

13.0 COMMUNITY SERVICES AND INFRASTRUCTURE

13.1 SCOPE OF ASSESSMENT

Community services and infrastructure, for the purposes of this assessment, include housing and temporary accommodations, transportation, and local services and infrastructure (water, sewer, power, solid waste, education, recreation, safety, and health care). These services and infrastructure are used by residents and may be operated and maintained by municipal, provincial and/or federal government authorities.

Community services and infrastructure was selected as a valued component (VC) because construction, operation, and decommissioning, rehabilitation and closure of the Project could increase demand for community services and infrastructure and affect (beneficially or adversely) community wellbeing. The Project also has the potential to result in positive effects if upgrades to existing infrastructure are made to address increased demand caused by the Project.

This assessment is linked to other VCs and is informed by the conclusions of the effects assessment for the following VCs:

- Community Health (Chapter 14) – provides information with respect to health services and infrastructure that may be affected by the Project
- Employment and Economy (Chapter 15) – demographic data and estimates of Project employment inform the assessment of potential effects on community services and infrastructure
- Land and Resource Use (Chapter 16) – provides information on power and transmission infrastructure relevant to this assessment
- Indigenous Groups (Chapter 17) – provides information on infrastructure and services for Indigenous groups potentially affected by the Project

13.1.1 Regulatory and Policy Setting

The Project is subject to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and the Newfoundland and Labrador *Environmental Protection Act* (NL EPA). This section identifies the primary guideline requirements of the federal and provincial authorities which influence the scope of the assessment on community health.

The Provincial EIS Guidelines (Appendix 1B) issued for the Project require that descriptions of community services and infrastructure be included, and that the assessment include the effect of Project-related demand on community services and infrastructure. The Federal EIS Guidelines (Appendix 1A) require consideration of effects on the human environment, including “socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities”.



13.1.2 The Influence of Engagement on the Assessment

As part of engagement with communities, governments, Indigenous groups, and stakeholders, Marathon has documented interests and concerns about the Project. An overview of Marathon's engagement activities are outlined in Chapter 3. Documented interests and concerns have influenced the EIS, including the scope of assessment on the VCs. Interests and concerns noted that relate to community services and infrastructure are detailed below. Issues and concerns related to potential accidents or malfunctions are described in the assessment of accidental events (Chapter 21). Issues and concerns related to employment and business benefits are described in Chapter 14 (in relation to community well-being) and Chapter 15 (in relation to employment and economy).

No questions or concerns were raised by Qalipu or Miawpukek through Marathon's engagement efforts specifically related to community services and infrastructure.

Questions and concerns raised by communities and other stakeholders through Marathon's engagement efforts include:

- The supply of medical services to mine personnel and plans for medical services on-site

Questions and concerns raised by fish and wildlife and civil society organizations through Marathon's engagement efforts include:

- The Project's use of roads and frequency of truck movements
- The use of forestry roads and impacts to ongoing forestry operations near the Project Area

13.1.3 Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographic extent of potential effects) and temporal boundaries (i.e., timing of potential effects). Spatial boundaries for the Community Services and Infrastructure VC were selected in consideration of the geographic extent over which Project activities, and their effects, are likely to occur to the VC. Temporal boundaries are based on the timing and duration of Project activities and the nature of the interactions with the VC. The spatial and temporal boundaries associated with the effects assessment for the Community Services and Infrastructure VC are described in the following sections.

13.1.3.1 Spatial Boundaries

Routine effects of the Project on community services and infrastructure are assessed using the following spatial boundaries (Figure 13-1).

Project Area: The Project Area encompasses the immediate area in which Project activities and components occur and is comprised of two distinct areas: the mine site and the access road. The mine site includes the area within which Project infrastructure will be located, and the access road is the existing road to the site, plus a 20 m wide buffer on either side. The Project Area is the anticipated area of direct physical disturbance associated with the construction and operation of the Project.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Local Assessment Area (LAA)/Regional Assessment Area (RAA): The LAA/RAA includes those communities that may see increased demands from Project activities and construction and operation workforce including: Grand Falls-Windsor, Badger, Buchans, Buchans Junction, Bishop's Falls, and Millertown (Figure 13-1). For the assessment of Project effects for community services and infrastructure, the RAA and LAA share the same geographic boundaries as the communities potentially affected by residual effects of the Project, cumulative effects (Chapter 20) and the effects of an accidental event or malfunction (Chapter 21) are the same. They are collectively referred to as the LAA/RAA in this VC.

13.1.3.2 Temporal Boundaries

The temporal boundaries for the assessment of potential effects on the Community Services and Infrastructure VC include:

- Construction Phase – 16 to 20 months, beginning in Q4 2021, with 90% of activities occurring in 2022
- Operation Phase – Estimated 12-year operation life, with commissioning / start-up and mine / mill operation slated to start Q2 2023
- Decommissioning, Rehabilitation and Closure Phase – Closure rehabilitation to occur once it is no longer economical to mine or resources are exhausted



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

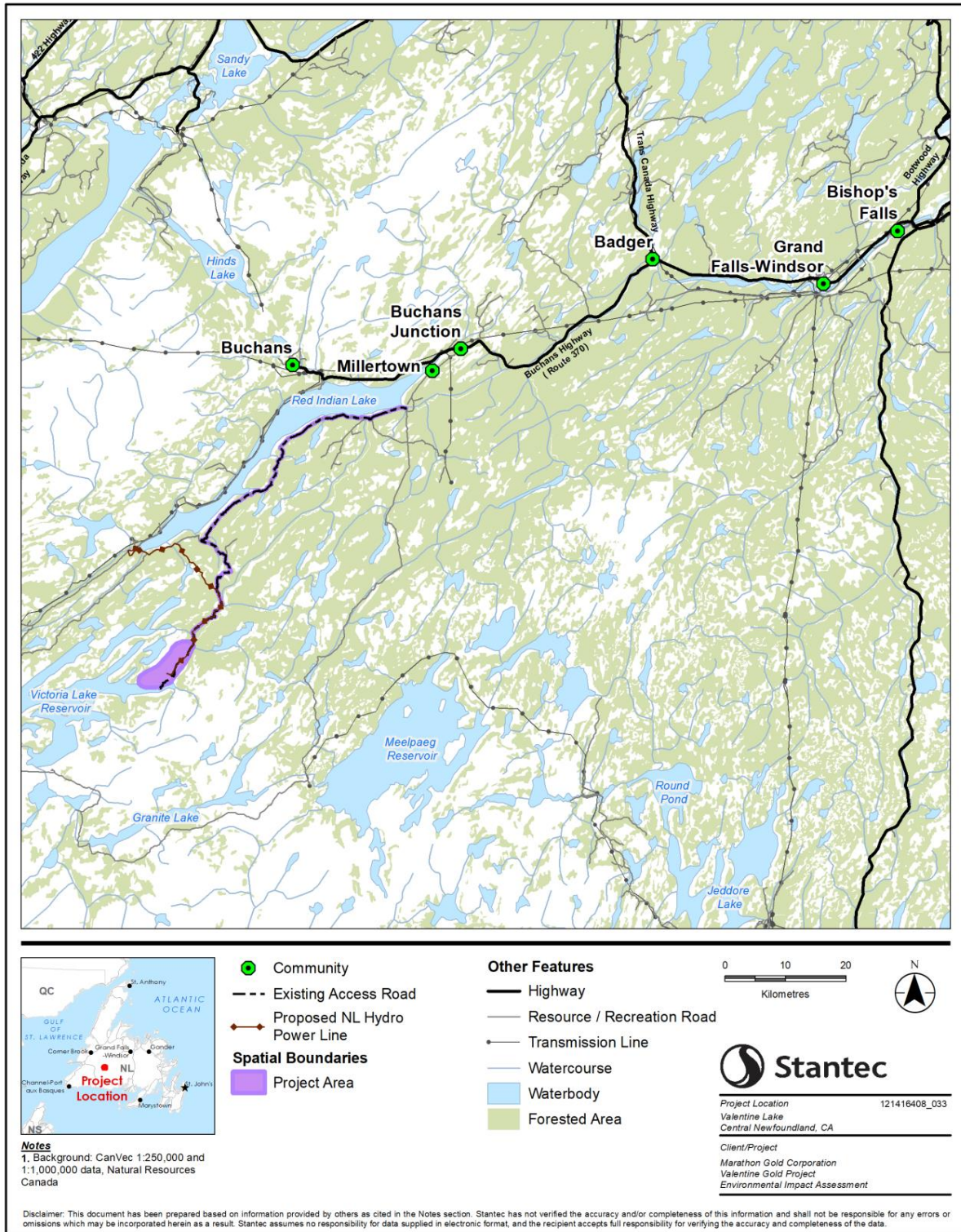


Figure 13-1 Community Services and Infrastructure Local Assessment Area/Regional Assessment Area



13.2 EXISTING CONDITIONS FOR COMMUNITY SERVICES AND INFRASTRUCTURE

A characterization of the existing conditions within the spatial boundaries defined in Section 13.1.3 is provided in the following sections. This includes a discussion of the influences of past and present physical activities on the VC, leading to the current conditions. An understanding of the existing conditions for the VC within the spatial area being assessed is a key requirement in the prediction of potential Project effects, provided in Section 13.5.

13.2.1 Methods

The existing socio-economic conditions of the LAA/RAA were established to provide an understanding of the communities most likely to be affected by the Project and to support the assessment of potential Project effects on community services and infrastructure.

This component examines community services and infrastructure (municipal administration, municipal services and infrastructure, permanent and temporary accommodations, health, education, recreation, transportation, utilities, policing and emergency services, education, and transportation) with an emphasis on those services and infrastructure that could come under pressure as a result of the Project.

The LAA/RAA for community services and infrastructure includes those communities that are most likely to provide services and infrastructure to the Project and where the Project workforce may live and/or use services and infrastructure. As a result, the services and infrastructure in these communities may see Project-related demands beyond those created by the existing population. Based on their proximity to the Project Area, this includes the Town of Grand-Falls Windsor, the Town of Badger, the Town of Buchans, the Local Service District (LSD) of Buchans Junction, the Town of Bishop's Falls and the Town of Millertown (Figure 13-1).

The existing data collection focused on information that facilitated the assessment of the beneficial and adverse effects of the Project, and which made a meaningful contribution to the assessment. For example, information on existing conditions was collected not just on relevant services and infrastructure, however, on their capacity and ability to absorb additional Project-related demand.

The services and infrastructure, their capacities, and the ease with which additional capacity can be provided were identified primarily through secondary research. The main sources of information on existing conditions are:

- Statistics Canada (2016 Census of Canada and National Household Survey)
- Newfoundland and Labrador Statistics Agency / Community Accounts
- Municipal corporations
- Provincial agencies, boards and commissions
- Planning boards and boards of trade
- School and health boards
- Police and other emergency response organizations
- Housing agencies



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Where information was not available through publicly available sources and clarification was required on the capacity of specific services and infrastructure, relevant authorities were contacted through phone calls and email.

13.2.2 Overview

The Project is located in rural Central Newfoundland (Central Region). The economy of the Central Region was built on natural resource-based industries, particularly forestry and mining. Logging has taken place in the region since the turn of the century; however, with the closing of Abitibi-Bowater Inc.'s pulp and paper mill in Grand Falls-Windsor in 2009, forestry in the area has decreased. The towns closest to the Project, Buchans and Millertown, were founded in the early 1900s in support of mining and logging activities in the area and continued to support these industries until the 1980s. Table 13.1 shows the distances (straight line and by road) of each community in the LAA/RAA from the Project Area.

Table 13.1 Communities within the LAA/RAA

Community Name	Type	2016 Population	Distance by Road (km) to Project Area	Straight Line Distance (km) to Project Area
Grand Falls-Windsor	Municipality	14,171	89	72
Badger	Municipality	704	58	48
Bishop's Falls	Municipality	3,156	103	86
Buchans	Municipality	642	46	10
Buchans Junction	LSD	77	16	13
Millertown	Municipality	81	9	8

Mining expanded in the Central Region in the 1920s, when technology became available to process the ore that was discovered in 1905. Buchans was established in 1927 as a mining town, with services and infrastructure provided by the American Smelting and Refining Company. The mine closed in 1984. In 2016, the population was 642, down nearly 8% from 2011 when the population was 696 (Statistics Canada 2017; 2020).

Grand Falls-Windsor is the largest community in the LAA/RAA. The Town was established in 1905 for its timber resources, hydro-electricity potential, and a deep-water port in the nearby community of Botwood. In 1991, the Towns of Grand Falls and Windsor amalgamated to become Grand Falls-Windsor (Grand Falls-Windsor 2020a). It is the sixth largest urban community in the province with a population of 14,171 in 2016, up 3% from 13,725 in 2011 (Statistics Canada 2017). It is a service hub providing municipal, health, education, retail, and other services to a region of approximately 50,000 people in communities from the Baie Verte area to the north and the central coast region of St. Alban's and Harbour Breton, to the south.

Badger began as a logging town when the Exploit Lumber Company established a sawmill there around 1900. It was from this community that the Badger Drive, a log drive along the Exploits River between Badger and Grand Falls-Windsor, took place between 1908 and 1991. Logging has remained important to the people of Badger, though many residents have found employment with mines in the area or commute to



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Grand Falls-Windsor for work and school (Town of Badger 2020). The population of Badger was 704 in 2016, decreasing 11% from 2011 when the population was 793 (Statistics Canada 2017).

Buchans Junction is situated at the junction where the railway lines from Buchans and Millertown met. The railway closed in 1977, however, the community remains. In 2016, Buchans Junction had a population of 77, down from 79 in 2011 (Statistics Canada 2017).

Millertown was established in 1900 to support logging activity and the sawmills continued to operate into the 1920s. In 1926, Millertown moved to higher ground due to the construction of the Exploits Dam, which flooded the original location (Town of Millertown n.d.). The population of Millertown decreased 18% percent between 2011 and 2016, from 99 to 81 (Statistics Canada 2017).

The Town of Bishop's Falls was established around 1900 with arrival of the Newfoundland Railroad. It continued to grow with the construction of a pulp mill in 1909, which ceased operation in 1952. Between 2011 and 2016, the population of Bishop's Falls decreased 5.5% from 3,341 to 3,156 (Statistics Canada 2017).

The following subsections describe the existing services and infrastructure within these communities, including those provided by the municipal (e.g., waste management), provincial (e.g., health services), and federal (e.g., Royal Canadian Mounted Police (RCMP)) governments, as well as infrastructure maintained by private operators (e.g., temporary accommodations, such as hotels).

13.2.2.1 Municipal Administration

Grand Falls-Windsor, Badger, Buchans, Bishop's Falls, and Millertown are registered municipalities that adhere to provisions of the municipality's regulations under the *Municipalities Act, 1999*. Buchans Junction is an LSD, which was established to provide basic services to communities based on the *Local Service District Regulations* under the *Municipalities Act, 1999*, and it shares municipal services with Millertown and Buchans. LSDs are administered by an elected committee, as well as staff it employs (EngageNL 2018).

The Town Council of Grand Falls-Windsor is comprised of a Mayor, Deputy Mayor, and five councilors (Grand Falls-Windsor n.d.). The Town's Chief Administrative Officer (CAO) is accountable to provide leadership and direction for town functions and activities pursuant to policies established by Council. The CAO is also the Town Clerk and the Department Head, with direct responsibilities for economic development and public protection services, which include policing, animal control, and fire protection. The five departments of the municipality of Grand Falls-Windsor are the Finance Department, Engineering and Works Department, Parks and Recreation Department, Economic Development and Tourism Department, and Public Works Department (Grand Falls-Windsor 2020b).

The Towns of Badger, Buchans, and Bishops Falls each have a Mayor, Deputy Mayor, and Town Councils comprised of five councilors each. Badger has a Town Manager and Assistant Town Clerk, and Buchans has a Town Clerk / Manager (Town of Badger 2020; Town of Buchans 2018). Millertown has an elected Mayor, Deputy Mayor, and a Town Clerk, as well as three councilors (Town of Millertown, n.d.).



13.2.2.2 Municipal Services and Infrastructure

Waste

Central Newfoundland Waste Management (CNWM) provides waste management services to the Central Region, including the communities in the LAA/RAA. It oversees the operation of the regional waste management site and seven waste management facilities, or transfer stations, one of which is in Buchans Junction (CRSB 2019). The regional waste management site and the main landfill for the LAA/RAA is the Norris Arm Waste Management Facility, a lined landfill with leachate collection for final disposal. When it opened in 2012, the landfill had a 50-year life expectancy, however, in 2016, a second lined cell was constructed, doubling the lifespan. As a result of the additional capacity, the facility has been collecting waste from the Western Regional Service Board, in addition to Central Region communities (CRSB 2019; Hickey 2010; NL Department of Municipal Affairs 2012).

Water and Sewer

Grand Falls-Windsor's protected surface water source is Northern Arm Lake, located outside the Exploits River watershed. The water treatment plant was built in 1996, treats water by gas chlorination, and has a rated capacity of 27,000 cubic metres per day (m^3/d) (NL Department of Municipal Affairs 2019). Several other communities in the Exploits Valley, including Botwood, Peterview, and Bishop's Falls, receive water from this facility.

The wastewater treatment facility in Grand Falls-Windsor was constructed in 1995 and services 13,000 people. Wastewater is treated by an aerated lagoon with an average load of 4,420,000 Litres per day (L/d), (NL Department of Municipal Affairs 2017). In 2018, Grand Falls-Windsor received environmental approval for its wastewater treatment facility expansion to include the addition of a wastewater aerated pond system that would incorporate two to three new aerated cells, an ultraviolet disinfection treatment system, and a sludge management system. The expansion is expected to be complete by February 2021 and it will have a capacity of 47,500 m^3/d . With this maximum daily flow, the wastewater treatment facility is expected to handle demands for the next 25 years (SNC Lavalin 2018; Clendenning, pers. comm. 2020).

Badger's water supply is located between the north side of Exploits River and the west and south sides of Little Red Indian Brook (Baird Planning Associates 2015). The water system has seen improvements over the last six years, including the installation of a new water storage tower in 2014, and has sufficient capacity to meet the demands of the community. Badger's wastewater treatment facility was built in 1966 and currently services approximately 800 people. Wastewater is treated by contact stabilization and the facility treats an average wastewater load of 276,420 L/d (NL Department of Municipal Affairs 2017). Badger's wastewater system needs replacement and the Town Council is discussing how best to deal with this issue (Hurley, pers. comm. 2020).

Water for the Town of Buchans is pumped from Buchans Lake to a water storage tank. It then goes through a filter and chlorination system and to the residents of the Town. Buchans discharges raw sewage at three outfalls into Buchans Brook. Some of the water and sewer infrastructure in Buchans is more than 60 years old and in need of improvement (Corbett, pers. comm. 2020).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Buchans Junction's water supply is Lapland Pond and water is treated by a gravity flow and chlorination system before being distributed to residents (NL Department of Municipal Affairs 2020.). Its wastewater treatment facility is an Abydoz wetland treatment system which was installed in 2013. The average wastewater load is 18,360 L/d and it has the capacity to treat existing and future households (Heath, pers. comm. 2020). Some properties also have septic tanks.

Bishop's Falls has a wetland wastewater treatment system, which was built in 2016. It consists of six acres of lined waste containment areas and has an average flow of 2,900 m³/d. The effluent from the town is pumped to the treatment facility where both effluent and sludge are treated via engineered wetlands. Stormwater and septic effluent are treated separately, then the flows are recombined with the treated storm water at the end of the system and discharged to the Exploits River.

Millertown's water supply is Water Pond. Infrastructure upgrade contributions from the provincial government in 2018 were used to install a water treatment system, construct a chlorination building, and upgrade the sewage pumping station (NL Department of Municipal Affairs 2020; Water Canada 2017). The wastewater treatment process for Millertown is a communal septic tank with contour disposal bed. It has an average wastewater load of 34,000 L/d and the last year of construction or upgrade was 1991 (NL Department of Municipal Affairs 2017).

Tourism, Culture and Recreation

Outdoor recreation pursuits are popular in the LAA/RAA. These include fishing, hunting and outfitting, as well as hiking, backcountry camping and snowmobiling. These activities are described in detail in Chapter 16 (Land and Resource Use). In terms of indoor recreation, Grand Falls-Windsor operates a stadium for sporting events, concerts, and recreational skating, as well as a community centre that has an indoor ice rink, swimming pool, fitness centre, and gymnasium. There are several children's playgrounds and two outdoor recreational complexes that have tennis courts, a running / walking track, a soccer field, beach volleyball courts, basketball courts, several baseball / softball fields, and a clubhouse among them. Other recreational and leisure facilities include a bowling alley, a curling club, as well as the Salmonid Interpretation Centre and Mary March Museum. There is a dinner theatre venue and the Gordon Pinsent Centre for the Arts, which has an art gallery, public library, and performance seating for 400 people (Grand Falls-Windsor n.d.).

The Town of Badger has a skateboard park, playground, softball field, swimming pool, and beach. Buchans has a stadium, ball field, and curling club (Town of Badger 2020; Town of Buchans 2018). The Mary March Wilderness Park is located along Route 370 near Buchans Junction (Mary March Wilderness Park n.d.). No other recreation facilities in Buchans Junction have been identified.

Bishop's Falls has a library, a recreation complex with a soccer field, playground, softball field, and tennis court, a stadium for ice hockey and other sports, and the Bishop's Falls Heritage Centre (Drover, pers. comm. 2020).

The Lewis Miller Room Museum in Millertown houses logging artifacts and the Millertown Community Centre hosts various community events. Millertown also has a skate park (Town of Millertown n.d.).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

13.2.2.3 Permanent and Temporary Accommodations

In 2016, there were 6,406 private dwellings in Grand Falls-Windsor of which 95.1% (6,091) were occupied by permanent residents. The average cost of a home in Grand Falls-Windsor was \$217,610 in 2016 and the average monthly rent was \$759 (Statistics Canada 2017). Between 2016 and 2017, the vacancy rate in Grand Falls-Windsor increased by 4.8% to 7.7% and then dropped to 5.7% in 2018 (NL Department of Finance 2018; CMHC 2018). Grand Falls-Windsor has 11 hotels, motels, bed-and-breakfasts, and one lodge and chalet for a total of approximately 250 rooms. There are also two campgrounds / RV parks, which offer a total of 122 tent and RV sites (Grand Falls-Windsor 2020b).

The Town of Badger had a total of 325 private dwellings in 2016 of which 92.9% (302) were occupied by permanent residents. In 2016, the average house price was \$143,230 and renters paid an average of \$736 each month (Statistics Canada 2017). According to the Badger Municipal Plan, 2015-2025, there is a shortage of land to accommodate long-term land development due to swampy areas, the location of the municipal water supply area, and high-flood risk from Badger's three rivers. However, Badger's population is not expected to increase, and housing demand is slowing (Baird Planning Associates 2015). There is one motel in Badger, two lodges, and one bed-and-breakfast with a total of 15 rooms (Town of Badger 2020).

Buchans had 417 private dwellings in 2016, of which 79.4% (331) were occupied by permanent residents. In 2016, the average cost of a home in Buchans was \$80,109 and the average monthly rent was \$603. There is one motel in Buchans with 19 rooms, cabin rentals and an RV Parking Pad (Town of Buchans 2018).

Buchans Junction had 54 private dwellings occupied by 38 permanent residents with an average house cost of \$94,999 (Statistics Canada 2017).

Bishops Falls had 1,502 private dwellings in 2016 of which 1,396 were occupied by permanent residents. The average cost of a home in Bishop's Falls in 2016 was \$165,864 and average monthly rent was \$787 (Statistics Canada 2017). Brookdale Country Inn in Bishop's Falls has seven rooms, and there is an RV park with 43 lots (Brookdale Country Inn n.d.).

The Town of Millertown had 66 private dwellings in 2016 and 38 permanent residents. The average cost of a dwelling was \$71,224 (Statistics Canada 2017). Millertown has two rental cabins and a bed-and-breakfast, which has nine bedrooms and can accommodate up to 21 guests (NL Tourism n.d.).

In 2017, the occupancy rate of temporary accommodations in the Central Region was 46.3%, compared to 51.1% for the province and up from 45.3% in 2016 (TCII 2017, 2018).

13.2.2.4 Health Services and Infrastructure

Health services and infrastructure in the LAA/RAA and specific topics related to the health and well-being of LAA/RAA residents are also discussed in Chapter 13 (Community Health).

Grand Falls-Windsor, Badger, Buchans, Buchans Junction, and Millertown fall within NL's Central Health region. The Central Regional Integrated Health Authority (Central Health) provides health and community



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

services to 177 communities and approximately 20% of the provincial population (Central Health n.d.). In 2019, Central Health had 262 acute care beds, two regional referral centres, nine health centres, 23 community health facilities, and 11 long-term care facilities (Central Health 2017; 2019).

In 2014, there were 116 family medicine practitioners in the Central Health region. This had fallen 1.7% by 2018 to 114. The number of specialists in the region increased 2.9% between 2014 and 2018 from 70 to 72. In 2018, Central Health had 123 family medicine physicians and 78 specialists per 100,000 population. The Province had 138 family medicine physicians and 132 specialists per 100,000 population in 2018 (CIHI 2018).

Central Health is challenged with recruitment and retention of family physicians and specialists. Central Health is currently the largest teaching region outside of St. John's. Six family medicine residents per year are matched to Memorial University's Central Stream where residents come to work at local sites for two years. This has proved to be an effective recruitment strategy for Central Health Family Medicine physicians. Central Health continues to work with the Department of Health and Community Services and the other Regional Health Authorities to explore successful recruitment and retention strategies (Central Health 2019).

The major healthcare facility for Grand Falls-Windsor and other neighboring communities is Central Newfoundland Regional Health Centre in Grand Falls-Windsor. It has approximately 130 acute care beds and 15 transitional long-term care beds. The Health Centre has 45 physicians, 26 of whom are specialists, and 24-hour emergency services. There are specialty services offered, including radiology, psychiatry, pathology, and general surgery (Central Health n.d.). Within Central Health, there is a combination of private, community and hospital-based ambulance services providing emergency pre-hospital care. The Paramedicine and Medical Transport Program is comprised of approximately 120 frontline staff with levels of training ranging from Emergency Medical Responders to Primary Care Paramedics to Advanced Care Paramedics. Within the LAA/RAA, ambulance services are based in Grand Falls-Windsor and Buchans.

Central Health provides community health services, such as maternal, child and population health, community support and residential services, and mental health and addiction services. Within the LAA/RAA, the Grand Falls-Windsor Community Health Centre coordinates the following community-based services:

- Public Health Nursing
- Continuing Care Nursing Services
- Community Supports Social Work
- Behavioral Management
- Mental Health and Addiction Services
- Doorways Counselling Service
- Medical Communications Centre
- Janeway Outreach (Central Health n.d.)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Central Health's Community Health Services may be reached to assist women who are victims of family violence. The Status of Women Central Office also offers support in a variety of capacities to women needing assistance.

The Town of Badger has no community healthcare facility and residents travel to Grand Falls-Windsor, approximately 20 minutes away, for health services. Residents of Bishop's Falls also rely on the hospital in Grand-Falls Windsor, and the town has a medical clinic with one family physician (Drover, R. pers. comm. 2020).

There is one health care facility in Buchans, the A.M. Guy Memorial Health Centre, which has 22 beds. There is one full-time doctor at the clinic as well as physician and nurse practitioner clinics, outpatient and 24-hour emergency services, and 24-hour ambulance services. This facility also provides chemotherapy, laboratory and diagnostic imaging services, and other public health services (Central Health n.d.). In general, the clinic can handle the existing demand for service (Corbett, pers. comm. 2020).

Millertown and Buchans Junction have no community healthcare facility and the closest medical centre is in Buchans, approximately 30 minutes away. As a result, the A.M. Guy Memorial Hospital is relied on by many residents in the LAA/RAA for primary and urgent care. However, the Buchans hospital has had difficulty in filling critical positions with permanent employees (X-Ray Tech, Lab Tech and MD), causing community residents to travel to the hospital at Grand-Falls Windsor (Humber and Corbett, 2020).

Long-term care in the LAA/RAA is available at Carmelite House in Grand Falls-Windsor and the A. M Guy Memorial Health Centre in Buchans, with a combined total of 83 long-term care beds (Central Health n.d.). Construction on a new 60-bed long-term care home in Grand Falls-Windsor began in 2019, with an expected completion of 2021 (NLDHCS and NLDTW 2019).

13.2.2.5 Police and Emergency Services

Policing services in the LAA/RAA are provided by the RCMP pursuant to the Provincial Policing Agreement. The RCMP operates a detachment in Grand Falls-Windsor, which provides service to Badger, Buchans, Buchans Junction, Bishop's Falls, and Millertown, in addition to other communities. As of March 2020, the detachment had 25 regular members on staff. The staffing levels are governed by the 2012 Provincial Policing agreement and the number of agreed upon positions by the Province (Bryan, pers. comm. 2020). Between 2016 and 2018, the crime severity index (CSI) for the Grand Falls-Windsor detachment decreased 9.5% from 73.38 to 66.75 in 2018. The CSI measures changes in the level of crime severity in Canada from year to year and includes Criminal Code violations including traffic and drug violations and Federal Statutes (Statistics Canada 2020).

Municipal Enforcement Officers are employed by the Town of Grand Falls-Windsor and have the power of a member of the Royal Newfoundland Constabulary with respect to the enforcement of *The Municipalities Act* and the Town Regulations. Municipal Enforcement Officers work with and provide assistance to the RCMP and are responsible for: monitoring and enforcing town regulations; security checks of town infrastructure; issuing traffic tickets; charging for violations; serving summons and notices; and attending court as required (Grand Falls-Windsor n.d.).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

There is one correctional facility within the LAA/RAA, the Bishop's Falls Correctional Centre, which accommodates minimum security male inmates from Central NL (NL Department of Justice and Public Safety 2020).

The Grand Falls-Windsor Fire Department has five full-time staff, three part-time staff, and 45 volunteer firefighters (Grand Falls-Windsor Fire Department 2008). The Badger Volunteer Fire Department has approximately 40 members. The volunteer firefighters work with the Central Newfoundland Ground Search and Rescue Team and with the Newfoundland Rangers (Town of Badger 2020). The Town of Buchans also has a volunteer fire department with 20 members led by a Fire Chief and they respond to approximately 10 calls for service each year (Town of Buchans 2018; Corbett, pers. comm. 2020). Bishop's Falls has a volunteer fire department with 35 members, and it responds to approximately 40 calls for service each year (Drover, pers. comm., 2020). Buchans Junction and Millertown each have a volunteer fire department. In 2017, Buchans Junction received funding for a new rural response unit vehicle and acquired a new fire truck in 2020 (SaltWire Network 2017).

13.2.2.6 Income Support and Employment Services

The province's Department of Immigration, Skills and Labour office in Grand Falls-Windsor provides employment services to residents of the Central Region. Federal employment services are available through the Town's Service Canada office. Grand Falls-Windsor also has an employment assistance services office, Employment OPTIONS, which provides a range of services to eligible clients, including career employment planning, job research assistance, and access to skills to maintain long-term employment. This office opened in 2018 and is funded federally through the Canada-Newfoundland Labour Market Development Agreement (CNA 2018a).

NL's Income Support program falls under the mandate of the Department of Advanced Education, Skills and Labour. In 2016, 9.6% of the population of Grand Falls-Windsor received Income Support with households receiving an average of \$9,900. In 2018, 9.7% of the Town's population received an average of \$9,600 in Income Support (NL Statistics Agency 2019).

In 2018, 6.1% of the population of the Buchans Area, including Badger, Buchans Junction, and Millertown received an average Income Support of \$7,625. The incidence of Income Support use in the Buchans Area was higher in 2016 when 8.4% of the population received an average of \$9,200 in Income Support benefits (NL Statistics Agency 2019).

Provincially, the 2018 average benefits were \$8,700, with 7.7% of the population receiving Income Support Assistance at some point in the year (NL Statistics Agency 2019).

13.2.2.7 Education

The LAA/RAA communities are within the Central Newfoundland and Labrador English School District (NLESD), which accounts for 79 of the 260 provincial schools and 22.1% (14,099) of the 63,772 total provincial enrolments for 2019-20. Student enrolment within the Central NLESD is in decline; enrolment among Full-time Equivalent Pupils fell 8.3% from 2016-2017 to 2019-2020 (NL Department of Education 2020).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Grand Falls-Windsor has three elementary schools, one junior high school, and one high school, with a total enrolment of 1,895 students during the 2019-2020 school year (NL Department of Education 2020). Grand Falls-Windsor also has three post-secondary institutions: College of the North Atlantic (CNA) campus which is the public college in the province, and two private colleges, Keyin College and Corona College (Grand Falls-Windsor 2020c). In 2016-2017, the CNA Grand Falls-Windsor campus had an enrolment of 398 students and offered online Distributed Learning courses to 1,150 students province-wide (CNA 2018b).

The Town of Badger has one school offering kindergarten to grade 9 with a total enrolment of 60 students in 2019-2020 (NL Department of Education 2020). Students commute to high school in Grand Falls-Windsor, approximately 25 minutes away. Badger has one post-secondary institution, Central Training Academy, providing five professional driver-training programs, including Heavy Equipment Operator and Transport Mechanic, approved by the Government of NL's Department of Education (Central Training Academy n.d.).

Lakeside Academy is the only school in Buchans. The total enrolment for 2019-2020 was 65 students from kindergarten to grade 12. There are two schools in Bishop's Falls, which had a total enrolment of 348 students in 2019-2020 (NL Department of Education 2020).

Buchans Junction and Millertown have no schools and students from these areas travel to Buchans.

13.2.2.8 Transportation

Grand Falls-Windsor is approximately one hour highway travel west of Gander Airport, 1.5 hours east of the Deer Lake Airport, four hours west of the St. John's International Airport, and five hours east of the Port aux Basques ferry terminal, which offers transportation services to Nova Scotia. The Trans-Canada Highway (Route 1) goes directly through Grand Falls-Windsor, allowing access to all high-volume roads within the town (Grand Falls-Windsor n.d.). In 2019, upgrades were completed to sections of Route 1 through Grand Falls-Windsor, and these will continue into 2021. There are also plans to complete resurface upgrades to Highway 370 from Buchans Junction towards Buchans (NL Department of Transportation and Works 2019).

Within the smaller LAA/RAA communities, there are several gravel roads, most of which are old forestry roads. These roads are used primarily by snowmobile and all-terrain vehicle (ATV) users.

The Badger Bypass Road, planned to be located east of the existing Route 1, has been identified as a future development in the province's Department of Transportation and Works long-term strategy. No detailed design or construction timeframe has been established or prepared (Baird Planning Associates 2015).

In Bishop's Falls, the arterial road system includes Route 1 of the Trans-Canada Highway, Botwood Highway, and Main Street (Tract 2016).

There are primary roads in Buchans and Millertown, and provincial highways connect Millertown and Buchans to the Trans-Canada Highway. Buchans Highway 370 is a two-lane highway that connects Buchans and Millertown to the Trans-Canada Highway at Badger. Highway 370 receives an average of



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

75 to 100 vehicles each day, including wood trucks hauling loads between Millertown and Badger (Corbett, pers. comm. 2020). It is generally in good condition, although there is one section near Buchans Junction that requires maintenance (Corbett, pers. comm. 2020).

The Port of Botwood was a shipping port for pulp and paper products from the mill at Grand Falls-Windsor. It is a centre for the export of fish, wood products and petroleum products, and has been used as a base for offshore exploration vessels.

13.2.2.9 Power Generation and Transmission

A detailed description of power lines and power sources in the LAA/RAA is provided in Chapter 16, Land and Resource Use. In summary, there is one hydroelectric facility within the LAA/RAA, the Victoria Dam and spillway, which are part of the Bay d'Espoir Hydroelectric Development. The Bay d'Espoir Hydroelectric Generating Facility has an installed capacity of 604 megawatt (MW) (NL Hydro 2020). Victoria Dam is discussed further in Chapter 19, Dam Infrastructure. A grid connection at the Star Lake Hydroelectric Generating Station will supply power to the Project.

Within the Land and Resource Use RAA, there are eight power lines with a combined total length of approximately 340 km (Chapter 16). They are operated and maintained by Newfoundland Power. There are no power lines within the Project Area or Land and Resource Use LAA.

13.3 ASSESSMENT CRITERIA AND METHODS

This section describes the criteria and methods used to assess environmental effects on community services and infrastructure. Residual environmental effects (Section 13.5) are assessed and characterized using criteria defined in Section 13.3.1, including direction, magnitude, geographic extent, timing, frequency, duration, reversibility, and ecological or socio-economic context. The assessment also evaluates the significance of these effects using threshold criteria or standards beyond which a residual environmental effect is considered significant are identified. The definition of significant effect on the Community Services and Infrastructure VC is provided in Section 13.3.2. Section 13.3.3 identifies the environmental effects to be assessed for community services and infrastructure, including effect pathways and measurable parameters. This is followed by the identification of potential Project interactions with this VC (Section 13.3.4). Analytical assessment techniques used for the assessment of community services and infrastructure are provided in Section 13.3.5.

13.3.1 Residual Effects Characterization

Table 13.2 presents definitions for the characterization of residual environmental effects on community services and infrastructure. The criteria are used to describe the potential residual effects that remain after mitigation measures have been implemented. Quantitative measures have been developed, where possible, to characterize residual effects. Qualitative considerations are used where quantitative measurement is not possible.



Table 13.2 Characterization of Residual Effects on Community Services and Infrastructure

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	Neutral – no net change in measurable parameters for community services and infrastructure relative to baseline Positive – a residual effect that moves measurable parameters in a direction beneficial to community services and infrastructure relative to baseline Adverse – a residual effect that moves measurable parameters in a direction detrimental to community services and infrastructure relative to baseline
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	Negligible – no measurable change. Low – capacity of community services and infrastructure will be at or near to existing conditions Moderate – demand for community services and infrastructure approaches current capacity, standard or threshold however will not result in a reduction in standards of service High – demand for community services and infrastructure exceeds current capacity, standard or thresholds that result in a reduction in standards of service
Geographic Extent	The geographic area in which a residual effect occurs	Project Area – residual effects are restricted to the Project Area LAA/RAA – residual effects extend into the LAA/RAA and interact with those of other projects in the LAA/RAA
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	Single event Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Duration	The period of time required until the measurable parameter or the VC returns to its existing (baseline) condition, or the residual effect can no longer be measured or otherwise perceived	Short-term – residual effect restricted to construction or decommissioning, rehabilitation and closure phases Medium-term – residual effect extends through operation and maintenance Long-term – residual effect extends beyond the life of the project Permanent – recovery to baseline conditions unlikely
Reversibility	Describes whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	Reversible – the residual effect is likely to be reversed after activity completion and rehabilitation Irreversible – the residual effect is unlikely to be reversed
Ecological and Socio-economic Context	Existing condition and trends in the area where residual effects occur	Resilient – community services and infrastructure have capacity to accommodate increased demand. Not Resilient – community services and infrastructure have limited capacity to accommodate increased demand.



13.3.2 Significance Definition

A significant adverse residual effect on community services and infrastructure is one that results in demands on services or infrastructure above and beyond current capacity, such that standards of service are routinely and persistently reduced below current levels for an extended period such that they are unlikely to recover to existing conditions.

13.3.3 Potential Effects, Pathways and Measurable Parameters

Table 13.3 lists the potential Project effects on community services and infrastructure and provides a summary of the Project effect pathways and measurable parameters and units of measurement to assess potential effects. Potential environmental effects and measurable parameters were selected based on review of recent environmental assessments for mining projects in NL and other parts of Canada, comments provided during engagement, and professional judgment.

Table 13.3 Potential Effects, Effect Pathways and Measurable Parameters for Community Services and Infrastructure

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in local housing and temporary accommodations	Demand on local housing and temporary accommodations may be affected by Project activities and Project-related population growth.	<ul style="list-style-type: none"> • Availability of accommodations (vacancy rates, inventory levels) • Cost of accommodation (\$) • Shelter-to-income ratio
Change in local services and infrastructure	Demand on local services and infrastructure may be affected by Project activities and Project-related population growth.	<ul style="list-style-type: none"> • Construction and operation labour force • Number of hospital beds • Police officers / 100,000 population • Physicians / 100,000 population • Road volume (vehicles/day) • Capacity of air transportation infrastructure • Teacher:student ratio

13.3.4 Project Interactions with Community Services and Infrastructure

Table 13.4 identifies the physical activities that might interact with the VC and result in the identified environmental effect. These interactions are indicated by checkmark and are discussed in detail in Section 13.5, in the context of effect pathways, standard and Project-specific mitigation / enhancement, and residual effects.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Table 13.4 Project-Environment Interactions with Community Services and Infrastructure

Physical Activities	Environmental Effects to be Assessed	
	Change in Local Housing and Temporary Accommodations	Change in Local Services and Infrastructure
CONSTRUCTION		
Access Road Upgrade / Realignment: Where required, road widening and replacement / upgrades of roads and culverts.	–	–
Construction Related Transportation along Access Road	–	✓
Mine Site Preparation and Earthworks: Clearing and cutting of vegetation and removal of organic materials, development of roads and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials, and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels. Also includes temporary surface water and groundwater management, and the presence of people and equipment on site.	–	–
Construction / Installation of Infrastructure and Equipment: Placement of concrete foundations, and construction of buildings and infrastructure as required for the Project. Also includes: <ul style="list-style-type: none"> • Installation of water control structures (including earthworks) • Installation and commissioning of utilities on-site • Presence of people and equipment on-site 	–	–
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge, and hazardous and non-hazardous wastes.	–	✓
Employment and Expenditures^B	✓	✓
OPERATION		
Operation-related Transportation Along Access Road	–	✓
Open Pit Mining: Blasting, excavation and haulage of rock from the open pits using conventional mining equipment.	–	–



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Table 13.4 Project-Environment Interactions with Community Services and Infrastructure

Physical Activities	Environmental Effects to be Assessed	
	Change in Local Housing and Temporary Accommodations	Change in Local Services and Infrastructure
<p>Topsoil, Overburden and Rock Management: Five types of piles:</p> <ul style="list-style-type: none"> • Topsoil • Overburden • Waste rock • Low-grade ore • High-grade ore • Rock excavated from the open pits that will not be processed for gold will be used as engineered fill for site development, maintenance and rehabilitation, or will be deposited in waste rock piles. 	–	–
<p>Ore Milling and Processing: Ore extracted from the open pits will be moved to the processing area where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes.</p>	–	–
<p>Tailings Management Facility: Following treating tails via cyanide destruction, tailings will be thickened and pumped to an engineered TMF in years 1 to 9, then pumped to the exhausted Leprechaun open pit in years 10 through 12.</p>	–	–
<p>Water Management (Intake, Use, Collection and Release): Recirculated process water and TMF decant water will serve as main process water supply, and raw water (for purposes requiring clean water) will be obtained from Victoria Lake Reservoir. Site contact water and process effluent will be managed on site and treated prior to discharge to the environment. Where possible, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent possible for use on site.</p>	–	–
<p>Utilities, Infrastructure and Other Facilities</p> <ul style="list-style-type: none"> • Accommodations camp and site buildings operation, including vehicle maintenance facilities • Explosives storage and mixing • Site road maintenance and site snow clearing • Access road maintenance and snow clearing • Power and telecom supply • Fuel supply 	–	✓
<p>Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge, and hazardous and non-hazardous wastes.</p>	–	✓



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Table 13.4 Project-Environment Interactions with Community Services and Infrastructure

Physical Activities	Environmental Effects to be Assessed	
	Change in Local Housing and Temporary Accommodations	Change in Local Services and Infrastructure
Employment and Expenditure ^B	✓	✓
DECOMMISSIONING, REHABILITATION, AND CLOSURE		
Decommissioning of Mine Features and Infrastructure	–	–
Decommissioning, Rehabilitation and Closure-related Transportation Along Access Road	–	✓
Progressive Rehabilitation: Rehabilitating infrastructure or areas not required for ongoing operation (e.g., buildings, roads, laydown areas); covering and revegetating completed tailings areas, where practicable, including commencing closure of TMF beginning in Year 9 (when tailings deposition moves to Leprechaun open pit); erosion stabilization and re-vegetation of completed overburden and/or waste rock piles; infilling or flooding of exhausted mining areas; and completing revegetation studies and trials.	–	–
Closure Rehabilitation: Active rehabilitation based on successes of progressive rehabilitation activities. Includes: demolishing infrastructure (e.g., buildings, equipment, facilities, roads, laydown areas); grading and revegetating cleared areas, where practicable; breaching and regrading ponds to reestablish drainage patterns; completing closure of TMF (covering with overburden and revegetating); erosion stabilization and revegetation of completed overburden and/or waste rock piles; and infilling or flooding of open pits.	–	–
Post-Closure: Long-term monitoring	–	–
Emissions, Discharges and Wastes^A	–	✓
Employment and Expenditures^B	✓	✓
Notes: ✓ = Potential interaction – = No interaction ^A Emissions, Discharges, and Wastes (e.g., air, waste, noise, light, liquid and solid effluents) are generated by many Project activities. Rather than acknowledging this by placing a checkmark against each of these activities, “Wastes and Emissions” is an additional component under each Project phase. ^B Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a checkmark against each of these activities, “Employment and Expenditures” is an additional component under each Project phase.		

The main Project interactions are a result of Employment and Expenditures as labour requirements may cause an increase in the local population and additional demands on community services and infrastructure, including housing, health and emergency services and infrastructure, utilities, as well as education, recreation, and transportation services and infrastructure. These interactions are addressed in subsequent sections.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Most of the Project physical activities (except for Transportation along the Access Road, Emissions, Discharges and Wastes, and Utilities, Infrastructure and Other Facilities) will not interact with community services and infrastructure. Production of Project waste materials destined for landfill (e.g., domestic waste) will place additional demands on the local landfill, and the movement of trucks, equipment, supplies and personnel will place additional demands on local roads. Except for landfill demand, the Project and the accommodations camp will operate independently of the LAA/RAA communities (e.g., power, water and wastewater systems will not rely on their resources). Therefore, the operation of utilities, infrastructure and other facilities will not place additional demands on existing community services and infrastructure, particularly utilities.

13.3.5 Analytical Assessment Techniques

Potential environmental effects on community services and infrastructure are qualitatively assessed by comparing anticipated Project demand with existing capacity, as established through baseline research. There may also be potential to expand existing capacity through advance planning and investment to accommodate new development.

