

14.0 CUMULATIVE EFFECTS

14.1 Definition of Cumulative Effects

As noted in Chapter 1, the Côté Gold Project (the Project) as currently planned is required to complete a Federal Standard EA pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). CEAA 2012 states that:

19. (1) The environmental assessment of a designated project must take into account the following factors: (a) the environmental effects of the designated project, including the environmental effects of malfunctions or accidents that may occur in connection with the designated project and any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out."

The Canadian Environmental Assessment Agency Guide for Addressing Cumulative Environmental Effects (CEA Agency, 1999) 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 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 planned to proceed.

The Operational Policy Statement, Assessing Cumulative Environmental Effects under the CEAA 2012 (CEA Agency, 2013) states:

"CEAA 2012 requires that each EA of a designated project take into account any cumulative environmental effects that are likely to result from the designated project in combination with the environmental effects of other physical activities that have been or will be carried out."

and further, that:

"A cumulative environmental effects assessment of a designated project must include future physical activities that are certain and should generally include physical activities that are reasonably foreseeable."

The cumulative effects analysis presented herein is therefore focussed on an 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 and its effects in regards to type of effect, and in time and space. Accidents and malfunctions are not likely to occur and are therefore not considered further in the assessment of cumulative effects.

The spatial boundaries considered for predicting cumulative effects include the following:

- biological local study area: as per the baseline studies, areas within 1 km from the centerline of each side of the proposed transmission line alignment and areas within 2 km from proposed Project facilities (see Figure 14-1);
- biological regional study area: areas within 2 km from the centerline of each side of the proposed transmission line alignment and within 32 km from proposed Project site facilities (see Figure 14-1); and
- the general area between Timmins and Sudbury within close proximity to the Project: it is believed that the municipalities of Timmins and Sudbury may experience socio-economic cumulative effects, and the cumulative effects analysis may extend to projects located beyond the physical boundaries of the biological regional study area.

There are a number of other potentially foreseeable types of activities which could make a contribution to cumulative effects at some point in the future. While it is not possible to assess the cumulative effects of such activities since they are hypothetical and undefined, it is possible to provide a general overview of their potential interactive effects, if projects related to these activities were to proceed. It is also important to stress here that if such future projects were to be defined, then it would be the responsibility of the proponents of any such projects to take the effects of the Côté Gold Project into consideration in their project assessment in accordance with applicable EA requirements.

14.2 Identified Planned Projects

The Province of Ontario does not maintain an inventory of major private and public sector projects. Human Resources and Skills Development Canada publishes a Labour Market Monitor report on a monthly basis, which provides news of major shifts in employment by private businesses. Both Timmins and Sudbury have been identified as areas of population and business growth. This section lists some of the projects which are in the cumulative effects study area, as defined above, or have effects on the study area, or indicate regional trends which relate to leading industries in the study area.

14.2.1 Mining and Exploration

Much of the crown land within the cumulative effects study area is under active claims (MNDM, 2013). There are several active mines in addition to active exploration in the Timmins and Sudbury regions (OPA, 2013; HRSDC, 2012).

Operational mines include:

