrane bioreactor. Each of these alternatives identified above will be assessed in the EA.

5.3.14 Power Supply and Routing

Reliable, cost-effective power is a critical component for the Côté Gold Project's operations. The majority of the power requirement is for the processing plant, with the balance required by the mine itself, along with ancillary needs such as dewatering, administration, etc. During construction, electrical power demand is expected to be relatively low, at around 5 to 6 MW or less. This power demand would be met through the existing transmission line (1 MW) as well as diesel generators (less than 5 MW). The current schedule anticipates that a 230 kV connection to support operations will be in service for the later stages of construction.

Diesel power is an effective method to support mine construction prior to additional grid power being brought to site and can serve effectively as emergency power for critical site functions. This alternative will be brought forward into the EA to be considered for short-term use during the construction phase and subsequent periodic use during the operations phase (and potentially during the closure phase) as needed when grid power is unavailable. On-site diesel-fired power generation, however, to support operations will result in the release of greater

amounts of carbon dioxide, NOx, and particulate emissions than other alternatives and is not considered to be cost effective for normal operations.

Alternative energy sources such as hydroelectric, solar and wind power were considered for primary power generation during operations. The nearest hydroelectric dam is Ontario Power Generation's Wawaitin Generating Station located approximately 90 km north of the Project and the capacity of the facility is too low to meet the Project's power requirements. Without viable energy storage technology, solar and wind generated electricity cannot meet the Project's power requirements on a consistent basis because of the intermittent nature of solar and wind generation. As a result, alternative energy sources as the primary power generation supply will not be assessed in the EA.

A review of transmission infrastructure that could serve the Project during operations has been carried out. A 500 kV Hydro One transmission line is located approximately 90 km east of the Project, however, Hydro One and the Independent Electricity System Operator generally do not allow direct connection to 500 kV transmission line. In addition to the 500 kV transmission line, there is a 115 kV transmission line located approximately 50 km east of the Project, however, 115 kV will not be sufficient for the Project. As a result, power during the operations phase of the Project will be supplied by a new 230 kV transmission line connected to the existing Hydro One in Timmins at the Porcupine Substation. Either one of the proposed alternative alignments of the transmission line would be owned and maintained by IAMGOLD. The two transmission line alternatives that will be carried forward in the EA are described below (see Figure 4).

- Shining Tree alignment: the first segment, of approximately 120 km in length, will be located parallel to an existing 115 kV transmission line from Timmins to Shining Tree. The second segment, with a length of approximately 40 km, from the Shining Tree Substation to the Project site, will be constructed within an existing right of way.
- Cross-Country alignment: this alternative is a more direct and shorter route, following in parts Highway 144.

No further transmission line alignments are currently considered because those alignments would either be longer or create more environmental disturbance compared to the alternatives being considered in the EA.

5.3.15 Mine Closure

IAMGOLD is committed to the progressive rehabilitation of the Côté Gold Project over the life of the Project. During the closure phase, mining is terminated and final reclamation of the site occurs. The EA will include an assessment of closure alternatives and the proposed progressive and final reclamation measures for the Côté Gold Project (site and related infrastructure if applicable, and may include a draft Closure Plan).

The EA will assess alternative closure methods consistent with Provincial regulatory requirements, in order prevent or reduce the potential effects on the environment. The following components will be considered:

- open pit mine (natural flooding, enhanced flooding, backfill with mineral waste);
- water management system (leave in place, partial or full removal);
- stockpiles (re-use, stabilization and covering/revegetation, use in backfill, engineered cover);
- TMF (permanent flooding, covering and revegetation);
- buildings (disassembly and removal, re-use of acceptable buildings);
- infrastructure (decontamination and removal, leave in place for future use, reclaim in place);
- drainage (stabilize and leave in place, removal); and
- SAR species and habitat.

It should be noted that when the Côté Gold Project proceeds to the permitting phase, a detailed, certified Closure Plan (including financial assurance) is required under Ontario Regulation 240/00 of the *Mining Act* which will be submitted by the proponent for review by applicable government agencies and Aboriginal groups, and will be consulted upon with the general public.

5.3.16 Summary of Alternatives

A summary the preliminary screening of the Project alternatives is provided in Table 5-7. Other alternatives may arise through ongoing engineering or consultation/engagement which will also be considered in the EA.

Table 5-7: Preliminary Screening of Alternative Methods

Project Element	Alternative	Assessed in the EA?	Rationale
Mining	Open pit mining	Yes	Orebody is a high tonnage, relatively low-grade deposit located near the surface, which is best suited to open pit mining.
	Underground mining	No	Orebody not suitable for underground mining, due to the fact that the gold is finely disseminated and close to the surface.
	Open pit and underground mining	No	Developing a smaller open pit, combined with an underground operation is not suitable due to the fact that the gold is finely disseminated in the orebody. In addition, it is not anticipated that the expanding the final pit into an underground operation be economically viable.
Minewater Management	Develop a separate minewater system	No	A key objective of the Project is to recycle as much of the on-site water as practicable. A separate minewater treatment and management system would go against this objective.
	Integrate minewater with TMF operations	Yes	This alternative is best suited for the Project's objective of recycling on-site water.
Mine Rock and Overburden Management	Place and manage the mine rock and the overburden in stockpile adjacent or proximal to open pit	Yes	For large mining projects, minimizing mine rock management cost is a major cost driver, therefore it is common to place mine rock and overburden as close to the pit as practicable.
	Establish a temporary stockpile location, with mine rock and overburden retained in the pit during operations and/or returned to pit at closure	No	Moving the large amounts of overburden and mine rock generated during the construction and operations phases again upon closure, would be cost excessive, thereby rendering the Project uneconomic.

Project Element	Alternative	Assessed in the EA?	Rationale
Gold Recovery	Non-cyanide recovery	No	No viable industrial scale application alternative available.
	Cyanide recovery methods	No	This method is applied when all gold is extremely fine and cannot be recovered partially by using gravity separation.
	Combination of non-cyanide and cyanide recovery methods	Yes	In this orebody, a portion of the gold can be recovered using gravity separation, such that a smaller fraction will require cyanide leaching, hence the combination of these two methods is the chosen alternative.
Process Effluent Treatment	In-plant cyanide recycling and destruction using the SO_2/Air process	Yes	This process is most commonly used at locations where surface waters and people would be severely impacted in case of accidental releases of tailings.
	Process plant effluent discharge to the TMF with natural degradation for the destruction of cyanide	No	The use of natural degradation presents a greater overall environmental risk.
	Process effluent discharge to the TMF with natural degradation for the destruction of cyanide, with supplemental hydrogen peroxide destruction of residual cyanide	Yes	Hydrogen peroxide treatment will have a lower cost than the SO_2/Air, but may carry environmental risks.
Tailings Management	Tailings slurry (with tailings thickened prior to leaving the process plant with a conventional thickener to a 50% solid content)	Yes	This is the most commonly used deposition method in cooler climates and is therefore most suitable for this Project.
	Thickened tailings (60% solid content)	No	Thickening of tailings is very costly and is generally only carried out in settings with very limited water availability and in dry climates.
	Paste thickened tailings (68% solid content)	No	
Water Supply	Mesomikenda Lake	Yes	The method of meeting the fresh water needs (that cannot be met by recycling) will be considered in the EA.
	Other area watercourse(s), lake(s) and pond(s)	Yes	
	Groundwater well(s)	Yes	

Project Element	Alternative	Assessed in the EA?	Rationale
Water Discharge	Mesomikenda Lake	Yes	All water discharge locations will be evaluated based on receiving water hydrological conditions, the water balance and the water quality model.
	Bagsverd Creek	Yes	
Watercourse Realignments	Realignment of Bagsverd Creek around the TMF and realignment of portions of Three Duck Lakes, Chester Lake, Clam Lake and the Mollie River system around the open pit and MRA.	Yes	Watercourse realignments are dependent on the location of Project components and will be optimized as further studies are completed. It will be designed to minimize impacts to receiving waters and aquatic species.
	Other realignments around Project components	Yes	
Site Infrastructure	Maintenance garage, warehouse and administration complex (various locations)	Yes	As Project design continues, the optimal location for these components will be further reviewed and defined.
	Accommodation complex (various locations)	Yes	
	Fuel and lube bay (various locations)	Yes	
	General laydown areas and temporary storage facilities (various locations)	Yes	
	Explosives manufacturing and storage facilities (various locations)	Yes	
Aggregate Supply	Overburden/mine rock	Yes	As the Project aggregate needs are defined, potential aggregate quantities and sources will be identified and assessed in the EA.
	Dedicated on-site aggregate pits	Yes	
	Commercial off-site aggregate pits	Yes	
Non-Hazardous Solid Waste	Truck waste off-site to an existing licensed landfill	Yes	EA will consider alternative non-hazardous waste management methods and locations.
	Develop an on-site landfill	Yes	
	Incineration	No	This alternative is not economically viable.
Hazardous Solid Waste	Shipment off-site to an appropriate licensed landfill	Yes	Shipment of hazardous solid waste is generally the preferred alternative for similar size projects.
	Development of an on-site hazardous solid waste management system (such as landfill)	No	This alternative's potential effects on the environment are unacceptable.

Project Element	Alternative	Assessed in the EA?	Rationale
Domestic Sewage	Septic tank(s) and tile field(s)	Yes	EA will consider proven methods of treating domestic sewage.
	Lagoons	Yes	
	Package sewage treatment plant	Yes	
	Trucking domestic waste office to a licensed treatment plant	Yes	
Power Supply and Routing	On-site diesel generation	No	This alternative has high environmental implications and is not economically viable for the Project.
	Tie in to the 115 kV line near the Project	No	This alternative is not considered based on the power requirements of the Project design.
	230 kV Shining Tree transmission line alignment	Yes	Both alignments will be evaluated as part of the EA and ongoing engineering studies.
	230 kV Cross-Country transmission line alignment	Yes	
	Alternative energy sources (hydroelectric, solar, wind)	No	Renewable energy cannot provide consistent uninterrupted power (renewable energy) or do not meet the IAMGOLD criteria regarding environmental protection (dedicated hydroelectric) or technical needs.
Mine Closure – Open pit mine	Natural flooding	Yes	EA will consider proven alternatives for the closure of the open pit mine.
	Enhanced flooding	Yes	
	Backfill with mineral waste	Yes	
Mine Closure – Water management system	Leave in place	Yes	EA will consider proven alternatives for the closure of water management system.
	Partial removal	Yes	
	Full removal	Yes	

Project Element	Alternative	Assessed in the EA?	Rationale
Mine Closure – Stockpiles	Re-use	Yes	EA will consider proven alternatives for the closure of stockpiles.
	Stabilization and covering/revegetation	Yes	
	Use in backfill	Yes	
	Engineered cover	Yes	
Mine Closure – TMF	Permanent flooding	Yes	EA will consider proven alternatives for the closure of the TMF.
	Covering and revegetation	Yes	
Mine Closure-Buildings	Disassembly and removal	Yes	EA will consider proven alternatives for the closure of buildings.
	Re-use of acceptable buildings	Yes	
Mine Closure – Infrastructure	Decontamination and removal	Yes	EA will consider proven alternatives for closure of infrastructure.
	Leave in place for future use	Yes	
	Reclaim in place	Yes	
Mine Closure – Drainage	Stabilize and leave in place	Yes	EA will consider proven alternatives for closure of drainage.
	Removal	Yes	

6.0 DESCRIPTION OF THE ENVIRONMENT

6.1 Overview and Study Area

The description of the existing environment provided herein is a brief summary based on baseline studies conducted to date for the Côté Gold Project. The intent of this section is to familiarize the reader with the local setting. Further detail, including copies of the baseline reports referenced herein, will be provided in the EA.

The objectives of the baseline studies are to characterize the physical, biological and human environment aspects of potentially impacted areas, along with reference locations (such as upstream locations), where appropriate for comparison. Environmental baseline data (description of the existing environment):

- helps inform Project designs (for example, knowledge of rock characteristics assists in determining how best to handle and store the material);
- will allow an assessment to be made of likely effects by the Project, including comparisons with established environmental guidelines, thresholds and limits, where applicable; and
- provides a reference for future environmental monitoring (that is, it allows a comparison to be made of pre-development and post development conditions).

Studies to date have been completed using standard field protocol and scientific methodology, to accurately document spatial and temporal variability, and have considered the information needs of regulatory agencies for approval of previous Ontario mining projects. Baseline studies have been and will continue to be carried out in consultation with interested stakeholders and Aboriginal communities. The baseline studies have included collection of site-specific information regarding the following general aspects (and others) as well as documentation of applicable published material:

- air quality;
- aquatic resources (fish and benthic invertebrates) and habitat;
- wildlife and habitat;
- vegetation;
- biodiversity and protected areas;
- soils;
- water quality;
- hydrology and climate;
- hydrogeology;
- geochemistry and geology;
- socio-economics;

- non-traditional land use; and
- cultural heritage resources (archaeology, built heritage and cultural heritage landscapes.

Environmental baseline studies are ongoing as of issuance of the Proposed ToR. The list below contains the baseline studies which have been used to inform the Proposed ToR describing the environment on the Côté Gold Project site:

- Golder Associates (2013): Côté Gold Project Hydrogeology Baseline Report - Draft;
- Golder Associates (2013): Côté Gold Project Hydrology and Climate Baseline Report - Draft;
- Golder Associates (2013): Côté Gold Project Water Quality Baseline Report - Draft;
- Golder Associates (2013): Côté Gold Project Terrestrial Baseline Studies Report - Draft;
- Minnow Environmental Inc. (2013): Côté Gold Baseline Fish and Fish Habitat Report - Draft;
- AMEC (2013): Côté Gold Project Non-Traditional Land Use and Resource Use Baseline Report - Draft; and
- AMEC (2013): Côté Gold Project Socio-Economic Baseline Study - Draft.

Additional baseline studies planned for 2013 include:

- air quality;
- noise;
- vibration;
- aquatic resources (fish and benthic invertebrates) and habitat;
- wildlife and habitat;
- vegetation;
- soils;
- water quality;
- hydrology and climate;
- hydrogeology;
- geochemistry and geology;
- visual aesthetics;
- socio-economics;
- non-traditional land use;

- traditional knowledge and traditional land use (TK/TLU); and
- cultural heritage resources (archaeology, built heritage resources, and cultural heritage landscapes).

Nearby communities and residences, including cottage areas and tourism facilities are shown in Figure 5.