Characterization criteria presented in Section 13.3.1 are applied to residual environmental effects that remain after proposed mitigation and enhancements have been implemented. The significance of these environmental effects is determined by considering thresholds and methods, as outlined in Section 13.3.2. Limitations of information, data analyses, and interpretation are compensated for by taking a conservative approach in this assessment (i.e., overstating risk rather than understating risk).

13.4 MITIGATION AND MANAGEMENT MEASURES

A series of environmental management plans will be developed by Marathon to mitigate the effects of Project development on the environment. A full list of mitigation measures to be applied throughout Project construction, operation and decommissioning, rehabilitation and closure is provided in Section 2.7.4. Project planning and design and the application of proven mitigation measures will be used to reduce adverse effects to community infrastructure and services, as outlined in Table 13.5.

Table 13.5 Mitigation Measures: Community Services and Infrastructure

Category	Mitigation	C	O	D
Vehicles / Equipment / Roads	<ul style="list-style-type: none"> Marathon will develop and implement a Traffic Management Plan to manage transportation of workers and materials to site, product leaving site, the number of vehicles accessing the site, and to reduce traffic delays. 	✓	✓	✓
Materials Handling and Waste Management	<ul style="list-style-type: none"> Waste will be transported from site to be recycled, reused or disposed of in licensed / approved facilities. Non-reusable and non-recyclable wastes will be sent to the provincial waste management facility in Norris Arm, and reuse / recycling materials will be sent to the nearest management facility for each material type. 	✓	✓	✓
Employment and Expenditures	<ul style="list-style-type: none"> Marathon will work to develop cooperative protocols with responsible agencies to address access of Project personnel to emergency and other medical services, including employee medicals and check-ups. 	✓	✓	✓



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Table 13.5 Mitigation Measures: Community Services and Infrastructure

Category	Mitigation	C	O	D
	<ul style="list-style-type: none"> Workforce education will be provided to address topics such as: <ul style="list-style-type: none"> – healthy lifestyle choices – anti-harassment training – cultural awareness training – Marathon’s health and safety policies 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will provide an Employee Assistance Program to Project personnel. 	✓	✓	✓
	<ul style="list-style-type: none"> Work schedules / rotations for Project workers, and the requirement to stay at the mine site accommodations camp during their rotation will deter workers from spending time in local communities and accessing community recreation services and facilities outside of working hours. 	✓	✓	✓
	<ul style="list-style-type: none"> Rotation changes will be scheduled so that all workers do not arrive in and leave the site at the same time, limiting Project-related demands on both road and air services and infrastructure. 	✓	✓	✓
	<ul style="list-style-type: none"> Arrivals / departures of employee traffic will be scheduled to occur earlier than the existing observed morning peak hour for local traffic and later than the existing observed afternoon peak hour, if needed. 	✓	✓	✓
Site Facilities and Services	<ul style="list-style-type: none"> An accommodations camp will accommodate construction, operation and closure workers. 	✓	✓	✓
	<ul style="list-style-type: none"> Power, water and wastewater treatment at the Project site and accommodations camp will be provided by Marathon and will not rely on resources within the LAA communities. 	✓	✓	✓
	<ul style="list-style-type: none"> Project-specific environmental management plans and monitoring programs will be developed, including a Waste Management Plan that sets out procedures for reducing Project-related waste and limiting demands on the regional landfill. 	✓	✓	✓
	<ul style="list-style-type: none"> Security services will be established on-site. 	✓	✓	✓
	<ul style="list-style-type: none"> An on-site first aid facility will be provided with paramedic / nurse / ambulatory technician and an ambulance, as required. Designated, trained personnel will provide transport to the nearest hospital when required. During Project construction and operation, first aid stations and equipment will be distributed through the site, as appropriate. 	✓	✓	✓
	<ul style="list-style-type: none"> Catering and recreation opportunities will be provided at the accommodations camp, including fitness equipment. The design of facilities will also consider culturally appropriate spaces. 	✓	✓	✓
Engagement with Stakeholders, Indigenous Groups and the Public	<ul style="list-style-type: none"> Marathon will continue to engage with local communities, including through the negotiation of Community Cooperation Agreements with the six communities in proximity to the Project Area. Community engagement will include regular updates on planned and ongoing Project activities, the timely dissemination of environmental, employment, contracting, and procurement information, and sponsorship of community programs, activities and initiatives, consistent with Marathon’s corporate sponsorship policy and values. 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will liaise with local emergency providers so that roles and responsibilities are understood, and that the necessary resources required to respond are in place. 	✓	✓	✓



Table 13.5 Mitigation Measures: Community Services and Infrastructure

Category	Mitigation	C	O	D
Accidental Event Prevention and Response	<ul style="list-style-type: none"> Emergency response plans will be developed, including spill prevention and response, emergency response measures, training, responsibilities, clean-up equipment and materials, and contact and reporting procedures. 	✓	✓	✓
	<ul style="list-style-type: none"> Appropriate Project personnel will be trained in fuel handling, equipment maintenance and fire prevention and response measures. 	✓	✓	✓
	<ul style="list-style-type: none"> Fire prevention and suppression systems will be maintained on site, including fire response vehicles and associated equipment, fire water distribution, sprinklers, fire extinguishers and other firefighting equipment. 	✓	✓	✓
Notes: C – Construction Activities O – Operation Activities D – Decommissioning, Rehabilitation and Closure Activities				

13.5 ASSESSMENT OF ENVIRONMENTAL EFFECTS ON COMMUNITY SERVICES AND INFRASTRUCTURE

For each potential effect identified in Section 13.3.3, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The following sections first describe the pathways by which a potential Project effect could result from Project activities (i.e., the Project-effect pathway) during each Project phase (e.g., construction, operation and decommissioning). Mitigation and management measures (Section 13.4) are implemented to avoid or reduce these potential pathways and resulting environmental effects. Residual effects are those remaining following implementation of mitigation and these are characterized using the criteria defined in Section 13.3.1. A summary of predicted residual effects is provided in Section 13.5.3.

13.5.1 Change in Local Housing and Accommodations

13.5.1.1 Project Pathways

Changes to housing and accommodations may result from the presence of Project workers in the LAA/RAA increasing demand. Construction is estimated to require a peak labour force of approximately 625 full-time equivalents (FTEs) (an average of 320 FTEs) and operation is estimated to require a peak workforce of approximately 480 FTEs (an average of 300 FTEs). It is estimated that 90% of the construction and operation workforces will be sourced from NL. Approximately 65% will come from communities within the LAA/RAA (Chapter 15), although it is expected that all workers, regardless of whether they reside in the LAA/RAA communities, will stay at the accommodations camp for the duration of their shift and not commute to the Project site each day. Employees will work for two-week rotations, with a weekly rotation change of employees.

During construction and operation, workers will be accommodated at a 300-bed accommodations camp at the Project site. It is expected that the existing exploration camp will be refurbished and used for the



first six months of construction until the accommodations camp is operational, then maintained for overflow accommodations.

13.5.1.2 Residual Effects

It is expected that the construction labour force will primarily live in the accommodations camp at the Project site. As a result, Project workers will place limited demand on current housing and accommodations in the LAA/RAA. Construction workers will work for three weeks and have one week off. It is assumed that during their week off, workers will return to their home communities.

Some non-local construction workers or management staff may need or choose to stay in temporary accommodations in the LAA/RAA instead of the existing exploration camp, which would place limited additional demands on local available housing and accommodations. The LAA/RAA has 20 hotels / motels / bed-and-breakfasts / resorts / tourism operations, ranging from hotels and motels to seasonal camps, which have a total of 300 rooms. There are also more than 150 camp and RV sites in the LAA/RAA. In 2017, the vacancy rate for temporary accommodations was 46.3%, less than that for the province, indicating there is spare capacity for non-local workers if needed. In addition, the populations of all the communities within the LAA/RAA, with the exception of Grand Falls-Windsor, are decreasing, suggesting there is an excess of housing supply in the LAA/RAA.

Marathon is planning on constructing a 300-person capacity accommodations camp at the site, early in the construction phase, to allow accommodations for the peak construction period. The accommodations camp will house all workers during Project operation, including spare capacity for consultants, contractors, and other potential short-term requirements. With the accommodations camp capacity of 300, along with the existing exploration camp and additional temporary accommodations in the LAA/RAA, the operation and maintenance workforce is not likely to place additional demands on local housing and accommodations.

During decommissioning, rehabilitation and closure, non-local Project workers will likely have left the LAA/RAA, leading to a decrease in adverse effects on local housing and accommodations.

13.5.1.3 Summary

With the application of mitigation and management measures, particularly the use of an accommodations camp, residual adverse effects on housing and accommodations capacity during construction, operation decommissioning, rehabilitation and closure are predicted to be negligible, short to medium -term, occur in the LAA/RAA, be continuous and reversible, and occur in a resilient socio-economic context.

13.5.2 Change in Local Services and Infrastructure

13.5.2.1 Project Pathways

Effects on local services and infrastructure can result from a Project-related population increase during construction and operation, which would place additional demands on existing services and infrastructure, including health, emergency, education, recreation, transportation, and utilities. For instance, health care



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

and emergency services may be required by Project workers, and/or as a result of Project-related accidents or malfunctions, increasing the potential need for first responder and fire department services. Note that accidental events are assessed in Chapter 21.

Some Project-related activities during construction and operation would also place increased demands on local community services and infrastructure. The transportation of Project goods, services and workers could lead to additional use of existing transportation infrastructure. Greater traffic volumes along local road networks could increase travel times and the potential for accidents, which might place additional demands on local emergency services. In addition, the production of Project-related waste could place additional demand on local landfills.

13.5.2.2 Residual Effects

As described in Section 13.5.2.1, Project workers will live at the Project accommodations camp. A variety of services will be provided at the accommodations camp, and this will reduce additional demands on health, emergency, transportation, and recreation services and infrastructure, as well as utilities. For instance, the accommodations camp will provide catering for Project workers, as well as recreation opportunities, including a fitness centre.

Medical services will be provided through the on-site presence of a paramedic / nurse / ambulatory technician and an ambulance. As indicated in Table 13.5, Marathon will work to develop cooperative protocols with responsible agencies to address access of Project personnel to emergency and other medical services, including employee medicals and check-ups.

To further reduce demands on health care and emergency services and infrastructure, non-local Project workers will likely see health care providers in their hometowns during their off time. Security services at the Project site will also reduce demands on local police services, since the presence of on-site security officers will reduce the risk of crimes (e.g., trespassing, vandalism) at the Project site that would require police assistance.

Marathon will establish water and wastewater systems at the Project site that will not rely on LAA/RAA utility infrastructure. At the Project site and accommodations camp, sewage is to be collected via an underground sanitary sewer network to a common location, where it will be treated by an above-grade mechanical sewage treatment plant. The potable water treatment plant will meet Guidelines for Canadian Drinking Water Quality and be monitored in accordance with NL monitoring and reporting requirements. The Project will not place additional demands on existing water and sewer infrastructure in the LAA/RAA. Power for the Project will be provided via a 66 kilovolt High Voltage line to be constructed by NL Hydro from Star Lake to the main substation on the mine site. NL Hydro has confirmed that there is sufficient capacity in the generating system to supply the peak demand of 23 MW required for the Project.

With respect to Project-related waste materials (e.g., domestic waste, hazardous waste, recyclables), Marathon will follow the disposal guidelines outlined in the Project-specific Waste Management Plan:

- Solid waste will be transported from the site to be recycled, reused, or disposed of in licensed / approved facilities



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

- Non-reusable and non-recyclable wastes will be sent to the provincial waste management facility in Norris Arm
- Materials for recycling will be sent to the nearest management facility for each type of material

In 2016, the Norris Arm Waste Management Facility expanded its capacity to accept waste from Central Region communities for approximately 100 years, as well as from some communities within the Western Regional Service Board. With this expansion and the implementation of a Project-specific Waste Management Plan to reduce the amount of waste going to the landfill, the Project will not place additional demands on the local waste infrastructure beyond its capacity. In addition, waste oils, fuels and hazardous wastes will be safely managed (stored, handled and transported), as recommended by the suppliers and/or manufacturers and in compliance with applicable federal, provincial and municipal regulations.

It is unlikely that non-local construction workers will bring families with them for Project work because the construction phase will only last between 16 and 20 months. Therefore, it is not expected that schools in the LAA/RAA will see increased demand during the Project construction phase. During the operation phase, however, workers could bring families to live in the LAA/RAA since that phase will last for 12 years. The likelihood of this occurring is still considered low as local workers will live at the accommodations camp during their rotation. Operation workers who do not already reside in the LAA/RAA communities will likely return to their home communities during the off-time portion of their work rotation. In the event that non-local operation workers decide to move to LAA/RAA communities with families, there is spare capacity at LAA/RAA schools as enrolment within the Central NLESD is in decline.

During construction and operation, standard procedures, including traffic management and control, will be implemented to reduce traffic delays during construction. The Traffic Management Plan procedures will be developed during ongoing planning and engineering design and will address traffic staging to reduce delays. As with other community services and infrastructure, Marathon will continue to communicate with local communities and service providers with respect to scheduling so they may prepare for potential increased demands related to transportation.

Materials required for Project construction will be shipped to site by truck via an existing gravel access road from Millertown. Marathon plans to upgrade the road from a Class D gravel road to a Class A standard 7.3 m-wide driving surface, including ditching on both sides and cross drainage by culverts. This road will be maintained year-round by Marathon over the life of the Project. The access road is currently used by a number of cabin owners and land and resource users along Red Indian Lake and the improvement of the access road by Marathon will benefit these users through better access. During construction, it is estimated that traffic could include an average of six trucks per day for delivery of goods and a peak of 18 vehicles per day on staff rotation days (1- to 2-day period each week). During operation, estimated traffic on access roads is estimated to be five trucks per day and a peak of 10 vehicles per day on rotation change days. The Trans-Canada Highway (Route 1) and Highway 370 through the LAA/RAA are major transportation routes and capable of accommodating Project-related transportation demands. In 2019, upgrades were completed to sections of Route 1 through Grand Falls-Windsor, and these will continue into 2021. There are also plans to complete resurfacing upgrades to Highway 370 from Buchans Junction towards Buchans (NL Department of Transportation and Works 2019).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

As is common with roads in small rural communities in the province, some of the LAA/RAA roads have been identified for future upgrades and maintenance. Marathon will reduce the demands on transportation infrastructure by providing buses to move employees between local communities and the Project site. Because much of the workforce will already reside in the LAA/RAA communities and all workers will reside at the accommodations camp rather than commute to the Project site each day, workers will not create additional traffic on LAA/RAA roads. Scheduling of rotation changes so that the entire workforce does not arrive at or leave the Project on the same day (e.g., split shifts) will help reduce Project-related demands on roads on a given day.

During decommissioning, rehabilitation and closure, there will be a reduction in environmental effects on community services and infrastructure as a result of a reduction in demand on them from Project activities and as workers move away from the LAA/RAA due to diminishing employment. Additional demands that have been placed on most community services and infrastructure during operation will have been addressed prior to decommissioning. With respect to waste disposal, the removal and disposal of Project infrastructure during the decommissioning, rehabilitation and closure phase may place additional demands on the local landfill. However, while the current capacity of the landfill used by communities in the LAA is known, there is some uncertainty regarding usage rates over the next 15 years with potential improvements to the landfill and recycling technology and potential for demand to fluctuate. Marathon will consult with CNWM and develop a plan prior to decommissioning and closure to appropriately handle decommissioning waste. This plan will include consideration of local landfill capacity and measures to reduce unacceptable effects.

13.5.2.3 Summary

As described in Section 13.5.2.2, the Project will result in some positive effects on health and transportation services and infrastructure by potentially attracting new doctors to the LAA/RAA and through improvement of the existing access road, which is used by local cabin owners and land and resource users. With the application of mitigation and management measures, the residual adverse effects on the capacity of local services and infrastructure during all Project phases are predicted to be negligible to low in magnitude, occur in the short to medium-term, and continuous throughout construction, operation, and decommissioning, rehabilitation and closure. They are predicted to occur in the LAA/RAA in a socio-economic context that is resilient, and effects are likely to be reversed following decommissioning.

13.5.3 Summary of Project Residual Environmental Effects

The residual environmental effects on community services and infrastructure as a result of the Project are summarized in Table 13.6.

With the implementation of Project mitigation and management measures, residual effects on community services and infrastructure are expected to be of negligible to low magnitude, will occur in the LAA/RAA, be continuous for the short- to medium-term, and reversible. They will occur in a socio-economic context that is resilient.



Table 13.6 Project Residual Effects on Community Services and Infrastructure

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Local Housing and Accommodation	C	A	N	LAA/RAA	ST	C	R	R
	O	A	N	LAA/RAA	MT	C	R	R
	D	A	N	LAA/RAA	ST	C	R	R
Change in Local Services and Infrastructure	C	A	L	LAA/RAA	ST	C	R	R
	O	A	L	LAA/RAA	MT	C	R	R
	D	A	L	LAA/RAA	ST	C	R	R
<p>KEY See Table 13.2 for detailed definitions</p> <p>Project Phase C: Construction O: Operation D: Decommissioning</p> <p>Direction: N: Neutral P: Positive A: Adverse</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p> <p>Geographic Extent: PA: Project Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short-term MT: Medium-term LT: Long-term P: Permanent</p> <p>N/A: Not applicable</p> <p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological / Socio-Economic Context: R: Resilient NR: Not Resilient</p>								

13.6 DETERMINATION OF SIGNIFICANCE

A significant effect on community services and infrastructure is defined as one that results in demands on services or infrastructure above and beyond current capacity, such that standards of service are routinely and persistently reduced below current levels for an extended period such that they are unlikely to recover to existing conditions.

Because residual adverse effects on community services and infrastructure do not result in demands on services and infrastructure above and beyond current capacity such that standards of service are routinely and persistently reduced below current levels for an extended period, they are considered to be not significant for all phases of the Project.

With mitigation and management measures, the residual environmental effects on community services and infrastructure are predicted to be not significant.



13.7 PREDICTION CONFIDENCE

With the proposed mitigation and management measures, including implementation of normal planning procedures by the relevant authorities, and liaison between Marathon and those local authorities, the residual environmental effect of a change in capacity of community services and infrastructure has been determined with a high level of confidence.

13.8 PREDICTED FUTURE CONDITION OF THE ENVIRONMENT IF THE UNDERTAKING DOES NOT PROCEED

The Project is located in an area with a long history of mineral exploration and mining activity. With proven mineral reserves, should the Project not proceed it is likely that other mining proponents would secure interests in the area and seek to develop resources. It is anticipated that future projects would have similar effects as the Project on LAA/RAA community services and infrastructure. If no other mining proponents develop the resource, it is likely that the population of the smaller LAA/RAA communities would continue to decline, which would result in less investment in local community services and infrastructure.

13.9 FOLLOW-UP AND MONITORING

Government departments, public agencies, and private-sector companies that deliver community services and infrastructure will monitor the ongoing demand for community services as part of their normal planning practices. No follow-up and monitoring program is required.

13.10 REFERENCES

Baird Planning Associates. 2015. Badger Municipal Plan, 2015-2025. Available at:

<http://www.townofbadger.ca/wp-content/uploads/2015/03/BadgerMunicipalPlan.pdf>

Bryan, K. Staff Sergeant 'B' Division RCMP-GRC District Commander Grand Falls - Windsor, Springdale, Bay D'Espoir/ Conne River, & Harbour Breton Detachments, NL. Email, March 11, 2020.

Central Health. n.d. Health Services Areas. Available at: <https://www.centralhealth.nl.ca/hospitals-health-care-centres-long->

Central Health. 2017. Strategic Plan 2017-2020. Available at: https://eb6b7034-9bb0-4065-b31f-5109efcf9249.filesusr.com/ugd/d55165_0c044b0a12d0436892d3e53e350f4e1a.pdf

Central Health. 2019. 2018-2019 Annual Report. Available at: https://eb6b7034-9bb0-4065-b31f-5109efcf9249.filesusr.com/ugd/d55165_b16f4e60dd1c45dab950429988049cef.pdf

Central Training Academy. n.d. About us. Available at: <http://www.centraltraining.ca/index.html>

CIHI (Canadian Institute for Health Information). 2018. Supply, Distribution and Migration of Physicians in Canada. Available at: <https://secure.cihi.ca/estore/productSeries.htm?pc=PCC34>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Clendenning, C. Assistant Director of Engineering and Works, Town of Grand Falls-Windsor. E-mail, March 10, 2020.

CMHC (Canada Mortgage and Housing Corporation). 2018. Grand Falls-Windsor — Vacancy Rates by Bedroom Type by Zone. Available at: [https://www03.cmhc-schl.gc.ca/hmippimh/en/TableMapChart/Table?TableId=2.2.33&GeographyId=10&GeographyTypeId=2&DisplayAs=Table&GeographyName=Newfoundland%20and%20Labrador#TableMapChart/1006017/4/Grand%20Falls-Windsor%20\(T\)%20\(Newfoundland%20and%20Labrador\)](https://www03.cmhc-schl.gc.ca/hmippimh/en/TableMapChart/Table?TableId=2.2.33&GeographyId=10&GeographyTypeId=2&DisplayAs=Table&GeographyName=Newfoundland%20and%20Labrador#TableMapChart/1006017/4/Grand%20Falls-Windsor%20(T)%20(Newfoundland%20and%20Labrador))

CNA (College of the North Atlantic). 2018a. Employment OPTIONS office opens in Grand Falls-Windsor. Available at: <https://www.cna.nl.ca/news/news-article.aspx?messageid=1233>

CNA (College of the North Atlantic). 2018b. College of the North Atlantic Annual Report 2017-18. Available at: <https://www.cna.nl.ca/business-and-industry/pdfs/irp/annual-reports/2017-2018.pdf>

Corbett, D. Mayor, Town of Buchans. Email, March 10, 2020.

CRSB (Central Regional Service Board). 2019. 2018 Annual Report. Available at: <http://www.cnwmc.com/wp-content/uploads/2015/10/Central-Regional-Service-Board-Annual-Report-2018-.pdf>

Drover, R. Town Manager, Town of Bishop's Falls. Email, May 28, 2020.

EngageNL. 2018. Municipal Legislation Review, Public Engagement Discussion Guide. Available at: https://www.engagenl.ca/sites/default/files/discussion_guide_final_spring2018.pdf

Grand Falls-Windsor (Grand Falls-Windsor). n.d. Community Profile: Grand Falls-Windsor. Available at: https://grandfallswindsor.com/images/Grand_Falls-Windsor_Community_Profile.pdf

Grand Falls-Windsor (Grand Falls-Windsor) 2020a. History. Available at: <https://grandfallswindsor.com/living/relocating-here/history.html>

Grand Falls-Windsor (Grand Falls-Windsor) 2020b. Contact the Town. Available at: <https://grandfallswindsor.com/contact-us.html>.

Grand Falls-Windsor (Grand Falls-Windsor) 2020c. Education and Childcare. Available at: <https://grandfallswindsor.com/business-directory/education.html>

Grand Falls-Windsor Fire Department (Grand Falls-Windsor Fire Department). 2008. Welcome. Available at: <http://gfwfire.com/>

Heath, B. Local Service District Committee for Buchans Junction, email June 11, 2020.

Hickey, S. 2010. New Facility to be Operational in 2011: Next Stage in Waste Management. Article in The Telegram. Available at: <https://www.pressreader.com/canada/the-telegram-st-johns/20101223/281689726239878>

Humber, F. Mayor, Town of Millertown. Draft Proposal for Central Health, February 2020.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

Hurley, P. Town Manager, Town of Badger, email June 8, 2020.

NLDHCS (Newfoundland and Labrador Department of Health and Community Services) and NLDTW (Newfoundland Department of Transportation and Works). 2019. Construction to Start on Long-Term Care Homes for Central Newfoundland this Summer. Press Release, April 12, 2019. Available at: <https://www.gov.nl.ca/releases/2019/health/0412n04/>

NL Department of Education. 2020. Education Statistics. Available at: <https://www.gov.nl.ca/eecd/publications/k12/stats/#2020>

NL Department of Finance. 2018. The Economy 2018. Available at: <https://www.gov.nl.ca/fin/files/e2018-theeconomy2018.pdf>

NL Department of Justice and Public Safety. 2020. Institutional Services. Available at: <https://www.gov.nl.ca/jps/corrections/institutional-services/>

NL Department of Municipal Affairs. 2020. Newfoundland and Labrador Water Resources Portal. Available at: <https://maps.gov.nl.ca/water/reports/getreport.aspx?reportid=1013>

NL Department of Municipal Affairs. 2019. Newfoundland and Labrador Drinking Water Treatment Plants – 2019. Available at: https://www.mae.gov.nl.ca/waterres/PDF/WTP_Inventory.pdf

NL Department of Municipal Affairs. 2017. Newfoundland and Labrador Wastewater Treatment Facilities – 2017. Available at: https://www.mae.gov.nl.ca/waterres/waste/pdf/nl_wwtp.pdf

NL Department of Municipal Affairs. 2012. Central Newfoundland Waste Management Facility Officially Opens in Norris Arm; Federal and Provincial Partnership to Benefit Central Region. Available at: <https://www.releases.gov.nl.ca/releases/2012/ma/0629n07.htm>

NL Department of Transportation and Works. 2019. Five-Year Provincial Roads Plan – 2019 Edition. Available at: https://www.roads.gov.nl.ca/Transportation_Roads_Plan_2019.pdf. NLMA (Newfoundland and Labrador Medical Association). n.d. Department of Health and Community Services Ambulance Listing. Available at: https://www.nlma.nl.ca/FileManager/NLMA-Consultation-on-Safe--Sustainable-Health-Care-/docs/Ambulance_Profile_NL.pdf

NL Hydro. 2020. Hydro Generation. Available at: <https://nlhydro.com/operations/hydro-generation/>

NL Statistics Agency. 2019. Newfoundland and Labrador Community Accounts. Available at: <https://nl.communityaccounts.ca/default.asp>

NL Tourism (Newfoundland Tourism). n.d. Lakeview Inn. Available at: <https://www.newfoundlandlabrador.com/plan-and-book/accommodations/10229731>

SaltWire Network. 2017. Firefighting Upgrade. Available at: <https://www.saltwire.com/news/local/firefighting-upgrade-45646/?location=central-newfoundland>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Services and Infrastructure
September 2020

SNC Lavalin. 2018. Environmental Assessment Registration, Grand Falls-Windsor Wastewater Treatment Facility Expansion. Prepared for Department of Environment and Climate Change. Available at: https://www.mae.gov.nl.ca/env_assessment/projects/Y2018/1986/1986_reg_gfw_wwtf%20expansion.pdf

Statistics Canada. 2020. Crime severity index and weighted clearance rates, police services in the Atlantic provinces. Available at: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3510018601&pickMembers%5B0%5D=1.283>

Statistics Canada. 2017. Census Profiles, 2016 Census. Available at: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>

TCII (Tourism, Culture, Industry and Innovation). 2018. Provincial Occupancy Rates by Region, 2017. Available at: https://www.gov.nl.ca/tcii/files/Provincial_Occupancy_Rates_by_Region_2017.pdf

TCII (Tourism, Culture, Industry and Innovation). 2017. Provincial Occupancy Rates by Region, 2016. Available at: https://www.gov.nl.ca/tcii/files/Provincial_Occupancy_Rates_by_Region_2016.pdf

Town of Badger. 2020. The Town of Badger. Available at: <http://www.townofbadger.ca/>

Town of Buchans. 2018. Welcome to the Town of Buchans. Available at: <https://www.townofbuchans.com/>

Town of Millertown. n.d. About. Available at: <https://www.townofmillertown.com/>

Tract. 2016. Town of Bishop's Falls Municipal Plan 2015-2025. Available at: https://www.bishopsfalls.ca/UserFiles/Servers/Server_9965232/File/2015-2025%20Municipal%20Plan.pdf

Water Canada. 2017. Water System in Millertown, N.L. Receives Investment for Upgrades. Available at: <https://www.watercanada.net/water-system-in-millertown-n-l-receives-investment-for-upgrades/>



14.0 COMMUNITY HEALTH

14.1 SCOPE OF ASSESSMENT

Community health encompasses community well-being, which is affected by a variety of factors, including residents' access to health services and infrastructure, ability to conduct daily activities, and participation in employment and business opportunities. It also includes physical health, which may be affected by Project-related emissions to the air, soil, and water. Discharges to the environment may affect the quality and/or perception of the quality of country foods leading to a decrease in consumption, which may also affect well-being. For the purpose of this assessment, country foods is defined as all foods sourced outside of commercial food systems, including any food that is trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes outside of the commercial food chain (some stakeholders also refer to this as "traditional foods").

Community health was selected as a valued component (VC) as it is important to community members, government and stakeholders. Health and well-being are integral to population stability and maintaining or improving population health can prevent the need for investments in more costly medical interventions. The presence of the Project workforce could adversely affect the well-being of residents in communities close to the Project by altering demographics and disrupting community life. The health of Project workers could also be affected while on the job or as members of the local community (i.e., for local community residents who are employed by the Project). However, the Project may also contribute to positive effects on community well-being through employment and business opportunities, as well as other economic benefits (e.g., government revenue used, in part, to support social programs).

The assessment of community health is linked with the assessment of environmental effects for several other VCs:

- Atmospheric Environment (Chapter 5) and Surface Water Resources (Chapter 7) with respect to potential Project effects on the viability and perceived quality of country foods
- Community Services and Infrastructure (Chapter 13) with respect to potential Project effects on community services and infrastructure, which in turn can affect community well-being
- Employment and Economy (Chapter 15) with respect to employment and business opportunities and associated income
- Land and Resource Use (Chapter 16) with respect to changes in recreational patterns and country foods consumption and other Project effects that could alter land use, such as light and sound emissions and changes in the landscape
- Indigenous Groups (Chapter 17) with respect to the assessment of the effects of the Project on Indigenous groups, considering the current use of lands and resources for traditional purposes, change in health conditions, and change in socio-economic conditions
- Dam Infrastructure (Chapter 19) with respect to effects of vibrations or accidental events (e.g., Project dam failure) (Chapter 21) caused by the Project on dam infrastructure in the vicinity of the Project and subsequent downstream effects on public health and safety



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

The Project Description (Section 2.2.5) addresses the health and safety of Project workers while on the job. Accidental Events (Chapter 21) addresses both public and worker health and safety related to potential accidental events.

While Chapter 17 addresses potential effects of the Project specifically on the health of Indigenous groups, this chapter assesses Project-related effects on the well-being of local communities, which can include both Indigenous and non-Indigenous residents.

14.1.1 Regulatory and Policy Setting

In addition to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and the Newfoundland and Labrador *Environmental Protection Act* (NL EPA), the Project is subject to other federal and provincial legislation, policies and guidance. This section identifies the primary regulatory requirements and policies of the federal and provincial authorities which influence the scope of the assessment on community health.

The Provincial Environmental Impact Statement (EIS) Guidelines (Appendix 1B) issued for the Project require that a description of the existing environment include population health status. This includes a variety of topics, such as demographics, rates of chronic disease, communicable disease and rates of substance abuse. The Provincial EIS Guidelines (Appendix 1B) also require an assessment of population health.

The Federal EIS Guidelines (Appendix 1A) require consideration of effects on the human environment, including “socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities”.

For Indigenous groups, the Federal EIS Guidelines (Appendix 1A) require baseline information on health, including the state of physical, mental, and social well-being, as well as an assessment of Project effects on the health of Indigenous peoples. The assessment of potential change in health conditions of Indigenous groups is provided in Chapter 17 (Indigenous Groups).

The provision and management of health services, programs, and infrastructure fall under provincial jurisdiction in NL. Health services, programs, and infrastructure for Indigenous groups in the province are provided by federal, provincial, and municipal agencies, private businesses, First Nations governments, and service agencies in the communities and regions where they reside.

The provincial and federal regulatory requirements relevant to air and sound emissions and discharges to surface water from the Project (and thus relevant to community health) are described in Chapters 5 (Atmospheric Environment) and 7 (Surface Water Resources), respectively.

14.1.2 The Influence of Engagement on the Assessment

As part of ongoing engagement and consultation activities, Marathon has documented interests and concerns about the Project received from communities, governments, Indigenous groups and



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

stakeholders. An overview of Marathon's engagement activities is provided in Chapter 3. Documented interests and concerns have influenced the design and operational plans for the Project and the development of the EIS, including the scope of assessment of the VCs. Interests and concerns noted that relate to community health (which includes potential effects on country foods) or routine Project activities that could affect community health are provided below. Issues and concerns related to potential accidents or malfunctions are described in the assessment of accidental events (Chapter 21).

Questions and concerns raised by Qalipu through Marathon's engagement efforts include:

- Processing onsite, including the use of cyanide and the heap leach process
- Decommissioning, rehabilitation and closure of the Project, including disposition of camp infrastructure at end of mine life and ensuring remediation of the Project Area takes place
- Atmospheric environment including the potential impact of tree clearing and increased emissions on air quality
- Water quality and water treatment
- Interference with fish and fish habitat through use of culverts on water courses
- Limitation of access to lands and resources for traditional use
- Interest in involvement in the environmental monitoring for the Project

Questions and concerns raised by Miawpukek through Marathon's engagement efforts include:

- The impact of COVID-19 on the Project
- The need for treatment to protect water quality
- Tailings, including questions about treatment, accidental events, and rehabilitation and closure
- Acknowledgement that interests of Miawpukek extend beyond caribou and include plants and waterfowl
- Potential impacts on pine marten and caribou migration as a result of increased industrial activity in the Central Region, and potential impacts of the Project on moose and salmon
- Potential impact on Miawpukek land and resource use
- Interest in involvement in environmental monitoring for the Project

Questions and concerns raised by communities and other stakeholders through Marathon's engagement efforts include:

- Tailings and potential risks, including how tailings will be managed, the treatment of effluent, understanding "detox tailings", the consideration of use of a geo-membrane liner, potential impact of the tailings pond and polishing pond on water resources, and the long-term plan [closure] for the tailings pond
- The supply of medical services to mine personnel and plans for medical services on-site
- Impact of Covid 19 to the overall Project schedule and impact on exploration drilling
- Air quality including dust, and specifically dust from tailings
- Potential long-term effects of the Project on fish and wildlife and downstream effects on tourism, and concerns related to the allotment of Project profits being set aside for harm prevention and remediation of the area
- Impacts of the Project to caribou and on moose hunting in the area



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

Questions and concerns raised by fish and wildlife and civil society organizations through Marathon's engagement efforts include:

- Project description, including the size of the Project footprint, pit stability, the source of power for the Project, use of cyanide, the process that will replace the heap leach process, how tailings will be transported, and tailings management (and consideration of alternatives)
- Caribou including understanding the information provided by the Province of NL, the collection of caribou data by Marathon, and the potential impact of noise and waste rock and interference with caribou migration
- Water quality including the potential for contamination, the potential for acid rock drainage, and the need for the protection of small ponds near the Project Area

14.1.3 Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographical extent of potential effects) and temporal boundaries (i.e., timing of potential effects). Spatial boundaries for community health were selected in consideration of the geographic extent over which Project activities, and their effects, are likely to occur on the VC. Temporal boundaries were based on the timing and duration of Project activities and the nature of the interactions with the VC. The spatial and temporal boundaries associated with the effects assessment for community health are described in the following sections.

14.1.3.1 Spatial Boundaries

The following spatial boundaries were used to assess Project effects, including residual environmental effects, on community health in areas surrounding the mine site and access road (Figure 14-1).

Project Area: The Project Area encompasses the immediate area in which Project activities and components occur and is comprised of two distinct areas: the mine site and the access road. The mine site includes the area within which Project infrastructure will be located, and the access road is the existing road to the site, plus a 20 metre (m) wide buffer on either side. The Project Area is the anticipated area of direct physical disturbance associated with the construction, operation and decommissioning, rehabilitation and closure of the Project.

Local Assessment Area (LAA) / Regional Assessment Area (RAA): The LAA/RAA for community health includes those communities where the Project workforce may live and/or use health services and infrastructure. Based on their proximity to the Project, this includes the Town of Buchans, the Local Service District of Buchans Junction, the Town of Millertown, the Town of Badger, the Town of Grand-Falls Windsor, and the Town of Bishop's Falls (Figure 14-1). For the assessment of Project effects for community health, the RAA and LAA share the same geographic boundaries as the communities potentially affected by residual effects of the Project, cumulative effects (Chapter 20) and the effects of an accidental event or malfunction (Chapter 21) are the same. They are collectively referred to as the LAA/RAA in this VC.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

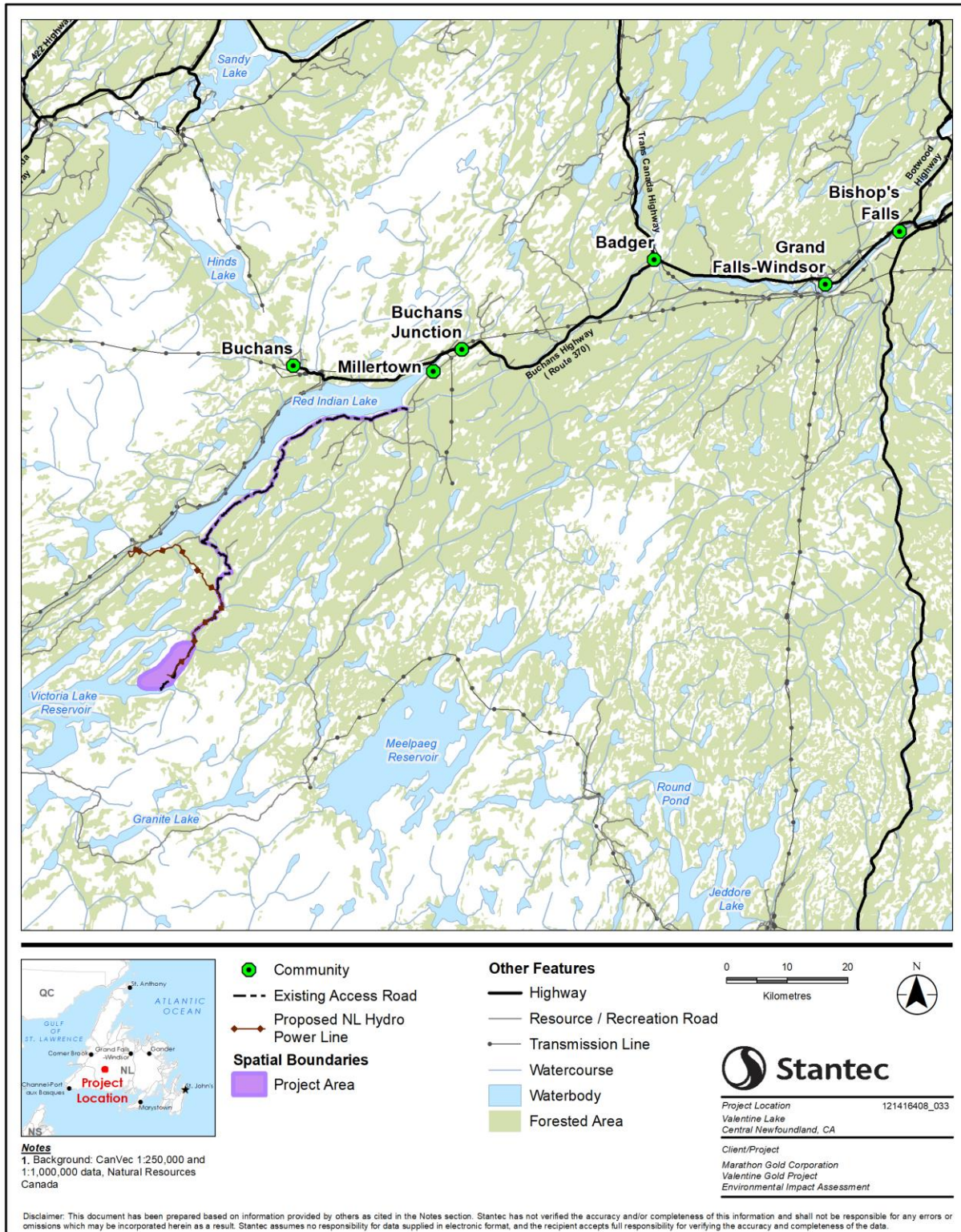


Figure 14-1 Communities in the LAA/RAA for Community Health



Baseline information has been drawn from Chapters 15 (Employment and Economy) and 17 (Indigenous Groups), which have LAAs and RAAs that differ from those for the Community Health VC. However, the assessment of community health considers the effects of the Project on the health and well-being of the residents, both Indigenous and non-Indigenous, of the communities within the LAA/RAA for this chapter.

14.1.3.2 Temporal Boundaries

The temporal boundaries for the assessment of potential effects on the Community Health VC include:

- Construction Phase –16 to 20 months, beginning in Q4 2021, with 90% of activities occurring in 2022
- Operation Phase – Estimated 12-year operation, with commissioning / start-up and mine / mill operation slated to start Q2 2023
- Decommissioning, Rehabilitation and Closure Phase – Closure rehabilitation to occur once it is no longer economical to mine or resources are exhausted

14.2 EXISTING CONDITIONS FOR COMMUNITY HEALTH

A characterization of the existing conditions within the spatial boundaries defined in Section 14.1.3 is provided in the following sections. This includes a discussion of the influences of past and present physical activities on the VC, leading to the current conditions. An understanding of the existing conditions for the VC within the spatial area being assessed is a key requirement in the prediction of potential Project effects in Section 14.5.

14.2.1 Methods

Information on existing conditions in the LAA/RAA was collected through secondary research from publicly available data and literature, as well as primary and secondary data provided to Marathon from Indigenous groups and local communities. Data sources used to describe existing conditions include:

- Government sources, including Statistics Canada (i.e., Community Profiles and the Canadian Community Health Survey [CCHS]), the Newfoundland and Labrador (NL) Statistics Agency, and health authorities
- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)'s Community Well-being (CWB) Index
- Community profiles from municipal sources
- Conversations with municipal representatives
- Results from engagement with Indigenous groups, communities and stakeholder groups
- Information from past research, publications, and assessments conducted in the region

14.2.1.1 Quality and Reliability of Secondary Information

Secondary information used to describe existing conditions is of sufficient quality and reliability to accurately inform the assessment of potential residual and cumulative effects on community health. Known quality / reliability issues include:



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

- **Data suppression** - Statistics Canada regularly suppresses (i.e., selectively does not disclose) survey information to protect the identity of individuals and to address data quality issues. Both the 2011 National Household Survey (NHS) and 2016 Census of the Population (Census) are subject, in part, to data suppression by Statistics Canada. Due to this suppression, data taken from the 2011 NHS are underrepresented, a factor that is considered in the presentation of information in the existing conditions and assessment.
- **CWB Index limitations** - The CIRNAC CWB Index measures socio-economic wellbeing for individual communities across Canada and is the only published index that provides comparability across Census Subdivisions (CSDs) in Canada for which data are publicly available. A community will not appear in the 2016 CWB index database if it has fewer than 65 people, there are data quality issues, or was not fully enumerated in the census.
- **CCHS limitations** - Published annually, the CCHS provides estimates of various health characteristics at the national, provincial, census metropolitan area, and population center geographical level. Publicly available information at the community or CSD level is not available. Information is collected for the portion of the population aged 12 years and older.
- **Timeliness of information** – While information taken from the 2016 Census is the most up-to-date and comparable source of population and demographic information for LAA/RAA communities, information may not exactly represent existing (i.e., 2020) conditions. Other sources of data (e.g., industry and service provider reports and publications) are also subject to this quality consideration.
- **Purpose of publication** – Most of the secondary sources used to describe existing conditions were created for purposes other than describing existing conditions within environmental assessments (EAs). This may affect the reliability of information drawn from these sources.

14.2.2 Overview

14.2.2.1 Demographic and Economic Overview

The Project is located in the Central Region of NL (Central Newfoundland). The economy of Central Newfoundland was built on natural resource-based industries, particularly forestry and mining. Logging has taken place in the region since the turn of the century; however, with the closing of Abitibi-Bowater Inc.'s pulp and paper mill in Grand Falls-Windsor in 2009, forestry in the area has decreased. The communities closest to the Project, Buchans, Buchans Junction and Millertown, were founded in the early 1900s in support of mining and logging activities in the area and continued to support these industries until the 1980s.

Two First Nation groups in NL have been identified for consideration in this assessment by the Federal EIS Guidelines (Appendix 1A): Miawpukek First Nation (Miawpukek) and Qalipu First Nation (Qalipu). Miawpukek (Conne River) reserve is approximately 113 km from the Project Area and is located outside of the LAA/RAA for Community Health. Qalipu does not have reserve lands and is known as a "landless band". The main office for the Qalipu is in Corner Brook and is approximately 78 km from the Project Area, with administrative offices located in other communities across the central and western parts of the Island of Newfoundland. Qalipu members reside in 67 communities across the Island. Most Miawpukek members reside outside the Miawpukek reserve. As members of Qalipu and Miawpukek reside in communities in the LAA/RAA, the discussion of community health in relation to non-Indigenous



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

individuals in these communities would be generally applicable to those members of Qalipu and Miawpukek. A discussion of health and socio-economic conditions specific to both the Qalipu and Miawpukek is included in Chapter 17 (Indigenous Groups).

In 2016, the total population of the LAA/RAA was 38,340 (51.8% female) (Statistics Canada 2017, 2018). Within the LAA/RAA, Grand Falls-Windsor accounted for 37.0% of the total population (14,171 people). Approximately 6.2% or 2,360 people (52.3% female) within the LAA/RAA identified as Indigenous, compared to the provincial average of 8.8%.

The total size of the LAA/RAA labour force was 17,785 (49.6% female) (Statistics Canada 2017, 2018). Of the total LAA/RAA labour force, 6.5% identified as Indigenous (1,155 people, of whom 50.2% were female). Unemployment rates across the total and Indigenous component of the LAA/RAA labour force (15.6% and 21.6% respectively) were similar to provincial averages (15.6% and 21.4% respectively). More detailed descriptions of demographics and the economy of the LAA/RAA, as well as Indigenous groups in the LAA/RAA, are included in Chapters 15 (Employment and Economy) and 17 (Indigenous Groups).