- Dome Underground Mine (Gold), Goldcorp Inc. – Porcupine Gold Mines: Timmins. Production capacity: 11,000 tonnes per day for Dome Mill. Reserves: approximately two years remaining. Employees: 80.
- Timmins West Mine (Gold), Lake Shore Gold Corp.: 18 km west of Timmins. Production capacity: 2,500 tonnes per day. Reserves: Approximately 10 million tonnes. Employees 285.
- Bell Creek Mine (Gold), Lake Shore Gold Corp.: Timmins. Production capacity: 2,500 tonnes per day. Reserves: Approximately 10 million tonnes. Employees: 100.
- Hoyle Pond Mine (Gold), Goldcorp Inc. – Porcupine Gold Mines: Timmins. Production capacity: 900 tonnes per day. Reserves: 95.3 million tonnes for all Porcupine Gold Mines (mostly Hoyle Pond). Employees: 244.
- Penhorwood Mine (Talc), Imerys Talc: 70 km southwest of Timmins along Highway 144. Employees: 40.
- Kidd Creek Mine (Copper, Zinc, Lead, Silver, Cadmium), Glencore Xstrata PLC: Timmins. Production capacity: 6,500 tonnes per day. Reserves: 15.5 million tonnes. Employees: 1,100 and 165 contractors.
- Lockerby Mine (Nickel and Copper), First Nickel Inc.: Chelmsford. Production capacity: 1,200 tonnes per day for nickel. Production capacity: 800 tonnes per day for copper. Reserves: 1,134 tonnes cobalt, 18,987 tonnes copper, 30,189 tonnes nickel. Employees: 120.
- Levack Mine (Nickel Copper, Platinum, Palladium), KGHM International Ltd.: Levack. Production capacity: 700 tonnes per day. Reserves: 0.9 million tonnes. Employees: 210.
- McCreedy West Mine (Copper, Nickel, Platinum, Palladium, and Gold), KGHM International Ltd.: Levack. Production capacity: 2,000 tonnes per day. Reserves: 300,000 tonnes. Employees: 100.
- Podolsky Mine (Copper and Nickel), KGHM International Ltd.: Capreol. Production rate: 1,200 tonnes per day. Reserves: 500,000 tonnes. Employees: 90.
- Copper Cliff North Mine, Creighton Mine, Garson Mine, Coleman and McCreedy East Mine, Ellen Mine, and Stobie Mine (Nickel, Copper, Cobalt, PGM), Vale S.A.: Sudbury. Production rate: 35,000 tonnes per day (Clarabelle Mill). Reserves: 105.4 million tonnes. Employees: 3,900.
- Nickel Rim South Mine and Fraser Mine (Nickel, Copper, Cobalt, PGM), Glencore Xstrata PLC: Sudbury. Production rate: 1.5 million tonnes per year. Reserves: 18 million tonnes. Employees: 1,000.

Other mining activities include the proposed re-opening by Glencore Xstrata Plc of two properties (Errington and Vermilion) in 2016 in the Sudbury area.

The following regional projects are at an advanced mineral exploration stage but none have released public notices regarding development beyond exploration (CEA, 2014):

- Hart Nickel Project (Nickel and Copper), Liberty Mines: Timmins.
- Globex Mining (Magnesite and Talc): Timmins.
- Frankfield East (Gold), Gowest Gold: Timmins.
- Broken Hammer (Nickel and Copper), Wallbridge Mining: Sudbury.
- Victor/Capre Project (Nickel and Copper), Vale S.A.: Sudbury.
- Victoria Project (Nickel and Copper), KGHM International: Sudbury.
- Totten Mine (Nickel and Copper), Vale S.A.: Sudbury.

Note that Goldcorp's Hollinger Mine has recently commenced mining activities.

Present and potential future mines will have some cumulative effects with the Project, including potentially increased road traffic (discussed in Section 14.2.3) and increased land development. Additionally, the present and potential future mining projects will require the same socio-economic resources as the Project, such as labour and housing, discussed in Section 14.2.5.

The potential for additional mineral developments associated with existing (or future) mineral claims is dependent on whether or not these mineralized zones support sufficient resources to warrant advanced exploration and commercial production, and is yet to be determined. When and if such resources are identified, separate EA studies would be required to determine the likely environmental effects, including cumulative effects of additional mining operations. Currently, these exploration properties are not regarded as certain or reasonably foreseeable projects. In addition to exploration projects, Cliffs Natural Resources Inc. has proposed the construction of a chromite smelter in Capreol, Greater Sudbury, however, this project has been suspended.

The effects of land development in the biological regional and local study areas have been discussed in Chapter 9. The biological regional study area has a history of frequent forestry activities and fires which is reflected in the current vegetation structure. Vegetation communities are often young and dominated by tree species which are considered to be pioneers, colonizing recently disturbed lands. Since the effects of the Project on vegetation communities are reversible following decommissioning and closure, especially since the majority of forest communities are not mature, the effect is considered to be insignificant. Overall, based on natural environmental adaptations to disturbance, and on existing and forecast infrastructure, it is anticipated that the cumulative effects are insignificant or manageable.

14.2.2 Forestry

There is a history of forest logging throughout northern Ontario. The economy of communities within the defined spatial boundaries for cumulative effects prediction has long been driven by

forestry. The cities of Timmins and Sudbury were established for, and are sustained by, natural resource development industries, specifically, forestry and mining.