Study areas have been identified for the various environmental disciplines. These study areas will be further refined as Project design and baseline activities progress, and will consider receptors and areas where direct and indirect Project effects may occur. At this point, the preliminary local study areas can be defined as follows:

- air quality, noise and vibrations – includes the area adjacent to the main Project emission sources and the transmission line alignments, including nearby receptor locations, such as cottages;
- hydrology, water quality, hydrogeology and aquatic biology – includes the watercourses and water bodies in the vicinity and downstream of the Project infrastructure. The study area for hydrology, water quality and aquatic biology also includes a buffer around the transmission line alignments. Effects to groundwater are not foreseen throughout the construction, operation or closure of the transmission line alignment and it is therefore not included in the local study area;
- soils, wildlife, vegetation, archaeology and land use – includes the Project site and adjacent areas, as well as the transmission line alignments;
- socio-economic – includes communities that are closest to the Project site and could therefore experience socio-economic Project effects. The local study area is comprised of Gogama, Mattagami First Nation (IR #71) and portions of Highway 144 that connect these communities with the Project site; and
- visual aesthetics – includes receptor locations that would potentially experience changes in their visual landscape based on Project design.

Regional study areas were primarily selected to capture maximum spatial extent of Project effects.

6.2 General Description of the Côté Gold Project

As of October 24, 2012, the Côté Gold Property includes approximately 81 patented mining claims, 456 unpatented mining claims, 3 mining leases and 50 Mining Licenses of Occupation located in the Townships of Arbutus, Yeo, Chester, Benneweis, Champagne, Smut, Invergarry, Esther, Osway, Huffman, Potier, Neville, St. Louis, Groves, Benton, Somme, and Fingal. The gold mineralization, as currently understood, is located within 13 claims in Chester Township.

The Project site is situated within the Mollie River and Neville Lake subwatersheds. The Mollie River drains directly to Minisinakwa Lake, while Neville Lake drains sequentially to Mesomikenda Lake, the Makawi River and Minisinakwa Lake. From Minisinakwa Lake, water flows to the Minisinakwa River, Mattagami Lake and the Mattagami River, which flows northward through the City of Timmins. The Mattagami River (part of the Arctic watershed), flows north through Northern Ontario and confluences with the Moose River prior to discharge to James Bay.

A number of lakes encompass the Côté Gold Project site area, including Chester Lake, Clam Lake, Côté Lake, and Three Duck Lakes. A number of small tributaries drain from the general site area into the Mollie River, which includes Clam Creek, Unnamed Pond, and Mill Pond.

The open water reach of the river between Chester Lake and Côté Lake ranges in width from 5 to 20 m, with a depth of 1 to 2 m, and is bordered by a flooded grassy marsh, interspersed with dead standing coniferous trees. Numerous stands of planted Jack Pine occur adjacent to the marsh, in addition to evidence of recent logging activities.

The Project is accessible by Highway 144 to the east via the Mesomikenda Lake access road. Highway 144 connects with Sudbury in the south, Gogama, and Timmins in the north. A road to access the Project site is planned to be constructed, although the route has not yet been defined. This access route is not expected to have any major water crossings. Gogama is situated near the Canadian National (CN) rail line, and is connected to the electrical grid.

Power to support site preparation and construction will be derived from the existing local grid, supported by diesel power generator(s) (less than 5 MW), as required. During the operations phase of the Project, power will be supplied by a new 230 kV transmission line connected to the existing HydroOne Network in Timmins. The proposed alternatives for the alignment of the transmission line are shown in Figure 4.

Pipelines will be needed to transport and dispose of water between various facilities, including the open pit, processing plant, TMF and mine water pond. A pipeline will also be constructed to provide freshwater (likely from the Mesomikenda Lake) for potable and process requirements. It is anticipated that excess treated effluent from the TMF will be pumped via pipeline to the receiving water after a downstream polishing pond.

There are no known Areas of Natural and Scientific Interest, or Provincially Significant Wetlands within or near to the general Project site area.

The Project site does not directly overlap with any First Nation reserve lands. Mattagami 71 Reserve is the closest First Nation reserve land, located approximately 40 km north of the Project site (see Figure 1).

6.3 Climate, Air Quality and Noise

6.3.1 Climate

Located in the Boreal Shield ecozone of Ontario (Natural Resources Canada, 2012), the Project site is characterized by long, cold winters and short, warm summers with little to no annual water deficit (Energy, Mines and Resources Canada, 1990).

Regional climate stations maintained by Environment Canada are located in Timmins, Chapleau and Sudbury, Ontario. Long-term climate statistics for the period 1971 to 2000 describe annual total precipitation in the range of approximately 800 mm to 900 mm, with between 31% and 38% falling as snow. Annual average temperatures at these regional sites is in the range of 1.3ºC to 3.7ºC, with minimum daily average temperatures occurring in January and maximum daily average temperatures occurring in July.

Winds are primarily from the south or southwest during the summer months, and from the north or northwest during the winter months.

An on-site meteorological station was established on the Project site in 2012. To date, daily temperature and total precipitation have been within the range of data collected at the regional climate locations.

6.3.2 Air Quality

Site specific background air quality data are not available for the Project site. However, estimates of background concentrations for commonly assessed air quality parameters (ozone; nitrogen oxides: NO, NO_2 and NO_x), as well as for particulate matter ($PM_{2.5}$), can be determined from Provincial air quality measurements from the nearest Provincial ambient air quality stations in Sudbury and North Bay (MOE, 2012).

Table 6-1 provides an overview of the available regional ambient air quality concentrations. Lower 10^{th} to 30^{th} percentile air quality values are generally considered to represent background air quality values, not influenced by anthropogenic activities. The Sudbury station reported air quality in the good to very good categories approximately 96.7% of the time, in the moderate category approximately 3.3% of the time, and in the poor category approximately <0.1% of the time (MOE, 2012).

Table 6-1: Regional Ambient Air Quality Concentrations

Parameter	10th Percentile	30th Percentile	Mean	Station
$PM_{2.5}$ (µg/m$^{3)}$	0	1	3.6	Sudbury*
Ozone (ppb)	14	23	28.7	Sudbury*
NO (ppb)	1	1	3.4	North Bay**
NO_2 (ppb)	2	3	7.6	North Bay**
NO_x (ppb)	3	5	11	North Bay**

Source: MOE, 2012.

* Data for fine particulate matter and ozone were taken from the closest station, Sudbury.

** Concentrations for nitric oxide, nitrogen dioxide and nitrogen oxides were not available from the Sudbury station and were therefore extracted from the North Bay station data.

No meaningful amounts of airborne contaminants are expected to be present in the atmospheric environment due to the absence of any concentrated recent human activity or large settlement within the Project site area. However, long range transport of air emissions and also natural sources, such as forest fires, may affect air quality at the site.

Air monitoring will be conducted for particulate and nitrogen oxides in 2013 to establish baseline levels for these parameters. Air quality concentrations for key metals and metalloids (arsenic, cadmium, lead and mercury) are not measured at the Sudbury station. Background concentrations of these parameters are generally assumed to be nil for impact assessment modelling purposes.

6.3.3 Noise

Existing noise levels in the vicinity of the Project site reflect a rural sound environment and are generally characterized by sounds of nature and minimal road traffic. The MOE requires that noise impacts from a site be assessed against the higher of either background or the Noise Pollution Control (NPC) exclusionary limits.

In accordance with the MOE guideline publication NPC-232, which classifies the acoustic environment with regards to the assessment of sound produced by industrial operations and ambient background noise environments, the Project site is defined as a Class 3 environment.

The MOE defines Class 3 as a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as agricultural areas, a small community with a population less than 1000, a wilderness area, or a rural recreational area such as a cottage or resort.

Additional guidelines that will be used to assess noise effects of the Project, include, as applicable:

- Construction noise:
  - MOE Publication NPC-115, “Construction Equipment”; and
  - MOE Publication NPC-118, “Motorized Conveyances”;
- Construction/operations vibration:
  - MOE Publication NPC-207, “Impulse Vibration in Residential Buildings”, November 1983 as amended;
- Construction/operations blasting:
  - MOE Publication NPC-119, “Blasting”, Model Municipal Noise Control By-Law, Final Report, August 1978.

6.4 Physiography, Soils and Geology

6.4.1 Physiography

The Project site is located within an area with moderately hilly boreal mixed wood (Birch, Pine, Poplar and Spruce) forest, bogs, fens and lakes commonly less than 10 m deep. Elevations range from 375 to 425 m above sea level (masl), averaging approximately 400 masl near the Project site. The area of the Project site is characterized by bedrock outcrops and glacial till and is typical of the Canadian Shield. The glaciated country has a gently rolling topography that seldom exceeds 50 m. The higher ground usually has a veneer of glacial soil over bedrock, with thicker overburden present in the low-lying areas between the hills.

6.4.2 Soils

In general, the composition of the overburden materials throughout the study area consists of an organic layer (peat in many cases) overlying silt and/or sand with occasional till overlying bedrock. Bedrock is very close or at surface in most areas, with the exception of valley bottom areas and low-lying wet areas. Overburden ranges in depth from 0 to 18 m. Soil pH values are ranging from 6.8 to 7.3. Ongoing subsurface investigations are being carried out to further characterize the geotechnical and hydrogeological properties of overburden soils and bedrock in the vicinity of the proposed open pit, watercourse realignments and other surface infrastructure components.

6.4.3 Geology and Geochemistry

The Côté Gold Project is situated in the Swayze Greenstone Belt. The Swayze area went through a complex and protracted structural history of polyphase folding, development of multiple foliations, ductile high-strain zones, and late brittle faulting. The Swayze Greenstone Belt includes a diversity of extrusive and intrusive rock types. Compositions of rock types are ranging from ultramafic through felsic, as well as both chemical and clastic sedimentary rocks. Igneous rocks mainly consist of both volcanic and plutonic rocks.

The northern part of the Project site is located within the transition from felsic to intermediate metavolcanic intrusive rocks into intermediate to felsic metavolcanic intrusive rocks. The southern portion of the Project site is located within Chester Township, with the majority of the township area overlying a narrow greenstone belt assemblage. This assemblage separates the Kenogamissi granitoid complex to the north from the Ramsey-Algoma granitoid complex to the south, a portion of the northern edge of which is called the Chester Granitoid Complex.

The Project's gold deposit is an intrusion hosted, disseminated gold deposit that initially has been interpreted as an Archean-aged gold porphyry deposit. Gold mineralization is associated with altered and brecciated intrusive rocks. Roughly, it can be pictured as a core breccia mass within diorite, surrounded by granodiorite. The volume of magmatically brecciated rock has been overprinted by the gold-mineralizing hydrothermal system, which has developed less definable zones of propylitic and potassic alteration.

A preliminary assessment of rock samples from the Côté Gold Project was conducted. Static analyses included: elemental analyses, whole rock analyses, static acid base accounting (ABA), short term leach tests, mineralogy (X-ray diffraction), and net acid generation analyses.

The results of the testing suggest that the mine rock is not potentially acid-generating (non-PAG) and has low levels of soluble metals. Preliminary testing of ore samples suggests that the tailings will be non-PAG, and will likely have associated low levels of soluble metals release.

More detailed geochemical investigations are underway to fully characterize the mine rock and tailings to be produced by the Project. The program includes additional static testing, plus laboratory and field based kinetic testing to gather more detailed information on acid generation and neutralization potentials, as well as expected rates of sulphide oxidation, neutralization potential consumption, and metal release.

6.5 Hydrology and Hydrogeology

6.5.1 Hydrology

The Project site is located within the Upper Mattagami River Watershed, which drains northward through the City of Timmins and ultimately to James Bay. Surface water flows at the Project site are controlled by a number of lakes and creeks, which flow to the Mollie River and Mesomikenda Lake prior to discharging to Minisinakwa Lake and ultimately the Mattagami River. The Mattagami River upstream of the City of Timmins Water Filtration Plant is within the Intake Protection Zone 3 in the context of the Mattagami River Source Water Protection program.

Regional hydrological monitoring stations maintained by Water Survey of Canada are located on the Mollie River (unregulated flow) and at Minisinakwa Lake (regulated flow), as well as by Ontario Power Generation at the Mesomikenda Lake Dam (regulated flow). The regulated flow systems are governed by a Water Management Plan in place for the Mattagami River.

Surface water flowpaths at the Project site are currently monitored by 15 hydrological sampling stations selected and installed during 2012. In general, these monitoring locations have been distributed throughout the two main subwatersheds of the Project site (i.e., the Mollie River subwatershed and the Neville Lake subwatershed). Automatic water level dataloggers have been installed and will be used in conjunction with instantaneous discharge measurements to develop a characterization of the streamflow regime in the vicinity of the Project site.

6.5.2 Hydrogeology

The geology of the Project site can be generally characterized by mafic metavolcanic, metasedimentary and pyroclastic bedrock overlain by a veneer of glacial till at higher elevations and peat and glaciolacustrine deposits at lower elevations.

To assess the hydrogeological conditions within the Project site area, a baseline hydrogeological field investigation was initiated in 2012. The baseline hydrogeological field investigation focused on near surface (shallow bedrock and overburden) conditions in the vicinity of the proposed open pit, TMF and MRA locations. In addition, investigations were directed to characterising the hydraulic properties of deep bedrock in the open pit area.

A total of 98 boreholes were drilled in the vicinity of various Project components and groundwater monitoring wells (nested and single wells) were installed in 63 of these boreholes to allow for water level monitoring and water quality sampling. Wells were installed with screens located in various overburden, where present, and bedrock material. Twenty monitoring wells have been outfitted with automatic water level sensor dataloggers and each of the 63 wells were monitored manually for water levels during four sampling events in 2012. Groundwater samples were collected from 37 wells three times in 2012 (spring, summer and fall). In addition, six angled drillholes were advanced into the deep bedrock within the proposed open pit to facilitate hydrogeological and geomechanical testing of major lithological units and structural features (e.g. dykes and faults) along ultimate pit walls.

The water level data provides an indication of groundwater level fluctuation and groundwater flowpaths in the vicinity of the Project site. The depth to groundwater throughout the site averages 0.6 m below ground surface (bgs) and ranges from 5.2 mbgs at areas of higher elevation and/or steeper topography to 0.5 m above ground surface (ags) (discharging conditions) at lower elevations near swampy areas and surface water features. Discharging groundwater conditions were generally observed at the base of steep slopes adjacent to low-lying swampy areas. Regional horizontal groundwater flow at the site is generally inferred to be from the south-southwest to the north-northeast. On a more localized scale, horizontal groundwater flow is inferred to be topographically controlled and the water table generally provides a subdued reflection of the topography with flow from recharge areas at higher elevation to discharge areas at lower elevation commonly adjacent to surface water features.

Hydraulic properties of the overburden and shallow bedrock were characterized through in-situ borehole packer testing and monitoring well rising head slug tests in shallow vertical

geotechnical boreholes. Deep angled boreholes were also drilled to angled depths of 771 m in the pit footprint and packer tests were conducted to investigate bedrock structure and groundwater flow paths. A wide range of hydraulic conductivity estimates were derived for overburden and bedrock at the Project site. Overburden materials ranged from fine grained tills to granular materials of higher permeability (~10^{-4} m/s). The permeability of bedrock at the Project site ranged from approximately 10^{-6} to 10^{-9} m/s and, where unfractured, less than 10^{-10} m/s. Packer testing of the deep angled boreholes suggested a weak trend to declining hydraulic conductivity values with depth as is typical in the Canadian Shield.