14.2.2.2 Educational Attainment and Services and Infrastructure

The LAA/RAA communities are within the Central NL English School District, which accounts for 79 of the 260 provincial schools and 22.1% (14,099) of the 63,772 total provincial enrolments for 2019-20. Student enrolment within the Central NL English School District is in decline; enrolment among Full-time Equivalent Pupils fell 8.3% from 2016-17 to 2019-2020 (NL Department of Education 2020).

In general, educational attainment (e.g., secondary and post-secondary education) was similar in the LAA/RAA to the rest of the province. Within the LAA/RAA, 50.2% of the total population and 51.9% of the Indigenous population had completed post-secondary education compared to provincial averages of 51.6% and 49.5%, respectively (Statistics Canada 2017, 2018).

Overall, females within the LAA/RAA accounted for a greater proportion of the total population with a college or university certificate, diploma or degree (59.2% of the population), while males generally accounted for a greater proportion of the population with an apprenticeship or trades certificate or diploma (50.1% of the population). Among the Indigenous population of the LAA/RAA, females accounted for a greater proportion of the population with a college certificate or diploma (59.0% of the population), while males accounted for a greater proportion of persons with a university certificate, diploma or degree (64.0% of the population).

More detail on the education services and infrastructure and educational attainment in the LAA/RAA is provided in Chapters 13 and 15, respectively.

14.2.2.3 Housing Availability and Affordability

A detailed description of housing and accommodations is available in Chapter 13. Information on inventory, average home costs, and subsidized housing is summarized in Table 14.1.



Table 14.1 Housing, LAA/RAA, 2016

Town	Number of Private Dwellings	Average House Cost	Average Monthly Rent	Subsidized Housing Units
Grand Falls-Windsor	6,406	\$217,610	\$759	482
Badger	325	\$143,230	\$736	7
Buchans	417	\$80,109	\$603	0
Buchans Junction	54	\$94,999	-	0
Bishop's Falls	1,502	\$165,864	\$787	81
Millertown	66	\$71,224	-	3

Source: Statistics Canada 2017

Within the LAA/RAA, there was a total of 8,770 private dwellings in 2016, 73% of which were in Grand Falls-Windsor. The average cost of a home was highest in Grand Falls-Windsor at \$217,610, which was lower than the average for the province at \$243,157 (Statistics Canada 2017). Average monthly rent was highest in Bishop's Falls in 2016 at \$787 (compared to \$836 in the province).

The Newfoundland and Labrador Housing Corporation (NLHC) administers social housing programs in NL. NLHC owns and administers approximately 5,560 social housing units throughout various regions of the province, with the greatest concentration of units located in St. John's (3,192) and Corner Brook (802). There are an estimated 14,000 individuals housed in NLHC units under this program. In the LAA/RAA, there are 573 subsidized housing units (NLHC 2020).

14.2.2.4 Health Care

Bishop's Falls, Grand Falls-Windsor, Badger, Buchans, Buchans Junction, and Millertown fall within the area serviced by NL's Central Integrated Regional Health Authority (Central Health). Central Health provides health and community services to 177 communities and approximately 20% of the provincial population (Central Health n.d.). In 2019, Central Health had 262 acute care beds, two regional referral centres, nine health centres, 23 community health facilities, and 11 long-term care facilities (Central Health 2017, 2019).

In 2014, there were 116 family medicine practitioners in the Central Health region. This had fallen 1.7% by 2018 to 114. The number of specialists in the region increased 2.9% between 2014 and 2018 from 70 to 72. In 2018, Central Health had 123 family medicine physicians and 78 specialists per 100,000 population. The Province had 138 family medicine physicians and 132 specialists per 100,000 population in 2018 (CIHI 2018).

Central Health works closely with officials from the Department of Health and Community Services on a variety of initiatives, including chronic disease self-management, waitlist management, healthy public policy, and provincial strategy development. It maintains a close working relationship with the other regional health authorities in the province and collaborates on projects of mutual benefit.

Recruitment and retention of family physicians and specialists has been a challenge for Central Health. Central Health is currently the largest teaching region outside of St. John's. Each year, six family



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

medicine residents are matched to Memorial University's Central Stream where residents come to work with the Health Region for two years. This has proven to be an effective recruitment strategy for Central Health Family Medicine physicians. Central Health continues to work with the Department of Health and Community Services and the other Regional Health Authorities to explore successful recruitment and retention strategies (Central Health 2019).

The Central Newfoundland Regional Health Centre services Grand Falls-Windsor and neighboring communities. Residents of Badger and Bishop's Falls, for instance, rely on the Health Centre for medical services (Drover, R. pers. comm., 2020). It has approximately 130 acute care beds and 15 transitional long-term care beds. The Health Centre has 45 physicians, 26 of whom are specialists, and 24-hour emergency services. Specialty services offered at the Health Centre include radiology, psychiatry, pathology, and general surgery (Central Health n.d.). Within the LAA/RAA, ambulance services are based in Grand Falls-Windsor and Buchans.

The only health care facility in Buchans is the A.M. Guy Memorial Health Centre, which has 22 beds. The facility services the local community, as well as residents of Millertown and Buchans Junction. There is one full-time doctor at this facility. Available services include physician and nurse practitioner clinics, outpatient and 24-hour emergency services, 24-hour ambulance services, chemotherapy, laboratory and diagnostic imaging services, and other public health services (Central Health n.d.). In general, the clinic can handle the existing demand for service (Corbett, D. pers. comm. 2020).

14.2.2.5 Self-Reported Health Characteristics

Table 14.2 compares a selection of available health characteristics taken from Statistics Canada's CCHS for the Central Health Region, where LAA/RAA communities are located, and for NL. Indicators presented in Table 14.2 were chosen by considering:

- the ultimate goal of a healthy population, defined broadly as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO 2008)
- potential effects of the Project on local communities, especially those related to the presence of temporary, non-local Project workers (e.g., sense of social connectivity, life stress, and life satisfaction)
- requirements outlined in the Provincial EIS Guidelines (Appendix 1B)

Table 14.2 Health Characteristics, Newfoundland and Labrador and Central Health Region, 2017/2018

Health Characteristic	Newfoundland and Labrador			Central Health Region		
	Total	Male	Female	Total	Male	Female
General Health Indicator (%)						
Perceived health (very good or excellent)	61.1	58.5	63.6	63.4	64.6	62.2
Has a regular healthcare provider	87.0	84.0	89.8	87.4	87.1	87.6



Table 14.2 Health Characteristics, Newfoundland and Labrador and Central Health Region, 2017/2018

Health Characteristic	Newfoundland and Labrador			Central Health Region		
	Total	Male	Female	Total	Male	Female
Mental Health Status (%)						
Perceived mental health (very good or excellent)	69.1	71.4	67.1	72.2	72.0	72.4
Sense of community belonging (very strong or somewhat strong)	77.7	76.9	78.6	81.7	82.6	80.9
Perceived life stress (Population aged 12 and over who reported perceiving that most days in their life were quite a bit or extremely stressful)	14.9	13.0	16.7	13.5	12.2	14.7
Life satisfaction (satisfied or very satisfied)	92.5	92.4	92.6	92.6	92.0	93.2
Rates of Chronic Disease (%)						
Arthritis (15 years and over)	27.2	22.7	31.4	29.8	26.2	33.2
Diabetes	9.0	9.4	8.7	12.2	12.2	12.2
Asthma	7.1	4.9	9.3	8.8	5.7	11.7
Chronic obstructive pulmonary disease (35 years and over)	5.9	6.4	5.4	4.4	3.7	5.0
High blood pressure	23.3	24.6	22.0	29.8	31.3	28.4
Rates of Substance Abuse and Healthy Living Indicators (%)						
Current smoker, daily or occasional	20.8	24.2	17.6	16.6	16.9	16.2
Heavy drinking	26.7	34.8	18.8	22.6	29.5	15.9
Physical activity, 150 minutes per week, adult (18 years and over)	49.4	51.4	47.4	44.2	45.0	43.4
Physical activity, average 60 minutes per day, youth (12 to 17 years old)	51.1	56.6	45.6	53.5	54.7	52.3
Source: Statistics Canada 2020						

Rates of Chronic Disease

The province of NL has some of the highest rates of chronic disease in Canada. In 2017, 63% of NL residents over the age of 12 had at least one chronic disease, such as diabetes, heart disease, or chronic obstructive pulmonary disease (NL Department of Health and Community Services 2019a).

The Central Health Region showed higher rates of arthritis, diabetes, asthma, and high blood pressure than the province. Rates of pulmonary disease were higher in the province at 5.9% of the population than in the Central Health Region (4.4%). In the Central Health Region, females had higher rates of chronic



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

disease than males in most instances (other than high blood pressure). Males and females in the Central Health Region had the same rate of diabetes in 2017-2018 (at 12.2%) (Statistics Canada 2020).

Rates of Disability

The Canadian Survey on Disability provides information about youth and adults in Canada whose everyday activities are limited due to long term conditions or health-related problems (Statistics Canada 2019a). According to the Canadian Survey on Disability, there were 101,580 people aged 15 years and over in NL in 2017 who reported having a disability. This represented 23.6% of the provincial population. Of the total persons with disabilities, 21.6% were male and 25.5% were female. The highest proportion of the population reporting to have a disability in 2017 were over the age of 65 (NL Statistics Agency 2019a).

Mental Health Status

In 2017-2018, 72.2% of Central Health residents perceived their mental health to be very good or excellent, which was slightly higher than 69.1% of the NL population. In the Central Health Region, more females than males felt they had very good or excellent mental health, however, this was the opposite amongst the provincial population. At 81.7%, the sense of community belonging was higher in the Central Health Region than in the province (77.7%) and perceived life stress was slightly lower in the Central Health Region (13.5%) than that for the province (14.9%). Life satisfaction was similar in both geographies (92.6% in Central Health and 92.5% in NL) (Statistics Canada 2020).

Rates of Substance Abuse and Healthy Living Indicators

Rates of smoking and alcohol consumption were higher in the province than in the Central Health Region in 2017-2018. Just over 20% of the provincial population smoked daily or occasionally versus 16.6% of the Central Health Region. Heavy drinking was common among more than a quarter of NL's population (26.7%) and more than one fifth (22.6%) of Central Health's population. Alcohol consumption and smoking are more prevalent among males than females in both geographies.

Roughly 50% of adults and youth in the province participated in physical activity (150 and 60 minutes per week, respectively). More youth and fewer adults in the Central Health Region participated in physical activity each week than in NL. In both the province and the Central Health Region males were more physically active than females (Statistics Canada 2020).

14.2.2.6 Communicable Disease

The province's Department of Health and Community Services is responsible for health protection of the population of NL through the prevention and control of communicable disease. This involves surveillance and reporting of disease, disease control programs including immunization, infection prevention and control and disease control recommendations. Central Health's Infection Prevention and Control team aims to promote infection prevention and control practices, protect patients, residents, clients and staff from healthcare-associated infections, and provide education to employees to assist with preventing the spread of infections within Central Health (Central Health n.d.).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

Current statistics on rates of most communicable diseases are not readily available for the Central Health Region; however, some data are available on rates of influenza. During the 2018/19 season there were 1,033 laboratory-confirmed cases of influenza in NL. Of these cases there were 270 hospitalizations, 63 intensive care unit admissions and 27 influenza-related deaths. Central Health had 136 confirmed cases of influenza (13.2% of the total cases in the province) or a rate of 1 per 100,000 population (NL Department of Health and Community Services 2019b).

Table 14.3 shows the number of cases of communicable disease by disease class in the Central Health region and the province in 2016. Sexually transmitted and bloodborne pathogens were the most prevalent type of communicable disease in the province in 2016. Central Health had 7.3% of the total of these cases in 2016. The second most prevalent category of communicable disease in the province in 2016 was vaccine preventable disease; NL had 217 cases of which Central Health had 18 cases (8.3%) (NL Department of Health and Community Services 2016).

Table 14.3 Communicable Diseases, Province and Central Health, 2016

Disease Class	Newfoundland and Labrador	Central Health	Central Health Cases as Percentage of Province
Enteric, Food and Waterborne (e.g., botulism, hepatitis A, listeriosis)	128	26	20.3
Diseases Transmitted by Direct Contact and Respiratory Route (e.g., influenza virus of a novel strain, meningitis, tuberculosis)	58	4	6.9
Sexually Transmitted and Bloodborne Pathogens (e.g., chlamydia, gonorrhoea, HIV infection)	1,210	88	7.3
Vectorborne and Other Zoonotic Diseases (e.g., Lyme disease, malaria, rabies)	4	1	25.0
Vaccine Preventable (e.g., chickenpox, hepatitis B, measles)	217	18	8.3
Source: NL Department of Health and Community Services 2016			

On March 11, 2020, the World Health Organization (WHO) characterized COVID-19 as a pandemic (WHO 2020). As of September 13, 2020, NL had reported 271 cases of COVID-19, 12 (4.4%) of which were located in the Central Health Region. Within the Central Health Region, only one case was located in the LAA/RAA (Grand Falls-Windsor) (Government of NL 2020a).

In response to the pandemic, the Government of NL has implemented a number of health orders and guidelines, including travel restrictions, physical distancing measures, and policies on mask wearing in public spaces (Government of NL 2020b).



14.2.2.7 Crime and Family Violence

Safe social environments in which community members feel connected foster positive health status (WHO 2008). Crime can adversely affect health due to violence and through use of illicit drugs, by increasing stress and anxiety as a response to real or perceived risk and by creating barriers for social interactions, thereby decreasing social cohesion within a community (Ruijsbroek et al. 2015).

Policing services in the LAA/RAA are provided by the Royal Canadian Mounted Police (RCMP). The RCMP operates a detachment in Grand Falls-Windsor, which provides service to Badger, Buchans, Buchans Junction, Bishop's Falls, and Millertown, in addition to other communities. Grand Falls-Windsor also has Municipal Enforcement Officers who assist the RCMP. Police services and infrastructure in the LAA/RAA are described in greater detail in Chapter 13. An overview of rates of criminal code violations and family violence in the LAA/RAA are provided below.

Between 2014 and 2018, the total number of violent criminal code violations (e.g., murder, manslaughter, sexual assault, criminal harassment) in the Grand Falls-Windsor RCMP District increased 18.8% from 425 to 505. In NL, the number of violent criminal code violations increased 6% between 2014 and 2018, from 6,650 to 7,050. In 2018, the ratio of violent crimes within the Grand Falls-Windsor RCMP district to that of the province (calculated by dividing the offence rate per 1,000 for a specific geography by the offence rate per 1,000 for the province) was 0.94 (NL Statistics Agency 2019b).

Family violence is any form of abuse or neglect that a child or adult experiences from a family member, or from someone with whom they have an intimate relationship. It is an abuse of power by one person to hurt and control someone who trusts and depends on them (Public Health Agency of Canada [PHAC] 2013). In NL in 2018, the number of police-reported child and youth family violence victims increased 3.0% from the previous year to 258 for a rate of 289 per 100,000 population. This compares to a rate of 264 per 100,000 in Canada. Female victims of intimate partner violence in NL in 2018 numbered 1,149 for a rate of 505 per 100,000 population. This represented an increase of 2% from the previous year and compares to 507 per 100,000 for Canada (Statistics Canada 2019b).

14.2.2.8 Social Connectivity

Healthy social support networks, in the form of support from families and friends, are linked to improved health status (PHAC 2013). Social support networks aid individuals in solving problems, dealing with adversity and in maintaining a sense of control over life circumstances. Collective networks of healthy social support networks positively influence social environments (PHAC 2013). Taken together, the relationships and resultant sense of satisfaction and wellbeing associated with social support networks seem to buffer individuals from select health problems.

A study on the social connections of Canadians by province indicated that large family networks were generally more often seen in the east with 67% of Newfoundlanders and Labradorians reporting close ties to at least five family members, measurably higher than the national average of 55%. The percentage of Newfoundlanders and Labradorians with at least 20 friends (57%) was also higher than other provinces and territories and much higher than the national average (47%). Residents of eastern Canada were also more likely than average to keep in regular contact with relatives living outside the home (Sinha 2014).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

With respect to social connectivity in the LAA/RAA communities, studies suggest that residents of mining communities, or communities whose economies rely on a single resource, band together to adapt to the industry's boom and bust cycles (Skeard 2014). In Buchans, for instance, social cohesion and community support have been instrumental in dealing with past mine closures and the community's strong sense of social cohesion has contributed to its perseverance and resilience as a town (Skeard 2014). The social connectivity of the LAA/RAA communities is also evidenced by the high percentage (80.9%) of Central Health Region residents who feel a strong sense of community belonging (Table 14.2; Statistics Canada 2020).

14.2.2.9 Community Well-Being Index

The CWB Index is comprised of four equally weighted components, widely accepted as being important to wellbeing: education, labour force activity, income and housing (CIRNAC 2019a, 2019b). The four component topics are combined to create a single well-being score that ranges from a low of 0 to a high of 100. In addition to comparability across the temporal scope of the Index (values are available for the Census reporting years 1981, 1991, 1996, 2001, 2006, 2011 and 2016), further utility is realized through the ability to identify changes in well-being (and component measures) over the 35 year temporal horizon of the Index.

Table 14.4 provides a summary of the methods used to calculate each component included in the CWB Index.

Table 14.4 Community Well-Being Index – Component Descriptions and Weighting

Indicator	Description	Weighting (%)
Education		
High school plus	Proportion of a community's population, 20 years and over, that has obtained at least a high school certificate	75
University	Proportion of a community's population, 25 years and over, that has obtained a university degree at the bachelor's level.	25
Labour Force Activity		
Participation rate	Proportion of a community's population, aged 20 to 64, that was involved in the labour force during the week preceding census day, that is census reference week	50
Employment	Percentage of a community's labour force participants, aged 20 to 64, that were employed during census reference week	50
Income		
Income score	Defined in terms of total income per capita, as follows: $Income\ Score = \left(\frac{\log(income\ per\ capita) - \log(\$2,650)}{\log(\$75,000) - \log(\$2,650)} \right) \times 100$	100



Table 14.4 Community Well-Being Index – Component Descriptions and Weighting

Indicator	Description	Weighting (%)
Housing		
Quantity	Proportion of a community's population living in dwelling that are not crowded as measured by having no more than one person per room	50
Quality	Proportion of a community's population living in a dwelling that is not in need of major repairs	50
Source: CIRNAC 2019b		

Within the LAA/RAA, CWB Index scores (four components combined) are available for Grand Falls-Windsor, Badger, Buchans, Bishop's Falls, and Millertown (Table 14.5). Scores are not available for Buchans Junction since it has a population of less than 65 people. CWB Index scores have increased for communities within the LAA/RAA from 1991 to 2016, with Millertown showing the highest score in 2016 at 80. CWB Index scores for Grand Falls-Windsor, Badger, Buchans and Bishop's Falls, ranged from 69 to 77 in 2016, compared to the province's score of 72.

Table 14.5 Community Well-being Index Scores for LAA/RAA Communities, 1991 to 2016

Year	Grand Falls-Windsor	Badger	Millertown	Buchans	Bishop's Falls
2016	77	74	80	69	73
2011	75	71	-	71	70
2006	73	68	60	66	67
2001	71	63	51	61	65
1996	70	64	70	61	64
1991	68	59	53	62	64
Source: CIRNAC 2019a					

Tables 14.6 to 14.9 present the income, labour, housing, and education subcomponent scores for Grand Falls-Windsor, Badger, Buchans, Bishop's Falls. Scores for individual subcomponents are not available for Millertown. Education is the largest contributor to low CWB Index scores, particularly in 1991, when Badger had an education score of 29. Housing scores are the highest among the subcomponents for all communities between 1991 and 2016.

Between 1991 and 2016, income scores increased for all communities in the LAA/RAA (Table 14.6). Scores ranged from a low of 54 in Buchans in 1991 to a high of 76 for both Grand Falls-Windsor and Badger in 2016. In 2016, the income score for the province was 75.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

Table 14.6 Income Scores for LAA/RAA Communities

Year	Grand Falls-Windsor	Badger	Buchans	Bishop's Falls
2016	76	76	70	73
2011	72	66	69	67
2006	68	60	60	61
2001	66	56	56	60
1996	64	60	55	58
1991	64	56	54	56

Source: CIRNAC 2019a

The labour score for the province in 2016 was 74. For the LAA/RAA communities, labour scores ranged from 57 for Buchans in 2001 to 79 in Grand Fall-Windsor and Badger in 2011 (Table 14.7). In 2016, the labour scores for Grand Falls-Windsor, Badger and Buchans fell by 1 point, 5 points and 2 points, respectively. The labour score for Bishop's Falls, on the other hand, increased 5 points between 2011 and 2016.

Table 14.7 Labour Scores for LAA/RAA Communities

Year	Grand Falls-Windsor	Badger	Buchans	Bishop's Falls
2016	78	74	65	74
2011	79	79	67	69
2006	77	71	61	73
2001	77	68	57	71
1996	77	65	60	70
1991	77	66	63	72

Source: CIRNAC 2019a

Housing scores were high in communities within the LAA/RAA, ranging from a low of 86 in Badger in 1991 to 98 in Buchans in 2011 (Table 14.8). In 2016, LAA/RAA communities had housing scores of between 95 and 97, while the province's housing score was 95.

Table 14.8 Housing Scores for LAA/RAA Communities

Year	Grand Falls-Windsor	Badger	Buchans	Bishop's Falls
2016	96	97	95	97
2011	95	89	98	95
2006	95	94	94	94
2001	95	93	93	93
1996	95	96	94	95
1991	92	86	95	94

Source: CIRNAC 2019a



Community Health
September 2020

The education score for the province in 2016 was 49. Scores in the LAA/RAA communities were lower than for the other CWB Index components and were particularly low prior to 2001 (Table 14.9). Education scores ranged from 29 in Badger in 1991 to a high of 60 in Grand Falls-Windsor in 2016.

Table 14.9 Education Scores for LAA/RAA Communities

Year	Grand Falls-Windsor	Badger	Buchans	Bishop's Falls
2016	60	48	48	49
2011	55	49	50	47
2006	52	47	49	42
2001	44	37	40	36
1996	42	35	33	32
1991	39	29	36	33

Source: CIRNAC 2019a

14.3 ASSESSMENT CRITERIA AND METHODS

This section describes the criteria and methods used to assess environmental effects on community health. Residual environmental effects (Section 14.5) are assessed and characterized using criteria defined in Section 14.3.1, including direction, magnitude, geographic extent, timing, frequency, duration, reversibility, and ecological or socio-economic context. The assessment also evaluates the significance of residual effects using threshold criteria or standards beyond which a residual environmental effect is considered significant. The definition of a significant effect on community health is provided in Section 14.3.2. Section 14.3.3 identifies the environmental effects to be assessed for community health, including effect pathways and measurable parameters. This is followed by the identification of potential Project interactions with this VC (Section 14.3.4). Analytical assessment techniques used for the assessment of community health are provided in Section 14.3.5.

14.3.1 Residual Effects Characterization

Table 14.10 presents definitions for the characterization of residual environmental effects on community health. The criteria are used to describe the potential residual effects that remain after mitigation measures have been implemented. Quantitative measures have been developed, where possible, to characterize residual effects. Qualitative considerations are used where quantitative measurement is not possible.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

Table 14.10 Characterization of Residual Effects on Community Health

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	<p>Neutral – no measurable change</p> <p>Positive – a residual effect that moves measurable parameters in a direction beneficial to community health relative to baseline</p> <p>Adverse – a residual effect that moves measurable parameters in a direction detrimental to community health relative to baseline</p>
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	<p>Negligible – no measurable change</p> <p>Low – the Project will have a measurable effect on community health, although within the range of normal variation in baseline conditions</p> <p>Moderate – the Project will have a measurable effect on community health that exceeds the normal variation in baseline conditions, although can be managed using existing resources</p> <p>High – the Project will have a measurable effect on community health, which will exceed the management capacity of existing resources</p>
Geographic Extent	The geographic area in which a residual effect occurs	<p>Project Area – residual effects are restricted to the Project Area</p> <p>LAA/RAA – residual effects extend into the LAA/RAA and interact with those of other projects in the LAA/RAA</p>
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	<p>Single event</p> <p>Multiple irregular event – occurs at no set schedule</p> <p>Multiple regular event – occurs at regular intervals</p> <p>Continuous – occurs continuously</p>
Duration	The period of time required until the measurable parameter or the VC returns to its existing (baseline) condition, or the residual effect can no longer be measured or otherwise perceived	<p>Short term – residual effect restricted to construction or decommissioning, rehabilitation and closure phases</p> <p>Medium term – residual effect extends through operation</p> <p>Long term – residual effect extends beyond the life of the Project</p> <p>Permanent - recovery to baseline conditions unlikely</p>
Reversibility	Describes whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	<p>Reversible – the residual effect is likely to be reversed after activity completion and rehabilitation</p> <p>Irreversible – the residual effect is unlikely to be reversed</p>



Table 14.10 Characterization of Residual Effects on Community Health

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Ecological and Socio-economic Context	Existing condition and trends in the area where residual effects occur	<p>Undisturbed – area is relatively undisturbed or not adversely affected by human activity</p> <p>Disturbed – area has been substantially previously disturbed by human development or human development is still present</p> <p>Resilient – community has a moderate to high capacity to recover from a perturbation, with consideration of the existing level of disturbance.</p> <p>Not Resilient – community has a low capacity to recover from a perturbation, with consideration of the existing level of disturbance.</p>

14.3.2 Significance Definition

A significant adverse residual effect on community health is one that results in:

- deterioration of health and well-being over an extended period that cannot be managed or mitigated through adjustments to programs, policies, plans, or other mitigation; and/or
- a reduction in the quality of ambient air, water, country foods, or sound at levels predicted to result in exposures that are higher than the health-based guidelines established by regulatory organizations, and are likely to result in a substantive change in the health of communities.

14.3.3 Potential Effects, Pathways and Measurable Parameters

Table 14.11 lists the potential Project effects on community health and provides a summary of the Project effect pathways and measurable parameters and units of measurement to assess potential effects. Potential environmental effects and measurable parameters were selected based on review of recent EAs for mining projects in NL and other parts of Canada, comments provided during engagement, and professional judgment.

Table 14.11 Potential Effects, Effect Pathways and Measurable Parameters for Community Health

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in community well-being	<ul style="list-style-type: none"> • Project-related employment and income • Project-related change in population 	<ul style="list-style-type: none"> • Project employment estimates (local and non-local workers) • Provincial health characteristics • Community Well-being (CWB) Index • Crime Severity Index (CSI) • Metrics related to capacity of health services (i.e., number of hospital beds, doctor / patient ratio)



Table 14.11 Potential Effects, Effect Pathways and Measurable Parameters for Community Health

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in physical health conditions	<ul style="list-style-type: none"> Project activities causing a change in access to and availability of country foods to harvest Emissions and discharges from the Project resulting in air, sound, and, water, quality changes, which could affect human health through direct exposure (e.g., inhalation of air) and indirect exposure (e.g., ingestion of contaminated food) to contaminants A reduction in the value and perceived quality of country foods 	<ul style="list-style-type: none"> Change in hunting, trapping or plant harvesting activities (qualitative) Concentrations ($\mu\text{g}/\text{m}^3$ in air, $\mu\text{g}/\text{L}$ in water) or levels (dBA, % highly annoyed for sound)

The assessment of Project emissions and discharges on health conditions, although conducted specifically for Indigenous groups in Chapter 17 (Indigenous Groups), also applies to non-Indigenous residents.

14.3.4 Project Interactions with Community Health

Table 14.12 identifies the physical activities that might interact with community health and result in the identified environmental effect. These interactions are indicated by a checkmark and are discussed in detail below, in the context of standard and Project-specific mitigation / enhancement (Section 14.5), and effect pathways and residual effects (Section 14.6). Following the table, justification is provided for where no interaction (and therefore no resulting effect) is predicted.

Table 14.12 Project-Environment Interactions with Community Health

Physical Activities	Environmental Effects to be Assessed	
	Change in Community Well-being	Change in Physical Health Conditions
CONSTRUCTION		
Access Road Upgrade / Realignment: Where required, road widening and replacement / upgrades of roads and culverts.	–	–
Construction-related Transportation along Access Road	–	–



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

Table 14.12 Project-Environment Interactions with Community Health

Physical Activities	Environmental Effects to be Assessed	
	Change in Community Well-being	Change in Physical Health Conditions
Mine Site Preparation and Earthworks: Clearing and cutting of vegetation and removal of organic materials, development of roads and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials, and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels. Also includes temporary surface water and groundwater management, and the presence of people and equipment on site.	–	–
Construction / Installation of Infrastructure and Equipment: placement of concrete foundations, and construction of buildings and infrastructure as required for the Project. Also includes: <ul style="list-style-type: none"> • Installation of water control structures (including earthworks) • Installation and commissioning of utilities on-site • Presence of people and equipment on-site 	–	–
Emissions, Discharges and Wastes^A: Noise, air emissions / greenhouse gases (GHGs), water discharge, and hazardous and non-hazardous wastes.	–	✓
Employment and Expenditures^B	✓	–
OPERATION		
Operation-related Transportation Along Access Road	–	–
Open Pit Mining: Blasting, excavation and haulage of rock from the open pits using conventional mining equipment.	–	–
Topsoil, Overburden and Rock Management: Five types of piles: <ul style="list-style-type: none"> • Topsoil • Overburden • Waste rock • Low-grade ore • High-grade ore <p>Rock excavated from the open pits that will not be processed for gold will be used as engineered fill for site development, maintenance and rehabilitation, or will be deposited in waste rock piles.</p>	–	–
Ore Milling and Processing: Ore extracted from the open pits will be moved to the processing area where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes.	–	–



Table 14.12 Project-Environment Interactions with Community Health

Physical Activities	Environmental Effects to be Assessed	
	Change in Community Well-being	Change in Physical Health Conditions
Tailings Management Facility: Following treating tails via cyanide destruction, tailings will be thickened and pumped to an engineered TMF in years 1 to 9, then pumped to the exhausted Leprechaun open pit in years 10 through 12.	–	–
Water Management (Intake, Use, Collection and Release): Recirculated process water and TMF decant water will serve as main process water supply, and raw water (for purposes requiring clean water) will be obtained from Victoria Lake Reservoir. Site contact water and process effluent will be managed on site and treated prior to discharge to the environment. Where possible, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent possible for use on site.	–	–
Utilities, Infrastructure, and Other Facilities <ul style="list-style-type: none"> • Accommodations camp and site buildings, including vehicle maintenance facilities • Explosives storage and mixing • Site road maintenance and site snow clearing • Access road maintenance and snow clearing • Power and telecom supply • Fuel supply 	–	–
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge and hazardous and non-hazardous wastes.	–	✓
Employment and Expenditures^B	✓	–
DECOMMISSIONING, REHABILITATION AND CLOSURE		
Decommissioning of Mine Features and Infrastructure	–	–
Decommissioning, Rehabilitation and Closure-related Transportation Along Access Road	–	–
Progressive Rehabilitation: Rehabilitating infrastructure or areas not required for ongoing operation (e.g., buildings, roads, laydown areas); covering and revegetating completed tailings areas, where practicable, including commencing closure of TMF beginning in Year 9 (when tailings deposition moves to Leprechaun open pit); erosion stabilization and revegetation of completed overburden and/or waste rock piles; infilling or flooding of exhausted mining areas; and completing revegetation studies and trials.	–	–



Table 14.12 Project-Environment Interactions with Community Health

Physical Activities	Environmental Effects to be Assessed	
	Change in Community Well-being	Change in Physical Health Conditions
Closure Rehabilitation: Active rehabilitation based on successes of progressive rehabilitation activities. Includes: demolishing infrastructure (e.g., buildings, equipment, facilities, roads, laydown areas); grading and revegetating cleared areas, where practicable; breaching and regrading ponds to reestablish drainage patterns; completing closure of TMF (covering with overburden and revegetating); erosion stabilization and revegetation of completed overburden and/or waste rock piles; and infilling or flooding of open pits.	–	–
Post-Closure: Long-term monitoring	–	–
Emissions, Discharges and Wastes^A	–	✓
Employment and Expenditures^B	✓	–
Notes: ✓ = Potential interaction – = No interaction ^A Emissions, Discharges and Wastes (e.g., air, waste, noise, light, liquid and solid effluents) are generated by many Project activities. Rather than acknowledging this by placing a checkmark against each of these activities, “Wastes and Emissions” is an additional component under each Project phase. ^B Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a checkmark against each of these activities, “Employment and Expenditures” is an additional component under each Project phase.		

For change in community well-being, all Project activities will have labour requirements causing an increase in the local population, which could affect the availability of health services and infrastructure, as well as disrupt daily community life. Positive effects on community well-being will also result due to Project-related employment and business opportunities, which are addressed collectively as part of an Employment and Expenditures activity.

While many Project activities will result in emissions, discharges and wastes, the consideration of these emissions have been grouped together as a single Project activity. As such, this is the only activity expected to interact with change in physical health conditions. Emissions, Discharges and Wastes may include potential contaminants that could affect health through respiration and consumption of country foods.

14.3.5 Analytical Assessment Techniques

Characterization criteria (Section 14.3.1) for effects on community well-being are applied to residual environmental effects that remain after proposed mitigation and management measures have been implemented. The significance of these environmental effects is determined by considering thresholds outlined in Section 14.3.2.

The assessment of change in community well-being examines adverse effects on existing conditions using quantitative and qualitative methods. Quantitative methods are used to compare Project-related



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

employment and wages to existing conditions and to quantify changes in population. Qualitative methods are used to explore effect pathways drawing on academic and government literature.

CIRNAC's CWB Index (Section 14.2.2.9) is considered to be an appropriate tool to measure changes in community well-being because it is the only published index that provides comparability across all Canadian CSDs for which data are available, and it is comprised of four components that are widely accepted as important to well-being (i.e., education, labour force activity, income, and housing).

Central to the assessment of change in community well-being is the potential for the Project to result in disproportionate or inequitable effects on vulnerable populations. For the purpose of this assessment, it is understood that various subgroups, or 'vulnerable populations', within the active labour force portion are less likely to realize benefits of Project-related employment and income. It is also understood that these groups may be more susceptible to adverse changes in housing affordability and availability. For this assessment, vulnerable populations include:

- Youth, women, seniors, Indigenous persons, individuals, and households below the low-income cut-off (as by Statistics Canada [2019b])
- Marginally-housed individuals (includes individuals or households in core housing need as defined by CMHC [2018] similar to at-risk homelessness as defined by the Canadian Observatory on Homelessness [2018]), and individuals classified as homeless (includes individuals whom are absolutely homeless [unsheltered], individuals staying in overnight shelters [emergency sheltered], and individuals whose accommodation is temporary or lacks security of tenure [provisionally accommodated] [Canadian Observatory on Homelessness 2018])

Where applicable, the assessment of change in community well-being differentiates effects on these populations from the overall population of the LAA/RAA.

14.4 MITIGATION AND MANAGEMENT MEASURES

A series of environmental management plans will be developed by Marathon to mitigate the effects of Project development on the environment. A full list of mitigation measures to be applied throughout Project construction, operation and decommissioning, rehabilitation and closure is provided in Section 2.7.4. Project planning and design and the application of proven mitigation measures will be used to reduce adverse effects to community health. Mitigation and management measures for community health will be the same throughout the phases of the Project and include measures listed in Table 14.13. Mitigation measures identified in other VCs will also reduce the potential effects on the Community Health VC (Chapter 5 – Atmospheric Environment; Chapter 7 – Surface Water Resources; Chapter 13 – Community Services and Infrastructure; Chapter 15 – Employment and Economy; and Chapter 16 – Land and Resource Use).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

Table 14.13 Mitigation and Management Measures: Community Health

Category	Mitigation	C	O	D
Materials Handling and Waste Management	<ul style="list-style-type: none"> Appropriate ventilation, fire and safety protection, eyewash stations, and Safety Data Sheet stations will be located throughout storage facilities for reagents. 	-	✓	-
Employment and Expenditures	<ul style="list-style-type: none"> Marathon will work to develop cooperative protocols with responsible agencies to address access of Project personnel to emergency and other medical services, including employee medicals and check-ups. 	✓	✓	✓
	<ul style="list-style-type: none"> Workforce education will be provided to address topics such as: <ul style="list-style-type: none"> healthy lifestyle choices anti-harassment training cultural awareness training Marathon's health and safety policies 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will provide an Employee Assistance Program to Project personnel. 	✓	✓	✓
	<ul style="list-style-type: none"> Work schedules / rotations for Project workers, and the requirement to stay at the mine site accommodations camp during their rotation will deter workers from spending time in local communities and accessing community recreation services and facilities outside of working hours. 	✓	✓	✓
	<ul style="list-style-type: none"> A Gender Equity and Diversity Plan will be implemented that meets the approval of the Minister of Industry, Energy and Technology and Minister Responsible for the Status of Women and Marathon will engage with both Indigenous groups during the development of the Plan. A business access strategy for members of underrepresented populations will be included in the plan. 	✓	✓	✓
	<ul style="list-style-type: none"> A Benefits Agreement will be implemented that meets the approval of the Minister of Industry, Energy and Technology and Minister Responsible for the Status of Women. 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will communicate employment information to local communities and Indigenous groups in a timely manner so that local and Indigenous residents have an opportunity to acquire the necessary skills to qualify for potential Project-related employment. 	✓	✓	✓
	<ul style="list-style-type: none"> Procurement packages will be developed with consideration for capacity and capabilities of local and regional Indigenous and non-Indigenous businesses. 	✓	✓	✓
Site Facilities and Services	<ul style="list-style-type: none"> An on-site first aid facility will be provided with paramedic / nurse / ambulatory technician and an ambulance, as required. Designated, trained personnel will provide transport to the nearest hospital when required. During Project construction and operation, first aid stations and equipment will be distributed through the site, as appropriate. 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will implement COVID-19 protocols as necessary. 	✓	-	-
Accidental Event Prevention and Response	<ul style="list-style-type: none"> Mandatory safety orientations will be provided for employees. 	✓	✓	✓
Notes: C – Construction Activities O – Operation Activities D – Decommissioning, Rehabilitation and Closure Activities				



14.5 ASSESSMENT OF ENVIRONMENTAL EFFECTS ON COMMUNITY HEALTH

For each potential effect identified in Section 14.3.3, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The following sections first describe the pathways by which a potential Project effect could result from Project activities in the absence of mitigation during each Project phase (i.e., construction, operation and decommissioning, rehabilitation and closure). Mitigation and management measures (Section 14.4) are applied to avoid or reduce these potential pathways and resulting environmental effects. Residual effects are those remaining following implementation of mitigation, which are then characterized using the criteria defined in Section 14.3.1. A summary of predicted residual effects is provided in Section 14.5.3.

14.5.1 Change in Community Well-Being

14.5.1.1 Project Pathways

Community well-being within the LAA/RAA can be affected by Project-related employment and income and changes in population. Project-related employment and income can affect levels of disposable income and labour force activity. Depending on an individual's pre-employment situation, securing employment with the Project could result in positive or adverse effects. Through gained employment and increased income, individuals could realize an increase in the amount of time, and in some cases the financial ability, that they, or members of their household have to participate in recreational, subsistence, and family-related activities and physical exercise. Where changes in income result in increased levels of disposable income, Project-related employment could decrease financial barriers to accessing healthy market foods (i.e., store-bought).

In other cases, increased disposable income could decrease financial barriers to negative coping mechanisms, such as overeating, smoking, heavy drinking and illicit drug use. Depending on an individual's pre-employment situation, Project employment may also lead to a decrease in the amount of time that workers have available to engage in recreational activities and increase time away from family, which could result in increased stress, strained family dynamics, and increased reliance on negative coping mechanisms.

Project-related employment and income also stimulate changes in population caused by the presence of a temporary non-local labour force in LAA/RAA communities. This population growth may change the demographics and social structure of nearby communities, and out-of-region workers could disrupt normal, daily living activities of nearby residents and land users. Community well-being may also be affected by additional demands on the existing health, housing, and education services and infrastructure caused by Project-related population growth.



14.5.1.2 Residual Effects

Employment and Income

Construction is estimated to require a peak labour force of approximately 625 full-time equivalents (FTEs) (an average of 320 FTEs) and operation is estimated to require a peak workforce of approximately 480 FTEs (an average of 300 FTEs). Marathon estimates that 50% of total direct employment (65% of estimated employment effects in NL) could be satisfied by residents of the LAA/RAA. Wages paid to Project workers will align with NL mining industry standards which, depending on Project phase (construction, operation, or decommissioning, rehabilitation and closure), are estimated (on average) to be between 67% and 112% greater than existing mean annual employment incomes in the LAA/RAA (\$49,904 for males and \$32,784 for females, total population; Chapter 15 provides additional information on employment and income estimates).

Given employment and compensation estimates, the Project is expected to have a beneficial effect on CWB Index scores of LAA/RAA communities (through changes in labour force employment [labour subcomponent] and individual / household income [income subcomponent]) and result in positive effects on community well-being. Depending on the pre-employment situation of individuals who secure employment with the Project, Project-related income could also result in positive effects on health status due to decreased use of drugs and alcohol and improved lifestyle choices and eating habits (Barron et al. 2010). This could also result in beneficial effects on mental and physical health (e.g., decreased blood pressure and other cardiovascular risk factors; Kline and Gonzalez 2003; Kelli et al. 2016), stress and anxiety (Barron et al. 2010).

Alternatively, employment-related stressors such as deadlines, workloads and other responsibilities, and time spent away from family during work rotations could result in increased levels of stress and anxiety, adversely affecting the health status of individuals who secure employment. This increased stress could lead to a reliance on negative coping mechanisms (e.g., drug and alcohol misuse, unhealthy lifestyle choices). Workforce education to encourage healthy lifestyle choices will help reduce these potential adverse health effects. Employee training will include awareness about the potential effects of drug and alcohol misuse, including social concerns such as effects that workers can have on their community and families. Workers will also have access to an Employee Assistance Program. Marathon will implement mitigation and management measures to protect the health and safety of workers while on the job. These are addressed in the Project Description (Section 2.2.5). Accidental Events (Chapter 21) addresses both public and worker health and safety related to potential accidental events. With mitigation and management measures in place, adverse residual effects related to employment and income are predicted to be low in magnitude, limited to the LAA/RAA, continuous throughout each Project phase, and reversible.

Due to the demographic profile of the LAA/RAA, positive employment and income effects will likely be experienced differently by Indigenous and non-Indigenous groups. Recognizing that the Indigenous population represents 6.5% of the LAA/RAA labour force, 6.5% of the population with an apprenticeship or trades certificate or diploma, and 5.7% of the population with educational attainment at or above the college diploma level, it is conservatively assumed that the Project will likely employ more non-Indigenous



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

than Indigenous persons. It is also likely that the Project will employ more males than females, as most jobs associated with the Project will be in trades and construction-related occupations and industries that have disproportionately high employment among males (Chapter 15). To address issues of diversity and inclusion, Marathon will implement the mitigation and management measures identified in Section 14.5, which will include implementation of a Gender Equity and Diversity Plan and a business access strategy for members of underrepresented populations, including Indigenous persons, women, visible minorities and persons with disabilities. Marathon and Qalipu have entered into negotiations with a view to concluding a socio-economic agreement that will provide a framework for the Parties' relationship through all phases of the Project. Marathon will continue to provide notice of employment and business opportunities to the Indigenous groups.

Population Change

Construction is estimated to require a peak labour force of approximately 625 FTEs (an average of 320 FTEs) and operation is estimated to require a peak workforce of approximately 480 FTEs (an average of 300 FTEs). Given these employment estimates, the assumed percentage of hires from LAA/RAA communities (50% of the Project's direct workforce), and the existing LAA/RAA population (38,340), non-local workers directly employed with the Project could result in an increase of the LAA/RAA's population of less than one percent. This estimate conservatively assumes that 50% of the Project's direct workforce would not be satisfied by current residents of the LAA/RAA, and thus could be an overestimate of non-local workers.

As described in Chapter 13 (Community Services and Infrastructure), an increase in the population of LAA/RAA communities related to Project employment will increase demands on community services and infrastructure, including housing and temporary accommodations, education, and health services and infrastructure. A decrease in access to these services and infrastructure can affect community well-being.

The housing and education CWB Index Scores could be affected by an increase in LAA/RAA populations. With respect to housing, given the planned use of a Project accommodations camp and results of the assessment of 'change in local housing and accommodations' (i.e., residual adverse effects on the availability of housing and accommodations during construction and operation), Project-related effects are predicted to be negligible (Section 13.5.2.2). The Project is therefore not anticipated to result in changes to the housing subcomponent of CWB Index scores for LAA/RAA communities or related variables (i.e., housing quality or quantity). Because changes in demand for housing are assessed as negligible, upward pressure on cost of housing and disproportionate effects on subpopulation groups within the LAA/RAA's 'vulnerable population' classification (e.g., persons on fixed incomes and marginally-housed persons) are not anticipated. The Project is therefore expected to result in negligible changes in existing conditions related to housing and community well-being.

Marathon will work with Indigenous groups and local communities to address educational and skills shortages that may arise as barriers to employment. The Project is not anticipated to have a measurable positive or adverse effect on the proportion of the current LAA/RAA population with a high school (or greater) or university educational attainment (education variables included in CIRNAC's CWB Index). In terms of access to education services and infrastructure, it is not expected that schools in the LAA/RAA



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

will see increased demand during any Project phase, since workers are unlikely to bring families with them to the LAA/RAA (Section 13.5.2.2). The Project is therefore expected to result in negligible changes in existing conditions related to education and well-being.

An increase in the population of the LAA/RAA can place additional demands on existing health services and infrastructure. A decrease in access to health care can lead to adverse effects on the well-being of residents. However, as described in Chapter 13, with the application of mitigation and management measures, including the provision of medical services for Project workers through the on-site presence of a paramedic / nurse / ambulatory technician and ambulance, adverse effects on health services and infrastructure are expected to be low in magnitude and reversible. Marathon will also work to develop cooperative protocols with responsible agencies to address access of Project personnel to emergency and other medical services, including employee medicals and check-ups. In addition, Marathon will have management and mitigation measures to protect employees while on the job (Section 2.2.5).