The cumulative effects analysis for forestry operations was limited to the biological regional study area. This area falls within the following five Forest Management Units:

- Abitibi River Forest, Sustainable Forest License held by Abitibi River Forest Management Inc.;
- Romeo Malette Forest, Sustainable Forest License held by Tembec;
- Pineland Forest, Sustainable Forest License held by EACOM Timber Corporation;
- Spanish Forest, Sustainable Forest License held by Domtar; and
- Timiskaming Forest, Sustainable Forest License held by Timiskaming Forest Alliance Inc.

The current 10 year Forest Management Plans (FMP) for the five units (start dates ranging between 2009 and 2011; ARFMI, 2012; Tembec, 2009; EACOM, 2011; Domtar, 2010; TFAI, 2011) show a planned harvest of approximately 3,262 ha (9.7%) in the biological local study area, approximately 35,755 ha (8.8%) in the biological regional study area (inclusive of the local study area) and approximately 6,004 ha (4.2%) in an additional 10 km buffer along the proposed transmission line alignment (see Figure 14-1).

Forestry operations have been commonplace in the region within the recent past and this is reflected by the forest structure as many forest communities within the biological regional study area are second-growth forests. At present logging operations emulate natural disturbance patterns (MNR, 2001), such that the forest communities have adapted to disturbance from logging and subsequent succession. Given this natural adaptation, forestry operations are not anticipated to result in noticeable cumulative environmental effects with the Project. Forest regeneration will occur immediately following Project closure.

14.2.3 Transportation

The Ministry of Northern Development and Mines (MNDM) has published the Northern Highways Program for projects to be constructed from 2012 to 2016 (MNDM, 2012). Projects in the cumulative effects study area include:

- Highway 101 Resurfacing (31 km), west of Highway 144;
- Highway 144 Resurfacing (60+ km), several segments south of Highway 560; and
- Highway 560 Resurfacing (3 km), eastern Gowganda and western Gogama.

In addition to this, public sector investments are being made for the expansion of Highway 69 and Highway 17 near Sudbury.

The Project will likely increase traffic on local highways leading to and from the Project site, creating additional pressure on the local infrastructure such that highway improvements, as listed above, will be beneficial in supporting this increase. The majority of the traffic generated by the Project will use Highway 144 as it connects the site with Timmins and Sudbury, which are projected to be the main traffic routes of Project workers and contractors. These volumes are, on average, manageable and within the service capacities of Highway 144. The effects on traffic are considered distinguishable but within the normal range of variability and will last throughout the Project life, though at lower levels during the operations, closure and post-closure phases compared to the construction phase.

Given that the listed transportation projects are relevant to already existing infrastructure and no new corridors will be cut, no cumulative environmental effects are anticipated.

14.2.4 Electricity

Hydro One maintains a list of transmission system projects in northern Ontario (Hydro One, 2014), however, none of these projects are located within the defined spatial boundaries for cumulative effects prediction. As such, Hydro One projects are not expected to contribute to cumulative effects.

14.2.5 Municipalities

The development of local infrastructure and road upgrades are expected in communities within municipalities in the defined spatial boundaries for cumulative effects prediction. For example, general construction with the value of building permits in the Greater Sudbury Census Metropolitan Area totalled \$301M in 2011. Infrastructure development projects in Timmins include a planned upgrade of the Timmins Mattagami Waste Treatment plant (a \$74,000,000 project).

Populations within the defined spatial boundaries for cumulative effects prediction are expected to grow as a result of the Project. This is considered a positive, highly distinguishable effect and may result in the need for investment by communities or government. Municipal projects, as described above, will aid in supporting this growth. Population changes in Timmins and Sudbury are not expected to have a noticeable effect on demand for public utilities.

Labour markets for skilled mining workers are somewhat limited, not only from the growth of the mining industry in the region over the past decade but also from the need to replace existing workers who are at or near retirement age. As a result, hiring by the Project is expected to attract workers to the region since labour demand is expected to exceed the regional supply of skilled workers.

Existing housing stocks in urban areas are considered sufficient to meet the demand from newcomers, however, some communities within the defined spatial boundaries for cumulative effects prediction face bottlenecks in their ability to accommodate changes in the housing stock

needed to house potential migrants arriving to their community. The Project, through stimulating economic growth and bringing outside workers into the region, will encourage the housing market. Timmins' proposed expansion of its water capacity through the waste treatment plant, described above, will somewhat alleviate housing demands as it will open 2,000 lots by 2014.