6.6 Surface Water, Sediment, and Groundwater Quality

6.6.1 Surface Water Quality

Water quality sampling has been completed at 21 locations quarterly or monthly, coincident with the 15 hydrological stations and with 9 additional locations. The complete list of water quality parameters is provided in Table 6-2.

Table 6-2: Water Quality Parameters

Parameters	Surface Water Quality Monthly/Quarterly Baseline Monitoring Program	2013 Supplementary Surface Water Quality Monitoring Program	Groundwater Quality Baseline Monitoring Program (3x yearly)
pH	X	X	X
alkalinity	X	X	X
acidity	2 analyses	X	X
electrical conductivity	X	X	X
dissolved oxygen	—	X	—
total dissolved solids	X	X	X
total suspended solids	X	X	X
hardness	X	X	X
dissolved organic carbon	X	X	—
total organic carbon	4 analyses	X	—
chemical oxygen demand	4 analyses	—	—
calcium	X	X	X
magnesium	X	X	X
potassium	X	X	X
sodium	X	X	X
chloride	X	X	X
fluoride	X	X	X
sulphate	X	X	X
aluminum	X	X	X
antimony	X	X	X

Parameters	Surface Water Quality Monthly/Quarterly Baseline Monitoring Program	2013 Supplementary Surface Water Quality Monitoring Program	Groundwater Quality Baseline Monitoring Program (3x yearly)
arsenic	X	X	X
barium	X	X	X
beryllium	X	X	X
boron	X	X	X
cadmium	X	X	X
chromium	X	X	X
cobalt	X	X	X
copper	X	X	X
iron	X	X	X
lead	X	X	X
manganese	X	X	X
mercury	X	X	X
molybdenum	X	X	X
nickel	X	X	X
selenium	X	X	X
silver	X	X	X
strontium	X	X	X
thallium	X	X	X
titanium	X	X	X
tungsten	X	X	X
uranium	X	X	X
vanadium	X	X	X
zinc	X	X	X
zirconium	X	X	X
total cyanide	X	X	X
free cyanide	—	X	—
sulphur	3 analyses	—	X
nitrate	4 analyses	X	X
nitrite	4 analyses	X	X
ammonia	X	X	X
total Kjeldhal nitrogen	4 analyses	—	—
total phosphorus	X	X	—
phosphate	X	—	—
soluble reactive phosphorus	4 analyses	—	—
oil and grease	5 analyses	X	—
phenols	—	X	—

Parameters	Surface Water Quality Monthly/Quarterly Baseline Monitoring Program	2013 Supplementary Surface Water Quality Monitoring Program	Groundwater Quality Baseline Monitoring Program (3x yearly)
polycyclic aromatic hydrocarbons	—	X	—
polychlorinated biphenyls	—	X	—
escherichia coli	—	X	—
total coliform	—	X	—
radium-226	Monthly from Nov/12	X	—

Notes:
— = no analysis completed
X = analysis completed

Surface water quality results have typically been consistent between seasons, with concentrations of total phosphorous, iron, zinc, copper and dissolved aluminum occasionally exceeding regulatory guidelines (i.e., Provincial Water Quality Objectives and Canadian Council of Ministers of the Environment Canadian Water Quality Guidelines for the Protection of Aquatic Life). Water quality exceedances are generally interpreted to be naturally occurring in the vicinity of the proposed Côté Gold Project. Some exceedances in select locations may be related to historical operations. Water quality results are being further evaluated during the EA. Surface water quality sampling will continue during baseline characterization studies.

6.6.2 Sediment

Sampling of sediment quality was conducted in water bodies and watercourses across the site during an aquatic baseline survey conducted by AMEC in 2011. Samples were collected from the top (0 to 10 cm) horizon at wetland/lake sampling stations using a grab sampler from depositional environments. Sample analyses included: pH and total organic carbon, metals, such as silver, aluminium, arsenic, barium, beryllium, bismuth, calcium, cadmium, cobalt, chromium, copper, iron, mercury, potassium, magnesium, manganese, molybdenum, nickel, lead, antimony, selenium, titanium, tellurium, uranium, vanadium and zinc, as well as phosphorus, boron, sulphur, and silicon.

Sampling results indicated good sediment quality, with the majority of parameter concentrations below the 2008 MOE Provincial Sediment Quality Guidelines (PSQG). PSQG Lowest Effect Levels (LELs) were exceeded for the majority of the total organic carbon results. A few total organic carbon results also exceeded PSQG Severe Effect Levels (SELs), however this is typical of lakes in northern Ontario. Provincial SELs were found to be exceeded for iron and manganese concentrations in the Mollie River. In some of the surface waters, Federal Threshold Effect Level exceedances were observed for copper (AMEC, 2011). It is noted that the PSQGs were developed and strongly weighted by data for sediments in the Great Lakes

basins, which tend to have substantially lower natural content of many metals relative to sediments in Canadian Shield lakes (Prairie and McKee, 1994). Natural background concentrations, particularly in mineralized areas of the Canadian Shield lakes can naturally exceed LELs. Sediment quality evaluation will include a comparison to PSQG LELs, SELs and reference area values.

6.6.3 Groundwater Quality

Groundwater samples were collected three times in 2012 at 37 monitoring wells. Sample locations were selected to coincide with areas of potential infrastructure development at the Project site. Groundwater chemistry was analysed for major ions, metals, nutrients and physical parameters (e.g., conductivity and total dissolved solids). Groundwater quality results were compared to Ontario Drinking Water Standards (ODWS), Provincial Water Quality Objectives (PWQO) and the Canadian Council of Ministers of the Environment Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life. Results indicated that several parameter concentrations occasionally exceeded these regulatory criteria, including but not limited to copper, zinc, molybdenum, aluminum, silver, arsenic, iron, free cyanide and cadmium.

With respect to groundwater quality, several parameter concentrations were measured above their applicable ODWA or PWQO criteria during one or more monitoring events in 2012. Other than exploration drilling at the site, there is currently limited development. As such, these elevated parameter concentrations represent background conditions and will continue to be monitored to assess trends in water quality.

6.7 Biological Environment

6.7.1 Aquatic Resources

Aquatic assessments of water bodies within the boundaries of the proposed pit and associated potential MRA and TMF were conducted by Minnow Environmental Inc. (Minnow) in July 2012. Studies included the characterization of fish habitat and community structure of the water bodies, as well as sport fish population sizes, in Côté Lake and Unnamed Lake. Additional data on aquatic resources are available from the Baseline Aquatic Study performed in 2011 by AMEC, associated with a sampling program conducted during the summer and fall of 2010. These studies included water quality/hydrogeology analysis, benthic invertebrate surveys, aquatic macrophyte community assessment, and fish community assessment and habitat characterization.

A variety of fishing gear was used to collect fish using non-lethal techniques, including boat electro-fishing, hoop nets, short duration gill net sets, minnow traps and seine nets. Fish species captured from local surface waters during the aquatic assessment in July 2012 are listed in Table 6-3. Large-bodied fish species (Northern Pike, Yellow Perch, White Sucker) were captured in Côté Lake, Unnamed Lake, Bagsverd Lake (south and east arms), Clam Lake (main basin), Unnamed Pond, Mollie River and Bagsverd Creek. In Clam Lake (east arm) and Little Clam Lake, Northern Pike and Yellow Perch, but no White Sucker, were captured. Except for the presence of White Sucker in Bagsverd Pond and West Beaver Pond, no large-bodied fish

were captured in other sampled ponds (i.e., Beaver Pond, East Beaver Pond, and North Beaver Pond). Some of the water bodies also supported Lake Whitefish and Walleye, which also represent sport fish. Samplings of the water bodies did not provide evidence of any aquatic SAR (such as Lake Sturgeon), either under Federal *(*Species at Risk Act*)* or Provincial *(*Endangered Species Act*)* legislation (Minnow, 2012).

Mollie River, Bagsverd Creek and Clam Creek were characterized by slow flows, except for shallow and rocky portions. Due to extensive macrophyte coverage observed along the banks, the surveyed watercourses provide suitable spawning grounds for Northern Pike. Ponds surrounding the Project site had an approximated depth of 1 m and, except for Unnamed Pond, presented emergent macrophytes and wood debris. Alders, sedges, shrubs, and grasses dominated the banks. The banks of the surveyed lakes were all intensely forested. Black Spruce and Cedar mainly overhung the shorelines with alders, shrubs, sedges and grasses in the understory at the lakes' edges. Within the lakes, emergent macrophytes were observed in the periphery, providing spawning habitat for Yellow Perch and Northern Pike. Lake depths vary from approximately 3 m in Côté Lake, 1.6 m in Unnamed Lake and up to 5.8 m in Little Clam Lake (Minnow, 2012).

Additional baseline data collection is currently ongoing and is targeting Bagsverd Creek, Bagsverd Lake, Chester Lake, Clam Lake, Delaney Lake, Errington Creek, Three Duck Lakes, Mesomikenda Lake, Neville Lake, Rene Lake, Schist Lake, Unnamed Lake and Weeduck Lake. Results of the additional baseline data collection will be included in the aquatic resource baseline report.

Table 6-3: Fish Species Captured in the Vicinity of the Côté Gold Project

Surface Water Body	Fish Species Captured	
	Large-Bodied	**Small-Bodied**
Côté Lake	• Northern Pike • Yellow Perch • White Sucker • Lake Whitefish • Burbot	• Blacknose Shiner • Golden Shiner • Iowa Darter
Unnamed Lake	• Northern Pike • Yellow Perch • White Sucker • Walleye	• Blacknose Shiner • Golden Shiner • Iowa Darter • Central Mudminnow • Slimy Sculpin
Bagsverd Lake (south and east arms only)	• Northern Pike • Yellow Perch • White Sucker • Walleye	• Blacknose Shiner • Golden Shiner • Iowa Darter • Spottail Shiner • Fathead Minnow

Surface Water Body	Fish Species Captured	
	Large-Bodied	Small-Bodied
Clam Lake (main basin)	• Northern Pike • Yellow Perch • White Sucker • Burbot • Smallmouth Bass	• Blacknose Shiner • Iowa Darter • Spottail Shiner
Clam Lake (east arm)	• Northern Pike • Yellow Perch	• Blacknose Shiner • Golden Shiner • Iowa Darter • Johnny Darter
Little Clam Lake	• Northern Pike • Yellow Perch	• Blacknose Shiner • Golden Shiner • Iowa Darter
Beaver Pond	—	• Iowa Darter • Fathead Minnow • Pearl Dace • Northern Redbelly Dace • Finescale Dace
Unnamed Pond	• Northern Pike • Yellow Perch • White Sucker	• Iowa Darter
East Beaver Pond	—	• Fathead Minnow • Northern Redbelly Dace • Finescale Dace
North Beaver Pond	—	• Northern Redbelly Dace • Finescale Dace
Bagsverd Pond	• White Sucker	• Iowa Darter • Central Mudminnow • Fathead Minnow • Northern Redbelly Dace • Finescale Dace
West Beaver Pond	• White Sucker	• Finescale Dace • Golden Shiner • Iowa Darter • Central Mudminnow • Fathead Minnow • Pearl Dace • Northern Redbelly Dace • Finescale Dace
Mollie River	• Northern Pike • Yellow Perch • White Sucker	• Blacknose Shiner • Golden Shiner • Iowa Darter
Bagsverd Creek	• Northern Pike • Yellow Perch • White Sucker • Burbot	• Golden Shiner • Iowa Darter • Central Mudminnow • Longnose Dace

Note: — = no species.
Source: Minnow, 2012.

6.7.2 Vegetation Communities

The Project is located within the Lake Abitibi (3E-5) Ecoregion (Crins, 2002), which extends from Wawa, Ontario, in the west to just past the Ottawa River in the east (Environment Canada, 2010). Throughout this region, the typical forest habitat is described as a mixed forest characterized by stands of white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), eastern white pine (*Pinus strobus*), along with some red pine (*Pinus resinosa*), yellow birch (*Betula allegheniensis*) and trembling aspen (*Populus tremuloides*) (Environment Canada, 2010). Warmer areas along the Lake Superior shore contain sugar and red maple (*Acer saccharum, A. rubra*), and yellow birch, whereas drier sites may have stands of white, red and jack pine (Pinus banksiana) (Environment Canada, 2010). Black spruce (*Picea mariana*), tamarack (*Larix laricina*), and eastern white cedar (*Thuja occidentalis*) dominate in poorly drained areas. Wetlands are characteristically bowl bogs that are treed and surrounded by peat margin swamps (Environment Canada, 2010).

Observations indicate that the vegetation cover within the Project area is typical of the Lake Abitibi (3E-5) Ecoregion. The Project site and the transmission line corridor segment from the Shining Tree station to the Project site each contained 6 landcover types (Spectranalysis Inc,. 2004). Based on the Forest Ecosystem Classification (FEC) system for northeastern Ontario (Taylor et al., 2000), 11 ecosite types were identified within the proposed Project site area, and nine ecosite types were identified along the transmission line corridor from Shining Tree to the Project site. No sensitive plant communities were identified in the study area (NHIC, 2012).

As the FEC system was developed for the forest land cover only, the new provincial Ecological Land Classification (ELC) system for the boreal forest region of Ontario will be used to classify vegetation communities in the Project area. The ELC not only classifies forested areas but allows for the classification of non-forested wetlands and other non-forested communities. An ecosite conversion methodology to convert the FEC ecosite classifications to the new provincial system will be applied to the data collected thus far.

6.7.3 Wildlife

Based on the habitat ranges provided by the Atlas of the Mammals of Ontario (Dobbyn, 1994), 49 mammals have potential to inhabit the Project area. No mammal specific surveys were conducted during the 2012 field surveys, however, incidental mammal observations were recorded throughout the 2012 field program. Signs of ten mammal species were observed in the Project site area (five in the Project site area and eight in the transmission line corridor segment from Shining Tree to the Project site). A winter aerial survey conducted between February 27 and March 1, 2013 observed 21 Moose (*Alces alces*) and one Red Fox (*Vulpes vulpes*) along the transmission line route alternatives. In addition tracks of Moose, Red Fox, Wolves (*Canus sp.*), Lynx (*Lynx sp*.), River Otter (*Lontra Canadensis)*, Pine Marten (*Martes Americana*), Mink (*Neovison vison*), Weasel (*Mustela sp*), Snowshoe Hare (*Lepus americanus*), and Porcupine (*Erethizon dorsatum*) were observed during the survey.