Changes in the population of the LAA/RAA have the potential to result in adverse changes in social connectivity. In the extreme, demographic change associated with non-local workers could lead to adverse interactions between local residents and workers (e.g., physical altercations), increased crime, and reliance on negative coping mechanisms (e.g., drug and alcohol misuse) within LAA/RAA communities. However, the Project-related changes in population are expected to be minimal (less than a one percent change from baseline) and non-local workers will likely come from other parts of NL. Also, due to mitigation and management measures, including the use of a Project accommodations camp, workforce sensitivity training (expected to reduce the likelihood of adverse interactions with local residents), and work rotations that will limit the amount of time workers spend in LAA/RAA communities, the Project is not likely to adversely affect social connectivity. The likelihood that residents will perceive population effects is low.

The presence of a temporary non-local workforce has the potential to increase the transmission of communicable diseases (e.g., influenza) and sexually transmitted infections within the LAA/RAA. Due to the nature of accommodations camps (high-density lodging with shared common environments), there is increased potential for communicable disease to spread amongst the Project's workers and to local residents (due to interactions between the Project's workforce and local residents). The current rates of communicable disease in the Central Health Region represent a small portion of the total provincial cases. Since the non-local Project workforce will represent less than one percent of the LAA/RAA population and because the nature of work rotations will limit social interaction between Project workers and residents, it is not likely that rates of communicable disease will increase as a result of the Project.

Marathon is currently operating an exploration camp on site with COVID-19 protocols and measures in place to protect workers and residents in the area. With respect to the Project, Marathon will have all necessary protocols in place to reduce risks to the health of workers and residents in the LAA/RAA, based on requirements at that time. Based on current guidance, this will include health questionnaire screening, social distancing measures, restricting numbers of workers in enclosed spaces, wearing masks, increased cleaning by housekeeping staff, and contingency plans in the event that any employee exhibits symptoms of COVID-19. As the status of the COVID-19 pandemic at the time of Project



development cannot be predicted, Marathon can only commit to taking appropriate measures to address it at that time based on provincial and or federal health guidelines.

14.5.1.3 Summary

Overall, a mixture of positive and adverse residual effects on community well-being are anticipated. During construction and operation, positive effects will be low in magnitude (conservatively characterized based on uncertainty with respect to levels of local employment and the extent to which Project wages will be realized by local residents). These are predicted to occur within the LAA/RAA on a continual basis over the medium term, to be reversible, and occur within a resilient socio-economic environment.

In consideration of planned mitigation and management measures, adverse residual effects on community well-being during construction and operation, including those on social connectivity and physical and mental health, are predicted to be low in magnitude. Mitigation measures include use of an accommodations camp, encouraging healthy lifestyle choices, access to an Employee Assistance Program for Project personnel, and work rotations that will limit time spent by Project workers in LAA/RAA communities. Residual adverse effects occur in the LAA/RAA continuously over the medium term, are reversible, and occur within a resilient socio-economic environment.

Non-local Project workers will likely leave the area during decommissioning, rehabilitation and closure, leading to a decrease in adverse effects that result from Project-related employment and income, and change in population. However, this phase will also see a decrease in positive effects resulting from Project employment and income. Adverse effects during this phase are predicted to be low in magnitude, occur in the LAA/RAA continuously over the short term, be reversible, and occur within a resilient socio-economic environment.

14.5.2 Change in Physical Health Conditions

14.5.2.1 Project Pathways

Emissions of air contaminants during construction, operation and decommissioning, rehabilitation and closure phases of the Project may result from combustion of fossil fuels, such as diesel and gasoline, by heavy mobile equipment and vehicles, and dust generated by land clearing and equipment movements on unpaved roads. Fugitive releases of dust during blasting, ore handling and processing, and wind erosion of stockpiles and tailings beach surfaces may occur during operation. The processing plant is also a potential source of air contaminants during operation. In the absence of mitigation, potential changes in air quality could directly affect the health (through inhalation) of people in the LAA engaged in fishing, hunting, trapping, harvesting, gathering, or camping. Particulates in air could settle onto the soil and vegetation, which could then affect the quality of country foods, resulting in contaminant exposure via ingestion.

Project construction, operation and/or decommissioning activities could affect the quality of surface water through the discharge or seepage of metal-enriched water into the environment. Changes in water quality could affect the health of people through dermal contact or incidental ingestion of surface water while in the LAA. Changes in stream water quality may also result in changes in fish tissue quality, resulting in



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

indirect exposures via ingestion of fish. Physical health conditions may also be affected through changes in access to and the availability of wildlife, fish and plants that are harvested for country foods. Access to the mine site will be restricted throughout the life of the Project. Site clearing and construction activities will remove vegetation that may be used as country food, as well as remove habitat that is suitable for wildlife, vegetation or fish species harvested for consumption. Sensory disturbance (e.g., noise, dust, visual) from Project activities, including increased traffic along the access road (e.g., bus and truck traffic), could result in avoidance of the LAA by harvested wildlife species, such as caribou, and reduce the abundance of species available to harvesters within the LAA. Perceived decreased quality of country foods as a result of Project activities may lead to conscious decisions by some people to forego consumption, therefore, decreasing consumption of country foods.

During construction and operation, noise emissions are expected from heavy mobile equipment and vehicles used for land clearing, earth moving activities, and material handling, as well as equipment delivery and rotation changes. Some noise emissions are anticipated during decommissioning, rehabilitation and closure; however, those emissions are expected to be lower in magnitude than during construction or operation. Changes in noise levels could affect the annoyance levels and disturb the sleep of people at accommodation camps within the LAA.

During the decommissioning, rehabilitation and closure phase, reduced levels of traffic and sensory disturbance are anticipated due to reduced levels of Project activities (in comparison to construction and operation). Habitat will ultimately be returned to natural conditions during post-closure, which will lessen the avoidance of the area by wildlife species.

14.5.2.2 Residual Effects

Chapter 16 (Land and Resource Use) assesses the potential effects of reduced access to land and Project-related sensory disturbances (e.g., noise) on non-Indigenous land uses, including hunting, trapping and fishing. Chapter 17 (Indigenous Groups) provides an assessment of the effects of the Project on Indigenous groups, including on the current use of lands and resources for traditional purposes, change in health conditions, and change in socio-economic conditions. Chapter 5 (Atmospheric Environment) assesses the effects of Project activities on air quality, which may affect community health. Chapter 7 (Surface Water Resources) assesses the effects of the Project on the quality of surface water. The findings of these assessments inform the assessment of change in physical health conditions and are summarized in this section. An assessment of Project emissions and discharges on Indigenous health was completed in Chapter 17 (Indigenous Groups). The assessment of potential effects of the Project to Indigenous health used an approach consistent with Health Canada guidance (Health Canada 2018, 2017; 2016a; 2016b) and focused on the identified Project pathways related to changes in air quality, changes in water quality, changes in country foods (quality, access and availability), and changes in sound quality. Results of that assessment are summarized herein. This assessment is also applicable to non-Indigenous residents of the LAA/RAA.

Air Quality

An inventory of air contaminant emissions associated with construction and operation activities was completed as part of the air quality assessment (Chapter 5 – Atmospheric Environment). Although some



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

intermittent releases may occur during the decommissioning, rehabilitation and closure phase, the emissions are expected to be lower in magnitude than during construction or operation, and this phase was therefore not assessed quantitatively. Construction activities would add to existing air contaminant concentrations in the Project Area, however, emissions (and resulting ground-level concentrations) would be lower in magnitude than during Project operation, and generally confined to the Project Area.

Changes to air quality from Project-related releases of air contaminants during operation were assessed using an atmospheric dispersion model in combination with ambient background air contaminant concentrations. Details of the emissions estimates and dispersion modelling for the operation phase of the Project are provided in Section 5.5.1. Air quality standards are not “pollute up-to” levels, they are meant to be protective of health and therefore provide important benchmarks. As indicated in Table 5.17, maximum concentrations are less than the applicable standard. Although the maximum 1-hour PM_{2.5} concentration during Project Operation is predicted to be higher than the Canadian Ambient Air Quality Standard (CAAQS), additional analysis confirmed that there are no exceedances of the CAAQS at locations outside of the Project Area. Predicted concentrations are also presented graphically in the form of isopleth plots (concentration contour plots) in Appendix 5B (Dispersion Modelling Strategy). The highest predicted concentrations generally occur within 1 to 2 km of the Project Area. Seasonal dwellings within this area include a cabin, an outfitter camp that is not in use, the existing exploration camp and the accommodations camp. Chapter 5 identifies mitigation measures related to the design and construction of the accommodations camp and existing exploration camp (which will become the overflow camp) to address worker health and safety.

Based on the results of an atmospheric dispersion model in combination with ambient background air contaminant concentrations, changes to air quality are not expected to result in a change to Indigenous or non-Indigenous physical health conditions in the LAA/RAA.

Water Quality

As described in Section 7.5.2, mine contact water (including discharge from sedimentation ponds and groundwater that is not captured by the contact water management infrastructure) and effluent from the TMF will ultimately discharge to one of three receiving waterbodies: Victoria Lake Reservoir, Valentine Lake or Victoria River. LAA/RAA residents could be exposed to water from these waterbodies through dermal contact or incidental ingestion while in the LAA/RAA for other activities, such as fishing. It is unlikely that residents would drink water from the receiving waterbodies, and information gathered through engagement has not identified Victoria Lake Reservoir, Valentine Lake or Victoria River as potable water sources. As a result, occurrences of exposure to surface water are possible, however, they are expected to be infrequent.

To assess the possible change in physical health conditions related to exposures to surface water, predicted concentrations of the parameters of potential concern 100 m downstream of the receiving points at Victoria Lake Reservoir, Valentine Lake and Victoria River (provided in Appendix 7C, Chapter 7) were compared to health-based screening levels detailed in Table 17.4 in Chapter 17. Predicted concentrations (of parameters of potential concern) at the receiving waterbodies are below these health-based screening levels. These results suggest that, even if the surface water from the receiving



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

waterbodies were to be consumed, health risks would be negligible and would not result in a change to physical health conditions.

Country Foods

Ingestion of contaminants via food can be an important pathway of exposure for people, especially when contaminants can bioaccumulate or biomagnify in the food chain and/or when the consumption of country foods makes up a significant portion of a person's diet (Health Canada 2018).

Parameters of potential concern in air emissions and water discharges associated with the Project subject to bioaccumulation are limited to heavy metals. The potential for heavy metals in air particulate to affect the quality of terrestrial foods through deposition is considered negligible, as indicated by the low predicted concentrations of total suspended particulates (predicted maximum annual concentration is 8% of guideline, as indicated in Table 5.15, Chapter 5). The potential for heavy metals in water to affect the quality of aquatic foods (primarily fish) is also considered to be low. As indicated in Chapter 7 (Surface Water Resources) and Appendix 7C, modelled water quality results indicate that under average conditions, concentrations of heavy metals in water will meet CWQG-FAL within 200 m downstream of the receiving points and are unlikely to result in substantive changes to country foods.

As discussed in Sections 17.2.3 and 17.2.4, there are low levels of harvesting activities by Miawpukek and Qalipu within the Project Area and LAA/RAA; therefore, it is unlikely that the consumption of country foods constitutes a substantial portion of an Indigenous person's diet. Chapter 16 (Land and Resources Use) also indicates that the area surrounding the mine site has a lower level of use for hunting and fishing by non-Indigenous persons than areas along Red Indian Lake and east of the mine site. Given the low potential for air emissions and water discharges to affect the quality of country foods combined with the limited harvesting activities, the potential for a change in Indigenous and non-Indigenous health related to country foods consumption is considered to be low.

While there is limited current use for traditional purposes at the mine site, resources harvested for traditional purposes may be present within the Project Area. It has been conservatively predicted that, following site clearing activities, wildlife habitat throughout the mine site will be affected due to wildlife sensory disturbance, habitat loss and habitat fragmentation, and this may affect access to, and availability of, country foods. As assessed in Section 17.9, Marathon will continue to engage with Indigenous groups in the identification, review and analysis of existing and available information on Indigenous land and resource use activities, to consider this early and throughout Project planning and design. Marathon will also communicate Project information, updates on ongoing and planned activities, and discussion of issues and concerns and potential means of addressing these with Indigenous groups. Loss of access to areas currently used for country foods is therefore anticipated to be low. As a result, the associated health effects related to access and availability of country foods for Indigenous groups is anticipated to be low.

As assessed in Section 16.5.2, wildlife resource areas overlapped by the Project Area will be unavailable for harvesting during the life of the Project. The overlap with the Project Area is relatively small (i.e., less than 1% of each management area available) and there are alternate areas within the LAA/RAA where resource users could pursue these harvesting activities. Marathon will continue to engage with local resource users (hunters, outfitters, trappers, anglers) regarding the overlap of the Project with hunting,



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

trapping and fishing areas. This will include the communication of Project information, updates on ongoing and planned activities, and a discussion of issues and concerns and potential means of addressing these. Given the current low level of hunting and fishing in the vicinity of the mine site, loss of access to areas currently used for country foods by non-Indigenous users is also anticipated to be low. As a result, the associated health effects related to access and availability of country foods is anticipated to be low.

Sound Quality

The mine site is located in a remote area with limited human activity, and no substantive anthropogenic sound sources within 50 km. There are approximately 35 seasonal cabins / outfitter locations and the existing Marathon exploration camp located within 10 km of the mine site or 5 km of the access road; these represent the nearest sensitive receptors to the Project (Figure 5-2, Chapter 5).

To assess possible change in health conditions associated with sound from the Project, predicted and baseline sound levels were screened against Health Canada (2017) targets for annoyance (i.e., 6.5% highly annoyed) and sleep disturbance (40 dBA) for nearby receptor locations (i.e., locations where people are most likely to spend time). The sound levels associated with the Project were assessed in Section 5.5.3 for the construction and operation phases of the Project. While some sound emissions are anticipated during decommissioning, rehabilitation and closure, these emissions are expected to be lower in magnitude than during construction or operation.

During construction, existing nighttime sound levels will not be affected at the sensitive receptor locations because construction activities are not planned at night (and therefore would not affect sleep). During operation, sound pressure levels at receptors beyond the property boundary were not predicted to exceed the sleep disturbance threshold of 45 dBA recommended by Health Canada (2017). Nighttime sound pressure levels were greater than the nighttime target of 45 dBA at the accommodations camp and overflow camp. During both construction and operation phases, the change in %HA is not predicted to exceed the Health Canada criterion of 6.5%. Additional details of the assessment of sound quality and the modeling that was conducted is provided in Chapter 5 – Atmospheric Environment.

Based on the above, no residual adverse effects are predicted on Indigenous and non-Indigenous physical health conditions (i.e., annoyance or sleep disturbance) due to change in sound quality.

Summary

With the implementation of mitigation measures, the overall residual effects from the Project on a change in physical health conditions are anticipated to be negligible to low in magnitude, based on the low potential for air emissions and water discharges to affect the quality of country foods combined with the limited harvesting activities. Project effects on physical health conditions are expected to occur within the Project Area (direct loss of area) and LAA/RAA (indirect sensory disturbances). Residual effects related to current use will be short term (for construction) to medium term (for sensory disturbance), continuous in frequency, occur in a disturbed ecological context, and reversible following Project rehabilitation.



14.5.3 Summary of Project Residual Environmental Effects

The residual environmental effects on community health resulting from the Project are summarized in Table 14.14.

With the implementation of Project mitigation and management measures, residual effects on community health are expected to be negligible to low in magnitude, will occur in the Project Area and LAA/RAA, be continuous for the short to medium -term, and reversible. They will occur in a socio-economic context that is resilient and disturbed.

Table 14.14 Project Residual Effects on Community Health

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Community Well-Being	C	A/P	L	LAA/RAA	ST	C	R	R
	O	A/P	L	LAA/RAA	MT	C	R	R
	D	A/P	L	LAA/RAA	ST	C	R	R
Change in Physical Health Conditions	C	A	N-L	PA/LAA	ST-MT	C	R	D
	O	A	N-L	PA/LAA	ST-MT	C	R	D
	D	A	N-L	PA/LAA	ST-MT	C	R	D
<p>KEY</p> <p>Table 14.10 provides detailed definitions</p> <p>Direction: N: Neutral P: Positive A: Adverse</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p> <p>Geographic Extent: PA: Project Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short term MT: Medium term LT: Long term P: Permanent</p> <p>N/A: Not applicable</p> <p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological / Socio-Economic Context: R: Resilient NR: Not Resilient D: Disturbed U: Undisturbed</p>								

14.6 DETERMINATION OF SIGNIFICANCE

A significant adverse residual effect on community well-being is one that results in deterioration of health and well-being over an extended period, which cannot be managed or mitigated through adjustments to programs, policies, plans or other mitigation. A significant adverse residual effect on physical health conditions is one that results in a reduction in the quality of ambient air, water, country foods or sound at levels predicted to result in exposures that are higher than the health-based guidelines established by



regulatory organizations, and is likely to result in a substantive change in the health of an identified receptor.

Although the Project is anticipated to result in changes to air, water and sound, direct exposures are not expected to exceed health-based guidelines; therefore, the risk of adverse effects to physical health conditions from direct exposures is negligible, while the potential for a change in physical health related to country foods consumption is considered to be low. Both adverse and positive effects on community well-being are anticipated over the life of the Project, with adverse residual effects being low in magnitude. Adverse effects will be mitigated through measures such as use of an accommodations camp, an Employee Assistance Program, and continued engagement with communities in the LAA/RAA. With mitigation and management measures, residual environmental effects on community health are predicted to be not significant.

14.7 PREDICTION CONFIDENCE

The known success of proposed standard mitigation measures and the resilience of the existing socio-economic environment of the LAA/RAA contribute to increased confidence in the prediction of residual effects. However, due to the nature of social interactions and differences in individual actions, behaviours and influences, as well as uncertainty regarding the extent to which Project employment will be realized by local residents, prediction confidence with respect to changes in community health is moderate.

14.8 PREDICTED FUTURE CONDITION OF THE ENVIRONMENT IF THE UNDERTAKING DOES NOT PROCEED

The Project is located in an area with a long history of mineral exploration and mining activity. With proven mineral reserves, should the Project not proceed it is likely that other mining proponents would secure interests in the area and seek to develop resources. It is anticipated that future projects would have similar effects as the Project on LAA/RAA community health. If no other mining proponents were to develop the resource, residents that would have secured employment will not realize the benefits that would have come from Project-related employment and income. It is likely that the population of the smaller LAA/RAA communities would continue to decline, which would result in lower levels of investment in local health services and infrastructure. More details on population effects are discussed in Chapters 13 (Community Services and Infrastructure) and 15 (Employment and Economy).

14.9 FOLLOW-UP AND MONITORING

Government departments, public agencies and private-sector companies that deliver health-related services and infrastructure will monitor the ongoing demand for such services as part of their normal planning practices. For this reason, and because the management of population health falls under the responsibility of the provincial government, no follow-up and monitoring program is proposed for change in community well-being. Monitoring of regional employment associated with the Project is addressed in Chapter 15 (Employment and Economy). Monitoring of Project-related emissions and discharges is described in Chapter 5 (Atmospheric Environment), Chapter 6 (Groundwater Resources), and Chapter 7 (Surface Water Resources).



14.10 REFERENCES

14.10.1 Personal Communications

Corbett, D. Mayor, Town of Buchans. Email, March 10, 2020.

Drover, R. Town Manager, Bishop's Falls. Email, May 28, 2020.

14.10.1.1 Literature Cited

Barron, T., Orenstein, M., & Tamburrini, A.-L. 2010. Health Effects Assessment Toll (HEAT): An Innovative Guide to HIA in Resource Development Projects. Available at: http://www.erm.com/globalassets/documents/publications/2010/erm_healtheffectsofresourcedevelopmentprojects.pdf

Canadian Observatory on Homelessness. 2018. Canadian Definition of Homelessness. Available at: <https://www.homelesshub.ca/sites/default/files/COHhomelessdefinition.pdf>

Central Health. No Date. Health Services Areas. Available at: <https://www.centralhealth.nl.ca/hospitals-health-care-centres-long->

Central Health. 2017. Strategic Plan 2017-2020. Available at: https://eb6b7034-9bb0-4065-b31f-5109efcf9249.filesusr.com/ugd/d55165_0c044b0a12d0436892d3e53e350f4e1a.pdf

Central Health. 2019. 2018-2019 Annual Report. Available at: https://eb6b7034-9bb0-4065-b31f-5109efcf9249.filesusr.com/ugd/d55165_b16f4e60dd1c45dab950429988049cef.pdf

CIRNAC (Crown-Indigenous Relations and Northern Affairs Canada). 2019a. The Community Well-Being Index. Available online at: <https://www.sac-isc.gc.ca/eng/1345816651029/1557323327644#chp3>

CIRNAC. 2019b. About the Community Well-Being Index. Available online at: <https://www.sac-isc.gc.ca/eng/1421245446858/1557321415997>

CMHC (Canadian Mortgage and Housing Corporation). 2018. About Affordable Housing in Canada. Available online at: <https://www.cmhc-schl.gc.ca/en/developing-and-renovating/develop-new-affordable-housing/programs-and-information/about-affordable-housing-in-canada>

Government of NL (Newfoundland and Labrador). 2020a. Pandemic Update. Available at: <https://covid-19-newfoundland-and-labrador-gnl.hub.arcgis.com/>

Government of NL (Newfoundland and Labrador). 2020b. Mining Sector COVID-19 Safety. Available at: <https://www.gov.nl.ca/covid-19/information-sheets-for-businesses-and-workplaces/mining-sector-covid-19-safety/>

Health Canada. 2016a. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality. Available at: <https://www.acee.gc.ca/050/documents/p80054/119376E.pdf>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

- Health Canada. 2016b. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality. Available at: <https://aeic-iaac.gc.ca/050/documents/p80054/119377E.pdf>
- Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Available at: <https://aeic-iaac.gc.ca/050/documents/p80054/119378E.pdf>
- Health Canada. 2018. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods.
- Kelli, H., Haider, M., Hammadah, M., Awad, M., Dunbar, S., Lewis, T., Quyyumi, A. 2016. PM041 Lower Income Is Associated With Increased Cardiovascular Risk Factors, Systemic Inflammation, Arterial Stiffness and Oxidative Stress. *Global Heart*, 11(2), e77-e78. doi: 10.1016/j.gheart.2016.03.268.
- Kline, M., and Gonzalez, P. 2003. Mental health and psychosomatic consequences of unemployment and dysfunctional employment: a bimodal hypnotherapy and career counseling approach. *Journal of Psychosomatic Research*, 55(2), 138. doi: 10.1016/S0022-3999(03)00337-4.
- NL (Newfoundland and Labrador) Department of Education. 2020. Education Statistics. Available at: <https://www.gov.nl.ca/eecd/publications/k12/stats/#2020>
- NL (Newfoundland and Labrador) Department of Health and Community Services. 2016. Disease Report, Quarterly Report, Volume 33, Number 1, March 2016. Available at: https://www.health.gov.nl.ca/health/publichealth/cdc/pdf/CDR_March_2016_Vol_33_No1.pdf
- NL (Newfoundland and Labrador) Department of Health and Community Services. 2019a. The Way Forward, Chronic Disease Action Plan. Available at: https://www.health.gov.nl.ca/health/chronicdisease/pdf/chronic_illness.pdf
- NL (Newfoundland and Labrador) Department of Health and Community Services. 2019b. 2018/2019 Influenza Report. Available at: https://www.health.gov.nl.ca/health/publichealth/cdc/flu/Seasonal_Influenza_Report_2018_2019.pdfCommunicable
- NLHC (Newfoundland and Labrador Housing Corporation). 2020. Rental Housing Portfolio. Available at: <https://www.nlhc.nl.ca/wp-content/uploads/2020/05/Rental-Housing-Portfolio-March-2020.pdf>
- NL (Newfoundland and Labrador) Statistics Agency 2019a. Persons with and without disabilities aged 15 years and over, by age and sex, Canada, Newfoundland and Labrador, 2017. Available at: https://www.stats.gov.nl.ca/Statistics/Topics/health/PDF/Disability_Persons_With_Without_AgeGrp_Sex_CanNL.pdf
- NL (Newfoundland and Labrador) Statistics Agency. 2019b. Newfoundland and Labrador Community Accounts. Available at: <https://nl.communityaccounts.ca/default.asp>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Community Health
September 2020

- PHAC (Public Health Agency of Canada). 2013. What Makes Canadians Healthy or Unhealthy? Available online at: <https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health/what-makes-canadians-healthy-unhealthy.html>
- Ruijsbroek, A., Droomers, M., Groenewegen, P. P., Hardyns, W., & Stronks, K. 2015. Social safety, self-rated general health and physical activity: Changes in area crime, area safety feelings and the role of social cohesion. *Health & place*, 31, 39-45. doi: <http://dx.doi.org/10.1016/j.healthplace.2014.10.008>
- Sinha, M. 2014. Spotlight on Canadians: Results from the General Social Survey, Canadians' Connections with Family and Friends. Available at: <https://www150.statcan.gc.ca/n1/en/pub/89-652-x/89-652-x2014006-eng.pdf?st=B4N4FzGL>
- Skeard, J. 2014. "Hope Springs Eternal": A Study of Company and Community in the Former Mining Town of Buchans, Newfoundland A Thesis submitted to the School of Graduate Studies in partial fulfillment of the requirements for the degree of Master of Arts, Department of Geography, Memorial University of Newfoundland, October, 2014.
- Statistics Canada. 2020. Health Characteristics, Two-Year Period Estimates. Available at: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310011301>
- Statistics Canada. 2019a. Canadian Survey on Disability (CSD). Available at: <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3251>
- Statistics Canada. 2019b. Family violence in Canada: A statistical profile, 2018. Available at: <https://www150.statcan.gc.ca/n1/pub/85-002-x/2019001/article/00018-eng.pdf>
- Statistics Canada. 2018. 2016 Census. Statistics Canada Catalogue no. 98-510-X2016001. Aboriginal Community Profile. Ottawa. Released July 18, 2018. Available at: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E>
- Statistics Canada. 2017. Census Profiles, 2016 Census. Available at: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>
- WHO (World Health Organization). 2020. Rolling Updates on Coronavirus disease (COVID-19). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>
- WHO (World Health Organization). 2008. Commission on Social Determinants of Health FINAL REPORT – Closing the Gap in a Generation – Health Equity through action on the social determinants of health. Available at: http://apps.who.int/iris/bitstream/10665/43943/1/9789241563703_eng.pdf



15.0 EMPLOYMENT AND ECONOMY

15.1 SCOPE OF ASSESSMENT

Employment and economy have been assessed as a valued component (VC) because economic conditions may be affected by the construction, operation, and decommissioning, rehabilitation and closure of the Project. Employment and business support the economic livelihoods of residents, and provide associated social benefits stemming from earned income. Economic effects (e.g., labour, labour income, and contributions to Gross Domestic Product [GDP] and government revenues) are of interest to the public, stakeholders, regulators, Indigenous groups, and governments.

The assessment of employment and economy is linked with the assessment of Land and Resource Use (Chapter 16) with respect to effects on outfitters. Other sections that are supported by components of this assessment include:

- Community Services and Infrastructure (Chapter 13) with respect to changes in demand for community infrastructure and services due to changes in population (stemming from Project employment-related effects)
- Community Health (Chapter 14) with respect to changes in community wellbeing due to changes in employment and income
- Indigenous Groups (Chapter 17) with respect to potential employment and procurement opportunities

15.1.1 Regulatory and Policy Setting

The Provincial Environmental Impact Statement (EIS) Guidelines (Appendix 1B) issued for the Project require that descriptions of labour force requirements and economic benefits to Newfoundland and Labrador (NL) are provided. The Federal EIS Guidelines (Appendix 1A) require consideration of effects on the human environment, including “socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities.” The Provincial and Federal EIS Guidelines (Appendix 1B and 1A) also require that effects on outfitters be considered.

15.1.2 The Influence of Engagement on the Assessment

As part of ongoing engagement and consultation activities, Marathon has documented interests and concerns about the Project received from communities, governments, Indigenous groups and stakeholders. An overview of Marathon’s engagement activities is provided in Chapter 3. Documented interests and concerns have influenced the design and operational plans for the Project and the development of the EIS, including the scope of assessment on the VCs. Interests and concerns noted that relate to employment and economy are detailed below.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Overall, a high degree of support for the Project has been expressed in terms of potential local economic benefits, including:

- Local employment - local employment is of key interest to residents and provincial regulators
- Contracting and business opportunities - Local contracting and business opportunities are of interest to Indigenous groups, community residents, and provincial regulators

Marathon also consulted with the Newfoundland and Labrador Outfitters Association. While the Association acknowledged the positive economic effects of the Project, certain outfitters expressed concern regarding Project-related changes in land and resource use (affecting the quality of experience of area outfitting and success rate of hunts), increased pressure on hunting and angling from the Project's workforce, and overall adverse effects on business operations (e.g., increased costs and lower revenues).

Questions and concerns raised by Qalipu through Marathon's engagement efforts include:

- The need to balance economic benefits against potential adverse environmental effects of the Project
- Employment opportunities, including the targets for employment of women and Indigenous women, and the establishment of training funds and training programs
- Need to involve youth due to their interest in both the environmental and socio-economic aspects of the Project
- Need for ongoing engagement

Questions and concerns raised by Miawpukek through Marathon's engagement efforts include:

- Need for ongoing engagement
- Access to economic opportunities

Questions and concerns raised by communities and other stakeholders through Marathon's engagement efforts include:

- Timely and ongoing engagement with communities and other stakeholders
- Employment opportunities, including types of jobs available (contract versus permanent), how soon will hiring begin, salaries, lengths of shifts, accommodations for employees, how to apply, experience required and the timing for different types of employment
- Local benefits and whether local residents will be represented in the workforce, whether Marathon will have a policy on local hires (including consideration of how close potential employees currently live in relation to the mine) and whether priority will be given to Buchans, Millertown and Buchans Junction, as the three communities closest to the mine site
- Preferential hiring of Indigenous persons
- Contracting opportunities for local businesses, including when requests for contracts for the construction phase will be issued, whether there will be supplier workshops in local communities, and when an engineering contractor [prime engineering consultant] will be appointed



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

- Marathon's corporate plans related to the Project including whether there will be an office in central Newfoundland, when an EPCM contractor will be chosen, the likelihood of Marathon being bought by, or entering into a partnership with another company, the location of any additional Marathon mines, and an understanding of any major Project hurdles

Questions and concerns raised by fish and wildlife and civil society organizations through Marathon's engagement efforts include:

- Which stakeholder groups have been engaged by Marathon
- Need for Marathon to provide compensation if outfitting operations are impaired

15.1.3 Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographic extent of potential effects) and temporal boundaries (i.e., timing of potential effects). Spatial boundaries for the Employment and Economy VC were selected in consideration of the geographic extent over which Project activities, and their effects, are likely to occur on the VC. Temporal boundaries were based on the timing and duration of Project activities and the nature of the interactions with the VC. The spatial and temporal boundaries associated with the effects assessment for the Employment and Economy VC are described in the following sections.

15.1.3.1 Spatial Boundaries

The following spatial boundaries were used to assess Project effects, including residual environmental effects, on employment and economy in areas surrounding the mine site and access road (Figure 15-1):

Project Area: The Project Area encompasses the immediate area in which Project activities and components occur and is comprised of two distinct areas: the mine site and the access road. The mine site includes the area within which Project infrastructure will be located, and the access road is the existing road to the site, plus a 20-metre (m) wide buffer on either side. The Project Area is the anticipated area of direct physical disturbance associated with the construction, operation, and decommissioning, rehabilitation and closure of the Project.

Local Assessment Area (LAA)¹: The LAA includes communities most likely to provide labour, goods and services required for Project construction and operation and captures the maximum area within which Project effects can be predicted or measured with a reasonable degree of accuracy and confidence. The LAA includes the Project Area and aligns with the administrative boundary of Statistics Canada's Census Division (CD) Number 6 (No. 6). CD No. 6 includes the following communities: Town of Appleton, Town of Badger, Town of Bishop's Falls, Town of Botwood, Town of Buchans, Town of Gander, Town of

¹ Because the assessment of 'change in economic activities of outfitters' is closely related to changes in land and resource use, the assessment regularly references the Land and Resource Use (Chapter 16) LAA and RAA. The Land and Resource Use LAA is defined as a 1 kilometre (km) buffer around the mine site and a 500 m buffer around the access road. This has been selected to capture the area where effects on land and resource use are likely to be most prevalent (e.g., effects to harvested species and sensory disturbance effects to nearby land users). The Land and Resource Use RAA is defined as a 35 km buffer around the Project Area, encompassing Victoria River and Red Indian Lake, as well as the communities of Millertown, Buchans, and Buchans Junction.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Glenwood, Town of Grand-Falls Windsor, Town of Millertown, Town of Norris Arm, Town of Northern Arm, Town of Peterview, as well as unorganized CD No. 6 Census Subdivisions (CSDs) A (which includes the Designated Place of Buchans Junction), C, D and E.

Regional Assessment Area (RAA)¹: The RAA is an area that establishes the context for determining the significance of Project-specific effects and is the area that informs the assessment of cumulative effects. The RAA is also used as the area from which Project-related effects on the economy are assessed. The RAA for employment and economy is the Province of NL.

15.1.3.2 Temporal Boundaries

The temporal boundaries for the assessment of potential effects on the Employment and Economy VC include:

- Construction Phase – 16 to 20 months, beginning in Q4 2021, with 90% of activities occurring in 2022
- Operation Phase – Estimated 12-year operation life, with commissioning / start-up and mine / mill operation slated to start Q2 2023
- Decommissioning, Rehabilitation and Closure Phase – Closure rehabilitation to occur once it is no longer economical to mine or resources are exhausted



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

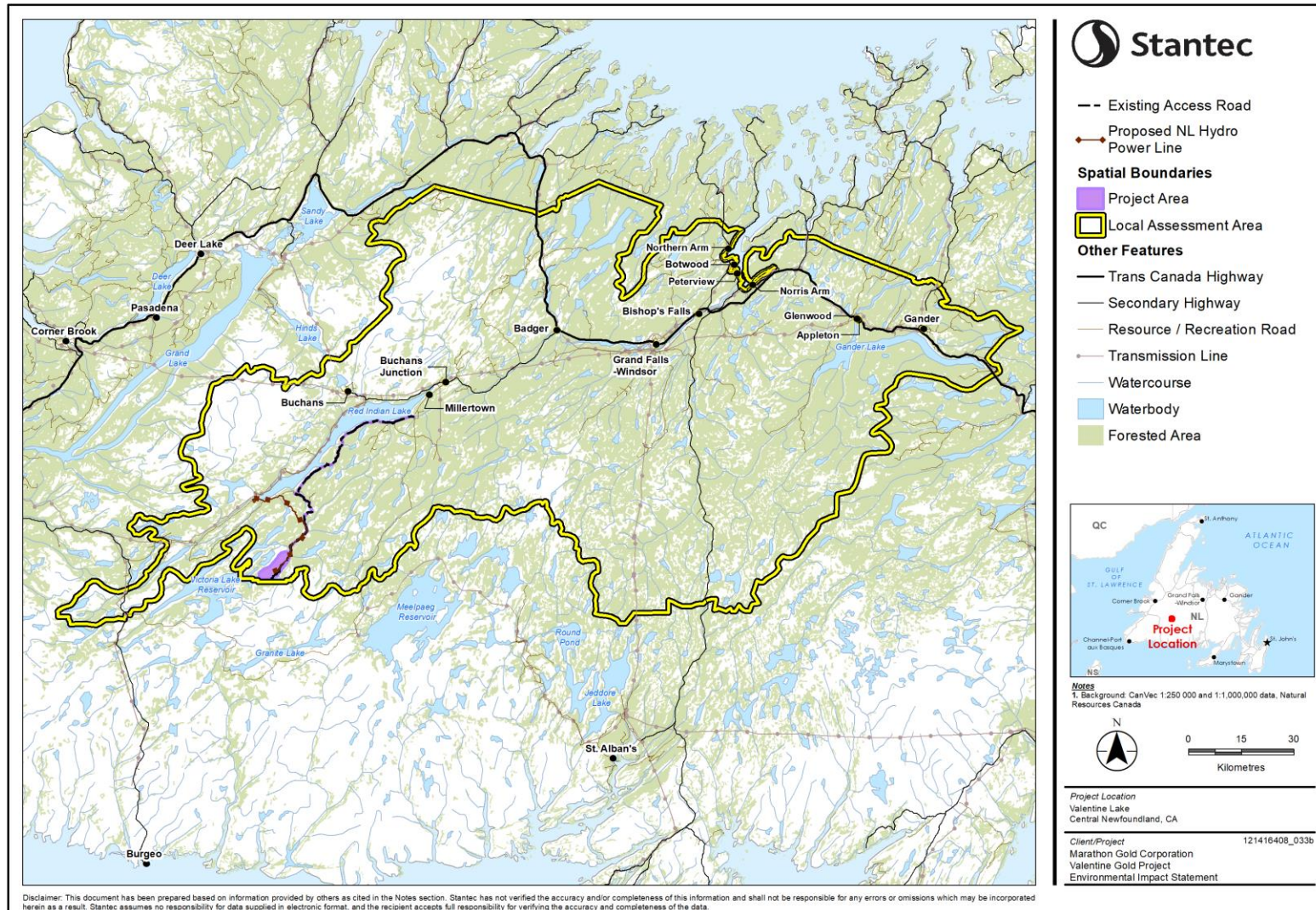


Figure 15-1 Spatial Boundaries for Employment and Economy



15.2 EXISTING CONDITIONS FOR EMPLOYMENT AND ECONOMY

A characterization of the existing conditions within the spatial boundaries defined in Section 15.1.3 is provided in the following sections. This includes a discussion of the influences of past and present physical activities on the VC, leading to the current conditions. An understanding of the existing conditions for the VC within the spatial area being assessed is a key requirement in the prediction of potential Project effects provided in Section 15.5.

15.2.1 Methods

Both primary (i.e., an original source and first-hand evidence) and secondary (i.e., second-hand information from other researchers) sources of information were used to describe the existing conditions in the LAA and RAA. Primary research involved engagement with outfitters and municipalities, including email and telephone correspondence. Primary information was also obtained from meetings with Indigenous groups and regulators. Secondary information included government sources (Statistics Canada, NL Statistics Agency, Government of NL and Tourism NL), publicly available data and literature, as well as previously prepared information (e.g., reports, studies) submitted to Marathon from Indigenous groups and local communities.

Much of this chapter relies on government databases including census data from Statistics Canada. Statistics Canada regularly suppresses (i.e., selectively does not disclose) survey information to protect the identity of individuals and to address data quality issues. Both the 2011 National Household Survey and 2016 Census of the Population (Census), which are used in this chapter are subject, in part, to data suppression by Statistics Canada.

15.2.2 Overview

Mining is one of the largest and oldest industries in NL and has a measurable effect on the provincial economy (Government of NL 2020). The history of mining within the LAA is long, dating back to prospecting activities in 1905 and construction of the first base metals mine in 1926. Although mining operation largely slowed in the LAA, the most recent downturn associated with the 2015 closure of Teck Resources Limited's (Teck's) Duck Pond copper-zinc mine, the existing labour force is well positioned to respond to increased demand for construction and mining-related activities.

The following sections provide information on the total and Indigenous population within the LAA and RAA; educational attainment within the LAA and RAA; labour force indicators; total and employment incomes; the mining industry, including the history of mining in the LAA, mineral exploration, the contribution of mining industries to the provincial economy, and direct mining employment; and economic contributions of outfitting businesses.

15.2.2.1 Population

In 2016, the total population of the LAA was 38,340 (51.8% female), an increase of 2.8% from 2011 (Table 15.1) (Statistics Canada 2012, 2014, 2017, 2018). Total population increases in the LAA were greater than the RAA (provincial) average of 1.0%. Grand Falls-Windsor, the largest community in the



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

LAA, accounted for 37.0% of the total population (14,171 people). Approximately 6.2% or 2,360 people (52.3% female) within the LAA identified as Indigenous, compared to the RAA (provincial) average of 8.8%.

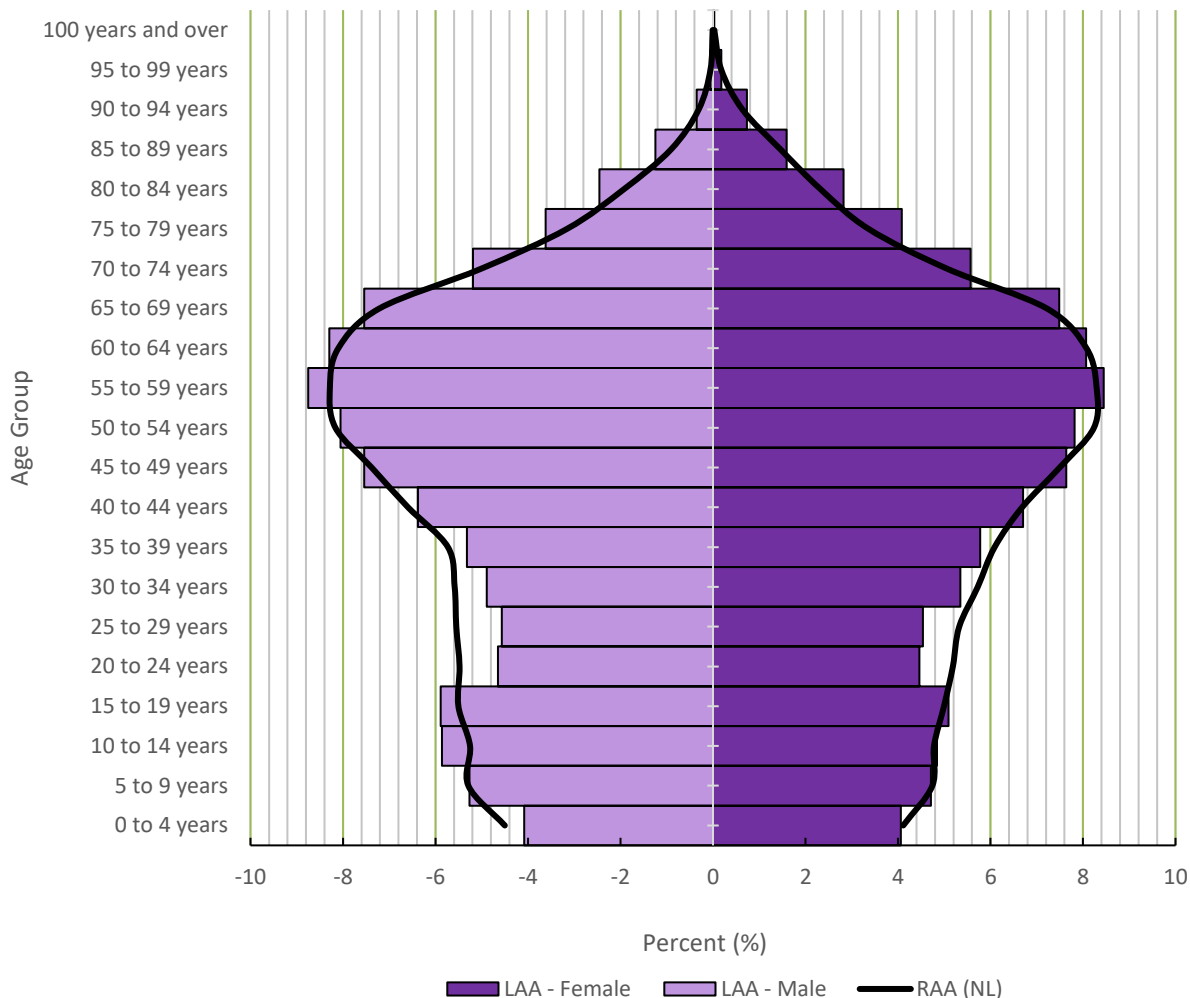
Table 15.1 Population Change – 2011 to 2016

Location	Dataset	Total Population			Indigenous Population ^A		
		Total	Male	Female	Total	Male	Female
LAA	2016	38,340	18,495	19,845	2,360	1,125	1,235
	% Change 2011-2016	2.8	2.8	2.8	43.0	55.2	33.5
RAA (NL)	2016	519,720	253,930	265,790	45,730	22,105	23,625
	% Change 2011-2016	1.0	1.3	0.7	27.7	23.9	31.5

Notes:
^A Indigenous and non-Indigenous totals may not sum to equal total population counts as they are based on a 25% population sample size.
 2011 'Total Population' data from 2011 Census of the Population – Census Profile. 2011 'Aboriginal Population' data taken from 2011 National Household Survey – Aboriginal Profile.
 Values shown in "Total" columns are the sum of male and female Census Subdivision (CSD) subsets taken from Statistics Canada's 2011 and 2016 Census Profile (Census of the Population). Due to Statistics Canada rounding (Statistics Canada 2019) totals may not exactly align with those shown on CSD Census Profiles and may not sum across tables.
 Source: Statistics Canada 2012, 2014, 2017, 2018

Figure 15-2 shows the distribution of the 2016 LAA population (total population) by age cohort compared to the RAA (provincial) average. Generally, there is a smaller percentage of males within the LAA population between 0 to 4 years of age and 20 to 34 years of age than across the RAA (province), and a greater percentage between 55 to 64 years of age (Statistics Canada 2017, 2018). Among females, there is a smaller percentage between 20 to 29 years of age than measured across the RAA (province) and a greater percentage between 55 to 59 years of age.





Source: Statistics Canada 2018

Figure 15-2 Population Pyramid 2016, Total Population

15.2.2.2 Educational Attainment

Educational attainment for residents of the LAA and RAA in 2016 is summarized in Table 15.2.