As such, cumulative effects resulting from the Project and municipal developments will result in population growth within the local communities; however, this is considered to be a positive and desirable effect.

14.3 Cumulative Effects Analysis

Based on the knowledge of the Project, including information gained from public consultation to date, mining, forestry, transportation and municipal development projects will result in various levels of cumulative effects.

Previous and existing developments have removed 9% of upland plant community types, relative to reference conditions in the biological regional study area. The Project is anticipated to remove 0.4% of the upland plant community habitat in the biological regional study area.

Forestry is expected to have a larger influence on the upland plant community populations in the biological regional study area as human developments not related to forestry (e.g., mineral exploration, recreational lodges, and roads) have disturbed about 2.1% of the biological regional study area since pre-disturbance conditions. In contrast, recent harvested areas (less than 18 years old) currently cover 7.4% of the biological regional study area. Forest harvesting operations have occurred in the biological regional study area since 1800, with most harvesting activities occurring in the last 25 to 30 years.

Most of the effects to plant populations can be attributed to forestry activities, while the Project and other types of human development are expected to have no measurable residual effect on upland plant community abundance and distribution.

Forestry is also expected to have a larger influence on wildlife populations in the biological regional study area as forestry has disturbed approximately 3.5 times more habitat than other human developments. Disturbance associated with human activities such as forestry operations and mineral exploration in the area have occurred since 1800.

Project effects on air quality, vibrations and noise, hydrology, hydrogeology and aquatic species and habitat are, for the most part, expected to be limited to the vicinity of the Project. The projects identified in the previous sections are located at such a distance from the Project that cumulative effects with the Project are not expected for these disciplines.

With respect to potential environmental effects on terrestrial ecology, land development from larger mining projects and forestry operations could potentially be cumulative to the Project.

However, logging operations have been commonplace in the area within the recent past and this is reflected by the forest structure, which is dominated by stands of pioneer tree species. This means that the majority of land clearing will be affecting second-growth forests. Following Project decommissioning and closure, these vegetation communities are typically allowed to regenerate. With respect to forest harvesting, at present day, logging operations emulate natural disturbance patterns (MNR, 2001), such that the communities have adapted to such disturbance and subsequent succession. As such, the effects of land clearing for these projects are not anticipated to have noticeable cumulative effects.