A total of 127 bird species have potential to inhabit the Project site area (OBBA, 2006). During the breeding bird surveys, 62 species were observed in the Project site area, while 50 species were observed in the transmission line corridor segment from Shining Tree to the Project site. Eleven species of waterbirds were observed in lakes and rivers in the Project site area and seven waterbird species were observed in this segment. Several bird SAR species were observed during the field surveys or as incidental observations. Two species designated as Special Concern provincially (bald eagle (*Haliaeetus leucocephalus*) and Canada warbler (*Wilsonia canadensis*)), one species designated as Special Concern federally (rusty blackbird (*Euphagus carolinus*)), and one federally threatened species (olive-sided flycatcher (*Contopus cooperi*)) were observed in the Project site area. Two species, federally listed as threatened (common nighthawk and olive-sided flycatcher), were observed in the transmission line corridor segment from Shining Tree to the Project site during the 2012 field program.

Five species of owls were observed in the Project site area during the 2012 owl surveys. Northern saw-whet owl (*Aegolius acadicus*) was the only species of owl observed in the transmission line corridor segment from Shining Tree to the Project site. All of the observed owl species are considered secure.

Two whip-poor-wills were observed during the 2012 field surveys. Both birds were observed at the same survey station in the transmission line corridor segment from Shining Tree to the Project site. The survey station was located in a cut area adjacent to a dense coniferous forest.SAR designations for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the Ontario Minister of Natural Resources (MNR), species are added to the provincial *Endangered Species Act* (ESA), which came into effect June 30, 2008 (Government of Ontario, 2007). The legislation prohibits the killing or harming of species identified as ‘endangered’ or ‘threatened’ in the various schedules to the Act. The ESA provides habitat protection to those species listed as endangered under the former *Endangered Species Act* (listed in Schedule 1 of the current legislation) and recently listed species (under separate regulations). However, the ESA does not immediately provide general or species-specific habitat protection to endangered species and threatened species included in Schedules 3 and 4 of the ESA until regulations identifying species-specific habitat come into effect, or the 5th anniversary of the date the ESA (30 June 2013), whichever comes first. However, all endangered and threatened species listed in the ESA are afforded protection of significant habitat under the Provincial Policy Statement (Ministry of Municipal Affairs and Housing, 2005).

Sensitive species refers to those listed in the ESA, the SARA (Schedule 1), or those considered vulnerable or imperilled in the province (provincial ranking of S1-S3). A background review of publically available information indicates that there is potential for 21 sensitive species to occur in the region containing the Project site. Of these, 14 species are considered at risk provincially (seven are designated Special Concern, six are Threatened, and one is considered Endangered) (Government of Ontario, 2007). One species was designated Special Concern under Federal legislation (Government of Canada, 2008). Four species are considered to be species of conservation concern and are tracked by the province (NHIC, 2012). Two species,

while not at risk currently, have been nominated by COSEWIC to receive a Federal designation of Endangered (COSEWIC, 2012).

Tri-coloured bat (*Pipistrellus subflavus*), little brown bat (*Myotis lucifugus*), and northern long-eared bat (*Myotis septentrionalis*) are listed by COSEWIC as Endangered. In Ontario small-footed bat (*Myotis leibii*) is designated a species of conservation concern, and little brown bat and northern long-eared bat are designated as Endangered species on the SAR in Ontario list. During the 2013 winter aerial survey, several areas of potential bat hibernacula were identified primarily along the cross-country transmission line alternative.

Eastern wolf (*Canis lupus lycaon*) has been designated as a species of Special Concern provincially and eastern cougar (*Puma concolor*) is designated as Endangered, on the Species at Risk in Ontario list. Despite many sightings of eastern cougar in the past two decades from eastern Canada, there are insufficient data to evaluate the taxonomy or assign a status to this cougar, according to COSEWIC (2012), and no specimens exist to substantiate its occurrence in the province (NHIC, 2012). For these reasons, it is unlikely that cougar occur in the Project site area.

Six sensitive bird species have potential to occur in the study area. Of these, four species are considered Threatened provincially (Canada warbler (*Wilsonia canadensis*), chimney swift (*Chaetura pelagica*), eastern meadowlark (*Sturnella magna*) and whip-poor-will (*Caprimulgus vociferous*). Olive-sided flycatcher (*Contopus cooperi*) has been designated as Threatened federally. Based on the available range maps (NHIC, 2012; ROM, 2012), one sensitive amphibian and two sensitive reptiles have potential to occur in the study area. The Project site is located at the northern extent of Blanding's turtle (*Emydoidea blandingii*) and snapping turtle (*Chelydra serpentine*) ranges and their presence is expected to be uncommon. Blanding's turtles are considered Threatened, both provincially and federally, while snapping turtles are considered Special Concern provincially and federally.

6.8 Human Environment

6.8.1 Population and Demographics

Gogama, the closest community to the Project site, reported a total population at the time of the 2011 census of 277, down 29.7% from the 2006 census. The unorganised subdivisions of North Sudbury and Timiskaming West also lost population between the 2006 and 2011 census. This decline may be explained by fluctuations in the forestry and mining activities in the area.

In Gogama and the unorganised subdivisions, the proportion of the population aged 0 to 14 and 15 to 19 is less than the Ontario average. The proportion of the population over 65 is higher than the Ontario average, thus contributing to a higher median age than the provincial average.

Mattagami First Nation, the closest First Nation to the Côté Gold Project, saw an on-reserve population increase by 2.1% from 189 persons in 2006 to 193 persons in 2011 (Statistics Canada, 2012). The Flying Post First Nation reserve, located west of Timmins recorded 40 people living on-reserve in the 2006 Statistics Canada survey, although the population currently resides in Nipigon. The registered population on-reserve for Brunswick House First Nation in 2010 was 186 (AANDC, 2011).

Data from 2006 indicates that Mattagami and Brunswick House First Nations have a large portion of their populations under the age of 19, about 15% more than the provincial average. As a result, the communities also have a low median age compared to the provincial average.

Education levels in Northern Ontario continue to be lower than the averages for Ontario and the differences in levels of education between northern Ontario and the rest of Ontario are continuing to increase. Aboriginal communities in the Project area have a lower education attainment than the province as a whole.

6.8.2 Regional Economy

Based on data from 2006, three out of every four jobs in Northeastern Ontario were in service industries such as trade, health, education and public administration (Statistics Canada, 2007). In the Project area, total resource-based (mining and forestry) jobs represented 9.7% of the labour force. The dependency on resource-based jobs was much higher in the Project area than for the province as a whole (2.9%; Statistics Canada, 2007). The Project area communities as a whole had 6.6% and 5.9% of the labour force in construction and manufacturing respectively. Labour force in non-basic industries in the area was concentrated in other services (often but not necessarily associated with tourism), business services and health care and social services.

Sudbury is the largest community in the Project area, and as such, is a service provider in the immediate region, followed by Timmins. The labour force participation in the Project area was 63.3%, which is lower than for Ontario as a whole, which is 67.1%.

In 2010, the Sudbury District (which includes Gogama) received 378,243 person-visits, 90% of which were from Ontario. These visitors spent $47.8 M in the region, and direct, indirect and induced effects from that spending resulted in the estimated increase of regional gross domestic product (GDP) by $26.5M and supported 491 jobs earning a total income of $16.5 M. Tourism is also expected to have raised a total of $13.3 M in taxes, of which $7.1 M was in Federal taxes and $6.2 M was in provincial taxes (MTCS, 2013b). Using the 2006 census data (as 2011 census data are not yet released), these jobs would represent 4.9% of the District's labour force of 10,065 (Statistics Canada, 2007).

The northern economy in 2006 had a higher share of its employment in mining and forestry than Ontario as a whole (3.9% versus 0.2%) and a higher share of public sector employment, e.g., public administration, education and health care (Statistics Canada, 2006). Data for 2003

indicate that employees in Northern Ontario were more unionized than employees across the province (40.5% versus 28.5%; Statistics Canada, 2006).

The Human Resources and Skills Development Canada Labour Market Bulletin for Fall 2012 indicates that after a quarter of growth (measured year over year), employment in the Northeast Ontario economic region fell by 11,100 jobs. The number of people participating in the labour force declined as well. As a result, the unemployment rate increased almost a full percentage point to 7.5% (close to the 2006 Project area figure of 7.6%) while the unemployment rate of Ontario as a whole had climbed to 7.9% (much higher than the 2006 rate of 6.8%). The report noted that the mining industry has been experiencing some headwinds, due to falling prices for some metals.

While First Nation communities tend to have higher unemployment rates and lower participation rates than those of nearby communities, no data is available for the specific communities in the Project area.

In the human environment regional study area median personal income and median household income were less than the provincial averages ($27,258 and $60,455, respectively). Data for Aboriginal groups resident in the Project area were not available from published sources.

6.8.3 Mineral Exploration, Forestry and Agriculture

The structure of employment in Northern Ontario changed markedly in the two decades preceding the 2006 Census (Bollman et al., 2006). Most importantly, the share of total employment in primary and manufacturing industries declined and the share of total employment in the service sectors increased. Given that economic development in northern Ontario continues to be linked to the primary resource sector (notably mining and forestry), sustainability is an issue that all Northern Ontario communities must face.

For the most part, communities were developed by large resource extraction companies based outside the region rather than by local entrepreneurs. This has meant that the social and economic structure of the region exhibits an overdependence on natural resource exploitation and a high degree of dependency on external forces (Southcott, 2008).

In 2011, the production of and exploration for minerals in Ontario generated $10.7 billion, accounting for more than 1.6% of the total value of GDP in Ontario. Mining in Ontario accounted for 16,067 employees earning $1.7 billion in wages and salaries, of which the Sudbury region accounted for 35.8% of the jobs and 37.2% of the wages and salaries paid. Local taxes paid by mining companies amounted to $31.9 million in 2011, of which $18.9 million was paid in the Sudbury region alone (Dungan and Murphy, 2012).

Opportunities for growth of the Project area economy are apparent across the tourism industry and public sector infrastructure and manufacturing, although mining continues to characterize the growth potential of most of the study area communities.

The Project overlaps with the Spanish Forest. The Sustainable Forest License for the Spanish Forest is held by EACOM Timber Corporation (formerly Domtar Inc.) who is responsible for harvest management, inventories and planning. The current Harvesting Plan for 2012 and 2013 indicate planned harvesting in the area near the Project. Ongoing communication takes place between IAMGOLD and EACOM to discuss these plans.

The majority of the land at and surrounding the Project site is classified under the Canada Land Inventory as having little to no capacity for arable culture or permanent pasture (Agriculture and Agri-Food Canada, 2011) and as such there is no active agricultural use in the Project site area. Historically, small farms existed near Gogama to support the Canadian National Railway worker camps.

6.8.4 Community Infrastructure and Services

Given that the region has experienced population decline, service capacity may be able to handle additional demands which could be experienced by regional communities in the event of Project-related population increases either temporarily in the construction phase or permanently in operations phase. It is expected that the Project will have a camp to accommodate workers during construction and operations, which should prevent any stress on local housing supply.

Gogama has two schools, English public and French Catholic. The Gogama Public School offers instruction in English from Junior Kindergarten to Grade 8. The Gogama Public School is operated by the District School Board Ontario North East (based in Timmins). The French Catholic school (École Notre-Dame-du Rosaire) offers French school from Junior Kindergarten to Grade 8 (Gogama, 2012). The French Catholic school in Gogama is operated by the Gogama Roman Catholic Separate School Board. Education after Grade 8 is provided in larger centers such as Sudbury or Timmins. Similarly, post-secondary education is available at many institutions in Timmins and Sudbury.

Health care services are provided through the nursing station in Gogama operated as a satellite facility sponsored by the *Centre de Santé Communautaire de Sudbury.* The nursing station is staffed by a full time nurse practitioner specialising in primary care from Monday to Thursday. Physicians visit the nursing station on an as-needed basis (Gogama, 2012).

Emergency services (fire, police and ambulance) are available in Gogama. Fire protection is delivered through the Gogama Volunteer Fire Protection Team. The police service is provided by the Ontario Provincial Police, which has a detachment in Gogama. The emergency ambulance service based in Gogama is provided by trained personnel.

The region is well serviced and accessible from Highway 144, a route that connects Sudbury in the south to Timmins in the north. For passengers travelling to Gogama, there is also bus service provided by Ontario Northland, and passenger rail service by Via Rail. Timmins and Sudbury have regular commercial air service.

Water and wastewater is managed by the local services board in Gogama. In unorganised North Sudbury subdivision and unorganised Timiskaming west subdivision, water and wastewater is privately managed on individual lots. Outside the urban centre of Sudbury, most rural areas are also on private water and wastewater systems. The City of Timmins has two water treatment plants.

Wawaitin Station is the closest hydroelectric generating station downstream of the Mesomikenda Lake Dam (approximately 92 km northeast of the Project site). There is no power generating capacity at the Mesomikenda outfall, although it is operated by Ontario Power Generation to assist in the downstream power generating objectives. Mesomikenda Lake's water level is controlled by a dam owned and operated by the Ontario Power Generation.

6.8.5 Recreation and Tourism

Recreation and tourism in the region is mainly related to outdoor pursuits such as hunting, fishing, camping, snowmobiling, and hiking which occurs primarily in the Spanish Forest. There are two Provincial Parks in the region: Spanish River/Biscotasi Lake Provincial Park (a waterway park located approximately 40 km southwest of Gogama) and La Motte Lake Provincial Park (10 km northeast of Gogama). As noted in Section 6.8.2, tourism is a major employer in the North East Ontario Tourism Region. This sector is highly dependent on hunting and fishing as well as other wilderness pursuits such as snowmobiling, canoeing and camping. Many of the tourism operations in the region are remote and only accessible by boat or plane. A number of tourism facilities have been identified that provide accommodation (cottages and camps), hunting, fishing, and other outdoor adventure services. Most are located near Gogama (Minisinakwa Lake) and northeast of the Project site near Rice and Pebonishewi Lakes.

6.8.6 Cultural Heritage and Paleontological Resources

6.8.6.1 Archaeology Resources

For the Côté Gold Project, as required and in accordance with the *Ontario Heritage Act*, and the Ministry of Tourism, Culture and Sport *Standards and Guidelines for Consultant Archaeologists* (MCTS, 2011), Stage 1 and 2 Archaeological Resource Assessment studies were undertaken for archaeological sites in 2011 and 2012.

The Stage 1 assessment consisted of detailed evaluation of the Project area's archaeological potential to determine the likelihood that the Project potentially affected area contains significant archaeological resources. The evaluation consisted of background and overview studies that relied on desktop research and some property inspection. This preliminary work identified high potential areas and existing sites for Stage 2 and possibly Stage 3 work. Stage 2 work involved consultation and information sharing with the Mattagami and Flying Post First Nations, to solicit local traditional knowledge regarding archaeological sites and areas that may have been used in past for cultural purposes. Stage 2 work also included extensive subsurface testing in areas of high archaeological potential for pre-contact First Nations and early historic mining archaeological sites.