In general, educational attainment (e.g., secondary and post-secondary education) was similar in the LAA as seen across the RAA (province). Within the LAA, 50.2% of the total population and 51.9% of the Indigenous population had completed post-secondary education compared to RAA (provincial) averages of 51.6% and 49.5%, respectively (Statistics Canada 2017, 2018).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.2 Educational Attainment in LAA and RAA - 2016

Topic	Total Population				Indigenous Population			
	Total		Male (%)	Female (%)	Total		Male (%)	Female (%)
	Number	Percent (%)			Number	Percent (%)		
LAA								
No certificate, diploma or degree	7,660	23.8	48.4	51.6	355	19.5	42.3	57.7
Secondary (high) school diploma or equivalency certificate	8,320	25.9	46.9	53.1	520	28.6	48.1	51.9
Apprenticeship or trades certificate or diploma	3,855	12.0	72.9	27.1	250	13.7	64.0	36.0
College, CEGEP or other non-university certificate or diploma	8,020	25.0	40.1	59.9	470	25.8	40.4	59.6
University certificate or diploma below bachelor level	635	2.0	36.2	63.8	20	1.1	0.0	100.0
University certificate, diploma or degree at bachelor level or above	3,630	11.3	43.3	56.7	205	11.3	46.3	53.7
Total	32,120	100.0			1,820	100.0		
RAA (NL)								
No certificate, diploma or degree	102,665	23.4	49.8	50.2	9,785	27.0	49.9	50.1
Secondary (high) school diploma or equivalency certificate	109,480	25.0	45.9	54.1	8,535	23.5	42.3	57.7
Apprenticeship or trades certificate or diploma	49,435	11.3	73.5	26.5	4,590	12.7	70.8	29.2
College, CEGEP or other non-university certificate or diploma	101,250	23.1	42.4	57.6	8,775	24.2	43.3	56.7
University certificate or diploma below bachelor level	10,405	2.4	41.1	58.9	715	2.0	39.9	60.1
University certificate, diploma or degree at bachelor level or above	64,700	14.8	43.1	56.9	3,850	10.6	36.4	63.6
Total	437,935	100.0			36,250	100.0		
<p>Notes: Values shown in "Total" columns are the sum of male and female CSD subsets taken from Statistics Canada's 2016 Census Profile (Census of the Population). Due to Statistics Canada rounding (Statistics Canada 2019) totals may not exactly align with those shown on CSD Census Profiles and may not sum across tables. Source: Statistics Canada 2017, 2018</p>								



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Overall, females within the LAA accounted for a greater proportion of the total population with a college or university certificate, diploma or degree, while males generally accounted for a greater proportion of the population with an apprenticeship or trades certificate or diploma. Among the Indigenous population of the LAA, females accounted for a greater proportion of the population with a college certificate or diploma (59.0% of the population), while males accounted for a greater proportion of persons with a university certificate, diploma or degree (64.0% of the population).

15.2.2.3 Labour Force

Table 15.3 provides a summary of labour force indicators for the LAA and RAA (province). In 2016, the total size of the LAA labour force was 17,785 (49.6% female) (Statistics Canada 2017, 2018). Of the total LAA labour force, 6.5% identified as Indigenous (1,155 people, of whom 50.2% were female).

In 2016, the LAA total labour force participation rate² (55.4%) was lower than the RAA (provincial) average, while the participation rate of the Indigenous portion of the labour force was slightly greater (48.8%) (Statistics Canada 2017, 2018). Minor variations in labour force participation rates were observed between males and females (total and Indigenous population) within the LAA and RAA (province).

Generally, unemployment rates within the LAA and RAA (province) were higher among males and Indigenous members of the labour force. Unemployment rates for males across total LAA (20.1%) labour force were higher than the RAA (provincial) average (18.6%), while unemployment rates for females across total LAA (11.2%) labour force were lower than the RAA (provincial) average (12.5%) (Statistics Canada 2017, 2018). Of the Indigenous portion of the LAA population, the unemployment rate was lower for males (24.3%) than the RAA (provincial) average (25.9%) and higher for females (19.0%) than the RAA (provincial) average (16.9%).

Table 15.3 Labour Force Indicators, 2016

Topic	Total Population			Indigenous Population		
	Total	Male	Female	Total	Male	Female
LAA						
Population aged 15 years+	32,125	15,435	16,690	2,365	1,130	1,235
Labour force	17,785	8,970	8,815	1,155	575	580
Participation rate (%)	55.4	58.1	52.8	48.8	50.9	47.0
Employed	14,990	7,165	7,825	905	435	470
Unemployed	2,790	1,805	985	250	140	110
Unemployment rate (%)	15.7	20.1	11.2	21.6	24.3	19.0
RAA (NL)						
Population aged 15 years+	437,935	212,785	225,150	45,725	22,100	23,625
Labour force	256,855	133,110	123,745	22,050	10,995	11,055

² The participation rate is the total labour force (employed and unemployed, combined) relative to the working-age population.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.3 Labour Force Indicators, 2016

Topic	Total Population			Indigenous Population		
	Total	Male	Female	Total	Male	Female
Participation rate (%)	58.7	62.6	55.0	48.2	49.8	46.8
Employed	216,705	108,395	108,310	17,335	8,145	9,190
Unemployed	40,155	24,715	15,440	4,715	2,850	1,865
Unemployment rate (%)	15.6	18.6	12.5	21.4	25.9	16.9
Notes: Values shown in "Total" columns are the sum of male and female CSD subsets taken from Statistics Canada's 2016 Census Profile (Census of the Population). Due to Statistics Canada rounding (Statistics Canada 2019) totals may not exactly align with those shown on CSD Census Profiles and may not sum across tables. Source: Statistics Canada 2017, 2018						

Employment by Industry

Employment patterns in 2016 (by sex) across the total and Indigenous portions of the LAA, as compared to RAA (provincial) averages, are illustrated in Figures 15-3 and 15-4, respectively. Not including variations in employment across male and female components of the labour force (total and Indigenous), industry employment within the LAA was similar to RAA (provincial) averages.

Table 15.4 provides a summary of LAA employment (by sex) in industries most likely to be called upon to provide direct and indirect labour and goods and services to the Project.

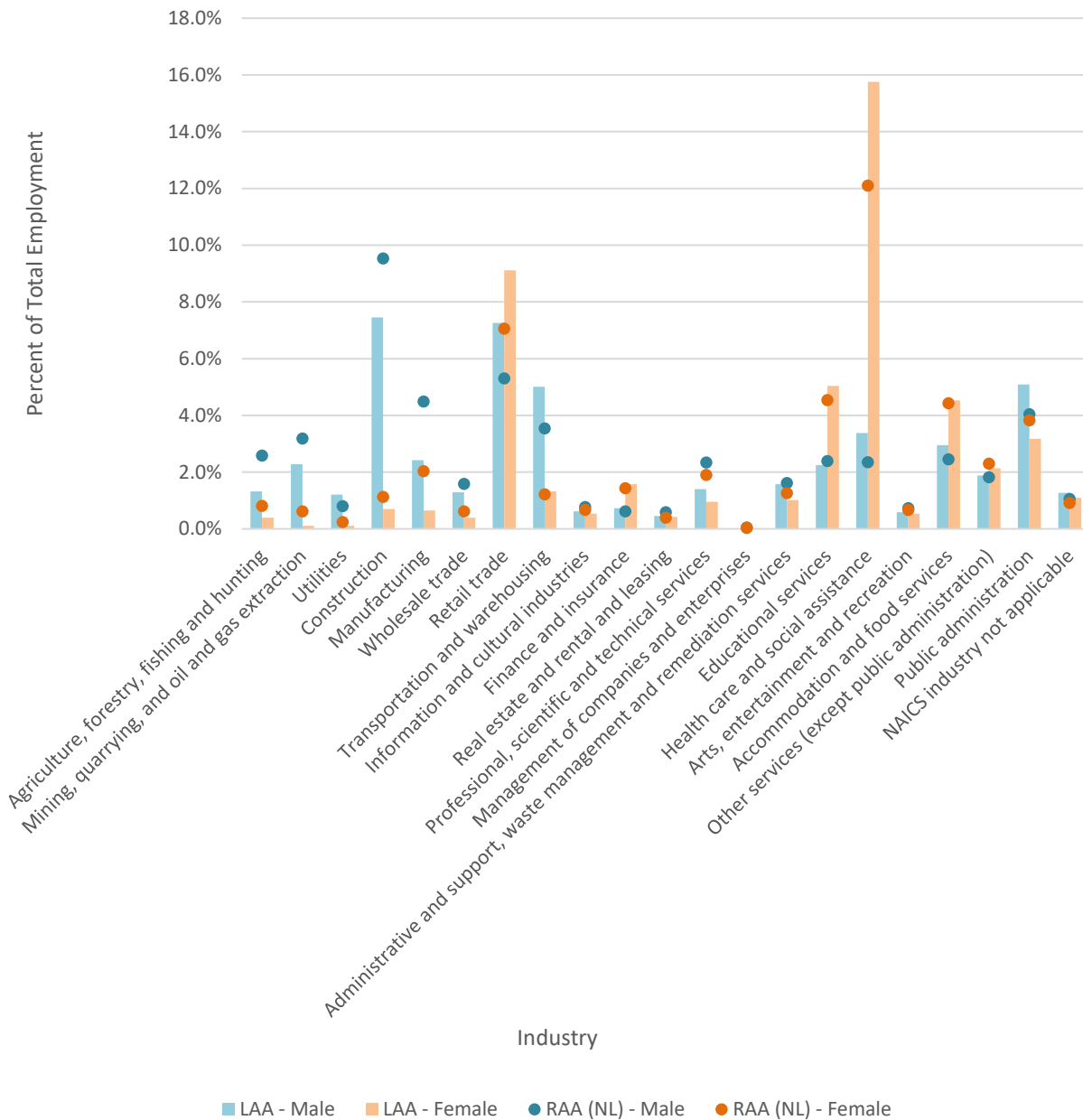
Table 15.4 LAA Employment (by Sex) in Select Industries

	Total (#)	Male (%)	Female (%)
Total Labour Force			
Mining, Quarrying and Oil and Gas Extraction	425	95.3	4.7
Construction	1,450	91.4	8.6
Transportation and Warehousing	1,125	79.1	20.9
Professional, Scientific and Technical Services	420	59.5	40.5
Indigenous Labour Force			
Mining, Quarrying and Oil and Gas Extraction	25	60.0	40.0
Construction	85	100.0	0.0
Transportation and Warehousing	65	84.6	15.4
Professional, Scientific and Technical Services	640	49.2	50.8
Source: Statistics Canada 2017, 2018			



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020



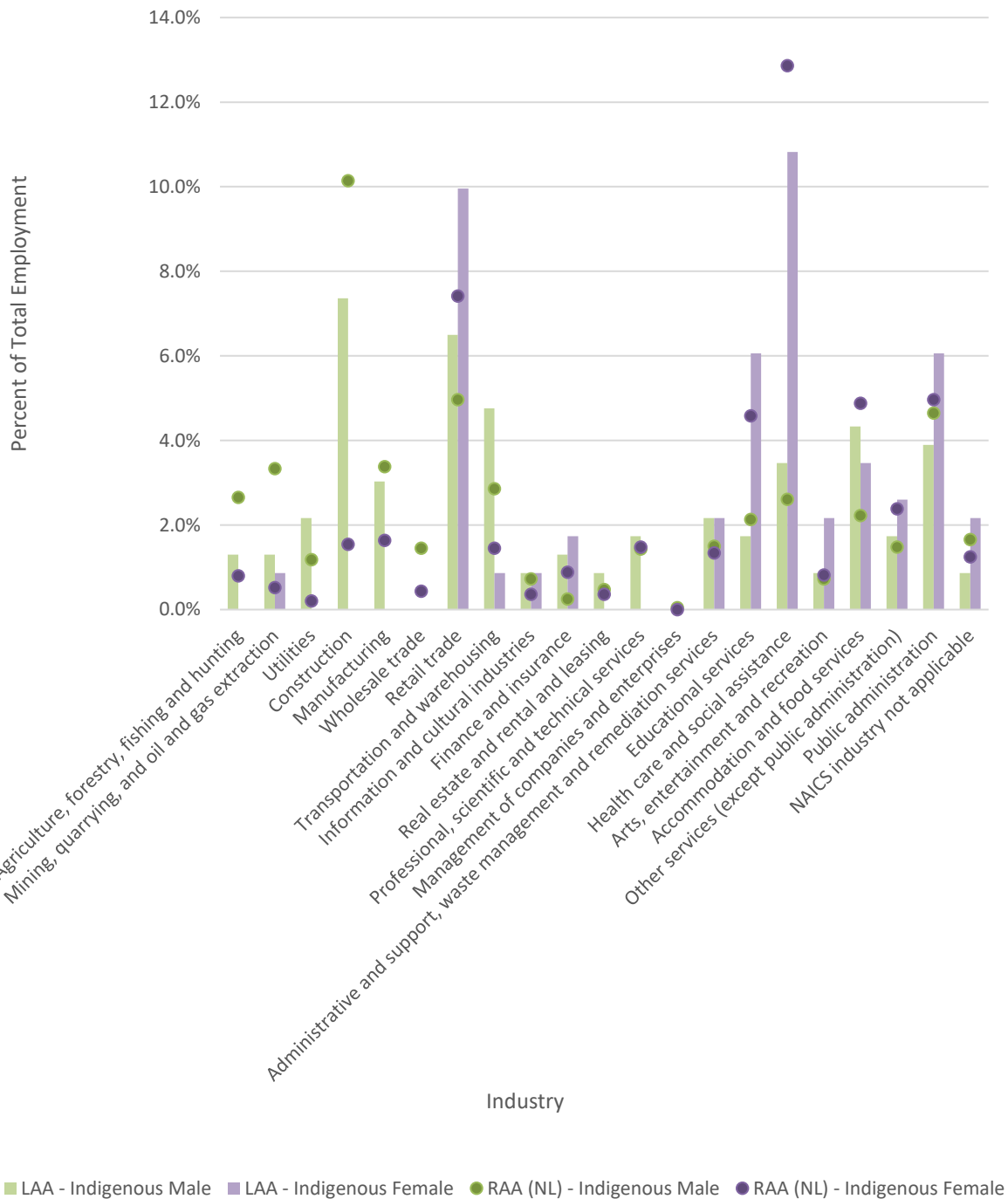
Source: Statistics Canada 2017

Figure 15-3 Industry Employment 2016, by Sex, Total Population



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020



Source: Statistics Canada 2018

Figure 15-4 Industry Employment 2016, by Sex, Indigenous Population



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Employment by Occupation

Employment patterns in 2016 (by sex) across the total and Indigenous portions of the LAA, as compared to RAA (provincial) averages, are illustrated in Figures 15-5 and 15-6, respectively. Not including variations in employment across male and female components of the labour force (total and Indigenous), occupational employment within the LAA was similar to RAA (provincial) averages with the exception of the following notable differences:

- LAA total labour force - less employment in natural resources, agriculture and related production (9.6% vs. the RAA [provincial] average of 17.3%) and manufacturing and utilities (22.5% vs. the RAA [provincial] average of 36.6%)
- LAA Indigenous labour force - greater employment in business, finance and administration (20.2% vs. the RAA [provincial] average of 11.9%) and less employment in trades, transport, equipment operators and related occupations (11.9% vs. the RAA [provincial] average of 20.0%) (Statistics Canada 2017, 2018)

Table 15.5 provides a summary of LAA employment (by sex) in occupations most likely to be called upon to provide direct and indirect labour to the Project.

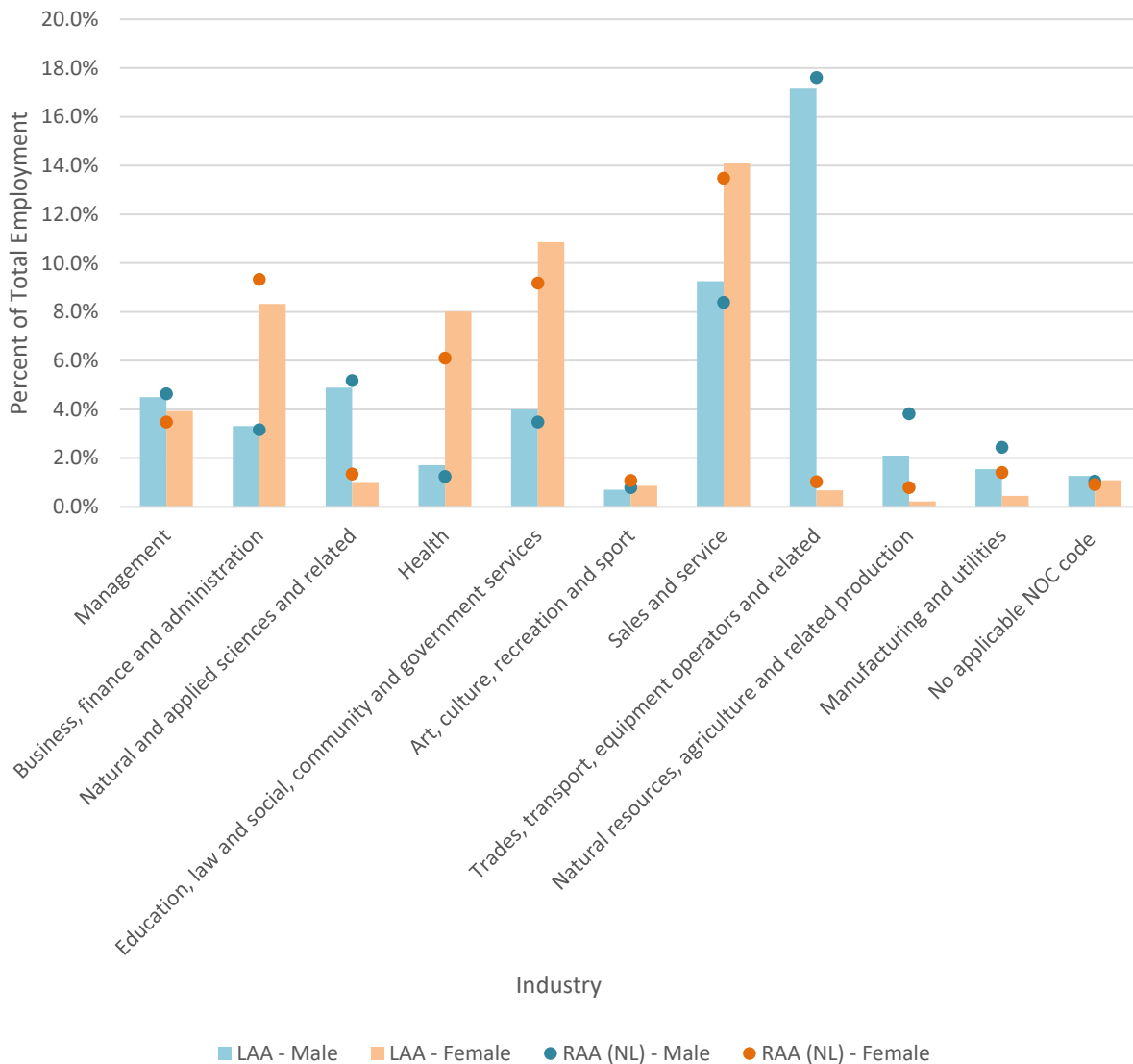
Table 15.5 LAA Employment (by Sex) in Select Occupations

	Total (#)	Male (%)	Female (%)
Total Labour Force			
Management	1,500	53.3	46.7
Natural and applied sciences (and related)	1,050	82.9	17.1
Trades, transport and equipment operators (and related)	3,170	96.2	3.8
Natural resources, agriculture and related production	415	90.4	9.6
Indigenous Labour Force			
Management	80	56.3	43.8
Natural and applied sciences (and related)	70	100.0	0.0
Trades, transport and equipment operators (and related)	155	90.3	9.7
Natural resources, agriculture and related production	15	100.0	0.0
Source: Statistics Canada 2017, 2018			



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020



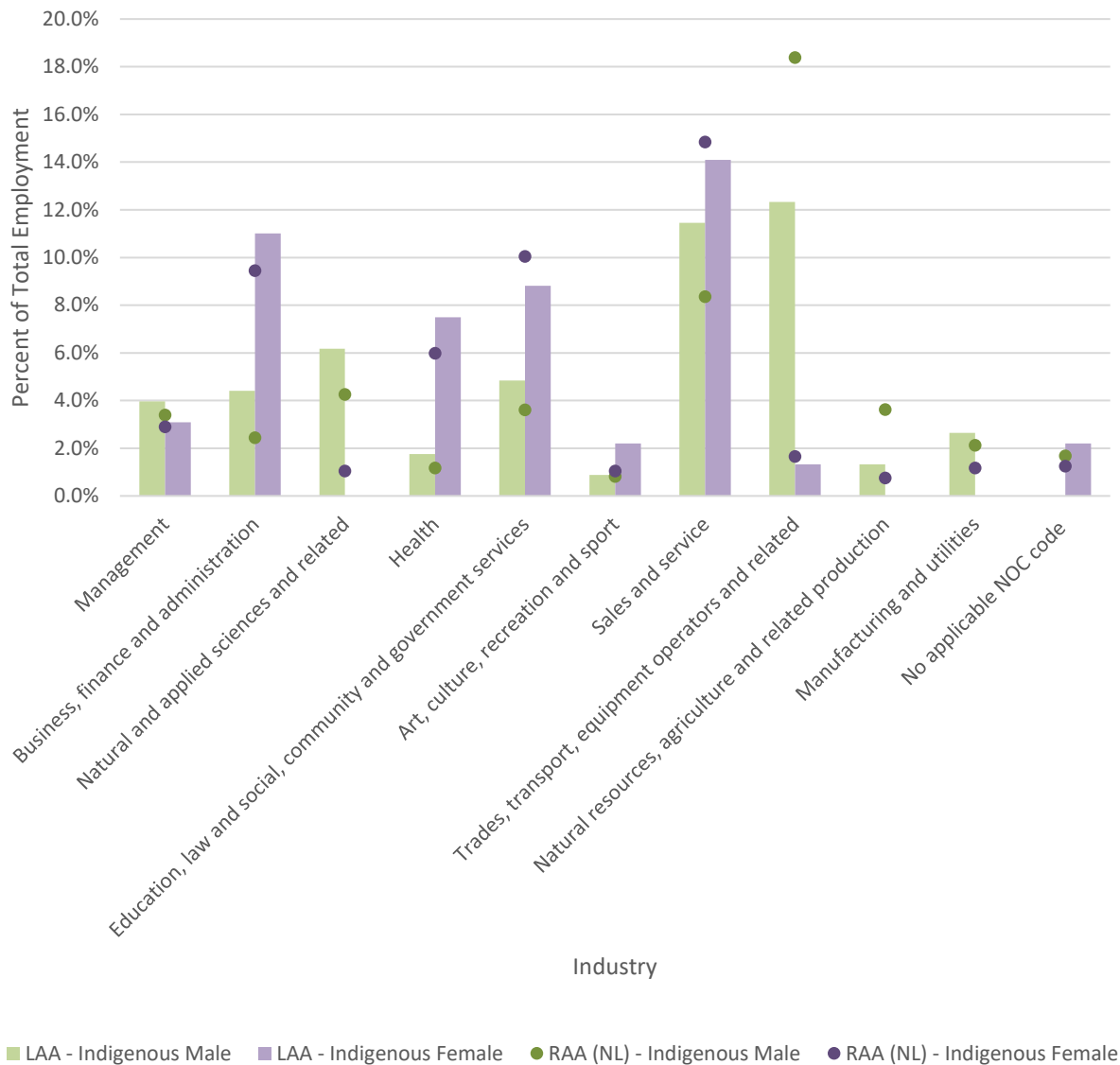
Source: Statistics Canada 2017

Figure 15-5 Occupational Employment 2016, by Sex, Total LAA Population



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020



Source: Statistics Canada 2018

Figure 15-6 Occupational Employment 2016, by Sex, Indigenous LAA Population



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Average Wages for Select Industries

Table 15.6 provides a summary of average gross hourly wages (2019) for NL workers in industries likely to provide direct labour to the Project. Average annual wages were applied to three scenarios to estimate average annual employment (Table 15.6). As calculated, estimated annual wages under scenario one are based on full-time employment and 2,100 person hours per year (no overtime); scenario two is based on 12-hour workdays and a two-week on / two-week off work schedule (overtime after 40 hours per week); and scenario 3 is based on 10-hour workdays and a three-week on / one-week off work schedule (overtime after 40 hours per week).

Table 15.6 Average Employee Wages by Industry, NL (2019)

Industry	Average Hourly Wage	Scenario 1 - Annual Wage (based on 2,100 hrs/year)	Scenario 2 - Annual Wage (based on 12-hour 2x2 work schedule) ^A	Scenario 3 - Annual Wage (based on 10-hour 3x1 work schedule) ^A
Forestry, fishing, mining, quarrying, oil and gas	\$36.50	\$76,650	\$100,594	\$120,998
Construction	\$28.70	\$60,291	\$79,125	\$95,174
Professional, scientific and technical services	\$33.00	\$69,300	\$90,948	\$109,395
Note: ^A Assumes overtime payments beyond 40 hours per week; rounded down to nearest thousand Source: Statistics Canada 2020a				

15.2.2.4 Individual Income

This section presents information on 2015 total and employment incomes (annual, before-tax) for individuals within the LAA and RAA (province). Total income represents the sum of regular and recurring monetary receipts from part-time and full-time employment income, income from investment sources, income from employer and personal pension sources, other regular cash income (e.g., child support payments and spousal support payments), and income from government sources (e.g., income support) (Statistics Canada 2017, 2018). Employment income is the sum of wages, salaries, tips, commissions, and net income from self-employment (Statistics Canada 2017, 2018).

Except for mean total income among Indigenous males in the LAA, total incomes (mean and median) and employment incomes (mean and median) of the LAA were lower than RAA (provincial) incomes (Table 15.7). In each case (i.e., LAA and RAA [provincial] averages for the total and Indigenous populations), total incomes and employment incomes (mean and median) were higher among males than females.



Table 15.7 2015 Individual Income (Annual – Before Tax)

Topic	Measure	Total Population			Indigenous Population		
		Total	Male	Female	Total	Male	Female
LAA							
Total Income (\$)	Median	30,349	39,469	24,190	26,786	38,810	22,102
	Mean	41,283	51,036	32,235	39,400	50,361	30,039
Employment Income (\$)	Median	28,896	37,717	23,473	22,602	30,162	19,424
	Mean	41,525	49,904	32,784	36,335	45,003	27,675
RAA (NL)							
Total Income (\$)	Median	31,754	40,880	25,314	29,089	36,140	24,352
	Mean	45,210	56,724	34,259	40,528	49,138	32,650
Employment Income (\$)	Median	31,528	41,659	24,445	26,830	35,586	22,035
	Mean	46,153	57,421	34,087	40,397	49,521	31,461
Source: Statistics Canada 2017, 2018							

15.2.2.5 Mining Industry

Mining is one of the largest and oldest industries in NL and has a measurable effect on the provincial economy (Government of NL 2020). In 2018, mining and quarrying (inclusive of support activities) accounted for 6.6% (\$2.0 billion) of total provincial GDP (\$30.4 billion; Statistics Canada 2020b). Metal ore mining accounted for 97.3% of 2018 mining and quarrying GDP in NL with non-metallic mining accounting for the remaining 2.7% (no coal mining occurred). Of metal ore mining, iron ore mining contributed the greatest percentage of GDP (64.9% of metal ore mining GDP), followed by copper, nickel, lead and zinc ore mining (34.1%) and gold and silver ore mining (1.0%).

Mining and Barite Operations Near the Project

The economy of this rural region of central Newfoundland has been shaped primarily by natural resource-based industries, including mining, forestry, and hydroelectric developments. In terms of mining, the history of communities in the vicinity of the Project dates back to prospecting activities in 1905 and construction of the first base metals (copper, zinc, and lead) mine in 1926 by the Buchans Minerals Corporation³ and development of the mining community of Buchans (Buchans Resources 2020, Heritage NL 2020). Over 400 workers were employed during the early phases of mine / town development. Ore was produced from the first site ‘Lucky Strike’ in 1928 (Heritage NL 2020). Continuous mining occurred in the area (at various sites – ‘Lucky Strike’, ‘Oriental’, ‘Old Buchans’, ‘Rotheremere’, and ‘MacLean’) by various companies up until 1984 (Heritage NL 2020).

³ The Buchans Minerals Corporation had leased mining rights from the partnership of the American Smelting and Refining Company (Asarco) and the Anglo-Newfoundland Development Company (AND Company)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Between 1982 and 1984 Asarco, in addition to its mining operation, operated a barite plant (Buchans Barite Plant), supplying drilling mud to oil and gas exploration activities occurring off NL's coast (Barite Mud Services Inc. 2014). Closure of the barite operation in 1984 was directly linked to discontinued offshore drilling and the subsequent loss of demand for local barite (Barite Mud Services Inc. 2014). Aside from continued mineral exploration and the operation of a granite quarries, the mining operations in and near the LAA were largely stagnant between 1985 to 2004.

In 2005, Teck began construction of the 'Duck Pond' copper-zinc mine (located 35 km southeast of Buchans). Construction of the Duck Pond mine (2005) employed more than 200 workers while the annual operation (2006-2015) employed more than 300 workers (the mine had a peak workforce of roughly 400 workers in 2013) (Teck 2001, Canadian Mining Journal 2013). Most of the mine's workforce came from the RAA, including the LAA communities of Buchans, Buchans Junction, Millertown, Badger and Grand Falls-Windsor (Intergovernmental Working Group on the Mineral Industry 2016). Teck ceased mining operation at Duck Pond in 2015. Decommissioning phases are ongoing, employing an annual average of nine persons.

In 2005, Atlantic Barite Limited (ABL) began seasonal (May to October) operation at the Buchans barite plant (formally operated by Asarco) supplying the drilling operation. The ABL operation employed an annual average of 11 workers (Department of Natural Resources [DNR] 2020a). By 2009, ABL had ceased its barite operation. In 2014, Barite Mud Service Inc. resumed seasonal operation at the Buchans barite plant. Barite Mud Services Inc. currently employs 18 workers (DNR 2020a). Additional information on existing mineral and quarrying land use is provided in Chapter 16.

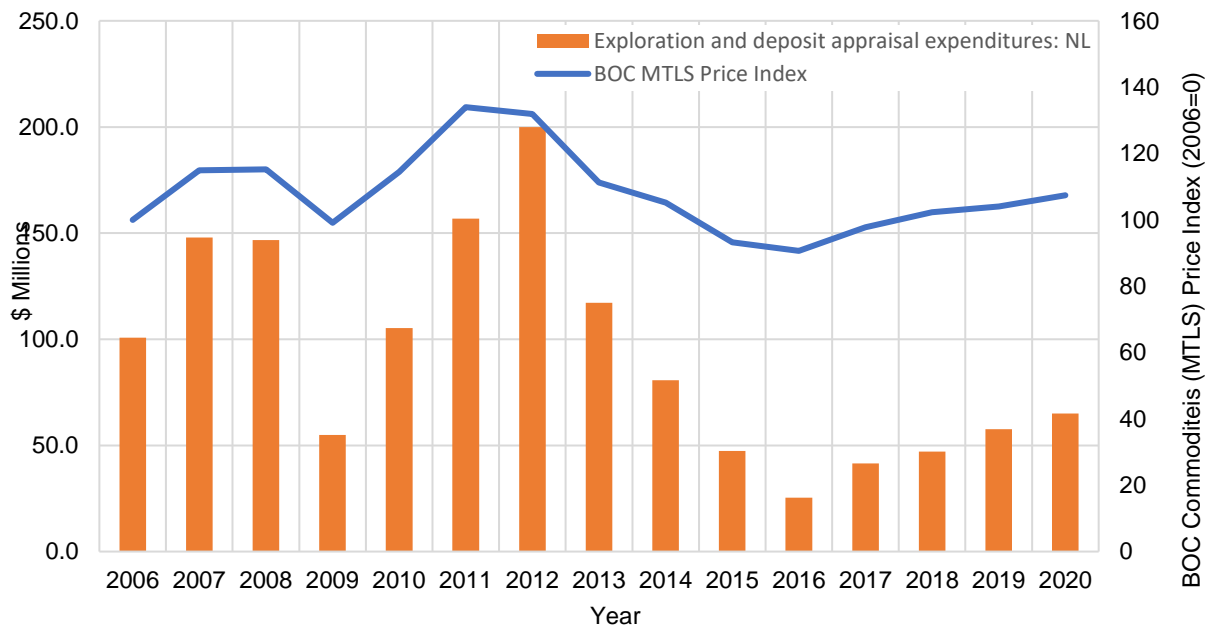
Mineral Exploration

Mineral exploration is a key indicator of the long-term viability of the mining industry as it may lead to the discovery and subsequent development of mineral deposits (Natural Resources Canada [NRCAN] 2020a). In general, mineral exploration is highly dependent on commodity prices (NRCAN 2020b). This relationship is illustrated in Figure 15-7 where a positive correlation is observed between mineral and metal commodity prices and expenditures on mineral exploration in NL between 2006 and 2020. Except for 2009 (slightly less than \$55 million), annual exploration expenditures between 2006 and 2013 remained above \$100 million, hitting a high of nearly \$200 million in 2012. Between 2012 and 2016, exploration expenditures trended downward hitting a low of just over \$25 million. Since 2016, expenditures have trended upward; a trend that differs from the rest of Canada where since 2018, expenditures have trended downward (Figure 15-8), opposite that of metal and mineral commodity prices.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020



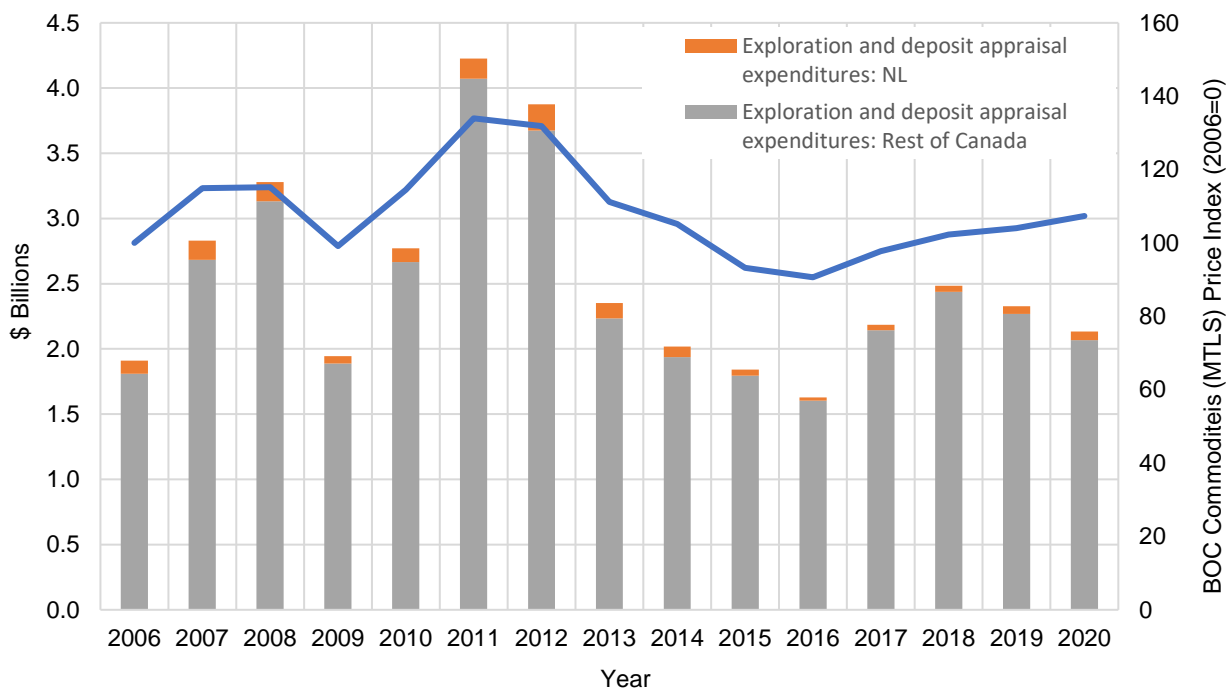
Notes: 2019 exploration and deposit appraisal expenditures are estimates; 2020 represent spending intentions. BOC Commodities (MTLS) Price Index is based on annual calculations (Jan) except for 2020, which is monthly (Jan).
Source: BOC 2020a, 2020b, Mining Association of Canada 2018, 2020; NRCan 2020c, 2020d

Figure 15-7 NL Mineral Exploration and Deposit Appraisal Expenditures and Bank of Canada (BOC) Metals Commodity Price



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020



NOTES: 2019 exploration and deposit appraisal expenditures are estimates; 2020 represent spending intentions. BOC Commodities (MTLS) Price Index is based on annual calculations (Jan) except for 2020, which is monthly (Jan).

SOURCE: BOC 2020a, 2020b, Mining Association of Canada 2018, 2020; NRCan 2020c, 2020d

Figure 15-8 Canada Mineral Exploration and Deposit Appraisal Expenditures and Bank of Canada Metals Commodity Price

Gross Value of Mineral Shipments

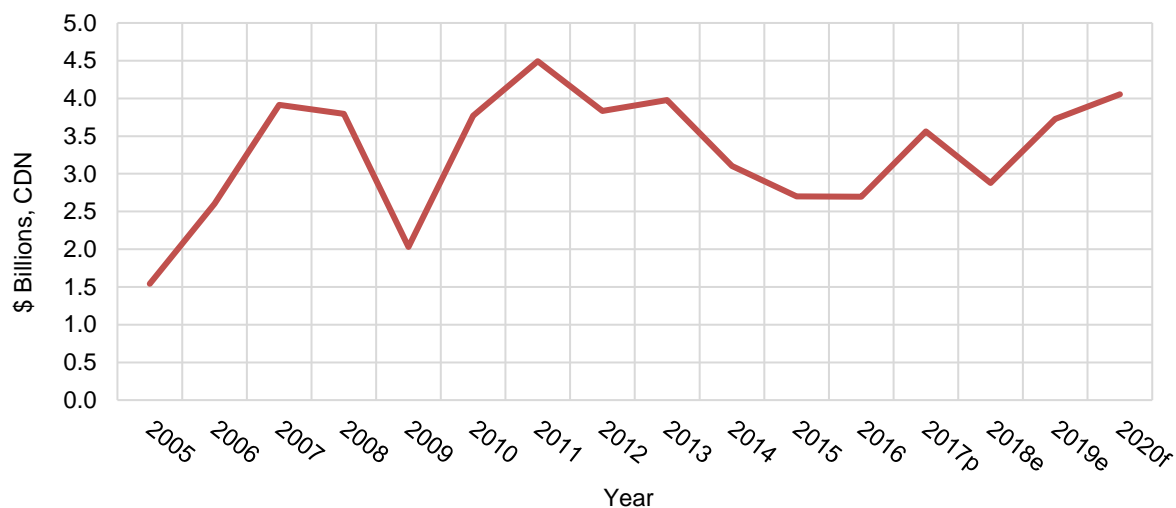
The Gross Value of Mineral Shipments (GVMS), calculated as the value of commodity shipments made by producing mining companies for a given year, is a standard measure used in NL to quantify the mining industries contribution to the provincial economy (DNR 2019). Between 2005 and 2020 (forecast), GVMS increased 163% from \$1.5 billion in 2005 to a forecasted value of \$4.1 billion in 2020 (DNR 2020c). Despite an overall increase, GVMS was variable over the 15-year period increasing to a high of \$4.5 billion in 2011, dropping to a low of \$2.0 billion in 2009, and was marked by a period of general decline between 2011 and 2016 (Figure 15-9). Notwithstanding a \$700 million reduction between 2017 and 2018, total GVMS has trended upward since 2016.

Based on forecast data, 87% (\$3.5 billion) of total GVMS in 2020 will be associated with shipments of iron ore (66% of total or \$2.7 billion) and nickel (21% of total or \$840 million; DNR 2020c). Shipment of copper (6% of total or \$240 million), other-metals (4% of total or \$160 million), and non-metals (3% of total or \$130 million) account for the remaining 13% of GVMS (DNR 2020c). With operations ceased at Teck’s Duck Pond Mine, contributions to 2020 GVMS from the mining operations in the LAA are minor.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020



NOTES: p = preliminary; f = forecast; e = estimate

SOURCE: DNR 2020c

Figure 15-9 Gross Mineral Shipments, NL

Producing and Developing Mines

At the time of writing, there were 11 producing mines and six developing mines in NL (DNR 2020d, 2019). Table 15.8 provides a summary of producing and developing mines. The only producing mines within the LAA are associated with Barite Mud Services Inc. (barite) near Buchans, China Minmetals Rare Earth Group Co. Ltd (antimony) near Glenwood, and Hi-Point Industries (1991) Ltd. (peat) near Bishop’s Falls. Outside the LAA, the nearest producing mines are associated with Anaconda Mining Inc. (gold) and Rambler Metals and Mining Canada Ltd. (copper and gold) on the Baie Verte Peninsula (roughly 100 km north of Badger).

Table 15.8 Producing and Developing Mines in NL (as of May 2020)

Company	Project, Mine or Deposit	Approximate Location	Commodities
Producing			
Anaconda Mining Inc.	Point Rouse Project (Pine Cove Open Pit Mine, Pine Cove mill and tailings facility, Stog’er Tight Mine, Argyle Mineral Resource)	Baie Verte Peninsula, Newfoundland	Gold
Atlantic Minerals Limited	Lower Cove Quarry, White hills area	Lower Cove, Port au Port Peninsula, Newfoundland	Dolomite Limestone
Barite Mud Services Inc.	Buchans Barite plant	Buchans, Newfoundland	Barite
China Minmetals Rare Earth Group Co. Ltd.	Beaver Brook Antimony Mine Inc.	Glenwood	Antimony ore (processed into stibnite concentrate)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.8 Producing and Developing Mines in NL (as of May 2020)

Company	Project, Mine or Deposit	Approximate Location	Commodities
Canada Fluorspar (NL) Inc.	Grebes Nest Pit, Venter Pit, Open Cut Pit	St. Lawrence, Newfoundland	Fluorspar
Galen Gypsum Mines Limited	Coal Brook Gypsum deposit	St. George's Bay area, Newfoundland	Gypsum
Hi-Point Industries (1991) Ltd.	N/A	Near Bishop's Falls, Newfoundland	Peat
Iron Ore Company of Canada	Carol Lake Project, Magy Pit Extension	Labrador City, Labrador	Dolomite Iron ore
Rambler Metlas and Mining Canada Ltd.	Ming Copper-Gold Mine, Nugget Pond mill	Baie Verte Peninsula, Newfoundland	Copper Gold
Red Moon Resources Inc.	Ace Gypsum Mine	Flat Bay area, Newfoundland	Gypsum
Tacora Resources Inc.	Scully Mine and mill	Wabush, Labrador	Iron ore
Tata Steel Mineral Canada Ltd.	11 open pits in Labrador	Menihek area, Labrador	Iron ore
Trinity Resources Ltd.	N/A	Conception Bay South, Newfoundland	Pyrophyllite
Vale Newfoundland and Labrador Limited	Vale Voisey's Bay Mine, Vale Long Harbour Nickel Processing Plant	Voisey's Bay, Labrador	Cobalt, Copper, Nickel
Proposed / Developing			
Marathon Gold	Valentine Mine	Near Buchans, Newfoundland	Gold
Alderon Iron Ore Corp.	Kami Iron Ore Project	Near Wabush, Labrador	Iron ore
Buchans Resources Limited	Lucky Strike Mine (Lundberg base metal deposit)	Buchans, Newfoundland	Zinc
Matador Mining Limited	Cape Ray Gold	Near Port Aux Basque	Gold
Maritime Resources	Green Bay Property (Hammerdown mine)	Springdale, Newfoundland	Gold
Search Mineral Inc.	Foxtrot Rare Earth Element Mine	Port Hope Simpson, Labour	Rare earth metals
	Henly Harbour	Southern coast of Labrador (between Red Bay and Mary's Harbour)	Rare earth metals
	Red Wine Complex	Churchill Falls, Labrador	Rare earth metals
Source: DNR 2020d, 2019			

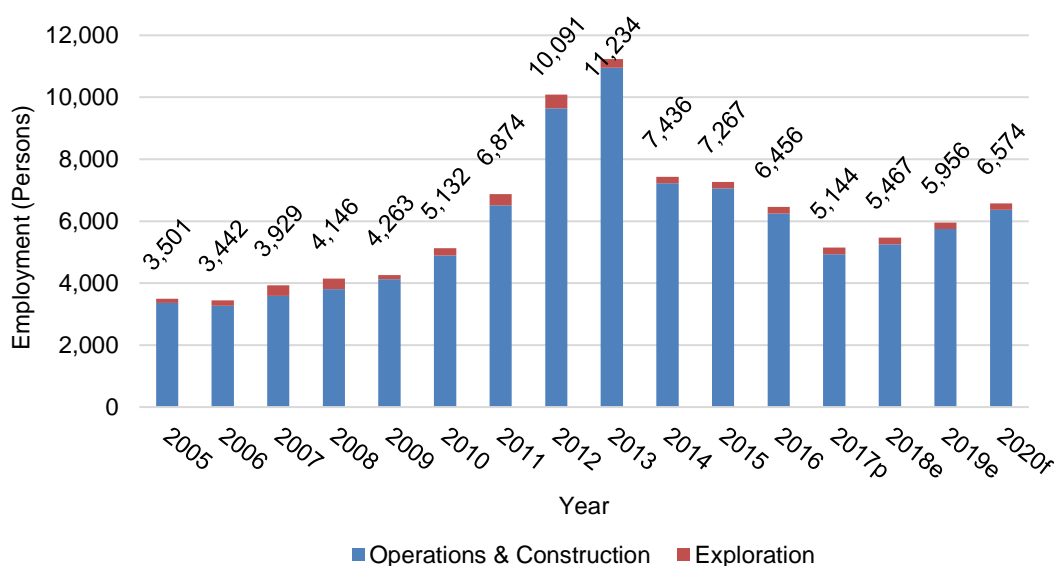


VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Direct Mining Employment

Figure 15-10 illustrates changes in annual average direct mining employment (exploration, construction, and operation) between 2005 and 2020. Between 2005 and 2020 (forecast), exploration activities employed an annual average of over 220 persons, while construction and operational mining activities employed a combined average of over 5,380 persons. Employment in mineral exploration peaked in 2012 at an annual average of nearly 450 persons while construction / operational employment peaked in 2013 at 10,950 persons. Overall, direct employment has trended upward since 2017 following a four-year period of declining employment. Since 2014, employment in mineral exploration has remained constant at an average of 210 persons (DNR 2020a).