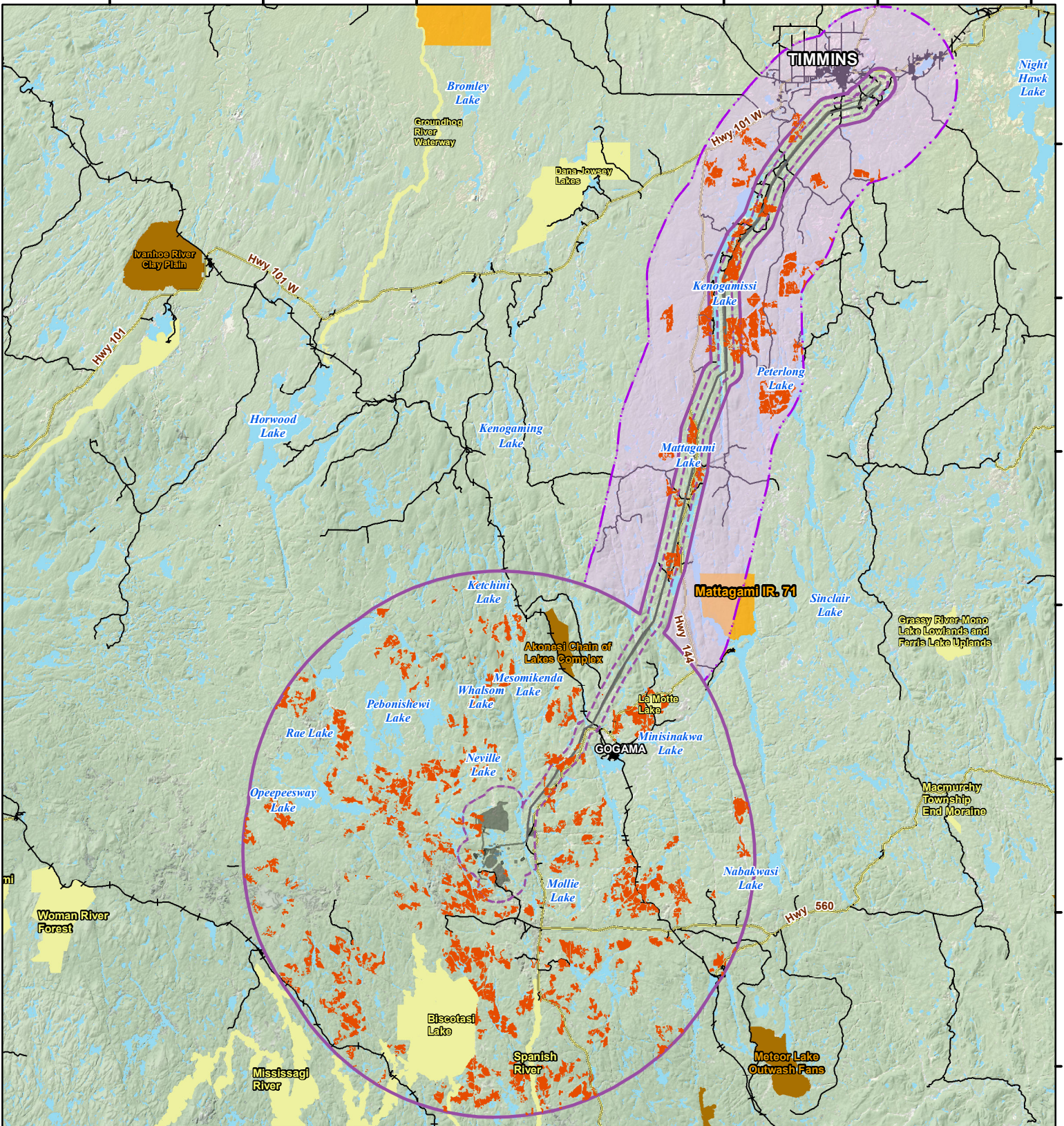
With regard to potential economic and social effects, it is reasonably possible that some of the larger proposed mining projects listed above could have effects that would be additive to those of the Project in terms of regional employment and business opportunities. The effects would be positive and difficult to quantify at this stage, until construction contracts are let and staff are hired. Overlapping effects from these projects with the Project effects on housing and accommodations, public utilities, community and social services, and local traffic within the defined spatial boundaries for cumulative effects prediction, will likely result in additional pressures, however, based on existing and forecasted infrastructure, and on modelling conducted with regards to socio-economics (see Appendix T), these pressures can be accommodated. In general, population growth in local communities is considered to be a positive and desirable effect.

As such, there are consequently no known proposed or planned projects that would be expected to have a cumulative adverse effect on effects assessment indicators defined for the Project (see Chapter 9). The cumulative effects, which have been identified, are anticipated to be either insignificant or positive. Therefore, no follow-up or mitigation programs are required or suggested.

FIGURES



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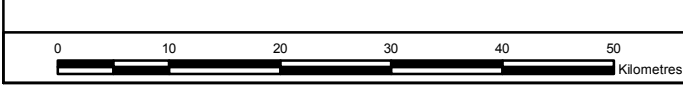
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LEGEND

- Proposed Site Facilities
- Railway
- Highway/Expressway
- Local Road
- Wooded Area
- First Nation Reserve
- Conservation Reserve (Regulated)
- Provincial Park
- Forest Harvest Blocks within Study Areas (approx.)
- Biological Local Study Area
- Biological Regional Study Area
- Additional Area around Proposed TL (10km buffer)

NOTES:
 All base data on this map was extracted from Land Information Ontario, MNMD, OBM Ontario Digital Geospatial Database and Ontario Road Network Database.
 - Harvest blocks approximated from:
 - Abitibi River Forest 2012-2022 Management Plan Index Map
 - Pineland Forest 2011-2021 Management Plan Map
 - Romeo Malette Forest 2009-2019 Management Plan Index Map
 - Spanish Forest 2010-2020 Management Plan Map
 - Timiskaming Forest 2011-2021 Management Plan Index Map

CÔTÉ GOLD PROJECT
Forest Harvest Blocks within the Biological Regional and Local Study Areas



Datum: NAD83
 Projection: UTM Zone 17N



PROJECT N°: TC121522
 SCALE: 1:680,000

FIGURE: 14-1
 DATE: April 2014