To date, through the Stage 1 and 2 studies, a total of 31 archaeological site and features have been located and recorded within the Côté Gold Project local study area. The sites include 16 pre-contact archaeological sites, nine historic archaeological sites, six ancient trails and several portages.

The recommendation from the Stage 2 studies includes Stage 3-4 fieldwork for eight of the pre-contact archaeological sites and two of the historic archaeological sites. Some of this work began in the fall of 2012 and further work is being undertaken during the 2013 field season.

Excavation will proceed with participation of the Mattagami and Flying Post First Nations at the sites listed in Table 6-4 during 2013.

Table 6-4: Summary of Archaeological Sites Scheduled for Stage 3-4 Archaeological Work in 2013

Archaeological Site Type	Local Name	Borden Designation
Pre-contact	Two Pike Point	CjHl 11
Pre-contact	Côté Lake 1 Site	CjHl 12
Pre-contact	Flat Rock Site and Rocky Narrows	CjHl 2 and CjHl 15
Pre-contact	Chester 1,3 Sites	CjHl 4,5
Pre-contact	Chester 5 Site	CjHl 7
Pre-contact	Table Point Site	CjHl 17
Historic Mining	Sheppard Site	CjHl 21
Historic Mining	Shannon Cabin	CjHl 25

Note: Other sites may also undergo Stage 3-4 work depending on Project impact areas

6.8.6.2 Cultural Heritage Landscapes and Built Heritage Resources

Preliminary assessment indicates that there is a cultural landscape consisting of a 1930s era gold mining camp with associated mining sites and remains. Further documentation and assessment of this cultural heritage landscape will be conducted in 2013. No built heritage resources other than ruins have as-yet been identified in the local study area. A complete report of the assessment of built heritage and cultural landscapes will be prepared in 2013.

6.8.6.3 Paleontological Resources

The Côté Gold Project area has no paleontological resources. Fossils are not present as all the rocks in the area are very old and predate any plant or animal life on earth.

7.0 DESCRIPTION OF POTENTIAL EFFECTS

7.1 Effects Analysis Overview

Residual effects (after mitigation) will be assessed within the EA and will consider:

- effects of the undertaking on the physical, biological and human environment; and
- potential cumulative effects resulting from the Côté Gold Project with other past and reasonably foreseeable future undertakings.

The methodology described in this document, with minor variations, has been used in the past by AMEC to conduct several EAs for, or related to, mining projects in Ontario, which were subsequently approved or are currently within the approvals process by the Ontario Minister of the Environment or Federal Minister of the Environment as applicable. These include the:

- Aquarius Project (Federal EA pursuant to the *Canadian Environmental Assessment Act*);
- Victor (Diamond) Project (Federal EA pursuant to the *Canadian Environmental Assessment Act*);
- Detour Lake Project (Federal EA pursuant to the *CEAA, 2012;* two Provincial Individual EAs pursuant to the Ontario *Environmental Assessment Act*, and one Class EA pursuant to the Ontario *Environmental Assessment Act*); and
- Rainy River Project (a coordinated Federal and Provincial EA pursuant to the *CEAA, 2012* and the Ontario *Environmental Assessment Act*, respectively).

This methodology has also been utilized for a number of other mining-related undertakings which were subject to a proponent-driven Class EA process under the Ontario *Environmental Assessment Act* related to the Electricity Projects Regulation, that were reviewed by Federal and Provincial government agencies, other stakeholders and Aboriginal groups at the time.

7.2 Effects Analysis Methodology

The key objective of the effects analysis methodology proposed for this EA is to consider all potential effects of the Project on the physical, biological and human environment.

7.2.1 Approach

The following steps will be taken in assessing the effects of the Project:

- Identification of effects assessment indicators for each discipline that will be used, where appropriate, to characterize how the Project could affect the environment. These effects assessment indicators will be chosen such that they represent the effects on the environment as a whole.
- Development of suitable assessment criteria (e.g., direction, magnitude, frequency, duration, extent, reversibility and likelihood) for assessing the effects of the Project on the environment.
- Design and execution of a baseline monitoring program to collect the necessary information to support the assessment of the effects of the Project on the environment.
- Characterization of the emissions and other changes resulting from the Project that will affect the effects assessment indicators and thus be used to assess the effects of the Project on the environment.
- Prediction of how emissions and changes resulting from the Project will affect the effects assessment indicators.
- Determination of the impacts resulting from the Project by applying the established assessment criteria to the predicted effects on the effects assessment indicators.
- Identification of suitable mitigation and/or monitoring measures for any significant impacts.

Throughout the EA, if certain components of the physical, biological or human environment are identified as having a special value, additional consideration will be given to these. Data from baseline studies, including personal interviews and literature sources; and information obtained through regulatory consultation, public consultation and Aboriginal engagement will be used to identify such components.

7.2.2 Effects Analysis

The effects analysis is structured according to environmental area (physical, biological or human), potential effect, proposed mitigation and significance. Mitigation refers to measures that are proposed to prevent, eliminate, or reduce effects, and includes elements inherent in the Côté Gold Project design. Mitigation also includes compensation, as in the case of potential adverse effects to fish habitat where the provision of alternative fish habitat can be used to offset adverse effects. Compensation will also be considered for any other physical, biological or human environment effect that cannot be avoided, prevented or otherwise mitigated. The

significance of environmental effects will be determined after the application of mitigation, and will be evaluated on the basis of the identified assessment criteria.

In carrying out the environmental effects analysis, a number of analytical methods and tools will be utilized and are expected to include laboratory tests, mass balance calculations, statistical packages and various types of models. For example, the methodology for estimating air emissions will follow all the required methods and requirements provided in guidance from the MOE (Procedure for Preparing an Emission Summary and Dispersion Modelling Report Version 3.0, PIBS 3614e03). Modelling (most recent version of the U.S. EPA AERMOD model) will be used to predict air quality impacts. The modelling will be done using the methods and requirements provided in the MOE publication "Air Dispersion Modelling Guideline for Ontario Version 2.0, PIBS 5165e02". Results of the modelling will be combined with baseline air quality data to provide predicted total ambient air quality. The ambient air quality will be compared against MOE ambient air quality criteria as well as to the MOE's "Summary of Standards and Guidelines to support Ontario Regulation 419" document.

Assessment criteria anticipated to be used to assess significance include consideration of magnitude, geographic extent, duration, frequency, and reversibility of each effect. An assessment of likelihood will be completed if a residual effect after the application of mitigation is deemed potentially significant. The terms magnitude, geographic extent, duration, etc., are referred to as assessment criteria. Each criterion is defined for various levels. Criteria are currently foreseen to be categorized into three levels (Levels I, II, and III), where Level I is indicative of a negligible or limited potential to contribute to an overall significant environmental effect, and Level III is indicative of a high potential to contribute to an overall significant environmental effect. Level II represents an intermediate condition.

Effects are also described as to their likelihood of occurrence, recognizing that there is some overlap in the concepts of duration, frequency and likelihood.

The significance of environmental impacts is determined through the integration of the five assessment criteria previously mentioned. The significance is defined as either *significant* or *not significant*.

Impact significance is assigned through a decision tree which reflects the nature of the environmental effect and the potential for environmental impact. A decision tree is a tool that displays the logic on how each combination of the five assessment criteria is assigned a level of significance. This methodology allows for a transparent process, which can be understood and replicated by regulators and stakeholders.

After having determined the significance of an impact, each impact will be assigned a level of likelihood (also referred to as 'probability'). Impacts that would be determined to be *unlikely* and *significant* will be carried forward in the Management Plans and will be addressed under the section on Catastrophic Events.

7.2.3 Definition and Approach to Cumulative Effects Analysis

As noted in Section 2.2, the Côté Gold Project as currently understood is anticipated to require completion of a Federal EA, pursuant to CEAA, 2012. The Agency's Reference Guide for Addressing Cumulative Environmental Effects (Canadian Environmental Assessment Agency, 1994) defines cumulative environmental effects as:

> *"The effect on the environment which results from effects of a project when combined with those of other past, existing and imminent projects and activities."*

The guide further states that:

> *"To a limited extent, federal and other environmental assessments already address cumulative environmental effects. For example, most examine the baseline environmental conditions, which include the cumulative environmental effects of past and existing projects and activities. However, consideration should also be given to the cumulative environmental effects resulting from the interactions among the environmental effects of the proposed project with those of future projects and activities."*

Future projects and activities are defined in the Federal CEAA, 2012 as projects and activities that "will be carried out". These projects and activities include those that have received permits or approvals or are referenced in publicly available documents as planning to proceed.

The cumulative effects analysis presented in the EA will therefore be restricted to the analysis of cumulative effects on the existing environmental baseline related to identified projects and activities that "will be carried out"; and to those projects of significance within the broader regional context, which may overlap the undertaking in regards to type of effect, time and space. Input will be sought from Aboriginal communities into the cumulative effects analyses. The cumulative effects analysis may extend to projects located beyond the physical boundaries of the Project's study areas. The cumulative effects analysis will meet the requirements identified in the Operational Policy Statement – Assessing Cumulative Environmental Effects under CEAA 2012 (Canadian Environmental Assessment Agency, 2013).

7.3 Preliminary Description of Potential Effects

MOE (2009a) suggests that the Proponent may include a preliminary list of potential environmental effects, recognizing that the actual determination of effects and mitigation if appropriate will be assessed and defined in the EA. For this reason, a preliminary description of potential environmental effects has been developed and presented in Table 7-1, grouped by the primary elements of the undertaking defined in Section 4.1.

Potential benefits of the Côté Gold Project are expected to include local, regional and Provincial economic benefits, expected to be in the form of direct and indirect, employment and business opportunities; direct expenditures; taxation and royalties. Benefits are also summarized in Table 7-1.

Table 7-1: Preliminary Summary of Potential Effects

Project Component	Potential Effect
Mine (and aggregate operations)	• reduction in localized air quality due to the release of particulate from mining activities and heavy equipment diesel emissions; • increase localized sound emissions as a result of intermittent blasting activities, heavy equipment operation and safety equipment (back-up beepers); • alteration to the local terrain (physiography) from excavation of the open pit, forming a permanent surface depression in the landscape; • potential for loss of aquatic habitat by the re-routing of Three Duck Lakes, Chester Lake and Clam Lake and the Mollie River realignment to avoid the mine operation; • potential for aquatic species to be affected by the watercourse realignment and dewatering of Côté Lake; • depression of the local groundwater aquifer by changes to the local landscape and mine dewatering activities; • reduction in terrestrial habitat caused by the mine footprint development anticipated to be replaced by an open pit lake at closure; and • potential for terrestrial species disturbance due to construction and operations noise.
Buildings (including processing plant, maintenance garage, warehouse and accommodation complex)	• reduction in air quality and increase in localized sound emissions during construction; • reduction in air quality due to the release of emissions from the processing plant; • increase localized sound emissions as a result of processing plant and maintenance operations; • loss of local terrestrial habitat and/or quality of habitat, including habitat for SAR as a result of the process plant building and other buildings footprints and related operations; • potential for terrestrial species disturbance due to construction and operations noise; and • potential effect on water quality in the Mesomikenda Lake, Neville Lake or Wolf Lake from the release of treated effluent from the site, including treated process plant effluent and various wash water sources.
MRA	• reduction in air quality due to the release of particulate matter from stockpiling activities and from the stockpiles themselves prior to reclamation, as well as heavy equipment emissions; • increase noise levels as a result of heavy equipment operation, mineral waste deposition and safety equipment (back-up beepers); • alteration to the local terrain from excavation through the forming of permanent stockpiles elevated above the existing landscape; • potential for loss of aquatic habitat by overprinting and/or re-routing local creek systems to accommodate stockpiling operations; • potential effect on water quality in the Mesomikenda Lake, Neville Lake or Wolf Lake from the release of treated runoff and/or seepage from the stockpiles; • reduction in terrestrial habitat caused by the MRA footprint; and • potential for terrestrial species disturbance due to construction and operations noise.

Project Component	Potential Effect
TMF	• reduction in air quality due to dust release from the tailings surface as well as particulate matter from construction activities and heavy equipment operation; • increase noise levels as a result of heavy equipment operation and safety equipment (back-up beepers) during TMF dam construction; • alteration to the local terrain from the construction of a permanent facility raised above the surrounding landscape; • reduction in terrestrial habitat cause by the TMF footprint; • potential for terrestrial species disturbance due to construction and operations noise; • potential for loss of aquatic habitat by overprinting local creeks and associated wetlands; • potential alteration of local groundwater infiltration rates; and • potential effect on water quality in Bagsverd Creek and Mesomikenda Lake, from the release of effluent and seepage from the TMF.
On-site access roads and pipelines, power infrastructure	• reduction in localized air quality and increase in localized sound emissions during construction; • reduction in localized air quality due to dust release from roads and vehicle emissions; • loss of local terrestrial habitat and/or the quality of habitat, including for SAR as a result of the infrastructure footprints; and • potential for terrestrial species disturbance due to construction and operations noise.
Off-site transmission line	• increase in localized sound during construction; • alteration to local visual aesthetics; and • alteration to terrestrial habitat cause by the transmission line corridor development.
Overall Côté Gold Project	• direct local economic benefits, employment and business opportunities, direct expenditures and taxes; • indirect local economic benefits, spin-off employment and business opportunities; spin-off expenditures and taxes; • direct regional economic benefits, employment and business opportunities, direct expenditures and taxes; • indirect regional economic benefits, spin-off employment and business opportunities; spin-off expenditures and taxes; • direct Provincial economic benefits, employment and business opportunities, direct expenditures, taxes and royalties; • indirect Provincial economic benefits, spin-off employment and business opportunities; spin-off expenditures and taxes; • direct Federal economic benefits, employment and business opportunities, direct expenditures and taxes; • indirect Federal economic benefits, spin-off employment and business opportunities; spin-off expenditures and taxes; • extra demand on existing community and regional infrastructure, and social services in the region; • potential direct effect on cultural heritage resources; and • potential direct effect on local First Nations and Métis traditional land uses.

7.4 Malfunctions and Accidents

The risk of potential malfunctions and accidents will be identified from a variety of sources, including: experience with other similar projects (directly and through the literature), internal risk assessment discussions/workshops, government guidelines, and comments received from Aboriginal persons, government ministry/agency representatives, and other stakeholders.

Only malfunctions and accidents that have a reasonable probability of occurring during the Project will be considered. Medical and similar emergencies while important, are unlikely to have an environmental effect, and will be addressed through the IAMGOLD's Emergency Response Strategy.

8.0 COMMITMENTS AND MONITORING

The EA will include a comprehensive record of commitments made by IAMGOLD during the ToR process, and where or how they have been dealt with in the EA. The EA will also include a comprehensive record of commitments made by IAMGOLD during the preparation of the EA. This will include commitments relating to:

- impact management measures (such as mitigation measures);
- additional works and studies to be carried out;
- monitoring;
- public consultation and contingency planning; and
- documentation and correspondence.