NOTES: p = preliminary; f = forecast; e = estimate

SOURCE: DNR 2020a

Figure 15-10 Direct Mining Employment in NL - Operations, Construction and Exploration

Annual average direct employment forecasts for 2020 are summarized in Table 15.9. Within the LAA, active operations associated with Barite Mud Service Inc. (18 persons) near Buchans, China Minmetals (105 persons) and Hi-Point Industires (1991) Ltd. (23 persons) near Bishop's Falls is forecast to employ a combined annual average of 146 persons, representing 2.2% of direct mining employment in NL (total NL direct mining employment in 2020 is forecast to be 6,574 persons) (Figure 15-10). Teck's Duck Pond operation (near Millertown), which is in decommissioning phases, is forecast to employ an annual average of nine persons, increasing the LAA's overall share of NL direct mining employment to 2.4%. The two largest mining employers in 2020 include Vale Newfoundland and Labrador Limited (Voisey's Bay Mine – 2,433 persons) and the Iron Ore Company of Canada (Carol Lake Project – 1,991 persons), both of which are located in Labrador and account for a combined 67.3% of direct NL mining employment.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.9 Direct Mining Employment Forecast for NL – 2020

Company	Average Annual Employment (Persons)	Percent (%) of Construction / Operational Employment
Active Mining Companies		
Anaconda Mining Inc.	95	1.4
Atlantic Minerals Ltd.	88	1.3
Barite Mud Services Inc.	18	0.3
China minmetals (VCC / Beaver Brook Antimony Mines Inc.)	105	1.6
Canada Fluorspar Inc.	275	4.2
Galen Gypsum Quarries Ltd.	3	<0.1
Hi-Point Industires (1991) Ltd.	23	0.3
Iron Ore Company of Canada (Carol Lake Project)	1,991	30.3
Ramber Metals and Mining Canada Ltd.	195	3.0
Red Moon Resoruces Inc.	6	0.1
Tacora Resources Inc.	288	4.4
Tata Steel Minerals Canada Ltd.	255	3.9
Trinity Resources Ltd.	20	0.3
Vale Newfoundland and Labrador Limited (Voisey's Bay)	2,433	37.0
Mining Companies with Project in Decommissioning Phases		
Teck Duck Pond Operation	9	0.1
Mineral Exploration		
Exploration-related employment	210	3.2
Other Employers		
Carew Services Ltd.	2	<0.1
Island Aggregates / NCL Holdings (limestone quarrying)	1	<0.1
General employment - sand and gravel / stone quarrying	557	8.5
Total employment	6,574	100.0
Source: DNR 2020a, 2020b, 2019		



15.2.2.6 Outfitting

Outfitting is an important industry throughout rural Canada, including in NL. A study by Southwick Associates (2018) presented information on participation, spending, and the economic contributions of fishing and hunting outfitters in Canada in 2017. The study included surveys of outfitters belonging to a provincial association and their clients to estimate outfitted activity and spending, with resulting economic contributions estimated by Statistics Canada's Interprovincial Input-Output economic model.

The study estimated that in 2017 more than 730,000 clients used the services of a fishing or hunting outfitter in Canada, with outfitters and their clients spending more than \$3.8 billion on service offerings (Southwick Associates 2018). In 2017, average spending by foreign visitors for all-inclusive packages in Canada was \$2,288 per outfitted fishing trip and \$7,537 per outfitted hunting trip, compared to \$1,031 and \$3,198 for Canadian residents (Southwick Associates 2018). In 2017, the outfitting industry contributed nearly \$2.7 billion to GDP and supported more than 37,000 jobs, providing nearly \$1.6 billion in labour income (Southwick Associates 2018). The outfitting industry contributed more than \$657 million in federal, provincial, and municipal taxes (Southwick Associates 2018).

While primarily engaged in guided hunting and angling services, many Canadian outfitters also offer non-hunting and non-fishing activities, including wildlife viewing and photography, hiking, canoeing, and kayaking, snowmobile and ATV tours, and horseback riding (Southwick Associates 2018). As such, packages and service offerings offered by Canadian outfitting operations not only appeal to hunters and anglers but also to other outdoor recreational users.

NL Outfitting

In 2017, there were an estimated 77 fishing outfitters and 95 hunting outfitters in NL⁴ that provided services to 1,775 Canadian resident fishing clients (3,017 trips), 733 Canadian resident hunting clients (905 trips), 3,178 non-resident fishing clients (3,571 trips), and 2,986 non-resident hunting clients (4,655 trips) (Southwick Associates 2018). Evident from the composition of 2017 clientele, international tourists represent a major revenue stream for NL outfitters. This is further supported by a survey undertaken by Vincent (n.d.) in 2014 which indicated that approximately 85% of outfitting tourists in NL were from the United States of America (USA), 14% were Canadian (from provinces outside of NL), and less than 1% were other international tourists.

In terms of service offering, 79% of NL outfitting revenues in 2017 came from hunting-related services (88% from big game hunts and 8% from upland bird hunts), 17% from fishing, and 4% from non-fishing and non-hunting activities (sample size of 30 outfitting companies) (Southwick Associates 2018). On average, clients spent \$7,253 (CAD) per trip on NL hunting-related outfitting services and \$6,350 per trip on fishing-related services. In total, domestic clients spent an estimated \$4.4 million on outfitted hunting (including \$207,000 on licenses and permits for outfitted trips), while foreign clients spent \$35.0 million (including more than \$2.08 million on licenses and permits for outfitted trips) (Southwick Associates

⁴ The estimated number of fishing and hunting outfitters (i.e., 172) is greater than the provincial total provided by the Canadian Federation of Outfitter Associations (i.e., 150) as some outfitters offer both fishing and hunting services.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

2018). Domestic clients spent an estimated total of \$4.7 million on outfitted fishing (including \$129,000 on licenses and permits for outfitted trips), while foreign clients spent \$8.2 million (including \$448,000 on licenses and permits for outfitted trips) (Southwick Associates 2018).

It is estimated that outfitters in NL spent a total of \$4.2 million on hunting-related costs and \$1.1 million on fishing-related costs in 2017 (Southwick Associates 2018). Costs included expenses for items such as payroll, transportation, food and meals, fuel and oil, marketing and advertising, equipment maintenance and repair, small equipment purchases, and business and guide licenses and permits (Southwick Associates 2018). In addition, in 2017, NL outfitters donated more than \$700,000 to habitat and conservation organizations and an estimated \$381,000 to other charitable organizations (Southwick Associates 2018).

On average, NL outfitters employed 0.5 full-time year-round employees, 0.1 part time year-round employees, 5.0 full time seasonal employees, and 1.7 part time seasonal employees (Southwick Associates 2018). Indigenous persons accounted for 18% of workers employed by outfitters (Southwick Associates 2018). Approximately 57% of outfitting business in the province were owned solely or in partnership with Indigenous people (Southwick Associates 2018).

Economic contributions of outfitters, hunting clients, and fishing clients for 2017 in NL are provided in Table 15.10. Expenditures made by hunting clients accounted for the largest economic effects in 2017, followed by fishing clients, then outfitters themselves (Southwick Associates 2018). Estimates provided in Table 15.10 are inclusive of direct and indirect effects resulting from client expenditures on outfitter services and those related to operational expenditures made by outfitters, as well as induced effects (i.e., resulting from client and outfitter purchases of consumer goods and services from business related to the outfitting industry (e.g., hunting supply stores, butchers, restaurants)) (Vincent n.d.).

Table 15.10 2017 Economic Contributions of Outfitters, Hunting Clients, and Fishing Clients (CAD\$000s)

Contributor	Economic Effect (Total)					
	Full-Time Equivalents (FTE)	GDP	Labor Income	Tax Revenues		
				Federal	Provincial	Municipal
Outfitter	58	\$3,643	\$2,455	\$118	\$368	\$214
Hunting Client	335	\$28,472	\$15,274	\$2,469	\$4,020	\$599
Fishing Client	103	\$8,926	\$4,505	\$818	\$1,380	\$190
Total	496	\$41,040	\$22,235	\$3,406	\$5,768	\$1,003

Source: Southwick Associates 2018

Outfitting Companies within the LAA

As of April 2020, there were 46 outfitting companies operating across the Island of Newfoundland. Of these, the 13 outfitting companies within the employment and economy LAA (note: the LAA used in the Land Use VC differs; Chapter 16) offer bear, moose, and caribou hunts, as well as angling for salmon and



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

trout (Table 15.11; NL Tourism n.d., Newfoundland Labrador Outfitters Association 2013). Rates range from approximately \$6,100 to \$11,900 for a moose hunt, \$2,600 to \$6,500 for a bear hunt, \$5,750 to \$13,000 for a caribou hunt, and \$3,500 to \$4,000 for salmon and trout fishing (Lake Douglas Hunting and Fishing Inc. 2016, Migule Mountain Outfitters 2017, Where-Ya-Wannabee Outfitters n.d., Red Indian Lake Outfitting and Tours 2020, 2G Outfitters n.d., Central Newfoundland Outfitters 2020). Most (11 confirmed) of the 13 outfitting companies within the LAA offer outfitters camp or lodge accommodation.

The nearest active outfitters to the Project Area include: Notch Mountain Outfitters located at the southwest end of Red Indian Lake; Red Indian Lake Outfitting and Tours with their main lodge on the northern shore of Red Indian Lake; Victoria Outfitters and Lodge, Snowshoe Lake Hunting and Fishing, Lake Douglas Hunting and Fishing Inc., Black Ridge Outfitters Ltd., and 2G Outfitters located within approximately 30 km of the southern shore of Red Indian Lake. These outfitters offer black bear and moose hunting, as well as salmon and trout fishing (NL Tourism n.d., Black Ridge Outfitters Ltd. n.d., 2G Outfitters n.d., Newfoundland Labrador Outfitters Association 2013, Lake Douglas Hunting and Fishing Inc. 2016, Notch Mountain Outfitters 2019, Red Indian Lake Outfitting and Tours 2020, Victoria Outfitters and Lodge 2020). Notch Mountain Outfitters and Red Indian Lake Outfitting and Tours also offer caribou hunting (Notch Mountain Outfitters 2019, Red Indian Lake Outfitting and Tours 2020).

Respondents to Marathon's outfitters survey (n=4) state that the quality of experience and success rate of hunts are the primary factors affecting the overall success of local outfitter operations. Surveyed outfitters report high levels of customer satisfaction when it comes to the quality and success of local outfitter services. Except for one outfitter who asserts that existing Project-related mineral exploration has resulted in the direct loss of clientele, surveyed outfitters report an increasing trend in the number of annual clientele and see measurable rates of return customers (between 25 to 80% of annual clientele).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.11 Outfitters and Hunting and Angling Services within the LAA

Company	Hunting Services			Angling Services		Rates	Accommodation	Website
	Black Bear	Moose	Caribou	Salmon	Trout			
Where-Ya-Wannabee Outfitters	✓	✓		✓	✓	Moose hunt: \$6,000 USD-\$9,000 USD Moose and bear hunt: \$7,000 USD-\$12,000 USD	Yes	http://moosehuntingcanada.ca/
Red Indian Lake Outfitting and Tours	✓	✓	✓			Moose hunt: \$5,200-\$7,000 (2020) Bear hunt: \$4,500-\$6,500 (2020) Caribou hunt: \$12,000-\$13,000 (2020) Moose and caribou hunt: \$14,500-\$17,500 (2020)	Yes	https://redindianlake.com/
Notch Mountain Outfitters	✓	✓	✓	✓	✓			https://www.notchmountainoutfitters.com/
Victoria Outfitters and Lodge	✓	✓		✓	✓	Moose hunt: \$4,800-\$5,400 USD (2020) Moose and bear hunt: \$5,600-\$6,200 USD (2020)	Yes	https://www.victoriaoutfitters.com/
Snowshoe Lake Hunting and Fishing	✓	✓		✓	✓			
Lake Douglas Hunting and Fishing Inc.	✓	✓		✓	✓	Moose hunt: \$5,500-5,850 USD (2016) Bear hunt: \$3,200 USD (2016) Atlantic salmon and trout fishing: \$3,000 USD (2016)	Yes	http://www.lakedouglas.com/
Black Ridge Outfitters Ltd.	✓	✓		✓	✓		Yes	http://www.blackridgeoutfitters.ca/
2G Outfitters (Big River Lodge)	✓	✓		✓	✓	Moose hunt: \$4,600-5,000 USD (2019) Moose and bear hunt: \$6,000 USD (2019) Black bear hunt: \$2,800 USD (2019) Bear hunt and fishing: \$4,000 USD (2019) Fly fishing: \$2,600-\$2,800 USD	Yes	https://www.2goutfitters.com/
Migule Mountain Outfitters	✓	✓	✓	✓		Moose hunt: \$4,750 (2017) Bear hunt: \$3,250 (2017) Caribou hunt: \$5,750 (2017) Moose and bear hunt or caribou and bear hunt: add \$500 (2017) Moose, bear, and caribou hunt: \$9,000	Yes	http://www.migulemountainoutfitters.com/index.html
Central Newfoundland Outfitters	✓	✓	✓	✓	✓	Moose hunt: \$4,800-\$6,500 CAD (2020/2021) Black bear hunt: \$2,600-\$3,200 CAD (2020/2021) Caribou hunt: \$8,500 CAD (2020/2021) Moose and bear hunt: \$7,500 CAD (2020/2021) Moose and caribou hunt: \$12,200 CAD (2020/2021) Bear and caribou hunt: \$9,500 CAD (2020/2021) Moose, bear, and caribou hunt: \$12,700 CAD (2020/2021)	Yes	http://www.centralnloutfitters.ca/
Burgeo Road Outfitters Inc.	✓	✓	✓	✓			Yes	http://www.burgeoROADoutfitters.com/
Newfound Outfitting Ltd.	✓	✓	✓	✓	✓		Yes	http://newfoundoutfitting.com/
DADG MacDonald Outfitters Ltd.	✓	✓	✓	✓	✓		Yes	

Source: NL Tourism n.d., Where-Ya-Wannabee Outfitters n.d., 2G Outfitters n.d., Black Ridge Outfitters Ltd. n.d., Burgeo Road Outfitters n.d., Newfound Outfitting 2008, Newfoundland Labrador Outfitters Association 2013, Lake Douglas Hunting and Fishing Inc. 2016, Migule Mountain Outfitters 2017, Notch Mountain Outfitters 2019, Red Indian Lake Outfitting and Tours 2020, Central Newfoundland Outfitters 2020, Victoria Outfitters and Lodge 2020



15.3 ASSESSMENT CRITERIA AND METHODS

This section describes the criteria and methods used to assess environmental effects on employment and economy. Residual environmental effects (Section 15.5) are assessed and characterized using the criteria defined in Section 15.3.1, including direction, magnitude, geographic extent, timing, frequency, duration, reversibility, and ecological or socio-economic context. The assessment also evaluates the significance of residual effects using threshold criteria or standards beyond which a residual environmental effect is considered significant. The definition of a significant effect for the Employment and Economy VC is provided in Section 15.3.2. Section 15.3.3 identifies the environmental effects to be assessed for employment and economy, including effect pathways and measurable parameters. This is followed by the identification of potential Project interactions with this VC (Section 15.3.4). Analytical assessment techniques used for the assessment of employment and economy are provided in Section 15.3.5.

15.3.1 Residual Effects Characterization

Table 15.12 presents definitions for the characterization of residual environmental effects on employment and economy. The criteria are used to describe the potential residual effects that remain after mitigation measures have been implemented. Quantitative measures have been developed, where possible, to characterize residual effects. Qualitative considerations are used where quantitative measurement is not possible.

Table 15.12 Characterization of Residual Effects on Employment and Economy

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long term trend of the residual effect	<p>Neutral – no net change in measurable parameters for the employment and economy relative to baseline</p> <p>Positive – a residual effect that moves measurable parameters in a direction beneficial to employment and economy relative to baseline</p> <p>Adverse – a residual effect that moves measurable parameters in a direction detrimental to employment and economy relative to baseline</p>
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	<p>Negligible – no measurable change in employment and economy from existing conditions</p> <p>Low – a measurable change in employment and economy but residual effects cannot be distinguished from existing conditions within normal range of variability</p> <p>Moderate – a measurable change but not likely to pose a serious risk or benefit to employment and economy</p> <p>High – Measurable change that is likely to pose a serious risk or benefit to employment and economy</p>
Geographic Extent	The geographic area in which a residual effect occurs	<p>Project Area – residual effects are restricted to the Project Area</p> <p>LAA – residual effects extend into the LAA</p> <p>RAA – residual effects extend into the RAA</p>



Table 15.12 Characterization of Residual Effects on Employment and Economy

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	Single event Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Duration	The period of time required until the measurable parameter or the VC returns to its existing (baseline) condition, or the residual effect can no longer be measured or otherwise perceived	Short term – residual effect restricted to construction or decommissioning, rehabilitation and closure phases Medium term – residual effect extends through the operation phase (12 years) Long term – residual effect extends beyond the operation phase (greater than 12 years) Permanent – recovery to baseline conditions unlikely
Reversibility	Describes whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	Reversible – the residual effect is likely to be reversed after activity completion and rehabilitation Irreversible – the residual effect is unlikely to be reversed
Ecological and Socio-economic Context	Existing condition and trends in the area where residual effects occur	Resilient – VC is able to assimilate the additional change Not Resilient – VC is not able to assimilate the additional change because of having little tolerance to imposed stresses due to fragility or near a threshold

15.3.2 Significance Definition

For the potential effects ‘change in regional labour force’, ‘change in regional business’, and ‘change in economic activities of outfitters’, a significant adverse residual effect is defined as:

- Distinguishable⁵ from current conditions and trends; and cannot be managed or mitigated through adjustments to programs, policies, plans, or through other mitigation. A significant adverse effect occurs if there are residual adverse effects disproportionately experienced by one or more identified sub-populations.

For the potential effect ‘change in economy’, a significant adverse residual effect is defined as one that:

- Occurs if Project operation results in an economic loss, causing a decline in provincial GDP for four or more quarters.

The residual effects assessment considers both positive and adverse effects after mitigation and other management measures are implemented. However, a significance determination is made for adverse effects only.

⁵ “Distinguishable” means that the adverse effect is measurable, predictable, and attributable to one or more project or cumulative interactions (i.e., it is not within the boundaries of normal variation of the measurable parameter under baseline conditions).



15.3.3 Potential Effects, Pathways and Measurable Parameters

Table 15.13 lists potential Project effects on employment and economy and provides a summary of the Project effect pathways and measurable parameters and units of measurement used to assess potential effects. Potential environmental effects and measurable parameters were selected based on review of recent environmental assessments for mining projects in NL and other parts of Canada, comments provided during engagement, and professional judgment.

Table 15.13 Potential Effects, Effects Pathways and Measurable Parameters for Employment and Economy

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in regional labour force	<ul style="list-style-type: none"> The Project’s demand for labour will affect the regional labour supply Loss of Project employment following completion of decommissioning, rehabilitation and closure will affect the regional labour supply 	<ul style="list-style-type: none"> Qualified labour supply (persons) and existing wage levels Project employment (jobs and FTEs)
Change in regional business	<ul style="list-style-type: none"> Project spending will affect regional businesses Loss of Project spending following completion of decommissioning, rehabilitation and closure will affect the regional labour supply 	<ul style="list-style-type: none"> Value of local and regional spending and related employment Project contribution to increased competition for labour and wage inflation
Change in economic activities of outfitters	<ul style="list-style-type: none"> Site clearing may result in the loss of area available for outfitters Project presence, physical activities and site management activities may affect access to and/or the quality of the experience of outfitting activities 	<ul style="list-style-type: none"> Change in resource quality and quantity Change in access to resources Market value of affected resources
Change in economy	<ul style="list-style-type: none"> Project employment and spending will affect the economy Loss of Project employment and spending following completion of decommissioning, rehabilitation and closure will affect the economy 	<ul style="list-style-type: none"> GDP (\$) Tax revenue (\$)

15.3.4 Project Interactions with Employment and Economy

Table 15.14 identifies the physical activities that might interact with employment and economy and result in the identified environmental effect. These interactions are indicated by a checkmark and are discussed in detail below in the context of effects pathways, standard and Project-specific mitigation / enhancement (Section 15.4), and residual effects (Section 15.5). Justification where no interaction and, therefore, no resulting effect is predicted is provided following the table.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.14 Project-Environment Interactions with Employment and Economy

Physical Activities	Environmental Effects to be Assessed			
	Change in Regional Labour Force	Change in Regional Business	Change in Economic Activity of Outfitters	Change in Economy
CONSTRUCTION				
Access Road Upgrade / Realignment: Where required, road widening and replacement / upgrades of roads and culverts.	-	-	✓	-
Construction related Transportation along Access Road	-	-	-	-
Mine Site Preparation and Earthworks: Clearing and cutting of vegetation and removal of organic materials, development of roads and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials, and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels. Also includes temporary surface water and groundwater management, and the presence of people and equipment on site.	-	-	✓	-
Construction / Installation of Infrastructure and Equipment: Placement of concrete foundations, and construction of buildings and infrastructure as required for the Project. Also includes: <ul style="list-style-type: none"> • Installation of water control structures (including earthworks) • Installation and commissioning of utilities on-site • Presence of people and equipment on-site 	-	-	-	-
Emissions, Discharges and Wastes^A: Noise, air emissions / greenhouse gases (GHGs), water discharge and hazardous and non-hazardous wastes.	-	✓	✓	-
Employment and Expenditures^B	✓	✓	✓	✓
OPERATION				
Operation-related Transportation Along Access Road	-	-	-	-
Open Pit Mining: Blasting, excavation and haulage of rock from the open pits using conventional mining equipment.	-	-	✓	-



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.14 Project-Environment Interactions with Employment and Economy

Physical Activities	Environmental Effects to be Assessed			
	Change in Regional Labour Force	Change in Regional Business	Change in Economic Activity of Outfitters	Change in Economy
<p>Topsoil, Overburden and Rock Management: Five types of piles:</p> <ul style="list-style-type: none"> • Topsoil • Overburden • Waste rock • Low-grade ore • High-grade ore <p>Rock excavated from the open pits that will not be processed for gold will be used as engineered fill for site development, maintenance and rehabilitation, or will be deposited in waste rock piles.</p>	-	-	✓	-
<p>Ore Milling and Processing: Ore extracted from the open pits will be moved to the processing area where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes.</p>	-	-	-	-
<p>Tailings Management Facility (TMF): Following treating tails via cyanide destruction, tailings will be thickened and pumped to an engineered TMF in years 1 to 9, then pumped to the exhausted Leprechaun open pit in years 10 through 12.</p>	-	-	-	-
<p>Water Management (Intake, Use, Collection and Release): Recirculated process water and TMF decant water will serve as main process water supply, and raw water (for purposes requiring clean water) will be obtained from Victoria Lake Reservoir. Site contact water and process effluent will be managed on site and treated prior to discharge to the environment. Where possible, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent possible for use on site.</p>	-	-	-	-
<p>Utilities, Infrastructure, and Other Facilities</p> <ul style="list-style-type: none"> • Accommodations camp and site buildings, including vehicle maintenance facility • Explosives storage and mixing • Site road maintenance and site snow clearing • Access road maintenance and snow clearing • Power and telecom supply • Fuel supply 	-	-	-	-



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.14 Project-Environment Interactions with Employment and Economy

Physical Activities	Environmental Effects to be Assessed			
	Change in Regional Labour Force	Change in Regional Business	Change in Economic Activity of Outfitters	Change in Economy
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge and hazardous and non-hazardous wastes.	-	-	✓	-
Employment and Expenditure^B	✓	✓	✓	✓
DECOMMISSIONING, REHABILITATION AND CLOSURE				
Decommissioning of Mine Features and Infrastructure	-	-	✓	-
Decommissioning, Rehabilitation and Closure-related Transportation Along Access Road	-	-	-	-
Progressive Rehabilitation: Rehabilitating infrastructure or areas not required for ongoing operations (e.g., buildings, roads, laydown areas); covering and revegetating completed tailings areas, where practicable, including commencing closure of TMF beginning in Year 9 (when tailings deposition moves to Leprechaun open pit); erosion stabilization and revegetation of completed overburden and/or waste rock piles; infilling or flooding of exhausted mining areas; and completing revegetation studies and trials.	-	-	-	-
Closure Rehabilitation: Active rehabilitation based on successes of progressive rehabilitation activities. Includes: demolishing infrastructure (e.g., buildings, equipment, facilities, roads, laydown areas); grading and revegetating cleared areas, where practicable; breaching and regrading ponds to reestablish drainage patterns; completing closure of TMF (covering with overburden and revegetating); erosion stabilization and revegetation of completed overburden and/or waste rock piles; and infilling or flooding of open pits.	-	-	✓	-
Post-Closure: Long term monitoring	-	-	-	-
Emissions, Discharges and Wastes^A	-	-	✓	-
Employment and Expenditure^B	✓	✓	✓	✓
Notes: ✓ = Potential interaction - = No interaction ^A Emissions, Discharges, and Wastes (e.g., air, waste, noise, light, liquid and solid effluents) are generated by many Project activities. Rather than acknowledging this by placing a checkmark against each of these activities, "Wastes and Emissions" have been introduced as an additional component under each Project phase ^B Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a checkmark against each of these activities, "Employment and Expenditures" have been introduced as an additional component under each Project phase				



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Project demand and expenditures on services, labour, materials and equipment are the primary pathways through which changes in regional labour force, regional business (other than outfitters which also includes additional interactions), and economy occur. Both pathways are captured through the identified interaction with Employment and Expenditure. All remaining Project activities and components are identified as having no interaction. The assessment of change in regional labour force, business, and economy is considered in the overall context of each Project phase (i.e., construction, operation, and decommissioning, rehabilitation and closure).

The Project can affect the economic activity of outfitters through changes in access to land and resources, sensory disturbance affecting the availability and abundance of target species and client perception or enjoyment of outfitting activities, and through increased hunting and angling pressure on target species due to population-related effects of the Project. Changes in existing land use are evaluated in the context of Project construction (which aligns with changes in land ownership and/or the issuance of Crown land tenures and permits) and is captured through the interaction with Mine Site Preparation and Earthworks and Access Road Upgrade / Realignment, which are also fully assessed in Chapter 16. Sensory disturbances are assessed for each Project phase (construction, operation, and decommissioning, rehabilitation and closure) through the interactions with Open Pit Mining (for operation) and Emissions, Discharges and Wastes. For the operation phase, changes to the viewshed associated with Topsoil, Overburden and Rock Management is also considered. Increased hunting and angling pressure are assessed for each Project phase through the identified interaction with Employment and Expenditure. All remaining Project activities and components are identified as having no interaction.

15.3.5 Analytical Assessment Techniques

15.3.5.1 Economic Modelling

Economic impacts of the Project were estimated by Strategic Concepts Inc. (SC) (SC 2020, included as Attachment 9-A of Baseline Study Appendix [BSA] 9: Community Health, Services and Infrastructure / Employment and Economy) using a customized model to estimate direct, indirect, and induced impacts⁶ on employment, incomes, GDP, and taxation associated with the Project. Economic impacts were estimated for the economies of NL, the rest of Canada, and Canada as a whole. Parameters used in Strategic Concepts' economic impact analysis were based on data obtained from Statistics Canada, the Canada Revenue Agency, the provincial government, and economic impact assessments for other mining projects (SC 2020; BSA.9, Attachment 9-A). Annual capital expenditure profiles, operating costs, and estimates of expenditure types and expected sources of supply provided by Marathon formed the basis of Strategic Concepts' economic impact analysis (SC 2020; BSA.9, Attachment 9-A).

Results of Strategic Concepts' economic impact assessment are integrated into the assessment of 'change in regional labour force', 'change in regional business', and 'change in economy'. Residual

⁶ Economic impacts are described on a direct, indirect, and induced basis. Direct impacts result from direct employment by Marathon and its contractors during Project construction and operation (e.g., construction labour, facilities operations). Indirect impacts result from purchase of materials, services, and equipment by the Project during construction and operation phases (e.g., extra employees required by the contractor). Induced impacts result from spending by direct and indirect workers on consumer goods and services (e.g., employment in restaurants, hotels, and the retail sector supported by the Project) (SC2020).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Project effects within the LAA were quantified using assumptions from Marathon regarding estimated levels of local employment and in consideration of effect pathways, mitigation and management measures, and existing conditions.

Direct Project Costs

Over the life of the Project (including construction, operation and decommissioning, rehabilitation and closure), total direct costs are estimated to be slightly less than \$2.0 billion (undiscounted, 2020 Canadian [CDN] dollars), including \$504.0 million in labour costs (25.6% of total costs), \$1.1 billion in material costs (56.3% of total costs) and \$357.2 million in equipment costs (18.1% of total costs) (Table 15.15). Of construction costs (\$314.2 million), pre-production capital costs account for 86.5% of costs, with the remaining 13.5% associated with Phase 2 expansion capital costs. Total operating costs are estimated at \$1.4 billion, 87.3% comprised of operating costs and 12.7% sustaining capital costs. Annual operating costs (not including sustaining capital) are estimated at \$117.7 million, including \$25.5 million in labour costs (21.7% of annual operating costs), \$82.1 million in material costs (69.8% of annual operating costs), and \$10.1 million in equipment costs (8.6% of annual operating costs). Decommissioning, rehabilitation and closure costs are estimated at \$40.5 million.

Table 15.15 Direct Project Costs, Undiscounted (2020 CDN\$, Millions)

Category	Labour	Materials	Equipment	Total
Construction				
Pre-production Capital Costs ^A	124.6	68.0	79.3	271.9
Phase 2 expansion Capital Costs	16.5	9.4	16.4	42.3
Subtotal	141.1	77.4	95.7	314.2
Operation				
Operating Costs ^{B, C}	305.8	984.8	121.4	1,412.1
Sustaining Capital Costs	24.7	40.0	140.1	204.8
Subtotal	330.5	1,024.8	261.5	1,616.9
Decommissioning, Rehabilitation and Closure				
Closure Costs	32.4	8.1	-	40.5
Total Direct Project Costs				
Total	504.0	1,110.3	357.2	1,971.6
Notes: Costs are presented in 2020 Canadian dollars - Estimate not provided ^A Includes: mill, mine, infrastructure and owners' costs ^B Includes: milling, mining, and common and general and administrative costs ^C Annual average operating costs = \$117.7 million (\$25.5 million in labour, \$82.1 million in materials, \$10.1 million in equipment) Source: SC 2020				



15.4 MITIGATION AND MANAGEMENT MEASURES

Mitigation and management measures to reduce potential adverse effects and enhance positive effects on employment and economy are summarized in Table 15.16. A full list of mitigation measures to be applied throughout Project construction, operation and decommissioning, rehabilitation and closure is provided in Section 2.7.4. Mitigation measures identified in other VCs will also address potential adverse effects on employment and economy, specifically change in the economic activity of outfitters (Chapter 5 – Atmospheric Environment; Chapter 8 – Fish and Fish Habitat; Chapter 9 – Vegetation, Wetlands, Terrain and Soils; Chapter 10 – Avifauna; Chapter 11 – Caribou; Chapter 12 – Other Wildlife, Chapter 16 – Land and Resource Use). Mitigation measures provided in supporting chapters are not reproduced here.

Table 15.16 Mitigation and Management Measures: Employment and Economy

Category	Mitigation	C	O	D
Employment and Expenditures	<ul style="list-style-type: none"> A Gender Equity and Diversity Plan will be implemented that meets the approval of the Minister of Industry, Energy and Technology and Minister Responsible for the Status of Women and Marathon will engage with both Indigenous groups during the development of the Plan. A business access strategy for members of underrepresented populations will be included in the plan. 	✓	✓	✓
	<ul style="list-style-type: none"> A Benefits Agreement will be implemented that meets the approval of the Minister of Industry, Energy and Technology and Minister Responsible for the Status of Women. 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will communicate employment information to local communities and Indigenous groups in a timely manner so that local and Indigenous residents have an opportunity to acquire the necessary skills to qualify for potential Project-related employment. 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will work with the Province, educational and training institutions, Indigenous groups and stakeholders to identify skilled trade shortages relative to the Project and to identify training needs and opportunities to contribute to a sustainable Project workforce. 	✓	✓	✓
	<ul style="list-style-type: none"> On-the-job training programs and apprenticeship opportunities will be made available. 	✓	✓	✓
	<ul style="list-style-type: none"> Summary reports will be provided to the provincial regulator that include information on the number of persons employed by 4-digit National Occupational Classification (NOC), the number of full- and part-time employed, the number of apprentices (by level) and journey persons for each applicable 4-digit NOC code, gender and source of the workforce. 	✓	✓	✓
	<ul style="list-style-type: none"> Procurement packages will be developed with consideration for capacity and capabilities of local and regional Indigenous and non-Indigenous businesses. 	✓	✓	✓
	<ul style="list-style-type: none"> Project purchasing requirements will be posted in a timely manner so that local and regional businesses can position themselves to compete to supply goods and services needed for Project construction and operation. 	✓	✓	✓
Notes: C – Construction Activities; O – Operation Activities; D – Decommissioning, Rehabilitation and Closure Activities				



15.5 ASSESSMENT OF RESIDUAL ENVIRONMENTAL EFFECTS ON EMPLOYMENT AND ECONOMY

For each potential effect identified in Section 15.3.3, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The following sections first describe the pathways by which a potential Project effect could result from Project activities during each Project phase (e.g., construction, operation and decommissioning, rehabilitation and closure). Mitigation and management measures (Section 15.4) are applied to avoid or reduce these potential pathways and resulting environmental effects. Residual effects are those remaining following implementation of mitigation, which are then characterized using the criteria defined in Section 15.3.1. A summary of predicted residual effects is provided in Section 15.5.5.

15.5.1 Change in Regional Labour Force

15.5.1.1 Project Pathways

Project demand for labour has the potential to have beneficial and adverse effects on the regional labour force. Beneficial effects stem from increased local employment during construction and operation phases, while adverse effects stem from losses in local employment due to decreased labour demand as the Project transitions from the operation phase through the decommissioning, rehabilitation and closure phase. Over the life of the Project, total direct labour costs are estimated at \$504.0 million (25.6% of total direct Project costs). Direct labour costs, by phase, are summarized in Table 15.17 in Section 15.5.1.2.

15.5.1.2 Residual Effects

Direct Employment

Based on direct labour costs, a total of 4,861 full-time equivalents (FTEs) of direct employment are estimated over the life of the Project (Table 15.17). This is comprised of 743 FTEs during construction, 3,823 FTEs during operation (94.1% associated with operation and 5.9% with sustaining capital expenditures), and 295 FTEs during decommissioning, rehabilitation and closure. Employment estimates assume an average cost of labour of approximately \$190,000/FTE for construction labour, \$110,000/FTE with sustaining capital labour (part of the operation phase) and closure labour (part of the decommissioning, rehabilitation and closure phase), and \$85,000/FTE for the operation phase (SC 2020). Average labour income is estimated at \$151,000/FTE during construction, \$77,000/FTE during operation, and \$89,000/FTE during decommissioning, rehabilitation and closure.

Based on the 16 to 20-month construction period, total pre-production direct employment is estimated at approximately 656 FTEs while peak employment is estimate at 625 FTEs (occurring in 2022). Average annual direct employment during pre-production is estimated at 320 FTEs. Over the 12-year operation phase, total direct employment is estimated at 3,598 FTEs with peak employment estimated at 480 FTEs (sustained for three years). Average annual direct employment during operation is estimated at approximately 300 FTEs. Total direct employment is estimated at approximately 295 FTEs over the decommissioning, rehabilitation and closure phase (a peak workforce estimate has not been prepared for



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

decommissioning, rehabilitation and closure). For construction and decommissioning, rehabilitation and closure phases the actual number of employed persons could exceed FTE estimates by 25 to 50% based on the nature of contracted work (i.e., workers are often employed for less than a year to complete a given construction-related task; SC 2020). BSA.9, Attachment 9-A provides an estimated quarterly breakdown of the Project's workforce (in FTEs) by NOC over the construction, operation, and decommissioning, rehabilitation and closure phases.

Table 15.17 Total Direct Employment and Labour Income

Project Phase	Direct Employment (FTEs)	Direct Labour Income (\$ million)	Average Labour Income (\$) / FTE ^A
Construction			
Pre-production ^B	656	99.7	151,000
Phase 2 Expansion	87	13.0	149,000
Subtotal	743	112.7	151,000
Operation			
Operation ^C	3,598	275.2	76,000
Sustaining Capital	225	20.0	88,000
Subtotal	3,823	295.2	77,000
Decommissioning, Rehabilitation and Closure			
Closure	295	26.0	88,000
Total			
Total Direct	4,861	433.9	89,000
Notes: ^A Rounded down to nearest thousand ^B Annual average: 328 FTEs, \$49.9M in labour income, average labour income/FTE of \$151,000 ^C Annual average: 300 FTEs, \$22.9M in labour income, average labour income/FTE of \$76,000 Source: SC 2020			

Table 15.18 provides estimates of total direct employment (in FTEs), by four-digit National Occupational Classification (NOC), by Project phase. Employment estimates by four-digit NOC are considered preliminary and are subject to change as Project planning / engineering progresses. As currently estimated, occupations in trades, transport and equipment operation (NOC codes with the naming convention "7####"), natural resources, agriculture and related production (NOC codes with the naming convention "8####") and manufacturing and utilities (NOC codes with naming convention "9####") account for roughly 70% of direct construction (including phase 2 expansion), sustaining capital, and decommissioning, rehabilitation and closure labour and 84% of direct operation labour (Table 15.18).

For the occupations presented in Table 15.18, preliminary forecasts suggest that apprentices (of varying levels) could account for 5% of the direct construction and decommissioning, rehabilitation and closure workforce, and 2% of the direct operation workforce. Remaining trades-related occupations are anticipated to be filled by journeypersons and experience workers. BSA.9, Attachment 9-A provides summary information on educational requirements (by NOC) and the availability of training programs within NL for each of the four-digit NOC presented in Table 15.18.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.19 provides a breakdown of direct employment and labour income by estimated geographic residency of workers. Approximately 80% of direct employment effects are anticipated to occur in NL. In consideration of existing levels of educational attainment, baseline labour force conditions within the LAA and RAA (province) (Sections 15.2.2.2 and 15.2.2.3), and taking into account the recent closure of Teck's Duck Pond Mine (Section 15.2.2.5), Marathon estimates that 50% of total direct employment requirements (65% of estimated employment effects in NL) could be filled by residents of the LAA (Table 15.19). It is currently estimated that 5% of the direct construction workforce, 95% of the direct operation workforce, and 50% of the decommissioning, rehabilitation and closure workforce will be directly employed by Marathon with the remaining workforce comprised of contracted labour. Estimates of direct Project hires versus contracted labour by NOC for each Project phase are currently unavailable. Strategies to increase local and provincial recruitment are summarized in Section 15.4, Table 15.16.

While estimates of local and regional employment are provided, the degree to which residents of the LAA and RAA (province) secure employment with the Project depends on numerous considerations including existing levels of educational attainment, labour force conditions, and the extent to which local workers wish to participate in the Project. The extent to which contractors draw on labour from outside the LAA and RAA to complete Project work also affects levels of Project-related local and regional employment.

Recognizing that the Indigenous population represents 6.5% of the LAA labour force (8.6% of the RAA labour force), 6.5% of the population with an apprenticeship or trades certificate or diploma⁷ (9.3% of the RAA population), and 5.7% of the population with educational attainment at or above the college diploma level⁸ (7.6% of the RAA population), it is conservatively assumed that the Project will likely employ more non-Indigenous than Indigenous persons. It is also likely that the Project will employ more males than females as most jobs associated with the Project (Table 15.18) will be in trades and construction-related occupations and industries that employ disproportionately high numbers of males (Section 15.2.2.3). To address issues of diversity and inclusion, Marathon will implement the mitigation and enhancement measures identified in Section 15.4.

⁷ Educational attainment typically required to fulfill trades, transport and equipment operation-related occupations (BSA.9-A)

⁸ Educational attainment typically required to fulfill occupations related to natural and applied sciences (BSA.9-A)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.18 Estimate of Direct Employment (FTEs) by Four-Digit NOC Code

Category	NOC	Description	Construction		Operation		Decommissioning, Rehabilitation and Closure
			Pre-production	Phase 2 Expansion	Operation	Sustaining Capital	
Trades and Production Occupations	7521	Heavy equipment operators (except crane)	65	9	1,354	23	29
	7311	Construction millwrights and industrial mechanics (except textile)	55	8	141	19	25
	7511	Truck drivers	52	7	166	18	23
	7237	Welders and related machine operators	35	5	84	12	16
	9411	Machine operators, mineral and metal processing	31	4	186	11	14
	7312	Heavy-duty equipment mechanics	28	4	187	11	13
	7242	Industrial electricians	28	3	62	9	13
	9611	Labourers in mineral and metal processing	22	3	110	7	10
	8614	Mine labourers	19	3	76	7	8
	7452	Material handlers	18	2	-	5	8
	7371	Crane operators	14	2	-	5	6
	7611	Construction trades helpers and labourers	13	2	36	5	6
	7252	Steamfitters, pipefitters and sprinkler system installers	12	1	-	4	5
	9241	Power engineers and power systems operators	11	1	-	4	5
	7372	Drillers and blasters - Surface mining, quarrying and construction	7	1	464	2	3
	7612	Other trades helpers and labourers	4	1	48	2	2
	7271	Carpenters	2	1	-	2	1
7251	Plumbers	1	-	-	-	1	



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.18 Estimate of Direct Employment (FTEs) by Four-Digit NOC Code

Category	NOC	Description	Construction		Operation		Decommissioning, Rehabilitation and Closure
			Pre-production	Phase 2 Expansion	Operation	Sustaining Capital	
Professional and Physical Science Occupations	2113	Geologists, geochemists and geophysicists	21	3	55	7	10
	2143	Mining engineers	14	2	19	5	6
	2121	Biologists and related scientists	2	1	24	2	1
	2131	Civil engineers	2	-	12	-	1
Human Resources and Financial Occupations	1111	Financial auditors and accountants	12	1	-	4	5
	0112	Human resources managers	5	1	-	2	2
	0111	Financial managers	5	1	12	2	2
	1121	Human resource professionals	2	-	12	-	1
	1112	Financial and investment analysts	2	-	-	-	1
Support Workers	1414	Secretaries (except legal and medical)	12	1	-	4	5
	2263	Inspectors in public and environmental health and occupational health and safety	12	1	12	4	5
	2261	Non-destructive testers and inspection technicians	7	1	33	2	3
	9415	Inspectors and testers, mineral and metal processing	5	1	-	2	2
	1523	Production clerks	5	1	23	2	2
	1525	Dispatchers and radio operators	4	1	13	2	2
	6322	Cooks	9	1	-	4	4
	1241	Administrative clerks	2	1	9	2	1
	2234	Construction estimators	1	-	-	-	1
	6541	Security guards and related security service occupations	-	-	48	-	-
2262	Engineering inspectors and regulatory officers	1	-	-	-	1	



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.18 Estimate of Direct Employment (FTEs) by Four-Digit NOC Code

Category	NOC	Description	Construction		Operation		Decommissioning, Rehabilitation and Closure
			Pre-production	Phase 2 Expansion	Operation	Sustaining Capital	
Technical Occupations	2154	Land surveyors	9	1	22	4	4
	2171	Information systems analysts and consultants	4	1	-	2	2
	2243	Industrial instrument technicians and mechanics	7	1	48	2	3
	2232	Mechanical engineering technologists and technicians	7	1	8	2	3
	2212	Geological and mineral technologists and technicians	5	1	96	2	2
	2211	Chemical technologists and technicians	5	1	-	2	2
	2231	Civil engineering technologists and technicians	5	1	-	2	2
	2253	Drafting technologists and technicians	5	1	-	2	2
	2241	Electrical and electronics engineering technologists and technicians	5	1	48	2	2
	2255	Mapping and related technologists and technicians	4	1	-	2	2
	2254	Land survey technologists and technicians	4	1	-	2	2
	2233	Industrial engineering and manufacturing technologists and technicians	2	-	12	-	1
	2221	Biological technologists and technicians	5	1	12	2	2



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.18 Estimate of Direct Employment (FTEs) by Four-Digit NOC Code

Category	NOC	Description	Construction		Operation		Decommissioning, Rehabilitation and Closure
			Pre-production	Phase 2 Expansion	Operation	Sustaining Capital	
Supervisors, Coordinators, and Foremen	0811	Primary production managers (except agriculture)	12	1	59	4	5
	8221	Supervisors, mining and quarrying	12	1	69	4	5
	9211	Supervisors, mineral and metal processing	5	1	21	2	2
	0211	Engineering managers	7	1	21	2	3
	0711	Construction managers	7	1	-	2	3
	7301	Contractors and supervisors, mechanic trades	5	1	22	2	2
	7203	Contractors and supervisors, pipefitting trades	5	1	-	2	2
Total			660	93	3,624	234	295
Notes: - Not applicable Totals may not align with those shown in Tables 15.13 and 15.17 due to rounding Source: Adopted from SC 2020; Mining Industry Human Resources Council 2015							



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.19 Estimate of Direct Employment by Estimated Geographic Residency of Workers

	Total													
	Canada										Foreign		Total	
	RAA (NL)						Rest of Canada		Canada Total					
	LAA		Rest of RAA (NL)		RAA (NL) Total									
Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)	
Construction														
Pre-production ^A	328	49.6	177	26.7	505	76.7	118	18.0	623	94.7	33	5.0	656	99.7
Phase 2 Expansion	46	6.9	25	3.7	70	10.6	9	1.3	78	11.9	9	1.3	87	13.0
Subtotal	374	56.4	201	30.4	575	87.3	127	19.3	701	106.6	42	6.3	743	112.7
Operation														
Operation ^B	1,871	142.2	1,007	76.6	2,878	220.2	360	27.5	3,238	247.7	360	27.5	3,598	275.2
Sustaining Capital	117	10.2	63	5.5	180	15.8	22	2.0	202	17.8	22	2.0	225	20.0
Subtotal	1,988	153.1	1,070	82.4	3,058	236.0	382	29.5	3,440	265.5	382	29.5	3,823	295.2
Decommissioning, Rehabilitation and Closure														
Closure	153	13.3	83	7.2	236	20.7	29	2.6	265	23.3	29	2.6	295	26.0
Total														
Total Direct	2,515	222.8	1,354	120.0	3,869	344.0	538	51.4	4,406	395.4	453	38.4	4,861	433.9
Notes:														
^A Annual averages: LAA = 164 FTEs, \$24.8 million in labour income; Rest of RAA (NL) = 88 FTEs, \$13.3 million in labour income; RAA (NL) Total = 253 FTEs, \$38.4 million in labour income; Rest of Canada = 59 FTEs, \$9.0 million in labour income; Canada Total = 312 FTEs, \$47.4 million in labour income; Foreign = 17 FTEs, \$2.5 million in labour income; Total = 328 FTEs, \$49.9 million in labour income														
^B Annual averages: LAA = 156 FTEs, \$11.8 million in labour income; Rest of RAA (NL) = 84 FTEs, \$6.4 million in labour income; RAA (NL) Total = 240 FTEs, \$18.4 million in labour income; Rest of Canada = 30 FTEs, \$2.3 million in labour income; Canada Total = 270 FTEs, \$20.6 million in labour income; Foreign = 30 FTEs, \$2.3 million in labour income; Total = 300 FTEs, \$22.9 million in labour income														
Source: Adapted from SC 2020														



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

As the Project transitions into decommissioning, rehabilitation and closure, a decrease in workforce that ultimately results in the loss of employment will occur. This loss will be known and anticipated by Project workers as the operational life of the Project will be communicated at early stages and updated throughout the life of the Project. Mitigating the magnitude of this loss of employment is the gained labour income, skills and experience workers realize while employed with the Project. In the case of gained skills and experience, these improved qualifications will aid with securing employment on other and future projects within the LAA, RAA (province), or elsewhere. Loss of employment following closure of the Project is assessed as moderate in magnitude.