An Environmental Management Plan and a Social Management Plan will be developed for the construction, operation, closure and post-closure phases of the Project to ensure that:

- impacts are mitigated;
- benefits are enhanced;
- compliance with existing legislation, consistency with provincial guidelines, best practice and IAMGOLD's corporate policies is achieved; and
- compliance will be reported as per applicable legal requirements and/or permit conditions.

During the preparation of the EA, a Monitoring Framework will be developed with consideration of comments raised by stakeholders and Aboriginal communities for the post-EA phase, to address all stages of the proposed undertaking (planning, detailed design, tendering, construction, operation, closure and decommissioning). Where appropriate, it will include compliance monitoring and effects monitoring, as well as any follow-up programs developed through the Federal process. The existing environmental baseline monitoring network may be modified through the EA and environmental approvals processes.

9.0 CONSULTATION PLAN FOR THE EA

9.1 Potentially Affected and Interested Stakeholders

IAMGOLD is currently engaging with local and regional communities and other stakeholders in order to gain a better understanding of their issues and interests, to identify potential partnership opportunities and to ultimately gain the social license to operate. Stakeholders involved in the Project consultation activities to date include those with a direct interest in the Project, or those who were able to provide data for baseline studies. The Record of Consultation (RoC) provides a complete compilation of consultation efforts carried out for the Project to June 9, 2013.

The range of stakeholders is expected to increase and evolve throughout Project development to reflect varying levels of interest and issues over time. Stakeholders who have been or could be involved in the Project include:

Business and Community Interests:

- Cambrian College;
- Gogama Area Citizens Committee;
- Gogama Area Chamber of Commerce;
- Gogama Recreation Committee;
- Gogama Snowmobile Club;
- Greater Sudbury Chamber of Commerce;
- Greater Sudbury Development Corporation;
- Laurentian University;
- Mesomikenda Lake Cottagers;
- Northern College;
- Sudbury Area Mining Supply and Service Association;
- Timmins Chamber of Commerce;
- Timmins Economic Development Corporation;
- Local land and resource users (e.g., trapline permit holders);
- Adjacent or local mineral rights holders;
- Local small business owners; and
- Local tourism operators.

Environmental Non-Government Organizations:

- Mining Watch Canada;
- Northwatch; and
- Canadian Parks and Wilderness Society (Wildlands League).

Non-Government Organizations:

- Nature and Outdoor Tourism Ontario;
- Ontario Mining Association;
- Ontario Prospectors Association;
- Porcupine Prospectors and Developers Association; and
- Sudbury Prospectors and Developers.

Municipal Government:

- Community of Gogama (Gogama Local Services Board);
- City of Greater Sudbury; and
- City of Timmins.

Provincial (Ontario) Government:

- Ministry of Aboriginal Affairs;
- Ministry of Economic Development and Trade;
- Ministry of Energy;
- Ministry of Infrastructure;
- Ministry of Labour;
- Ministry of Municipal Affairs and Housing;
- Ministry of Natural Resources;
- Ministry of Northern Development and Mines;
- Ministry of the Environment;
- Ministry of Tourism, Culture and Sport;
- Ministry of Transportation;
- Mattagami Region Conservation Authority;
- Ontario Energy Board and Ontario Power Authority;
- Ontario Provincial Police; and

- Provincial Parliament representatives.

Federal Government:

- Aboriginal Affairs and Northern Development Canada;
- Canadian Environmental Assessment Agency;
- Environment Canada;
- Federal Parliament representatives;
- Fisheries and Oceans Canada;
- Health Canada;
- Major Projects Management Office;
- Natural Resources Canada; and
- Transport Canada.

IAMGOLD has developed a Stakeholder Engagement Plan (see Appendix D) to guide stakeholder consultation and engagement for the Project.

9.2 Potentially Affected and Interested Aboriginal Groups

IAMGOLD has drafted an Aboriginal Engagement Plan (see Appendix E) that includes a range of activities to engage and consult with communities. An understanding of the potential Aboriginal communities interested in the Côté Gold Project was developed through advice from the Ministry of Northern Development and Mines (MNDM) to Trelawney in a letter dated August 19, 2011 and through advice from the Agency based on information provided by Aboriginal Affairs and Northern Development Canada (AANDC). Considering the previous advice from regulators, the proposed footprint of the current Project and through discussion with local communities, IAMGOLD has made a preliminary identification of potentially affected Aboriginal communities. The RoC provides a complete compilation of consultation efforts carried out for the Project to June 9, 2013.

IAMGOLD has sought further direction from both the Provincial and Federal Crown agencies on the potentially affected communities. On March 6, 2013 the Federal Crown (the Agency) informed IAMGOLD that Mattagami, Flying Post, and Brunswick House First Nations, the Métis Nation - Region 3, and the Algonquin Anishinabeg Tribal Council should be consulted about the Project. They noted that as the Federal EA progresses, the Agency will be notifying Chapleau First Nation, Matachewan First Nation, and Beaverhouse First Nation about the Project. Direction on consultation with Aboriginal groups was discussed at a meeting on May 23, 2013 with the Provincial Crown. The Provincial Crown identified that the following Aboriginal groups should be consulted: Mattagami First Nation, Flying Post First Nation, Brunswick House First Nation, Matachewan First Nation and the Métis Nation of Ontario. Based on proximity, current advice from the Federal Crown, and information gathered through engagement activities, the

following groups shown in Table 9-1 may have Aboriginal or treaty rights or interests that could be impacted by the Côté Gold Project. In addition, Table 9-1 provides contact details for each group.

The Mattagami First Nation is a member of the Wabun Tribal Council and has reserve land closest to the Côté Gold Project. Based on discussions with the Mattagami First Nation and the Wabun Tribal Council, the following First Nations may have Aboriginal and treaty rights that are affected by the Project:

- Beaverhouse First Nation;
- Brunswick House; and
- Matachewan First Nation.

The Missanabie Cree First Nation is a member of the Mushkegowuk Council. The Missanabie Cree are in discussions with the government about reserve lands. IAMGOLD has contacted them to determine their interest in the Côté Gold Project. It is now understood as a result of subsequent information from the Agency (March 6, 2013) that this community does not need to be consulted.

The Côté Gold Project could potentially affect Métis harvesting rights. Most of the Métis peoples in Ontario are organized through the governance structure of the Métis Nation of Ontario (MNO), represented at the local level by MNO Charter Community Councils, located in Sudbury, Timmins and Chapleau.

AANDC, through the Agency, further provided information on the traditional territory assertions by the Algonquin Anishinabeg Nation Tribal Council. These traditional territorial maps may form part of their comprehensive land claims, however the Agency has confirmed that there has been no submission of a comprehensive land claim to Canada. The Algonquin Anishinabeg Nation Tribal Council has contacted IAMGOLD with respect to their interests in the Côté Gold Project. Subsequently, the Algonquin Anishinabeg Nation Tribal Council informed IAMGOLD that they will not be making an assertion for the Côté Gold Project. They recommended that IAMGOLD contact Wahgoshig and Abitibiwinni First Nations to confirm their non-participation status.

IAMGOLD contacted Wahgoshig First Nation; the First Nation identified that they have no comments on the Project and that the Project was not within their territory.

IAMGOLD also contacted Abitibiwinni First Nation to determine their interests in the Project. To date, no response has been received and IAMGOLD will be following up with this initial contact.

M'Chigeeng First Nation and Serpent River First Nation from the Robinson Huron Treaty area contacted IAMGOLD to discuss their harvesting rights in relation to the Côté Gold Project. IAMGOLD has contacted these First Nations to set a mutually agreeable date for a meeting.

To date, consultation has focused on the Mattagami First Nation, Flying Post First Nation, and their governance organization, the Wabun Tribal Council. IAMGOLD has also begun to involve other Wabun Tribal Council members, such as the Matachewan First Nation, Brunswick House First Nation, and the Beaverhouse First Nation. IAMGOLD met with the MNO, Region 3 Consultation Committee, to discuss the Project and consultation protocols.

Subsequent Aboriginal consultation activities will involve persons identified/delegated by the respective organizational decision-makers. IAMGOLD will remain open to hearing out additional assertions of claim over the areas potentially impacted by the Project.

Table 9-1: First Nations and Métis Groups Engaged in the Côté Gold Project

First Nation/Métis Organization	Governance Organization	Reserve near Project	Population		Approximate Distance from the Project (km)	Contact Name	Mailing Address	Email	Telephone	Fax
			On Reserve	Off Reserve						
CONSULT										
—	Algonquin Anishinabeg Nation Tribal Council	—	—	—	—	Chief Alice Jerome	81 Kichi Mikan, Maniwaki,AC, J9E 3C3	info@anishinabenation.ca	819-449-1225	819-449-8064
Brunswick House First Nation	Wabun Tribal Council	Mountbatten 76A Indian Reserve	188	549	80	Chief Andrew Neshawabin	P.O. Box 1178, Chapleau, ON P0M 1K0	—	705-864-0174	705-864-1960
		Duck Lake 76B Indian Reserve			108					
Flying Post First Nation	Wabun Tribal Council	Flying Post 73	1	203	106	Chief Murray Ray	Box 1027 Nipigon, ON P0T 2J0	flypost@shawbiz.ca	807-887-3071	807-887-1138
Matachewan First Nation	Wabun Tribal Council	Matachewan 72	42	640	108	Chief Elenore Hendrix	P.O. Box 160 Matachewan, ON P0K 1M0	chief@mfnrez.ca	705-565-2230	705-565-2311
Mattagami First Nation	Wabun Tribal Council	Mattagami 71	165	344	40	Chief Walter Naveau	P.O. Box 99 Gogama,ON P0M 1W0	walternaveau@knet.ca	705-894-2072	705-894-2887
Métis Nation of Ontario	—	—	—	—	—	Andy Lefebvre Marcel Lafrance	347 Spruce Street South, Timmins, ON P4N 2N2	AndyL@metisnation.org Lafrance.m@hotmail.com	705-264-3939	—
NOTIFY										
Beaverhouse First Nation	Wabun Tribal Council	No Reserves; Settlement	—	—	—	Chief Marcia Brown Martel	P.O. Box 1022 Kirkland Lake ON P2N 3L1	—	705-567-2022	705-567-1143
Chapleau Ojibwe First Nation	Wabun Tribal Council	Chapleau 74A	33	9	111	Chief Anita Stephens	P.O. Box 279, Chapleau ON P0M 1K0	info@chapleauojibwe.ca	705-864-2916	705-864-2911
SELF IDENTIFIED										
Abitibiwinni First Nation	Algonquin Anishinabeg Nation Tribal Council	Abitibi 70	529	470	180	Chief Bruno Kistabish	45 Rue Migwan, Pikogan QC J9T 3A3	administration@pikogan.com	891-732-6591	819-732-1569
M'Chigeeng First Nation	United Chiefs & Councils of Mnidoo Mnising	M'Chigeeng 22	931	1565	190	Kevin Eshkawkogan	P.O. Box 333, M'Chigeeng, ON P0P 1G0	keshkawkogan@circletrail.com	705-348-0179	705-377-4980
Serpent River First Nation	Mamaweswen, The North Shore Tribal Council Secretariat	Serpent River 7	n/a	n/a	152	Chief Isadore Day	P.O Box 14 Cutler ON P0P 1B0	Isadore_day@hotmail.com	705-844-2418	705-844-2757
Wahgoshig First Nation	—	Abitibi 70	131	175	180	Chief David Babin	RR3 Matheson, ON P0K 1N0	ibacoordinator@wahgoshig.com	705-273-2055	705-273-2900
—	Wabun Tribal Council	—	—	—	—	Shawn Batise	313 Railway Street Timmins, ON P4N 2P4	sbatise@wabun.on.ca	705-268-9066	705-266-4969

9.3 Overview of Proposed EA Consultation Activities

IAMGOLD will continue to inform and involve Aboriginal groups, the public and stakeholders in a variety of ways (see the Stakeholder and Aboriginal Consultation Plans in Appendices D and E). Early consultation activities conducted to date were to introduce the Company, to inform the community of the status of the exploration and mining-related activities, to provide information regarding the Provincial ToR, Federal Project Description, EA(s) and future consultation opportunities. These efforts are documented separately in the Record of Consultation (RoC).

Comments received from Aboriginal communities and stakeholders will be considered in the Project design, as applicable. The EA will document how the Project has been modified, as applicable, as a result of inputs from stakeholders and Aboriginal communities.

IAMGOLD and the Federal and Provincial government agencies recognize that opportunities exist to collaborate on planning and implementing stakeholder engagement and consultation for their respective EA processes, and will attempt to align consultation activities to the extent practical.

As much as possible, consultation on both the Provincial and Federal EAs will be coordinated in terms of timing and jointly-held activities. If the Minister of the Environment approves the ToR, the following activities are planned for the development of the EAs and are detailed in Appendices D and E:

- post notices (such as Notice of Commencement of the EA, Notice of Public Information Event(s)) in local newspapers and on the IAMGOLD website, and distribute information to those on the Project mailing list;
- hold ongoing discussions with stakeholders and Aboriginal groups (meetings, workshops and/or community open houses) to identify and attempt to resolve issues, collect baseline data, and to gather feedback on Project component options as well as the draft EA findings;
- prepare and widely distribute an IAMGOLD community newsletter at least 3 times per year to highlight information about the Côté Gold Project, EA findings including summaries of baseline studies, upcoming public meetings and to encourage feedback through the Company website, dedicated e-mail address, or through direct contact with Company staff;
- make available copies of draft EA documents for review and make hard copies available at convenient and strategic public locations, such as public libraries, Aboriginal community administration offices as well as IAMGOLD and government offices. The draft and final EA will also be made available for downloading from the IAMGOLD website;

- host public meetings or open houses in local communities and to provide updated information about the Project, provide information about the EA processes/findings, to discuss alternatives, and gather feedback about appropriate management of potential environmental effects; and
- maintain an IAMGOLD website to provide Project information and a link for direct feedback.

10.0 FLEXIBILITY TO ACCOMODATE NEW CIRCUMSTANCES

The Proposed ToR was issued to facilitate public consultation and comment and has been prepared in accordance with the *Code of Practice: Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario* (MOE, 2009a). The Project Description described in Section 4 and the alternatives described in Section 5 are preliminary in that the Côté Gold Project component locations such as the MRA, TMF, processing facilities, administrative facilities, etc., will be optimized during the engineering stage and as a result of ongoing consultation activities.

The EA document which will be guided by the approved ToR will be prepared in accordance with the *Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario* (MOE, 2009b). It is recognized that the Côté Gold Project is at the prefeasibility engineering design stage and consultation is ongoing. IAMGOLD recognizes that the EA must be prepared in accordance with the approved ToR. Circumstances may arise that could prevent the commitments made in the ToR from being fulfilled in full or in part as these engineering studies progress. IAMGOLD has attempted in this Proposed ToR to anticipate these changes but minor adjustments to the Proposed ToR may be required to be undertaken by IAMGOLD in consultation with the MOE.

As part of the EA, IAMGOLD would develop, if required, short term contingency plans as appropriate to gain further flexibility, such as minor design changes or specific consultation activities. Such plans will outline a course of action to be followed if unforeseen situations arise that would prevent the proponent from implementing or operating a component of the Côté Gold Project on a temporary basis, for example.

IAMGOLD maintains a Project mailing list and updates individuals about the Project including any changes through the distribution of newspaper and directly mailed notices, fact sheets, and newsletters. IAMGOLD also maintains a Project webpage where Project information can be obtained. Stakeholder meetings, workshops and public open houses also provide opportunities to share and gather feedback on changes to the Project with the public, stakeholders and Aboriginal groups.

11.0 OTHER APPROVALS REQUIRED

11.1 Municipal Approvals

Since the Project is located in an unorganized, north part of Sudbury which is not an incorporated municipality, no municipal approvals are anticipated at this time.

11.2 Provincial Environmental Approvals Processes

The *Ontario Water Resources Act*, the *Ontario Environmental Protection Act*, the *Mining Act*, the *Public Lands Act* and the *Ontario Planning Act* contain associated regulations, guidelines and policies that stipulate that relevant aspects of the physical, biological and/or human use environments are to be protected against contamination and undue disturbance from industrial and other sources, except as provided through the granting of permits, approvals and authorizations.

There are four primary Provincial agencies that could be involved with approvals/permits for the Côté Gold Project: MNDM, MOE, MNR and the Ontario Energy Board (OEB). Additional agencies which may be involved with permitting of Côté Gold Project components includes Ministry of Transportation (MTO), Infrastructure Ontario (IO) and Ministry of Tourism, Culture and Sport (MTCS).

The MNDM has a responsibility to ensure the orderly development of mineral resources in the province of Ontario, including responsibilities for the disposition of Crown lands for mining, and primary responsibility for mine closure activities. The MOE grants permits and approvals that address Project aspects related to water and air quality (including noise) and waste management. The MNR's role is to ensure the protection and wise use of Crown resources not otherwise disposed, such as through the *Mining Act* administered by the MNDM. The OEB has responsibility for energy-related approvals, including approval to construct transmission lines, and operates as an adjudicative tribunal, carrying out its regulatory function through oral or written public hearings.

A large number of Provincial environmental approvals are expected to be required construct and operate the Côté Gold Project. Table 11-1 provides a preliminary listing of Provincial approvals anticipated to be required, or likely to be required, for the construction and operation of the Côté Gold Project. These Provincial permits and approvals are informed in part, by the Provincial EA process that the approved ToR will guide.

Table 11-1: Expected Provincial Environmental Approvals and Relevant Project Component

Provincial Approval	Act/Responsible Agency	Relevant Project Components
Closure Plan	*Mining Act* MNDM	Mine construction/production and closure, including financial assurance.
Environmental Compliance Approval – Industrial Sewage Works	*Ontario Water Resources Act* MOE	Construct a mine/mill water treatment system(s) discharging to the environment, such as for tailings, pit water, site stormwater and mine rock pile runoff.
Permits to Take Water	*Ontario Water Resources Act* MOE	For taking of ground or surface water (in excess of 50 m^3/day), such as for potable needs and pit dewatering. During construction, a permit(s) may be required for dam and/or mill construction to keep excavations dry.
Various Work Permits for Construction	*Lakes & Rivers Improvement Act (LRIA)/Public Lands Act* MNR	For work/construction on Crown land. Could be required as part of construction of a transmission line. Multiple permits could be required.
Lakes and Rivers Improvement Act (LRIA) Permit	*Lakes & Rivers Improvement Act (LRIA)* MNR	Construction of a dam in any lake or river in circumstances set out in the regulations requires a written approval of the Minister for the location of the dam and its plans and specifications.
Forest Resource License (Cutting Permit)	*Crown Forest Sustainability Act* MNR	For clearing of Crown merchantable timber. Could be required as part of construction of the transmission line.
Aggregate Permit	*Aggregate Resources Act* MNR	Extraction of aggregate (e.g., sand/gravel/rock for tailings dam or other site construction).
Environmental Compliance Approval – Air and Noise (Operation)	*Environmental Protection Act* MOE	Discharge air emissions and noise, such as from mill processes, on-site laboratory and haul trucks (road dust).
Environmental Compliance Approval – Waste Disposal Site	*Environmental Protection Act* MOE	For operation of a landfill and/or waste transfer site.
Land Use Permit	*Public Lands Act* MNR	To obtain tenure for permanent facilities on Crown land, such as for a transmission line.
Leave to Construct	*Ontario Energy Board Act* OEB	Approval to construct a transmission line.

Provincial Approval	Act/Responsible Agency	Relevant Project Components
Clearance Letter	*Heritage Act* MTCS	Confirmation that appropriate archaeological studies and mitigation, if required, have been completed for the Project.
Environmental Compliance Approval	*Environmental Protection Act* MOE	Establishment and operation of a domestic sewage treatment plant, industrial sewage treatment facility (such as minewater pond, TMF) and domestic landfill, and management of air emissions.
Endangered Species Permit	*Endangered Species Act* MNR	Any activity that could adversely affect species or their habitat identified as 'Endangered' or 'Threatened' in the various schedules of the Act.

11.3 Federal EA Process

The Project, as it currently is understood, is anticipated to require completion of a Federal Environmental Assessment (EA), pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA, 2012).

The Federal "Regulation Designating Physical Activities" identifies the physical activities that constitute the designated projects that could require completion of a Federal EA. The following sections may apply to the Côté Gold Project:

- Section 7: "The construction, operation, decommissioning and abandonment of a structure for the diversion of 10,000,000 m^3/a or more of water from a natural water body into another natural water body...". However, it should be noted that most waters will be realigned and not diverted.
- Section 8: "The construction, operation, decommissioning and abandonment of a facility for the extraction of 200,000 m^3/a or more of ground water..."
- Section 15 (b): "The construction, operation, decommissioning and abandonment of a metal mill with an ore input capacity of 4,000 t/d or more."
- Section 15 (c): "The construction, operation, decommissioning and abandonment of a gold mine, other than a placer mine, with an ore production capacity of 600 t/d or more."

Based on this criterion, IAMGOLD submitted a Project Description to the Agency on March 15, 2013. If the Agency determines that a Federal EA is required, the Project Description will be used to assist in the development of the Environmental Impact Statement (EIS) Guidelines, which will prescribe the scope of the Federal EA required for the Project.

IAMGOLD is working closely with the Provincial and Federal approvals agencies to coordinate the EA processes to meet the needs of each *Act*, while minimizing duplication of effort. This coordination will be directed by the *Canada-Ontario Agreement on Environmental Assessment Cooperation*.

IAMGOLD, as well as the Federal and Provincial governments will attempt to align the schedule of the Federal EIS Guideline issuance with the approval of the Proposed ToR by the Ontario Minister of the Environment. These two documents (the approved ToR and EIS Guidelines) together will guide the draft and final EA document preparation and content, and associated consultation activities. It is fully expected that a single body of information will be used to inform both the Provincial and Federal EA processes, culminating in a single final EA report and where possible, coordinated consultation activities.

After IAMGOLD issues the final EA report, the Federal and Provincial processes will continue in a parallel manner according to the regulated requirements.

11.4 Federal Environmental Approvals

Table 11-2 summarizes the types of Federal environmental approvals that could potentially be required for the Côté Gold Project (in addition to engineering approvals related to explosives manufacturing and/or storage). In some instances, multiple approvals could be required.

Table 11-2: Expected Federal Environmental Approvals and Relevant Project Component

Federal Approval	Act/Responsible Agency	Relevant Project Component
Federal Environmental Assessment	*CEAA, 2012* Canadian Environmental Assessment Agency (the Agency)	Section 7: "The construction, operation, decommissioning and abandonment of a structure for the diversion of 10,000,000 m3/a or more of water from a natural water body into another natural water body...". However, it should be noted that most waters will be realigned and not diverted. Section 8: "The construction, operation, decommissioning and abandonment of a facility for the extraction of 200,000 m^3/a or more of ground water..." Section 15(b): "The construction, operation, decommissioning and abandonment of a metal mill with an ore input capacity of 4,000 t/d or more." Section 15(c): "The construction, operation, decommissioning and abandonment of a gold mine, other than a placer mine, with an ore production capacity of 600 t/d or more."
Schedule 2 Listing	MMER *Fisheries Act* Environment Canada	Overprinting of waters frequented by fish, by a deleterious mineral waste (tailings management facility).
Review of Works in Navigable Waters	*Navigable Waters Protection Act* Transport Canada	Any structure, device or other thing that is constructed or placed in, on, under, over, through or across a navigable waterway that may interfere with navigation.
Authorization(s) for Harmful Alteration, Disruption or Destruction of Fish Habitat	*Fisheries Act* Fisheries and Oceans Canada	Construction of the tailings facility, mine rock stockpiles, access road creek crossings, water works for water intake structures, and/or groundwater dewatering effects, that would cause disruption to creeks and/or ponds supporting fish populations.

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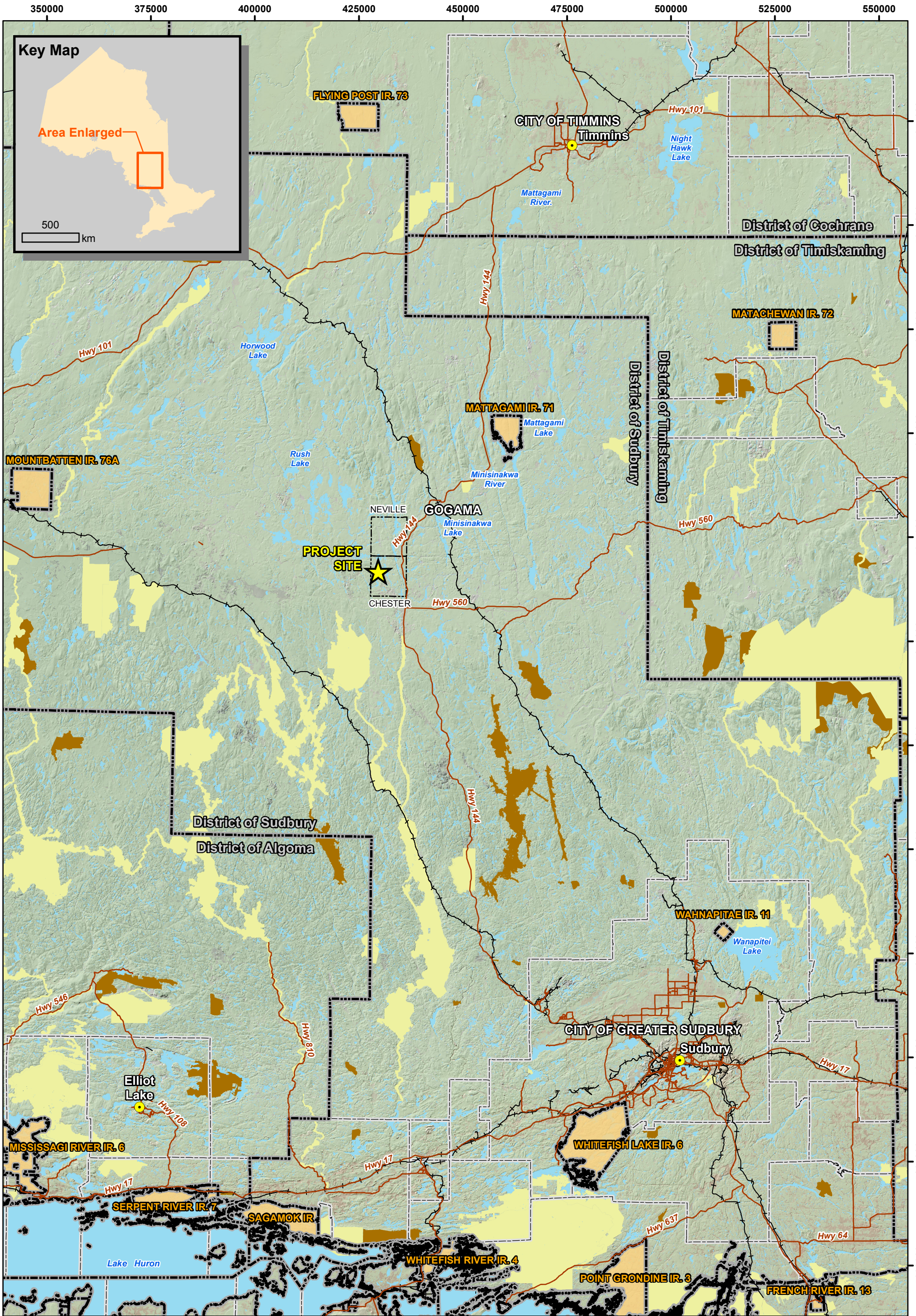
FIGURES



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LEGEND

- Project Site Location
- Regional Communities
- Major Roads
- Railway
- Lower Tier Municipality Boundary
- Upper Tier Municipality Boundary
- First Nation Reserve
- Conservation Reserve (Regulated)
- Provincial Park
- Wooded Area
- Waterbody / Large Watercourse

NOTES:
- Base data on this map was extracted from Land Information Ontario, MNDM, OBM Ontario Digital Geospatial Database and Ontario Road Network Database.