15.5.1.3 Summary

With the implementation of mitigation and management measures, Project residual effects on the LAA labour force are expected to be positive in direction and high in magnitude during construction and operation. Moderate magnitude adverse effects are anticipated as the Project transitions from operation through decommissioning, rehabilitation and closure (i.e., loss of direct employment). Positive and adverse effects are expected to extend to the RAA, although it is recognized that employment extends beyond NL. Effects are short term in duration during construction (16 to 20 months) and decommissioning, rehabilitation and closure, and medium term during operation. Effects occur continuously throughout each Project phase and are reversible following the completion of construction and operation; however, these are irreversible following the completion of decommissioning, rehabilitation and closure (due to potential permanent loss of Project-related employment). Based on existing conditions, effects occur within a resilient socio-economic context.

15.5.2 Change in Regional Business

15.5.2.1 Project Pathways

Project expenditures on services, materials and equipment has the potential to result in both positive and adverse effects on regional business. Positive effects include increased business revenue, which can support capital investment and hiring (indirect employment), thereby increasing capabilities and capacity among local businesses. Spending of income by direct and indirect workers further contributes to beneficial effects on local businesses, primarily within the service sector, resulting in induced employment effects. Adverse effects relate to Project contributions to labour drawdown (i.e., workers leave current employers to secure employment with the Project due to wage differentials or a desire to work on the Project) and wage inflation (i.e., to attract and retain workers local workers may have to increase compensation paid to workers).

Over the life of the Project, material and equipment costs are estimated at \$1.1 billion (56.3% of total direct Project costs) and \$357.2 million (18.1% of total Project costs), respectively. Direct material and equipment costs, by Project phase are summarized in Table 15.15 in Section 15.3.5.1. Average direct labour income over the life of the Project is estimated at \$433.9 million (approximately \$80,000/ FTE). Indirect labour income, by Project phase, is summarized in Table 15.20 in Section 15.5.2.2.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

15.5.2.2 Residual Effects

Indirect Employment

Table 15.20 provides an estimated breakdown of domestic indirect employment by estimated geographic residency of workers. Unlike in Section 15.5.1.2, estimates of foreign employment and labour income are not provided. Overall, 45% of domestic indirect employment and labour income effects are expected to occur in NL. The remaining 55% occur in other parts of Canada. Expenditures occurring outside NL relate to goods and services not supplied by NL businesses (e.g., mining equipment, mill equipment and consumables, mill liners, and chemicals) (SC 2020).

Table 15.20 Estimate of Indirect Employment by Estimated Geographic Residency of Workers

Category	RAA (NL)		Rest of Canada		Canada	
	Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)	Employment (FTE)	Labour Income (\$M CDN)
Construction						
Pre-production ^A	324	21.0	342	22.3	666	43.3
Phase 2 Expansion	35	2.3	82	5.3	117	7.6
Subtotal	359	23.3	424	27.6	783	50.9
Operation						
Operation ^B	3,357	218.2	3,811	247.7	7,168	465.9
Sustaining Capital	162	10.6	560	36.4	723	47
Subtotal	3,519	228.8	4,371	284.1	7,891	512.9
Decommissioning, Rehabilitation and Closure						
Closure	27	1.8	28	1.8	56	3.6
Total						
Total Indirect	3,905	253.9	4,823	313.5	8,730	567.4
Notes:						
^A Annual averages: NL = 162 FTEs, \$10.5M in labour income; Rest of Canada = 171 FTEs, \$11.2 million in labour income; Canada = 333 FTEs, \$21.7 million in labour income						
^B Annual averages: NL = 280 FTEs, \$18M in labour income; Rest of Canada = 318 FTEs, \$21 million in labour income; Canada = 597 FTEs, \$39 million in labour income						
Source: SC 2020						

Estimates of indirect employment (and labour income) are not provided for the LAA. The degree to which LAA businesses benefit from Project contracting and supply opportunities, and therefore result in indirect employment, depends on several factors, including their size, capability and capacity to accommodate Project requirements. Specifically, indirect employment resulting from Project spending on goods and services would only be expected to result in 'net new' (i.e., creation of) indirect employment if businesses become established or expand (by increasing workforces) to meet Project demands. In consideration of the LAA's industrial composition (e.g., large mining sector), existing labour force (Section 15.2.2.3)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

conditions, and using employment as a measure of capacity, businesses within the LAA are likely well positioned to compete for small- to medium-sized service and supply contracts, particularly those related to construction, transportation, and warehousing (Section 15.2.2.3).

Given the length of construction, operation, and decommissioning, rehabilitation and closure, it is possible that local business could expand (workforce size) or new businesses establish (especially those seeking to fulfill operational service and supply contracts) to meet Project demands; however, given that expansion and establishment of local businesses would be largely dependent on one revenue source (i.e., the Project), the degree to which this will occur is assumed to be low. Assuming the indirect employment estimated for NL (Table 15.20) were to occur in the LAA and result in 'net-new' new employment, indirect Project employment would result in an increase (over baseline conditions [LAA labour force of 17,785 persons]) of 1.1% in the number of employed persons within the LAA during pre-production (assuming an annual average employment of 162 FTEs) , a 1.9% increase during operation (assuming an annual average employment of 280 FTEs), and a 0.2% increase during decommissioning, rehabilitation and closure (assuming annual employment of 27 FTEs). Given these increases and the low likelihood that all indirect NL-based employment effects will occur in the LAA resulting in 'net-new' employment, residual effects within the LAA are considered low in magnitude.

As the Project transitions from operation through decommissioning, rehabilitation and closure, a loss of Project expenditures within the LAA could result (depending on economic conditions at the time) in adverse effects (i.e., a reduction) on indirect employment. The magnitude of this effect would align with gains in indirect employment during construction and operation (i.e., low magnitude).

Induced Employment

Induced impacts result from spending by direct and indirect workers on consumer goods and services (e.g., employment in restaurants, hotels, and the retail sector supported by the Project) (SC 2020; BSA.9, Attachment 9-A). Construction and operation of the Project is estimated to generate 6,150 FTEs of induced employment in Canada, of which 3,109 FTEs (49.4%) is anticipated to be realized by residents of NL (SC 2020; BSA.9, Attachment 9-A). Induced labour income is estimated at \$338 million in Canada with \$155 million occurring in NL (45.9% of domestic induced labour income). Estimates of induced employment and labour income by Project phase (i.e., construction and operation) are not available. Induced employment estimates were not calculated for the decommissioning, rehabilitation and closure phase. A summary of induced employment and labour income by estimated geographic residency of workers is provided in Table 15.21.

Table 15.21 Total Estimated Induced Employment and Income by Region

Category	RAA (NL)	Rest of Canada	Canada
Induced Employment (FTEs)	3,109	3,041	6,150
Induced Income (\$million)	155	182	338
Source: SC 2020			



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Because induced employment depends on consumer purchasing on the part of direct and indirect workers, the magnitude of effect largely depends on the magnitude of Project-related direct and indirect employment. Based on induced employment estimates for NL (Table 15.21), and assuming all induced employment estimated for NL were to occur in the LAA and result in 'net-new' employment, the Project would result in a 1.5% average annual increase in the number of employed persons within the LAA (over baseline conditions) during pre-development and operation. Given this increase and the low likelihood that all NL-based induced employment effects will occur in the LAA and result in 'net-new' employment, residual effects within the LAA are considered low in magnitude.

As with indirect employment, as the Project transitions from operation into decommissioning, rehabilitation and closure, a loss of direct and indirect Project-related employment within the LAA could result (depending on economic conditions at the time) in adverse effects on (i.e., a reduction in) induced employment. The magnitude of this effect would align with gains in induced employment during construction and operation (i.e., low magnitude).

Labour Scarcity and Increased Labour Costs

Potential adverse effects of Project spending and increased economic activity include labour scarcity and increased labour costs. Table 15.22 provides a comparison between existing employment income in the LAA and RAA and projected Project-case wages and salaries.

Table 15.22 Baseline Employment Income and Projected Project-related Wages and Salaries (undiscounted), LAA and RAA

Category	Existing Mean Annual Employment Income ^A		Range of Mean Annual Wages (Estimates) for Reference Industries / Sectors, NL	Projected Project Direct Wages, Mean (\$)
	LAA	RAA		
Construction	\$41,525	\$46,153	<ul style="list-style-type: none"> Forestry, fishing, mining, quarrying, oil and gas: \$76,650 to \$120,998 Construction: \$60,291 to \$95,174 Professional, scientific and technical services: \$69,300 to \$109,395 	\$151,000
Operation				\$77,000
Decommissioning, Rehabilitation and Closure				\$88,000
Note: ^A Mean employment income is presented for the total population (aggregate of Indigenous and non-Indigenous labour force) Source: Estimates of economic impacts are taken from SC 2020. Baseline wage information is taken from Tables 15.8				

Wages paid to the Project's direct workforce show a measurable variance from existing conditions in the LAA, RAA. Depending on Project phase wages and geography (LAA or RAA), projected wages are between 167% and 1327% greater than existing mean annual employment incomes. However, when compared to the range of mean annual wages paid to NL workers employed in reference industries and sectors, projected wages, with the exception of construction-related workers, fall within existing levels of compensation.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

While Project wages are likely to fall within the existing range of compensation paid to NL workers of industries and sectors most applicable to Project-related work, due to differentials between existing LAA and RAA conditions, the Project has the potential to contribute to upward pressure on wages through increased competition for labour among local employers. Combined with the potential for Project-related employment to be perceived as being more desirable than other forms of employment within the LAA and RAA, the Project could result in increased difficulty for local businesses to recruit or retain qualified workers.

To manage the Project's contribution to upward pressure on wages, Marathon will pay its direct workforce wages that are consistent with NL's mining industry. Combined with the anticipated size of the Project's local direct workforce, adverse effects on local and regional businesses (in terms of upward pressure on wages and associated increased difficulty to recruit or retain workers) is expected to be low in magnitude.

15.5.2.3 Summary

With the implementation of mitigation and management measures, Project residual effects on local and regional businesses are expected to be mixed in direction (positive and adverse) and low in magnitude. Positive effects relate to Project spending on goods and service contracts, and indirect and induced employment effects. Adverse effects result from anticipated upward pressure on wages and increased difficulty of local employers to recruit or retain workers who may be qualified for employment with the Project.

In both cases (positive and adverse), effects are expected to extend to the RAA, although it is recognized that employment also extends beyond NL. Effects are short term in duration during construction and during decommissioning, rehabilitation and closure, and medium term during operation. Effects occur continuously throughout each Project phase and are reversible following the completion of construction and operation; however, these are irreversible following the completion of decommissioning, rehabilitation and closure (due to the potential for permanent loss of Project-related expenditures and employment). Based on existing conditions, effects occur within a resilient socio-economic context within the LAA and RAA.

15.5.3 Change in Economic Activities of Outfitters

15.5.3.1 Project Pathways

Commercial operations of local outfitters could be adversely affected through changes in land and resource use (affecting the quality of experience of area outfitters perceived by potential clients or realized by current clients) and through changes in the cost of outfitting services (in response to adaptive actions taken by area outfitters to address adverse effects of the Project).

15.5.3.2 Residual Effects

Residual effects on land and resource use are assessed in Chapter 16. Results of the assessment conclude that outfitters operating within the Land and Resource Use LAA, specifically those that target moose and black bear near the Project Area (use of the Project Area and surrounding lands by outfitters



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

is limited), will realize a small reduction in area available for outfitting activities (roughly equivalent to 1% of the total moose / bear management area). The assessment also concludes that the quality of experience of outfitting activities could be adversely affected through sensory disturbances and changes in the access to / abundance of wildlife. Quality of experience could also be adversely affected due to the presence of, and increased hunting pressure from, the Project's workforce and from improved year-round access to hunting areas; however, Marathon will prohibit workers from bringing firearms and fishing gear to the site while working. Given this, and the limited use of the area for resource use, the assessment of change in land and resource use concludes that with the implementation of mitigation and management measures (Chapter 16), adverse effects on outfitters operating near the Project Area range from negligible to low in magnitude and occur throughout the Project. Marathon will continue to engage outfitters regarding the overlap of the Project with hunting, trapping and fishing areas in the Project Area. This will include the communication of Project information, updates on ongoing and planned activities, and a discussion of issues and concerns and a potential means of addressing them.

Because the quality of experience and success rate of hunting / angling activities are the primary factors affecting the success of local outfitting operations (in-turn affecting rates of customer satisfaction and the number of return customers), adverse changes on land and resource use are anticipated to result in similar magnitude adverse effects on the economic activities of outfitters. Over the short term (construction), reductions in clientele (due to adverse changes in the quality of outfitter experience and the success rates of hunts) and increased operating costs (associated with attracting new clientele and with adaptive measures taken by outfitters to secure new hunting / angling locations) are expected to result in low magnitude adverse effects on the economic activity of outfitters operating within a 1 km buffer around the mine site and a 500 m buffer around the access road (i.e., the Land and Resource Use LAA). Outside these buffers, effects extending to the LAA are anticipated to be negligible in magnitude. Because the Project Area does not overlap existing outfitting infrastructure (e.g., cabins, sheds, or cold / dry storage units), no direct costs associated with infrastructure removal / replacement are anticipated.

Over the long term (operation and decommissioning, rehabilitation and closure phases), it is assumed that outfitters operating within the LAA will have adjusted their operations in response to the Project and that adaptive actions taken in the short term will mitigate or preclude the likelihood that the Project will adversely affect outfitting activities. Because most outfitting clientele purchase 'top-tier' or 'all-inclusive' services and because most (85% to 95% of annual clientele) come from the USA⁹, outfitting clientele are not considered to be overly price sensitive (i.e., minor increases in pricing are not likely to deter consumers from purchasing services). Additional costs borne by outfitters can likely be passed on to the consumer with minor effect (i.e., negligible). Long-term adverse effects on the economic activities of outfitters operating within the LAA are anticipated to be negligible to low (low effects anticipated for outfitters that currently operate within a 1 km buffer around the mine site and a 500 m buffer around the access road).

Based on feedback from surveyed outfitters, beneficial effects of the Project on local employment and income are not expected to translate into increased benefits to area outfitters. This is primarily due to the market orientation of existing clientele and services (i.e., non-resident foreign customers [only one

⁹ Exchange rates between Canada and the USA work in favour of the consumer, a leading macroeconomic factor contributing to the success of outfitters (see Section 15.2.2.6)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

surveyed outfitter reported having a domestic NL consumer base, which accounts for roughly 3% of annual clientele)). Beneficial effects of the Project on the economic activities of outfitters are therefore anticipated to be negligible during all phases.

15.5.3.3 Summary

The Project is anticipated to have adverse effects on the economic activity of outfitters operating within the LAA. With the implementation of mitigation and management measures, adverse effects on outfitters operating within a 1 km buffer around the mine site and a 500 m buffer around the access road are anticipated to be low in magnitude and continuous in duration. Effects are short term in duration during construction and long term during operation and decommissioning, rehabilitation and closure phases.

Adverse effects on outfitters operating within the LAA outside the 1 km mine site and 500 m access road buffers are anticipated to be negligible to low in magnitude and continuous in duration. Effects are short term in duration during construction and long term during operation and decommissioning, rehabilitation and closure phases. Effects occur within a resilient socio-economic context based on existing conditions; however, given the residency of existing clientele (primarily from the USA), the future resiliency of outfitters to Project-related effects could be adversely affected as the global COVID-19 Pandemic and measures taken by governments (e.g., closure of the Canada-USA border) could affect existing operations. Effects are expected to be reversible following the completion of decommissioning, rehabilitation and closure.

15.5.4 Change in Economy

15.5.4.1 Project Pathways

Project spending will result in overall increased economic activity (i.e., GDP) in the LAA and RAA and will also contribute to provincial and federal government revenues through royalty payments and taxation on production, labour, goods, and services.

15.5.4.2 Residual Effects

Contributions to Gross Domestic Product

The Project will generate GDP through the value of production at the mine and direct, indirect, and induced employment and income. A summary of estimated GDP from capital and operating expenditures is provided in Table 15.23. Across Canada, the Project is estimated to generate \$3.6 billion in GDP, including \$1.9 billion from direct, indirect, and induced income and \$1.7 billion from production (SC 2020). Over the life of the Project, NL's GDP is estimated to increase by \$2.9 billion, with \$1.2 billion in labour incomes and \$1.7 billion from the net value of production (SC 2020). Assuming an annual average provincial GDP contribution of \$194 million, Project GDP contributions are predicted to represent a 0.6% increase in 2018 GDP levels. Over the life of the mine, GDP contributions are predicted to represent a 9.6% increase in 2018 provincial GDP levels.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Table 15.23 Estimated Project-Related Contributions to GDP (\$million) from Capital and Operating Expenditures by Geographic Region

Category	RAA (NL)	Rest of Canada	Canada
GDP from Income			
Direct	344	51	395
Indirect	254	314	567
Induced	598	365	963
Subtotal	1,196	730	1,926
GDP from Production			
Revenues	3,122	-	3,122
Less Cost of Production	(1,412)	-	(1,412)
Subtotal	1,710	-	1,710
Total GDP Contributions			
Total	2,906	730	3,636
Source: SC 2020			

While estimates of GDP contributions to the LAA have not been prepared, the Project is inherently beneficial to the local and regional economy. Because GDP is a measure of overall economic activity, the magnitude of effect is represented through the additive effect of Project-related changes in the local and regional labour force and businesses. The Project is expected to have a moderate magnitude positive effect on the GDP of the LAA and RAA during construction and operation. As the Project transitions from operation and into and through decommissioning, rehabilitation and closure, Project contributions to the GDP of the LAA and RAA will cease; however, contributions made during the decommissioning, rehabilitation and closure phase are estimated to be positive in direction and low in magnitude.

Federal and Provincial Taxes on Mining Operations

In NL, government taxes on mining operations include corporate income taxes, mining taxes and royalties, payroll taxes (Health and Post-Secondary Education Tax [HAPSET]) and Worker's Compensation premiums, value-added taxes (Harmonized Sales Tax), and excise taxes (e.g., on fuel) (SC 2020). A summary of direct, indirect and induced taxes for Canada and NL is provided in Table 15.24. The Project is estimated to generate \$292 million in direct, indirect, and induced taxes for the Government of Canada, while the Government of NL is estimated to receive \$398 million in direct, indirect and induced taxes. Direct corporate income taxes (\$139 million [\$11.6 million annual average]) represent the largest source of revenue from the Project for the federal government, while direct mining taxes (\$126 million [\$8.4 million annual average]) and corporate income taxes (\$139 million [\$9.3 million annual average]) represent the largest source of revenue from the Project for the Government of NL (SC 2020). Due to the provincial and national scope of Project tax contributions, effects are not characterized at the LAA level.



Table 15.24 Estimated Direct, Indirect and Induced Taxes (\$million)

Category	Government of NL		Government of Canada	
	Total	Annual Average (Over 12 Years)	Total	Annual Average (Over 12 Years)
Direct Company Taxes				
Corporate Income Tax	139	9.3	139	11.6
Mining Tax	126	8.4	-	-
Direct Fuel Tax	35	2.3	8	0.6
Direct Carbon Tax	9	0.6	24	1.8
Direct Income Taxes				
Direct Provincial Income Tax	34	2.3	48	2.8
Direct HAPSET	7	0.5	-	-
Indirect Income Taxes				
Provincial Income Tax	9	0.6	31	2.1
PST and other Indirect Taxes	4	0.3	2	0.1
Provincial Tax on Profits	3	0.2	13	0.9
Indirect HAPSET	3	0.2	-	-
Induced Income Taxes				
Provincial Income Tax	3	0.2	10	0.6
PST and other Taxes	24	1.6	11	0.7
Provincial Tax on Profits	1	0.0	6	0.4
Induced HAPSET	2	0.1	-	-
Total Taxes				
Total	398	26.6	292	21.7
Note: HAPSET = Health and Post-secondary Education Tax Source: SC 2020				

15.5.4.3 Summary

With the implementation of mitigation and management measures, Project residual effects on GDP are predicted to be positive in direction and moderate in magnitude during construction and operation. Positive low magnitude effects are anticipated during decommissioning, rehabilitation and closure. Effects are expected to primarily extend to the RAA, although it is recognized that Project expenditures, and therefore contributions to GDP extend beyond NL. Effects are short term in duration during construction and decommissioning, rehabilitation and closure, and medium term in duration during operation. Effects occur continuously throughout each Project phase and are reversible following the completion of each phase. Because Project effects are inherently beneficial, the socio-economic context in which effects occur is characterized as being resilient.



15.5.5 Summary of Project Residual Environmental Effects

Residual environmental effects that are likely to occur as a result of the Project are summarized in Table 15.25. The significance of residual adverse effects is considered in Section 15.6. Overall, with the implementation of mitigation and management measures, residual effects on economy and employment are mixed (positive and adverse) within positive effects ranging from low to high in magnitude and adverse effects ranging from low to moderate in magnitude. Except for effects on economic activities of outfitters, which are limited to the LAA (more pronounced within a 1 km buffer of the mine site and a 500 m buffer of the access road), effects on employment and economy generally extend to the RAA (province), although it is acknowledged that positive effects extend beyond NL. Effects range in duration from short to long term and occur continuously across Project phases. Both reversible and irreversible effects are anticipated. Given existing conditions, effects occur within a resilient socio-economic context.

Table 15.25 Project Residual Effects on Employment and Economy

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Regional Labour Force	C	P	H	LAA/RAA	ST	C	R	R
	O	P	H	LAA/RAA	MT	C	R	R
	D	A	M	LAA/RAA	ST	C	I	R
Change in Regional Business	C	P / A	L	LAA/RAA	ST	C	R	R
	O	P / A	L	LAA/RAA	MT	C	R	R
	D	P / A	L	LAA/RAA	ST	C	I	R
Change in Economic Activity of Outfitters	C	A	N-L	LAA	ST	C	R	R
	O	A	N-L	LAA	LT	C	R	R
	D	A	N-L	LAA	LT	C	R	R
Change in Economy	C	P	L	LAA/RAA	ST	C	R	R
	O	P	M	LAA/RAA	MT	C	R	R
	D	P	L	LAA/RAA	ST	C	R	R



Table 15.25 Project Residual Effects on Employment and Economy

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
<p>KEY See Table 15.12 for detailed definitions</p> <p>Project Phase C: Construction O: Operation D: Decommissioning, rehabilitation and closure</p> <p>Direction: N: Neutral P: Positive A: Adverse</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p>	<p>Geographic Extent: PA: Project Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short term MT: Medium term LT: Long term P: Permanent</p> <p>N/A: Not applicable</p>			<p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological / Socio-Economic Context: R: Resilient N: Not resilient</p>				

15.6 DETERMINATION OF SIGNIFICANCE

While the residual effects assessment considers both positive and adverse effects after mitigation and other management measures are implemented, a significance determination is made for adverse effects only. For the potential effects ‘change in regional labour force’, ‘change in regional business’, and ‘change in economic activities of resource-dependent businesses and industry’, a significant adverse residual effect is defined as:

- Distinguishable¹⁰ from current conditions and trends; and cannot be managed or mitigated through adjustments to programs, policies, plans, or through other mitigation. A significant adverse effect occurs if there are residual adverse effects disproportionately experienced by one or more identified sub-populations.

For the potential effect ‘change in economy’, a significant adverse residual effect occurs if Project operation results in an economic loss, causing a decline in provincial GDP for four or more quarters.

¹⁰ “Distinguishable” means that the adverse effect is measurable, predictable, and attributable to one or more Project or cumulative interactions (i.e., it is not within the boundaries of normal variation of the measurable parameter under baseline conditions).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Since adverse residual adverse effects on employment and economy are anticipated to be low to moderate in magnitude and, occur within the boundaries of a normal variation in baseline conditions (exemplified through the LAA's long history of mineral exploration and mining, including the recent operation and closure of Teck's Duck Pond Mine), Project effects are not assessed as being distinguishable from current conditions such that adverse changes cannot be managed or mitigated through adjustments to programs, policies or plans. In terms of the local and regional economy, Project operation is not expected to result in economic losses that cause a decline in provincial GDP for four or more quarters. With the implementation of mitigation and management measures, residual adverse effects on employment and economy are predicted to be not significant.

15.7 PREDICTION CONFIDENCE

There is a moderate degree of confidence in the assessment of effects on employment and economy because of uncertainty about future economic conditions in the LAA and RAA (province). This is especially so given economic uncertainty surrounding the global COVID-19 pandemic and its effect on the resiliency of local communities and outfitters. The extent of local and regional employment will also depend on finalized Project workforce planning, while the extent to which regional businesses are affected depends on how they choose to respond to the opportunities presented by Project spending. The degree to which outfitters choose to adjust existing operations in response to Project-related changes in land and resource use is also unknown.

15.8 PREDICTED FUTURE CONDITION OF THE ENVIRONMENT IF THE UNDERTAKING DOES NOT PROCEED

The Project is located in an area with a long history of mineral exploration and mining activity. With proven mineral reserves, should the Project not proceed it is likely that other mining proponents would secure interests in the area and seek to develop resources. It is anticipated that future projects would have similar effects as the Project on the regional labour force, regional businesses, economic activities of outfitters, and the economy. With the recent closure of Teck's Duck Pond Mine and resultant loss of area employment, the Project serves to diversify the economic base of the LAA and RAA and increase local employment that otherwise may not be realized over the short term.

15.9 FOLLOW-UP AND MONITORING

Follow-up and monitoring will be implemented in accordance with the Project's Benefits Agreement and Gender Equity and Diversity Plan. As part of this, periodic reports for each phase of the Project will be developed. These reports will include information on the number of persons employed by 4-digit NOC, the number of full- and part-time employed, the number of apprentices (by level) and journey persons for each applicable 4-digit NOC code, gender and source of the workforce. No additional follow-up and monitoring programs are proposed.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

15.10 REFERENCES

- 2G Outfitters. n.d. 2G Outfitters Newfoundland, Ca. Available at: <https://www.2goutfitters.com/> Accessed: April 2020.
- Barite Mud Services Inc. 2014. Environmental Registration – Buchans Barite Harvest and Processing Operations: A Comprehensive Environmental Plan for Re-Activation of Buchans Development Corporation’s Barite Operation in Buchans. Available at: <https://www.gov.nl.ca/eccm/files/env-assessment-projects-y2014-1758-1758-registraton.pdf>
- Black Ridge Outfitters Ltd. n.d. Welcome to Black Ridge Outfitters! Available at: <http://www.blackridgeoutfitters.ca/>
- BOC (Bank of Canada). 2020a. Annual Bank of Canada Commodity Price Index. Available from: <https://www.bankofcanada.ca/rates/price-indexes/bcpi/>
- BOC (Bank of Canada). 2020b. Monthly Bank of Canada Commodity Price Index. Available at: <https://www.bankofcanada.ca/rates/price-indexes/bcpi/>
- Burgeo Road Outfitters. n. d. Burgeo Road Outfitters – Big Game Hunting at its best in western Newfoundland, Canada. Available at: <http://www.burgeoroadoutfitters.com/>
- Central Newfoundland Outfitters. 2020. Central Newfoundland Outfitters Newfoundland, Canada. Available at: <http://www.centralnloutfitters.ca/>
- DNR (Department of Natural Resources). 2020a. Mining Industry Average Employment. Available at: https://www.geosurv.gov.nl.ca/minesen/avg_employment/
- DNR (Department of Natural Resources). 2020b. Active Exploration Companies. Available at: https://www.geosurv.gov.nl.ca/minesen/mineral_exploration/
- DNR (Department of Natural Resources). 2020c. Gross Value of Mineral Shipments by Commodity. Available at: https://www.geosurv.gov.nl.ca/minesen/mineral_shipments/
- DNR (Department of Natural Resources). 2020d. Mining Companies & Commodities. Available at: https://www.geosurv.gov.nl.ca/minesen/mines_commodities/default.asp
- DNR (Department of Natural Resources). 2019. Mining in Newfoundland and Labrador – Fall 2019. Available at: <https://www.gov.nl.ca/iet/files/MNL-Overview.pdf>
- Government of NL (Newfoundland and Labrador). 2020. Natural Resources. Mines. Available at: <https://www.gov.nl.ca/iet/mines/>
- Heritage Newfoundland and Labrador [Heritage NL]. 2020. Buchans: The Making of a Company Town. Available at: <https://www.heritage.nf.ca/articles/economy/buchans-town.php>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Intergovernmental Working Group on the Mineral Industry. 2016. Facilitating Responsible Mineral and Energy Development – Compendium of Case Studies on Building Public Confidence in the Mineral and Energy Resource Sectors. Energy and Mines Ministers' Conference, Winnipeg, Manitoba, August 2016. Available at:

https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/emmc/pdf/Compendium_access_16-0059%20eng.pdf

Lake Douglas Hunting and Fishing Inc. 2016. Lake Douglas Outfitters. Available at:

<http://www.lakedouglas.com/>

Migule Mountain Outfitters. 2017. Migule Mountain Outfitters. Available at:

<http://www.migulemountainoutfitters.com/index.html>

Mining Association of Canada. 2020. Facts and Figures 2019. Available at:

<https://mining.ca/documents/facts-and-figures-2019/>

Mining Association of Canada. 2018. Facts and Figures 2017. Available at: [https://mining.ca/wp-](https://mining.ca/wp-content/uploads/2019/03/Facts-and-Figures-English-Web_0.pdf)

[content/uploads/2019/03/Facts-and-Figures-English-Web_0.pdf](https://mining.ca/wp-content/uploads/2019/03/Facts-and-Figures-English-Web_0.pdf)

Mining Industry Human Resources Council. 2015. Canadian Mining Industry Employment, Hiring Requirements and Available Talent. 10-year Outlook. Available at: [https://mihrc.ca/wp-](https://mihrc.ca/wp-content/uploads/2020/03/LMI_National_Report_WEB_Final_2015.pdf)

[content/uploads/2020/03/LMI_National_Report_WEB_Final_2015.pdf](https://mihrc.ca/wp-content/uploads/2020/03/LMI_National_Report_WEB_Final_2015.pdf)

NRCan (Natural Resources Canada). 2020a. Our Natural Resources. Minerals and Mining. Minerals and Metals Facts. Minerals and Economy. Available at: [https://www.nrcan.gc.ca/our-natural-](https://www.nrcan.gc.ca/our-natural-resources/minerals-mining/minerals-and-economy/20529#exploration)

[resources/minerals-mining/minerals-and-economy/20529#exploration](https://www.nrcan.gc.ca/our-natural-resources/minerals-mining/minerals-and-economy/20529#exploration)

NRCan (Natural Resources Canada). 2020b. Maps, Tools and Publications. Publications. Minerals and Mining Publications. Canadian Mineral Exploration Information Bulletin. Available at:

[https://www.nrcan.gc.ca/maps-tools-publications/publications/minerals-mining-](https://www.nrcan.gc.ca/maps-tools-publications/publications/minerals-mining-publications/canadian-mineral-exploration-information-bulletin/17762)
[publications/canadian-mineral-exploration-information-bulletin/17762](https://www.nrcan.gc.ca/maps-tools-publications/publications/minerals-mining-publications/canadian-mineral-exploration-information-bulletin/17762)

NRCan (Natural Resources Canada). 2020c. Exploration Plus Deposit Appraisal Expenditures, by Province and Territory, 2015-2018 Annual and 2019 Revised Spending Intentions. Available at:

<https://sead.nrcan-rncan.gc.ca/PDF/ExploTable272018-en.pdf>

NRCan (Natural Resources Canada). 2020d. Exploration Plus Deposit Appraisal Expenditures, by Province and Territory, 2015-2018 Annual, 2019 Preliminary Estimates and 2020 Spending Intentions. Available at: <https://sead.nrcan-rncan.gc.ca/PDF/ExploTable022019-en.pdf>

Newfound Outfitting. 2008. Newfound Outfitting, Bay of Islands, Newfoundland and Labrador. Available at: <http://newfoundoutfitting.com/>

Newfoundland and Labrador Outfitters Association. 2013. Outfitters. Available at:

<http://nloa.ca/member/listing?q=>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

NL Tourism. n.d. Outfitters. Available at: <https://www.anglingnewfoundlandlabrador.com/plan-and-book/outfitters>.

Notch Mountain Outfitters. 2019. Notch Mountain Outfitters. Available at: <https://www.notchmountainoutfitters.com/>

Red Indian Lake Outfitting and Tours. 2020. Red Indian Lake Outfitting and Tours. Available at: <https://redindianlake.com/>

Southwick Associates. 2018. The Economic Contributions of Outfitter Businesses in Canada. Prepared for the Canadian Federation of Outfitter Associations. https://www.goabc.org/wp-content/uploads/2019/02/REPORT.-CFOA-Impact-of-Outfitting-Report-11_26_18.pdf

Statistics Canada. 2020a. Table 14-10-0064-01 Employee wages by industry, annual. Available at: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410006401>

Statistics Canada. 2020b. Table 36-10-0402-01 Gross domestic product (GDP) at basic prices, by industry, provinces and territories (x 1,000,000). Available at: <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3610040201>

Statistics Canada 2018. 2016 Census. Statistics Canada Catalogue no. 98-510-X2016001. Aboriginal Community Profile. Ottawa. Released July 18, 2018. Available at: <http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E>

Statistics Canada. 2017. Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. Available at: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>

Statistics Canada. 2014. National Household Survey (NHS) Aboriginal Population Profile. 2011 National Household Survey. Statistics Canada Catalogue no. 99-011-X2011007. Ottawa. Released November 13, 2013. Available at: <http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/aprof/index.cfm?Lang=E>

Statistics Canada. 2012. Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. Available at: <https://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E>

SC (Strategic Concepts Inc). 2020. An Analysis of the Economic Impacts Associated with Marathon Gold's Valentine Gold Project. Prepared for Marathon Gold Corporation. May 2020.

Teck (Teck Resources Limited). 2001. Duck Pond Copper-Zinc Project Environmental Impact Statement. Executive Summary. Available at: <https://www.gov.nl.ca/eccm/files/env-assessment-projects-y2002-867-duck-pond-execsumm.pdf>

Victoria Outfitters and Lodge. 2020. Get Into the Wild – Newfoundland Backcountry Hunts. Available at: <https://www.victoriaoutfitters.com/>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Employment and Economy
September 2020

Vincent, A. n.d. Outfitting Tourism: A Successful Tourism Niche in Newfoundland and Labrador. Available at: https://research.library.mun.ca/11957/1/Amanda_-_4950_Formatted.pdf

Where-Ya-Wannabee Outfitters. n.d. Guide Services for Newfoundland and Labrador. Available at: <http://moosehuntingcanada.ca/>



16.0 LAND AND RESOURCE USE

16.1 SCOPE OF ASSESSMENT

The Land and Resource Use valued component (VC) is defined as activities and infrastructure related to the use of land and resources, including designated land use (e.g., protected areas, communities), resource use (e.g., hunting, trapping, fishing, forestry) and recreational use (e.g., hiking, fishing, snowmobiling). It was selected as a VC because of the potential interactions between the Project and the use of the land and resources in and nearby the Project Area and their socio-economic value to the region. Current and future land uses, quality of life and livelihoods of stakeholders were also considered in the selection and assessment of this VC.

The assessment of land and resource use is closely linked to and informed by the conclusions of the effect assessments for the following VCs:

- Atmospheric Environment (Chapters 5) – given that Project-related activities may result in an increase in air quality, lighting, sound, and vibration levels that may cause a disturbance to both resources and resource users
- Surface Water Resources (Chapter 7) – given the importance of water quantity and quality to wildlife and the importance of water quality to health of resource users
- Fish and Fish Habitat (Chapter 8) – given the link with recreational and sport fishing
- Vegetation, Wetlands, Terrain and Soils (Chapter 9) – given the importance of vegetation communities to vegetation-based resource activities (i.e., forestry activities) and the importance of natural habitat to wildlife
- Avifauna, Caribou and Other Wildlife (Chapters 10, 11 and 12, respectively) – given the link with hunting, trapping and guided outfitting
- Indigenous Groups (Chapter 17) – given shared use of land with Indigenous groups
- Community Health (Chapter 14) – given the link with human health through direct consumption of vegetation, fish and wildlife gathered, hunted, or caught during recreational or commercially-based land and resource use

16.1.1 Regulatory and Policy Setting

In addition to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and the Newfoundland and Labrador *Environmental Protection Act*, the Project is subject to other federal and provincial legislation, policies and guidance. This section identifies the primary regulatory requirements and policies of the federal and provincial authorities which influence the scope of the assessment on land and resources use.



16.1.1.1 Federal

Applicable federal legislation related to land and resource use includes the *Canadian Navigable Waters Act* (CNWA). Under the CNWA, a navigable water is defined as a body of water where there is a reasonable likelihood that it will be used by vessels for any part of the year as a means of transport or travel for recreational or commercial purposes or for Indigenous peoples of Canada exercising their rights. For works on these water ways, a Minor Works Order is required, which allows for works to be built if they meet the criteria for applicable classes of work, as well as specific terms and conditions of construction. The dewatering or infilling and/or depositing materials into water which is navigable or flow into navigable waters is prohibited under the CNWA. Although the Project area does not include waterways listed as scheduled waters under the CNWA, the CNWA would also apply to waterways in the Project area where navigation by canoe / kayak is possible, such as Valentine Lake and Victoria Lake Reservoir. However, there are no Project features which would result in a change to navigation within Valentine Lake or Victoria Lake Reservoir. Additionally, road crossings along the access road have culverts / bridges currently and upgrades to the access road are not anticipated to result in changes to navigation. Ponds located on the mine site are considered small and unnavigable (Chapter 8 – Fish and Fish Habitat).

16.1.1.2 Provincial

Provincial legislation, regulations policy and guidance that are applicable to land and resource use include:

- *Forestry Act* – A cutting permit is required for cutting or removal of trees on forest lands or for activities that are likely to cause a wildfire. There are also environmental protection guidelines for planning forest operation for both industry and Crown that pertain to such things as existing and planned access roads, areas sensitive to erosion and buffers around waterbodies. As described further in Section 16.2.2.2, the Project Area is located within Planning Zone 5 and managed according to a five-year operation plan, the most recent of which is from 2016 to 2020.
- *Fisheries Act and Fishery Regulations* – Fishery regulations specified under the *Fisheries Act* govern daily and yearly quotas, possession limits and length limit for species fished in the inland and tidal waters. The regulations focus on the management and allocation of domestic fishery resources of the region. These regulations provide for fish harvester licensing, who may hold licences, vessel registration, gear requirements, open and closed seasons, restricted areas and other conservation and management measures. As described further in Section 16.2.2.2, angling occurs on a number of waterbodies in the Regional Assessment Area (RAA; Section 16.1.3), including an active recreational salmon fishery on the Exploits River, which flows northeast from Red Indian Lake.
- *Urban and Rural Planning Act* – This Act establishes the mandate for municipalities to adopt development plans and zoning by-laws to guide land use decisions and reduce land use conflicts within their boundaries. As noted in Section 16.1.1.3, while the Project Area does not overlap with areas regulated under this Act, nearby communities within the RAA are subject to these regulations.
- *Wild Life Act* – This Act governs the establishment of hunting zones and regulations regarding seasons. The *Wild Life Act* includes Wild Life regulations and orders pertaining to hunters and trappers who hold a valid licence and is the regulatory basis for the Newfoundland and Labrador



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

Hunting and Trapping Guide. As described further in Section 16.2.2.1, the Project Area is located within wildlife management areas and areas within the RAA are used for hunting and trapping activities which are regulated under this Act.

16.1.1.3 Municipal

The Project Area does not overlap with areas regulated under the *Urban and Rural Planning Act, 2000*; however, Buchans, Millertown and Buchans Junction are within the RAA (Section 16.2.2.1) and regulated under the *Urban and Rural Planning Act, 2000*.

16.1.2 Influence of Engagement on the Assessment

As part of ongoing engagement and consultation activities, Marathon has documented interests and concerns about the Project received from communities, governments, Indigenous groups and stakeholders. An overview of engagement activities by Marathon are provided in Chapter 3. Documented interests and concerns have influenced the design and operational plans for the Project, and the development of the Environmental Impact Statement (EIS), including the scope of assessment on the VCs. Interests and concerns noted that specifically relate to land and resource use or routine Project activities that could affect land and resource use are provided below. Issues and concerns related to potential accidents or malfunctions are described in the assessment of accidental events (Chapter 21).

Questions and concerns raised by Qalipu through Marathon's engagement efforts include:

- Whether Project infrastructure can be relocated to reduce the Project footprint
- Decommissioning, rehabilitation and closure of the Project, including disposition of camp infrastructure at end of mine life and ensuring remediation of the Project Area takes place
- Terrestrial environment, including the disturbance of caribou migration routes, the potential for the introduction of invasive plant and wildlife species
- Atmospheric environment including the potential impact of tree clearing and increased emissions on air quality
- Water quality and water treatment
- Interference with fish and fish habitat through use of culverts on water courses
- Limitation of access to lands and resources for traditional use
- Interest in involvement in the environmental monitoring for the Project
- Need for ongoing engagement

Questions and concerns raised by Miawpukek through Marathon's engagement efforts include:

- Need for ongoing engagement
- The size of the Project footprint
- The need for treatment to protect water quality
- Acknowledgement that interests of Miawpukek extend beyond caribou and include plants and waterfowl
- Potential impacts on pine marten and caribou migration as a result of increased industrial activity in the Central Region, and potential impacts of the Project on moose and salmon



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

- Potential impact on Miawpukek land and resource use
- Interest in involvement in environmental monitoring for the Project

Questions and concerns raised by communities and other stakeholders through Marathon's engagement efforts include:

- Timely and ongoing engagement with communities and other stakeholders
- Air quality including dust, and specifically dust from tailings
- Potential long-term effects of the Project on fish and wildlife and downstream effects on tourism, and concerns related to the allotment of Project profits being set aside for harm prevention and remediation of the area
- Impacts of the Project to caribou and on moose hunting in the area

Questions and concerns raised by fish and wildlife and civil society organizations through Marathon's engagement efforts include:

- The use of forestry roads and impacts to ongoing forestry operations near the Project Area
- Need for Marathon to provide compensation if outfitting operations are impaired
- Caribou including understanding the information provided by the Province of NL, the collection of caribou data by Marathon, and the potential impact of noise and waste rock and interference with caribou migration
- Water quality including the potential for contamination, the potential for acid rock drainage, and the need for the protection of small ponds near the Project Area
- Habitat compensation for loss of fish and fish habitat

16.1.3 Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographic extent of potential effects) and temporal boundaries (i.e., timing of potential effects). Spatial boundaries for the Land and Resource Use VC were selected in consideration of the geographic extent over which Project activities, and their effects, are likely to occur on the VC. Temporal boundaries are based on the timing and duration of Project activities and the nature of the interactions with the VC. The spatial and temporal boundaries associated with the effects assessment for the Land and Resource Use VC are described in the following sections.