0 12.5 25 50 75 100 Kilometres

Datum: NAD83
Projection: UTM Zone 17N

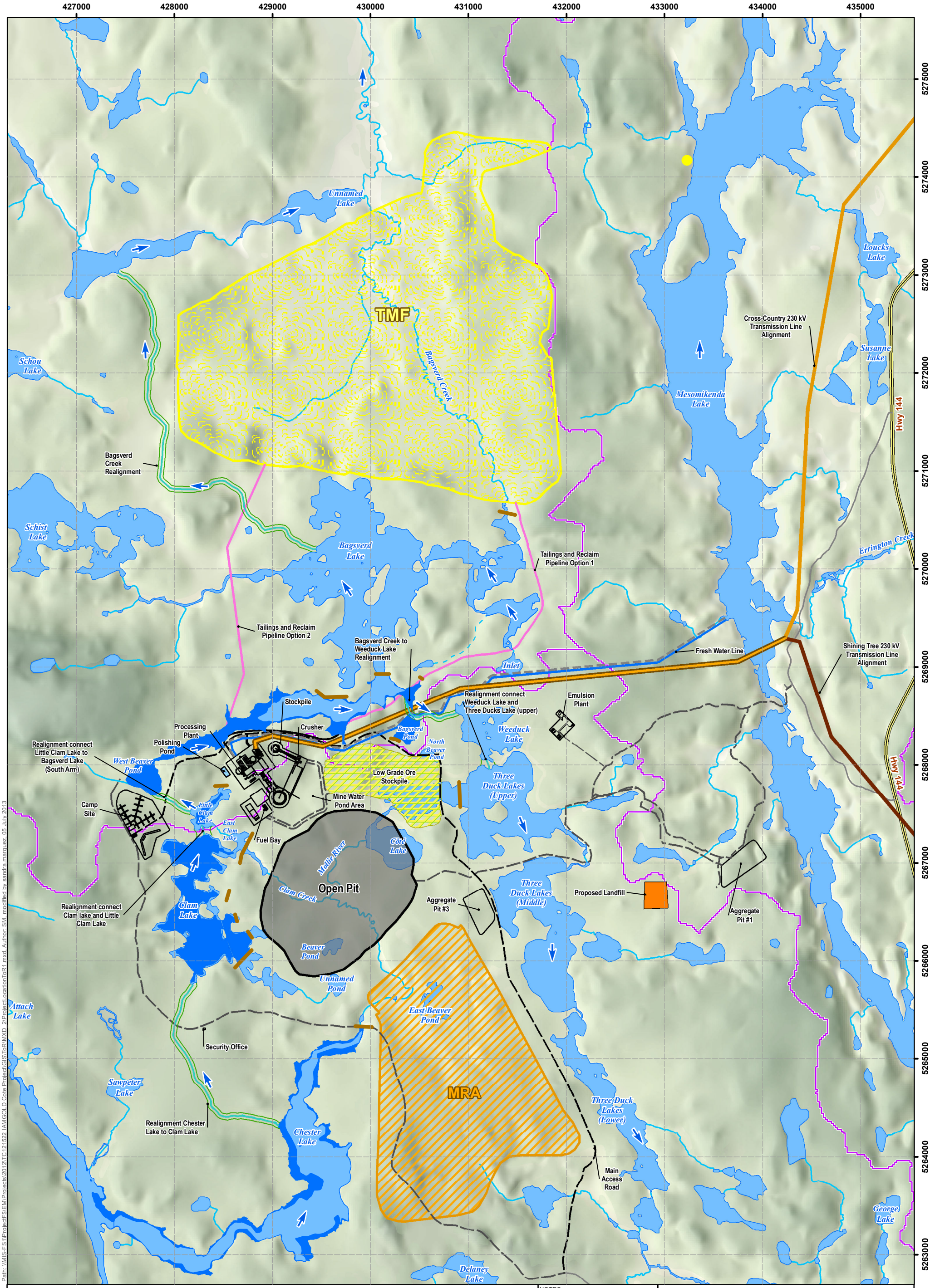
IAMGOLD® CORPORATION amec

CÔTÉ GOLD PROJECT

Project Location

DRAFT

PROJECT N°: TC121522	**FIGURE: 1**
SCALE: 1:850,000	DATE: July 2013



Path: \\MIS-FS1\Project$\EM\Projects\2012\TC121522 IAMGOLD Cote Project\GIS\ToR\MXD 2\ProjectLocationToR1.mxd Author: SM modified by sandra.marquez 05 July 2013

LEGEND

- Existing Intermittent Watercourse
- Existing Permanent Watercourse
- Existing Waterbodies
- Highway
- Local Road
- Subwatershed Boundary
- Wooded Area

Proposed Site Features

- Open Pit
- Potential Discharge Location
- Facilities
- Dam
- Main Access Road
- Access Road
- Cross-Country 230 kV Transmission Line Alignment
- Shining Tree 230 kV Transmission Line Alignment
- Tailings and Reclaim Pipeline
- Fresh Water
- Water Realignment
- Proposed Water Flow Direction
- Proposed Lake Area
- Polishing Pond
- Low Grade Ore Stockpile
- Proposed Mine Rock Area (MRA)
- Proposed Tailings Management Facility (TMF)
- Proposed Landfill

NOTES:
- Ontario base data extracted from Land Information Ontario (MNR)
- TMF and subwatershed provided by Golder Associates.
- Watercourse realignment and proposed lake area provided by Calder Engineering.
- Surface infrastructure, open pit, landfill, MRA and transmission lines provided by IAMGOLD.
- Mesomikenda Lake is preferred discharge option, but others are being investigated.

Datum: NAD83
Projection: UTM Zone 17N

0 0.5 1 2 3 4 Kilometres

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CÔTÉ GOLD PROJECT

Preliminary Site Plan

DRAFT

PROJECT N°: TC121522	**FIGURE: 2**
SCALE: 1:35,000	DATE: July 2013

427000 428000 429000 430000 431000 432000 433000 434000 435000 436000

5275000 5274000 5273000 5272000 5271000 5270000 5269000 5268000 5267000 5266000 5265000 5264000 5263000 5262000

Unnamed Lake
Bagsverd Creek
Schou Lake
Neville Lake Subwatershed
Bagsverd Lake
Schist Lake
Inlet
Bagsverd Pond
North Beaver Pond
Weeduck Lake
West Beaver Pond
Three Duck Lakes (Upper)
Little Clam Lake
East Clam Lake
Côté Lake
Clam Creek
Mollie River
Clam Lake
Three Duck Lakes (Middle)
Beaver Pond
Unnamed Pond
East Beaver Pond
Sawpeter Lake
Three Duck Lakes (Lower)
Mollie River Subwatershed
Chester Lake
George Lake
Delaney Lake
Rene Lake
Mollie River
Dividing Lake
Mesomikenda Lake
Loucks Lake
Susanne Lake
Hwy 144
Errington Creek

Path: \\MIS-FS1\Projects\2012\TC121522 IAMGOLD Cote Project\GIS\ToR\MXD_2\Hydrology_Vicinity.mxd. Author: SM, modified by sandra.marquez, 08 July 2013

LEGEND

- Current Flow Direction
- Existing Intermittent Watercourse
- Existing Permanent Watercourse
- Existing Waterbodies
- Subwatershed Boundary
- Highway/Expressway
- Local Road

NOTES:
-- Base data on this map was extracted from Land Information Ontario, OBM Ontario Digital Geospatial Database and Ontario Road Network Database.
- Subwatershed boundary provided by Golder.

Datum: NAD83
Projection: UTM Zone 17N

0 0.5 1 2 3 4 Kilometres

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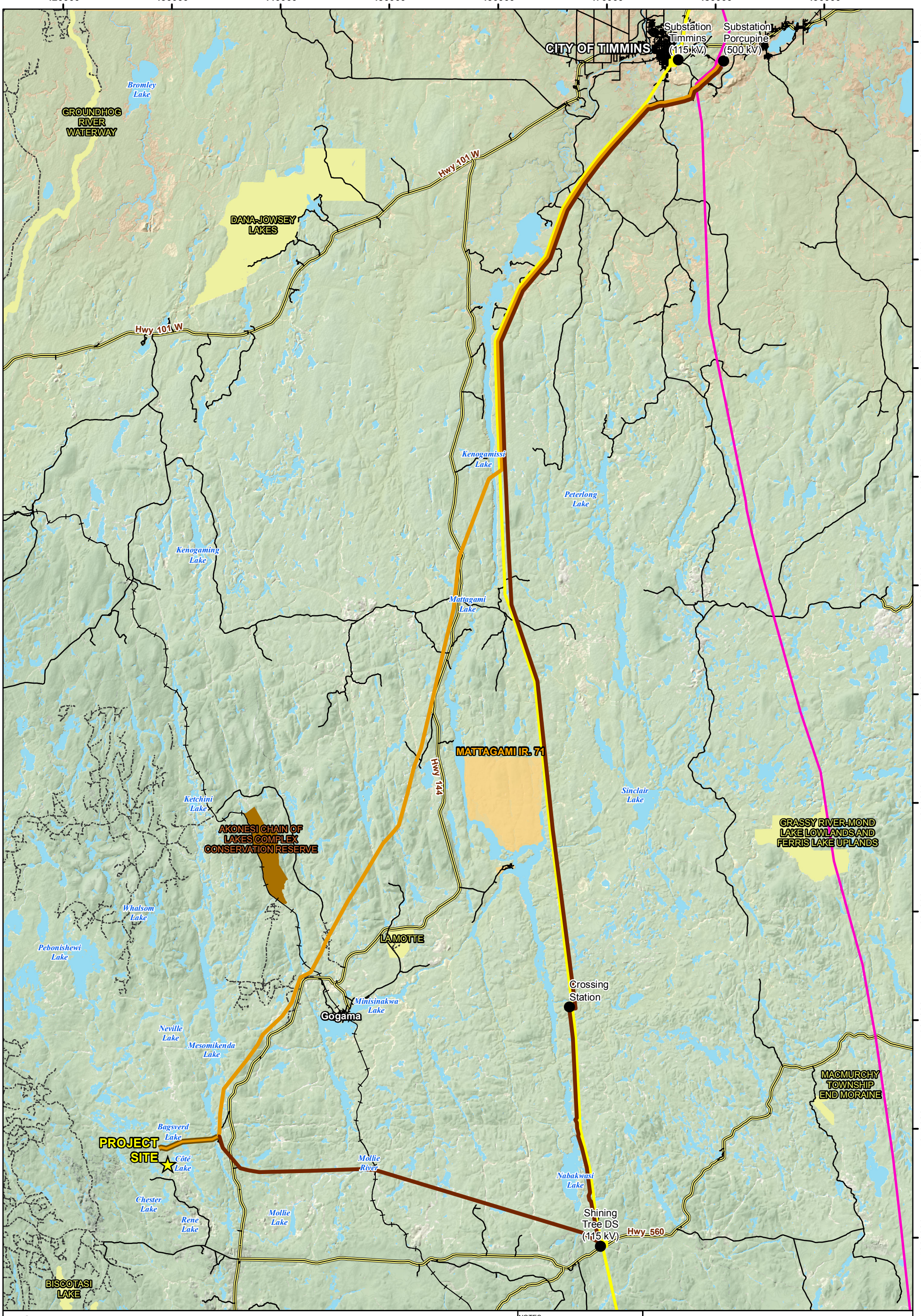
CÔTÉ GOLD PROJECT

Hydrology in the Vicinity of the Project

DRAFT

PROJECT N°: TC121522	**FIGURE: 3**
SCALE: 1:36,000	DATE: July 2013



Path: \\MIS-FS1\Project$\IEM\Projects\2012\TC121522 IAMGOLD Cote Project\GIS\ToR\MXD_2\TransmissionToR.mxd, Author: ken.brookes, modified by sandra.marquez, 04 July 2013

LEGEND

- Project Site Location
- Substations
- Proposed Cross-Country 230 kV Transmission Line Alignment
- Proposed Shining Tree 230 kV Transmission Line Alignment
- Existing 115 kV Transmission Line
- Existing 500 kV Transmission Line
- Railway
- Highway/Expressway
- Local Road
- Resource / Recreation Road
- First Nation Reserve
- Conservation Reserve (Regulated)
- Provincial Park

NOTES:
- Base data on this map was extracted from Land Information Ontario, MNDM, OBM Ontario Digital Geospatial Database and Ontario Road Network Database.

Datum: NAD83
Projection: UTM Zone 17N

0 5 10 20 30 40 Kilometres

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CÔTÉ GOLD PROJECT

Proposed Transmission Line Alignments

DRAFT

PROJECT N°: TC121522 | **FIGURE: 4**

SCALE: 1:327,000 | DATE: July 2013

425000

450000

5300000

5275000

5250000

AKONESI CHAIN OF LAKES COMPLEX CONSERVATION RESERVE

Genoa

Desrosiers

Whalen

Carter

Stetham

Eric

Frater

Somme

Jack

Noble

Huffman

Potier

Neville

St Louis

Groves

Arbutus

Yeo

Chester

Benneweis

Champagne

Alcona

Smuts

Invergarry

Vrooman

Westbrook

Hollinger

Biscotasi

Arden

Edinburgh

Inverness

PROJECT SITE

BISCOTASI LAKE

GOGAMA

LA MOTTE

SPANISH

Hwy 144

Hwy 560

Rush Lake
Northpoint Lake
Alike Lake
Resound Lake
Genoa Lake
Wenakoshi Lake
Whalsom Lake
Pebonishewi Lake
Billie Lake
Rice Lake
Owatawetnes Lake
Neville Lake
Mesomikenda Lake
Akonesi Lake
Rutter Lake
Bell Lake
Kenetogami Lake
Robitaille Lake
LaMotte Lake
Lost Lake
Wizard Lake
Little Wizard Lake
Minisinakwa Lake
Duckbreast Lake
St. Louis Lake
Muskeg Lake
Upper St. Louis Lake
Pensyl Lake
Tate Lake
Piggott Lake
Little Rice Lake
Rat Lake
Wolf Lake
Opeepeesway Lake
Schou Lake
Schist Lake
Bagsverd Lake
Yeo Lake
Arbutus Lake
Moore Lake
Côté Lake
Clam Lake
Three Duck Lakes
Chester Lake
Benneweis Lake
Champagne Lake
Pembroke Lake
Stony Lake
Potier Lake
Dividing Lake
Mollie Lake
Mollie River
Vrooman Lake
Kabetako Lake
Smuts Lake
Boot Lake
Shanacy Lake
Biscotasi Lake
Arden Lake
Duke Lake
Edinburgh Lake
Tenth Lake
South Inverness Lake

LEGEND

- Project Site Location
- Recreational Camping Area
- Tourist Establishment Area
- Cottage Residential Site
- Recreation Access Point
- Designated Camping Site
- Cottage Residential Area
- Snowmobile Trail Local Club Trail (L151)
- Snowmobile Trail Trunk Trail (C)
- Chester Townships
- Communications Line
- Transmission Line
- Railway
- Highway/Expressway
- Local Road
- Resource / Recreation Road
- Conservation Reserve (Regulated)
- Provincial Park
- Waterbody / Large Watercourse

NOTES:
- Base data on this map was extracted from Land Information Ontario, MNDM, OBM Ontario Digital Geospatial Database and Ontario Road Network Database.
- Cottage Residential Areas provided by Ontario MNR, Queen's printer for Ontario, Oct. 2012 Additional cottage residential areas in Whalen, Somme and Neville and part of Potier were provided by Mesomikenda Cottagers Association on December 2012.
- Trail head and trail information extracted from Land Information Ontario (MNR).
- Snowmobile trials approximated from online maps from Ontario Federation of Snowmobile Clubs (OFSC)

Datum: NAD83
Projection: UTM Zone 17N

0 2.5 5 10 15 20 Kilometres

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CÔTÉ GOLD PROJECT

Townships, Cottages Residential Areas and Tourism Facilities

DRAFT

PROJECT N°: TC121522 | FIGURE: 5

SCALE: 1:165,000 | DATE: July 2013

Path: \\MIS-FS1\Projectf$\EM\Projects\2012\TC121522 IAMGOLD Cote Project\GIS\ToR\MXD_2\comm_residencialToR1.mxd, Author: ken.brookes, modified by sandra.marquez, 04 July 2013