16.1.3.1 Spatial Boundaries

The following spatial boundaries were used to assess Project effects, including residual environmental effects, on land and resource use in areas surrounding the mine site and access road (Figure 16-1):

Project Area: The Project Area encompasses the immediate area in which Project activities and components occur and is comprised of two distinct areas: the mine site and the access road. The mine site includes the area within which Project infrastructure will be located, and the access road is the existing road to the site, plus a 20-metre (m) wide buffer on either side. The Project Area is the anticipated area of direct physical disturbance associated with the construction, operation and decommissioning, rehabilitation and closure of the Project.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

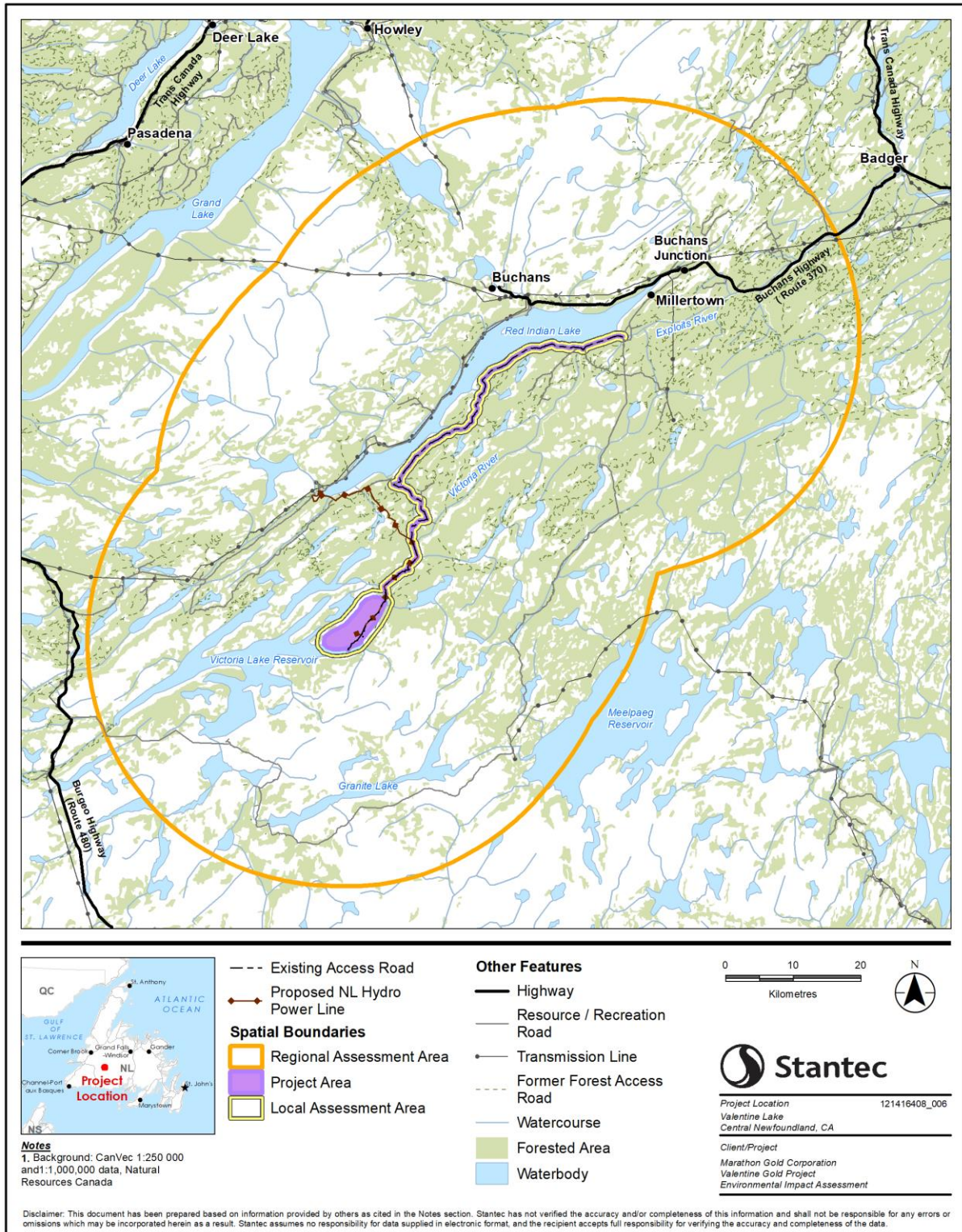


Figure 16-1 Spatial Boundaries for Land and Resource Use



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

Local Assessment Area (LAA): The LAA is comprised of a 1 kilometre (km) buffer around the mine site and a 500 m buffer around the access road. This has been selected to capture the area where effects on land and resource use are likely to be most prevalent (e.g., effects to harvested species and sensory disturbance effects to nearby land users).

Regional Assessment Area: The RAA is comprised of a 35 km buffer around the Project Area, encompassing Victoria River and Red Indian Lake, as well as the communities of Millertown, Buchans and Buchans Junction. The RAA informs the assessment of cumulative effects (Chapter 20) and is also used in the assessment of accidental events (Chapter 21).

16.1.3.2 Temporal Boundaries

The temporal boundaries for the assessment of potential effects on the Land and Resource Use VC include:

- Construction Phase – 16 to 20 months, beginning in Q4 2021, with 90% of activities occurring in 2022
- Operation Phase – Estimated 12-year operation life, with commissioning / start-up and mine / mill operation slated to start Q2 2023
- Decommissioning, Rehabilitation and Closure Phase – Closure rehabilitation to occur once it is no longer economical to mine or resources are exhausted

Seasonal temporal boundaries related to regulated hunting, trapping and fishing seasons are described in Section 16.2.2.2.

16.2 EXISTING CONDITIONS FOR LAND AND RESOURCE USE

A characterization of the existing conditions within the spatial boundaries defined in Section 16.1.3 is provided in the following sections. This includes a discussion of the influences of past and present physical activities on the VC, leading to the current conditions. An understanding of the existing conditions for the VC within the spatial area being assessed is a key requirement in the prediction of potential Project effects provided in Section 16.5.

16.2.1 Methods

Information on existing conditions for land and resource use by both Indigenous and non-Indigenous peoples was obtained through primary and secondary research. Primary data were collected through government, stakeholder, community, and Indigenous engagement activities undertaken for the Project. Correspondence with identified stakeholders was conducted and data was requested from government agencies. Secondary research included a desktop review of existing and publicly available research and studies, research findings, other environmental assessments, and a review of traditional knowledge, where available. Note that land use by Indigenous groups is specifically addressed in Chapter 17 (Indigenous Groups).

Land and resource use metrics generated through spatial analysis have also been used to describe the existing environment. Geospatial data were plotted using Geographic Information Systems (GIS) software



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

to determine the spatial distribution and nature of overlapping land uses within the Project spatial boundaries, as identified in Figure 16-1. By using GIS overlay mapping, the following information on land uses occurring in the vicinity of the Project was quantified:

- The number of land use permit and lease sites (e.g., cabins, recreation lots) and municipal planning areas in the LAA and RAA
- The number and/or area of provincial forests, wildlife management units (Bear / Caribou / Moose), provincial Crown lands, conservation lands, ecological reserves, and protected area lands in the LAA and RAA
- The number and/or area of recreational use areas (e.g., campgrounds, lodges, recreational sites, canoe routes, hiking trails, all-terrain vehicle (ATV) trails, snowmobile trails) in the LAA and RAA
- The number and/or area of Forest Management Districts (FMDs), research and monitoring sites and private land forest values in the LAA and RAA
- The number and/or area of mineral dispositions (e.g., mining claims, mineral leases, quarry leases, quarry permits, mining areas, aggregate resources) in the RAA
- The extent of potential Project interaction with registered traplines, game hunting areas and outfitter allocation areas and game bird hunting zones in the LAA and RAA
- The extent of potential Project interaction with commercially fished and sport fished lakes (trout / salmon) in the LAA and RAA
- Hydro and power infrastructure within the LAA and RAA

16.2.2 Overview

This section provides an overview of land and resource uses, including designated land use, resource use, and recreational use.

Designated land use includes lands within the RAA, LAA and Project Area that have defined uses as per provincial and municipal regulations and may be subject to property rights or interests. These areas include municipal planning areas and town boundaries, protected water supplies, protected roads, provincial crown land, protected conservation areas, and wildlife management areas. A description of these areas and their overlap with the RAA, LAA and/or Project Area are discussed in Section 16.2.2.1.

Resource use describes how the land in the RAA, LAA and Project Area is currently used for resource extraction, including hunting and outfitting, trapping, angling / fishing, mining and quarrying, forestry, and hydroelectric development. Section 16.2.2.2 provides a discussion of these activities and the level to which these activities occur in the RAA, LAA and/or Project Area.

Recreational use of the land includes leisure activities in which people take part on the land within the RAA, LAA and Project Area (e.g., hiking, fishing, snowmobiling). Section 16.2.2.3 describes the various landscapes within the spatial boundaries of the Project and the recreational activities in which people participate within and around those areas.



16.2.2.1 Designated Land Use

Municipal Land Use and Communities

In Newfoundland and Labrador (NL), municipal land use is governed by the *Urban and Rural Planning Act, 2000*, administered by the Department of Environment, Climate Change and Municipalities (NLDECCM). The Act establishes the Province’s land use planning system and details the requirements for preparing, approving and implementing planning documents. The Project is in a rural setting, outside of municipal boundaries and therefore is not located in an area subject to development and zoning controls. There are three communities within the RAA: Millertown, Buchans and Buchans Junction (Figure 16-1 and 16-2). The distance of each of these communities to the Project Area and mine site is listed in Table 16.1. The towns of Millertown and Buchans are both registered municipalities under the *Municipalities Act, 1999*. Buchans is the only community in the RAA that has a municipal planning area, which covers approximately 4 km² immediately surrounding the community (Figure 16-2). Buchans Junction is a Local Service District established under the *Local Service District of Buchans Junction (CNLR 75/96)* under the *Municipalities Act, 1999*. Information on community services and infrastructure is provided in Chapter 13.

Table 16.1 Communities within the RAA

Community Name	Type	Distance by Road (km)		Straight Line Distance (km)	
		To Mine Site	To Project Area	To Mine Site	To Project Area
Buchans	Municipality	126	46	48	10
Millertown	Municipality	89	9	60	8
Buchans Junction	Local Service District	96	16	66	13

Buchans, first established in 1927, was built around and in conjunction with the mining industry (Heritage NL 2020). The presence of ore (zinc, lead, copper, silver, and gold) was discovered in 1905 and in that same year, the Anglo-Newfoundland Development was granted mineral rights to approximately 6,000 km² of land surrounding Red Indian Lake. The mining industry grew in the central part of the Island of Newfoundland after 1926, when technology became available to process the ore. Buchans was essentially a mining town, with services and infrastructure provided by the American Smelting and Refining Company. In 1956, the Buchans Highway was opened and properties were established in a subdivision known as the Townsite just outside the town. Municipal services at Townsite and the Town of Buchans were managed independently until 1979 when they formally merged under one democratically elected municipal government (Heritage NL 2020). During the peak mining years at Buchans, the population was around 2,500 to 3,000 people. By 1985, the population was 1,500 and in the latest Census (2016), the population was 642 (Statistics Canada 2020).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

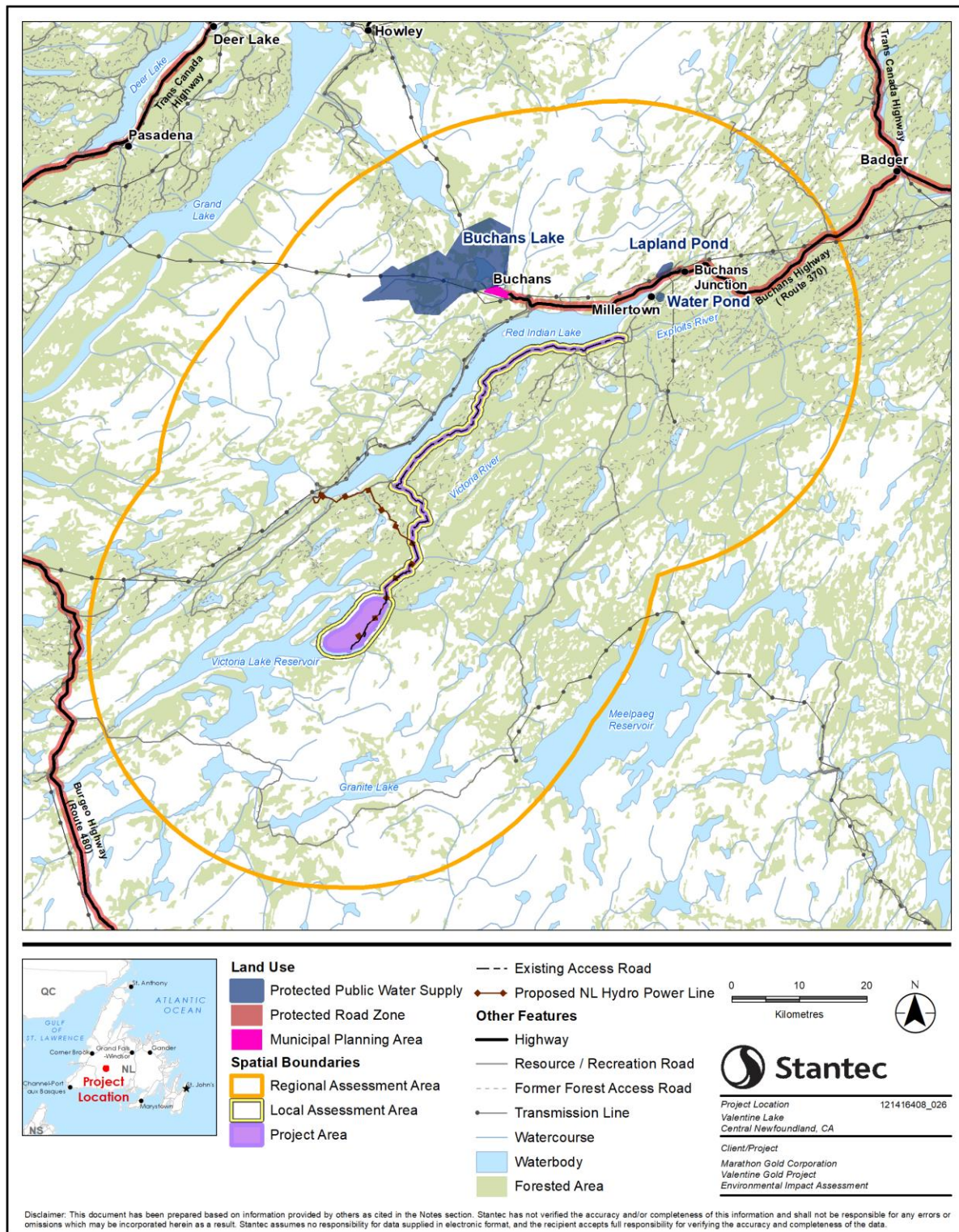


Figure 16-2 Municipal Land, Planning Boundaries and Municipal Water Supplies within the RAA



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Millertown was established in early 1900s when two sawmills were built along the shore of Red Indian Lake. The mill processed stands of white pine that surrounded the lake (Marsh 2015). The mills continued to operate into the 1920s, however in 1926 the town moved to higher ground due to the construction of the Exploits Dam, which flooded the land of the original Millertown location (Town of Millertown 2008). Today, the town provides access to ecotourism opportunities in the area, such as angling, hunting and backcountry recreation. The population of Millertown decreased 18% between 2011 and 2016, falling from 99 to 81 persons (Statistics Canada 2016).

Buchans Junction is such named as it used to be situated at the junction where the railway lines from Buchans and Millertown met. It became a small town as people congregated there and as it provided quick access to both Millertown and Buchans. Although the railway closed in 1927, the town remained. Today, it is a Local Service District and shares certain municipal services with Millertown and Buchans. In 2019, Buchans Junction had a population of 72 (Statistic Canada 2016).

Protected Water Supplies

The Water Resources Management Division of the NLDECCM is responsible for water resources management as per provisions of the *Environmental Protection Act* and the *Water Resources Act*. The Division has programs to protect, enhance, conserve, develop, control and effectively use the water resources of NL (NL Department of Municipal Affairs and Environment 2017). Protected water supply areas in the RAA, designated under section 39 of the *Water Resources Act*, are noted in Table 16.2 and shown on Figure 16-2. There are no protected water supply areas in the Project Area or LAA. Land use activities, such as domestic or commercial forest harvesting, agriculture, recreation, transportation, mineral exploration, and aggregate extraction, are permitted within a protected watershed, as long as they do not impair water quality (Water Resources Management Division 2013).

Table 16.2 Protected Water Supply Areas within the RAA

Community	Water Supply Location	Area (km ²)	Distance from the Project Area (km)	Distance from the Mine Site (km)
Buchans	Buchans Lake	320	20	43
Millertown	Water Pond	1	7	60
Buchans Junction	Lapland Pond	3	10	63

Protected Roads

In the RAA, there are main roads in Buchans and Millertown and provincial highways connecting Millertown and Buchans to the Trans-Canada Highway. There are two “protected roads” near the Project Area: Highways 370 and 480; however, there are none within the Project Area. Protected roads are designated under the provincial *Urban and Rural Planning Act*, as a means of controlling development alongside the protected road. Buchans Highway 370 connects both Buchans and Millertown to the Trans-Canada Highway at Badger and will be the main route for delivery of materials and equipment to the Project (Figure 16-2). Route 480, which heads south from the Trans-Canada Highway to Burgeo, will not be used for the Project.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Provincial Crown Land

The RAA is mainly comprised of unoccupied provincial Crown land. The Lands Branch of the Newfoundland and Labrador Department of Fisheries, Forestry and Agriculture (NLDFFA) is responsible for managing and allocating provincial Crown land. Recreational cabin use is permitted on Crown land through the acquisition of a grant in rural areas that are accessible by a road and where no conflicting land uses exist, or in areas without road access that have been designated by the Lands Branch for recreational cabin development. Cabin use is also permitted through the Remote Recreational Cottage Licenses to Occupy in remote areas that are not accessible by conventional motor vehicle and where there is no conflicting land use. Occupied Crown lands within the RAA are areas that are licenced or subject to licence applications for cabins (Figure 16-3); designated ecological reserves (Figure 16-3); mineral tenure impost lands (Figure 16-8); or subject to other legal uses.

There are 171 cabin plots and two cabin developments registered with Crown lands within the RAA. Of the 171 cabins, 14 cabins are located within the LAA and three are located within the Project Area: two along the access road corridor and one at the mine site (Figure 16-3).

Within the RAA, there are 21 outfitters registered with the Land Division, nine of which are active according to Tourism NL (Figure 16-3). The nearest active outfitter location is the Notch Mountain Outfitters Lodge, located approximately 11 km from the LAA and 17 km (straight line distance) from the mine site. The Lodge is located at the southwest end of Red Indian Lake where it joins Lloyd's River (Figure 16-3). Note that Notch Mountain Outfitters previously operated a remote outfitters camp and a number of licenses at Valentine Lake, and while they continue to hunt in the area, the remote outfitters camp is no longer in use by the outfitter. In 2019, at the request of Notch Mountain Outfitters, Marathon assisted / supported the transfer of their Valentine Lake licenses to their main lodge location on the Lloyd's River.

Four commercial Crown land licences held within the RAA are associated with mining activities and hydroelectric dams. NL Hydro holds Crown land licences for lands associated with the Star Lake, Buchans and Bay d'Espoir hydroelectric operation. Properties associated with the Duck Pond Copper-zinc Mine are also present within the RAA (Figure 16-3). Further information on hydroelectric facilities and mining activities within the RAA can be found in Section 16.2.2.2.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

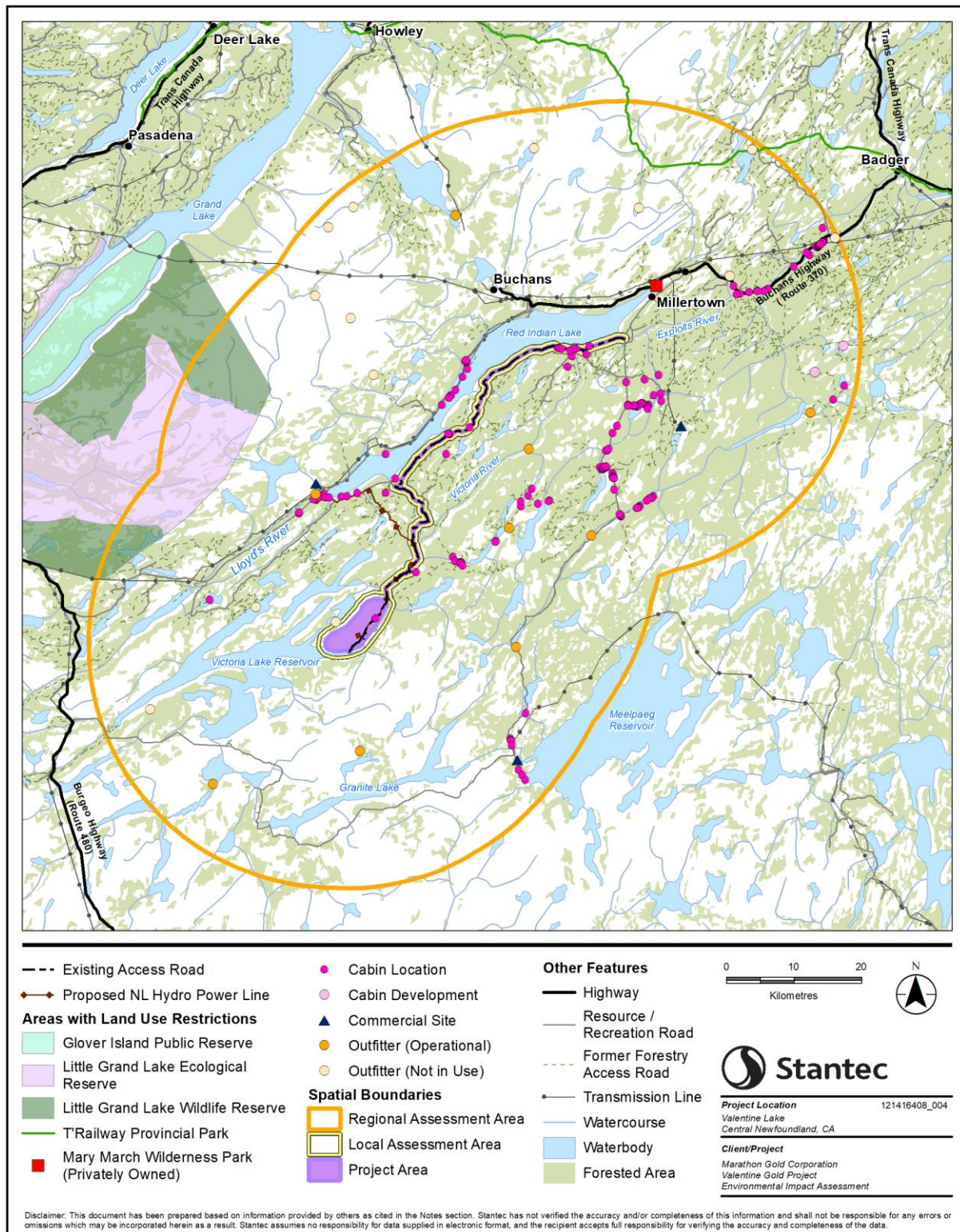


Figure 16-3 Land Use and Protected Areas within the RAA



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Protected Conservation Areas

Provincial Parks, Ecological Reserves and Management Areas

The province of NL manages 55 protected areas including 31 provincial parks, 16 ecological reserves, three wildlife reserves, two wilderness reserves, and three other protected areas (NLDFLR 2019a). Three provincial protected areas overlap the RAA: Little Grand Lake Ecological Reserve; Little Grand Lake Wildlife Reserve; and T’Railway Provincial Park (Figure 16-3). These protected areas are described in Table 16.3. There are no provincially protected areas within the Project Area or LAA.

Table 16.3 Provincially Protected Areas Within the RAA

Provincially Protected Area	Total Area / Length (km ²) / (km)	Total Area / Length of Overlap with RAA (km ²) / (km)	Reason for Protection
Little Grand Lake Ecological Reserve	729 km ²	216 km ²	Designated to protect extensive bogs and barrens and mature boreal forest that is prime habitat for the endangered American marten (Newfoundland population). The reserve spans the area of marten habitat under protection, which also provides buffers against the effects of human activity that would be harmful to the marten's recovery. Little Grand Lake Ecological Reserve also protects representative areas of three ecoregions: Western Newfoundland Forest-Corner Brook subregion; Central Newfoundland Forest-Portage Pond subregion; and Long-Range Barrens-Buchans Plateau / Topsails subregion.
Little Grand Lake Wildlife Reserve	569 km ²	137 km ²	This reserve was established in 2002 to protect the habitat of the American marten (Newfoundland population). It consists of two parcels, which span either side of the Little Grand Lake Provisional Ecological Reserve.
T’Railway Provincial Park	900 km	29 km	The T’Railway Provincial Park stretches almost 900 km, varying in width, from St. John’s to Port aux Basques along the main line of the old abandoned Canadian National railbed. This Island-long park corridor provides access to many of the Island’s representative natural and scenic landscapes and serves as the Island of Newfoundland portion of the Trans-Canada Trail system. ATVs and snowmobiles are allowed on the T’Railway for access and year-round enjoyment. Hiking, scenic touring and nature observation is encouraged and promoted, especially to residents and visitors to the province.
Source: NLDFLR 2019b			

American Marten (Newfoundland population) Critical Habitat (proposed)

The designation of an area as “critical habitat” under the *Endangered Species Act* is used to protect the habitat of species of conservation concern. The interior of the Island of Newfoundland offers habitat for the endangered American Marten (Newfoundland population). Based on marten occurrences and habitat suitability, the Recovery Plan for marten on the Island identified an area of critical habitat approximately 6,200 km² (The Newfoundland Marten Recovery Team 2010). A small portion (6.3 km²) of this proposed



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

critical habitat overlaps the Project Area (Chapter 12, Figure 12-6). Limited use restrictions apply to critical habitat and applications for land use are to be referred to the provincial Wildlife Division. More information on marten critical habitat can be found in Chapter 12 (Other Wildlife).

Sensitive Wildlife Areas

With respect to waterfowl, a Sensitive Wildlife Area (Victoria Steadies Sensitive Wildlife Area) along the Victoria River has been identified by the NLDFLR and the Newfoundland and Labrador Eastern Habitat Joint Venture as containing important waterfowl habitat (Newfoundland and Labrador Eastern Habitat Joint Venture 2008). This area was established to protect wetland habitat used as breeding, brood rearing and staging grounds for waterfowl.

While this area overlaps with the Project Area and LAA (Figure 10-3, Section 10.2.2), NLDFLR has indicated that the waterfowl habitat that was likely the focus of this designation are “steadies” on the Victoria River system located well to the north of the mine site, before the river drains into Red Indian Lake (B. Adams, pers. comm, 2020). A larger area was likely designated to highlight the need for continued drainage of the Victoria River watershed from Victoria Lake Reservoir to Red Indian Lake, to maintain wetland habitat for waterfowl species. A number of ponds / wetlands drain into the Victoria River, and following the establishment of two dams in the 1960s, these appear to be the only central aspects of waterflow to the special management areas / steadies which flow into Red Indian Lake (B. Adams, pers. comm, 2020). Therefore, maintaining wetland / watershed integrity and drainage patterns were identified as central conservation goals relating to this Sensitive Wildlife Area. Several mitigation measures in relation to the Sensitive Wildlife Area have been identified in Chapter 10 (Avifauna).

Private Parks

Mary March Wilderness Park is the only privately-owned park near the Project. Located along Route 370 near Buchans Junction, approximately 10 km north of the Project Area, it was established in 1969 as a provincial park. The park covers an area of 0.32 km² and includes hiking trails, ATV trails, 25 designated campsites, and 23 picnic sites. The park was privatized in 1995 and is currently being operated by a local resident (Mary March Wilderness Park n.d.).

Wildlife Management Areas

Hunting and trapping are regulated by NLDDFA's Wildlife Division (NLDDFA-Wildlife Division) through the *Wild Life Act* and Regulations, which is responsible for managing and conserving NL's biodiversity and wildlife resources (NLDFLR 2019b). As part of wildlife management, research is conducted and used to make recommendations to the NLDDFA-Wildlife Division, as well as to other provincial and federal government agencies, such as the Environmental Assessment Division of the NLDECCM and Fisheries and Oceans Canada (DFO) (NLDFLR 2019b). The NLDDFA-Wildlife Division's Research Section conducts collaring and monitoring of caribou, as well as research involving other big game, small game, furbearers, and fish species. The Game and Fur Management Section monitors the status of wildlife populations by monitoring population, biological components and hunter trends of each species, providing population estimates or relative abundance estimates, where possible (NLDFLR 2019b). This information is used to set licence quotas which are established within management areas. Wildlife management areas within NL include Moose Management Areas (MMAs), Bear Management Units (BMUs), Caribou



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Management Units (CMUs), small game management areas, and furbearing trap zones (Figures 16-4 to 16-7). As illustrated in Figure 16-4, the moose and bear management areas have the same boundaries; however, they are managed separately. Hunting and trapping activity occurring in these areas is discussed in Section 16.2.2.2. Table 16.4 provides a description of the overlap between the large game management areas and the RAA, LAA and Project Area.

Table 16.4 Management Areas with Overlap in the RAA, LAA and Project Area

Management Area / Unit	Area Number / Name	Total Area (km ²)	% Overlap With		
			RAA	LAA	Project Area
Moose and Bear	11	2,888	10%	-	-
	12	2,827	67%	-	-
	13	2,677	54%	-	-
	16	1,634	21%	-	-
	17	2,802	95%	4%	<1%
	18	3,875	58%	<1%	<1%
Caribou	61	9,404	2%	-	-
	62	6,067	65%	<1%	<1%
	63	12,330	26%	<1%	<1%
	66	4,358	34%	-	-
Small Game	Topsails	4,303	34%	-	-
	Rest of the Island	91,624	8%	-	-
Furbearing Trap Zone	83	299	100%	24%	11%
	14	199	100%	7.5%	0.4%
	221	198	100%	8.1%	0.4%
	134	233	100%	0.2%	-
	239	218	100%	6.5%	0.3%
	244	244	100%	-	-
	262	248	100%	-	-
	263	174	100%	-	-
	115	185	100%	-	-
	43	208	100%	-	-
	1107	487	100%	-	-
	44	154	0.9%	-	-
	369	149	0.1%	-	-
	123	157	100%	-	-
	128	64	77%	-	-
	8	104	66%	-	-
	29	261	34%	-	-
176	120	2%	-	-	



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

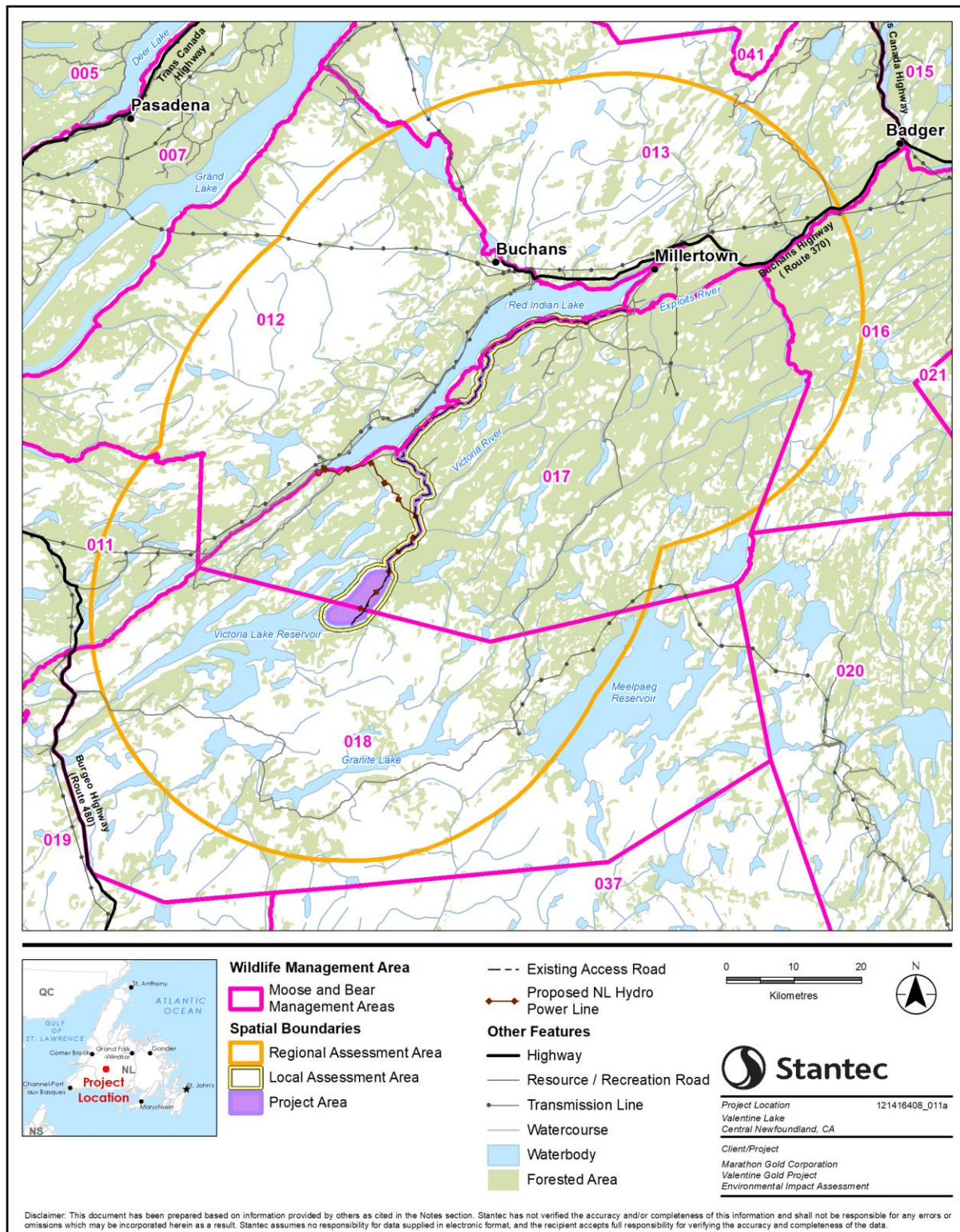


Figure 16-4 Moose and Bear Management Areas in the RAA



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

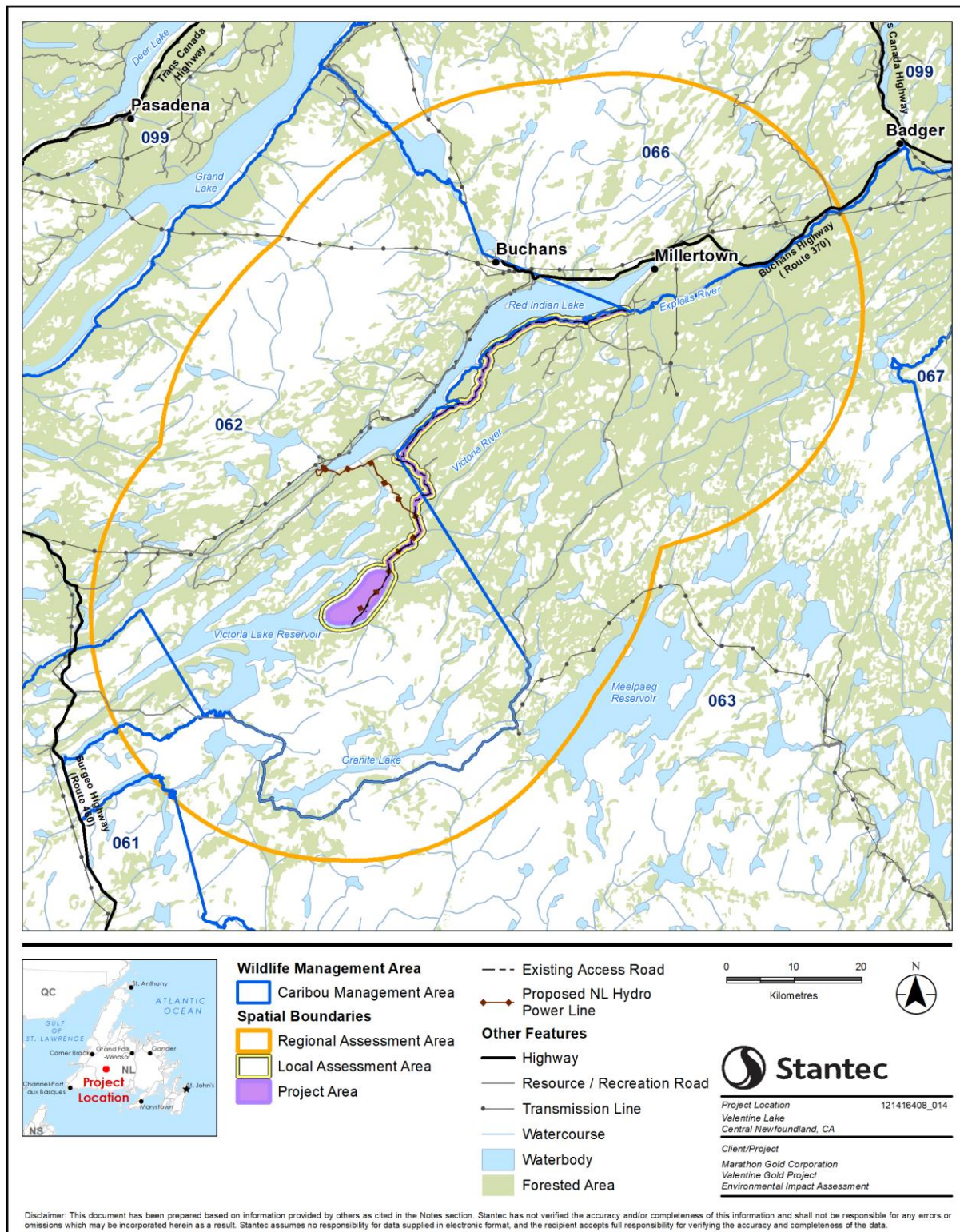


Figure 16-5 Caribou Management Areas in the RAA



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

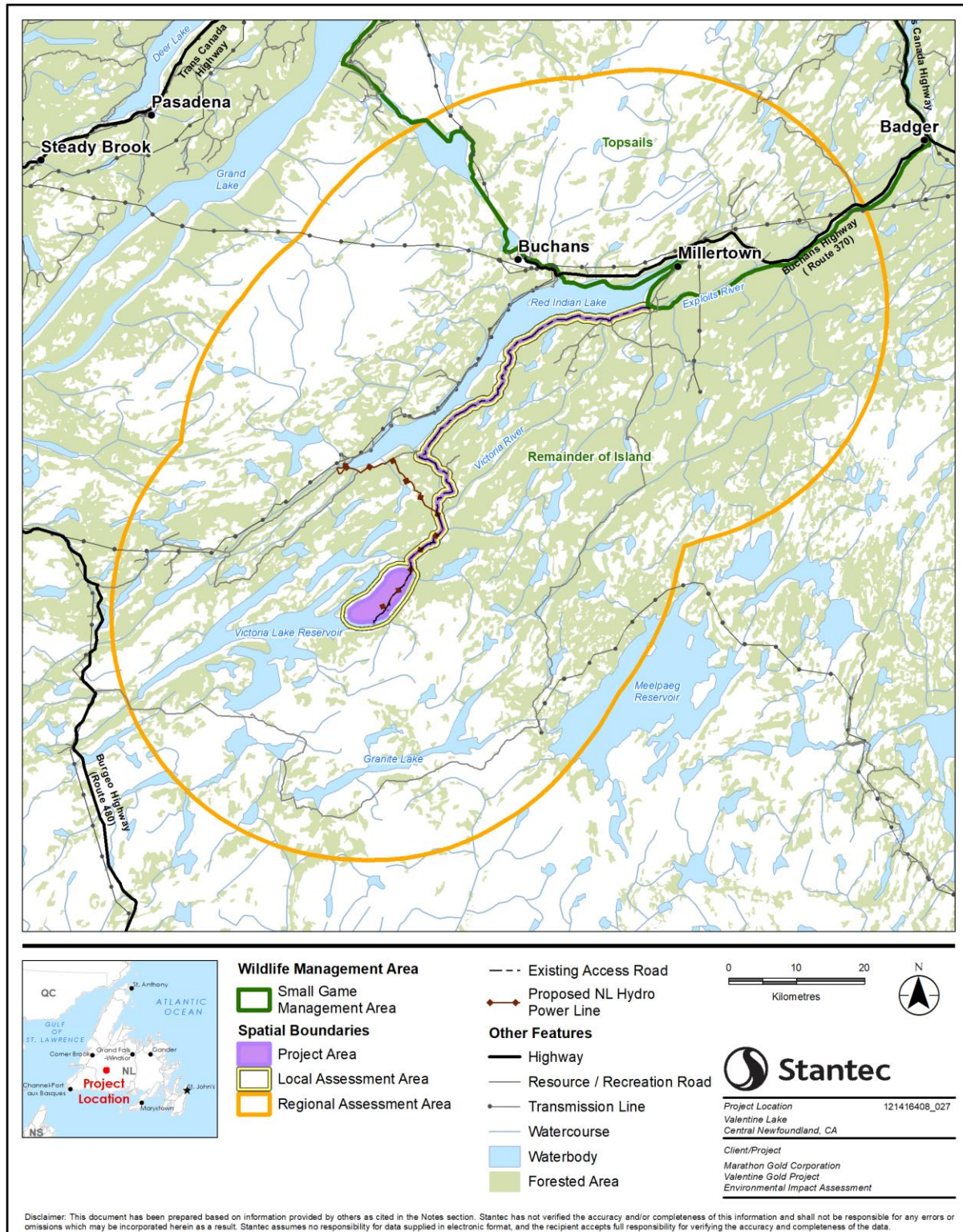


Figure 16-6 Small Game Management Areas in the RAA



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

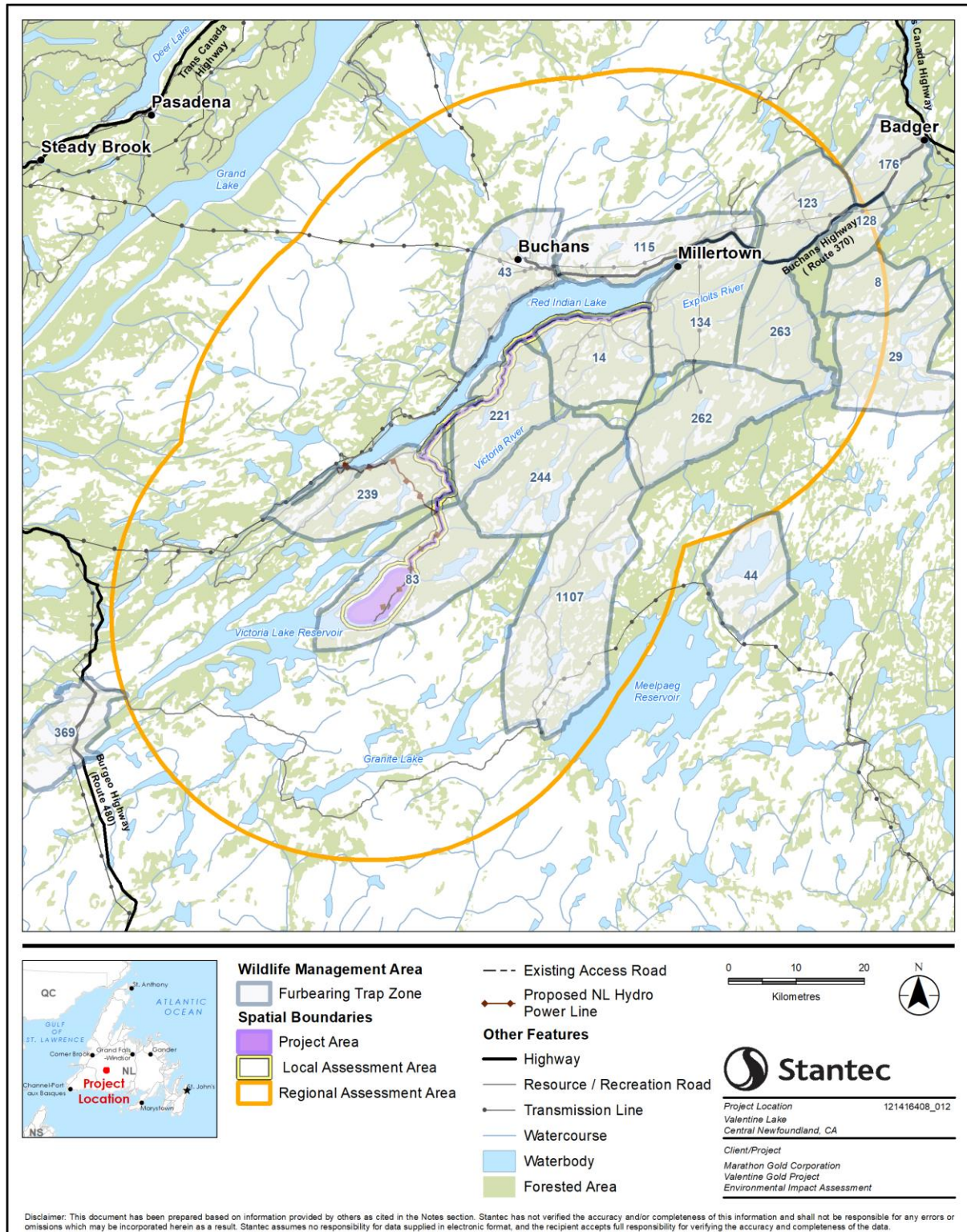


Figure 16-7 Furbearing Trap Zones in the RAA



16.2.2.2 Resource Use

Hunting and Outfitting

Hunting in NL provides recreational opportunities for residents and non-residents and contributes to the province's wildlife management programs and economy through local spending and the outfitting industry (NLDFLR 2019b). Non-residents wishing to hunt big game are required to apply through one of the outfitting companies and possess a valid non-resident hunting licence. As described above, hunting opportunities are provided throughout the province and are regulated by NLDDFA through Wildlife Management Units. Primary species of interest for hunting are moose, caribou, black bear, and small game (e.g., grouse and snowshoe hare). Seasons vary between species and are described below.

Big Game

Big game hunting includes moose, caribou and black bear. NLDDFA-Wildlife Division is responsible for managing big game populations and determines the maximum number of moose, caribou and black bear that can be safely harvested to prevent population declines, while making sure populations are being maintained at levels that will not degrade the habitat and possibly lead to a population collapse (NLDFLR 2019b). Hunting seasons and licence quotas are described below for each of these hunted species.

The hunting season for moose varies across the province, although typically extends from mid-September to late December in MMA 17 and 18, with a bag limit of one moose per licence. Licences are available to residents and non-residents. Within MMA 17 and 18, the moose quotas are 184 and 160 licences, respectively (NLDFLR 2019c). The 2019 to 2020 moose quota for the Island of Newfoundland was over 15,000 licenses, with a success rate of approximately 59% (Government NL 2019). Moose are distributed across the Island in varying densities, ranging from 0.5 moose/km² in non-forested areas to 2 moose/km² or greater in forested areas (McLaren et al. 2009). The densities in some areas of the Island are known to exceed the provincial management target of 2 moose/km² (Government of NL 2015), reaching as high as 12 moose/km² in MMA 17 (Mercer and McLaren 2002). As discussed in Section 12.2.2.1 (Other Wildlife), moose have been confirmed in the LAA and Project Area through both sightings and signs (e.g., trails, droppings, beddings). The most recent population estimates for moose MMAs 17 and 18 are 2151 (+/- 259) and 2639 (+/- 286) (S. Pardy, pers. comm., 2020).

In 2019, there were 38 caribou licences issued for either sex in CMU 62, with a bag limit of one caribou per licence, and the season was open from mid-September to early December. CMU 63 is currently closed for caribou as part of a population management strategy (NLDFLR 2019c). Caribou on the Island of Newfoundland have been assessed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (COSEWIC 2014). The Project Area overlaps or is in proximity to the ranges of caribou herds, including the Buchans, Grey River, Gaff Topsails, and La Poile herds. Animals from the Buchans herd migrate through the mine site biannually, while resident caribou (Grey River herd) occur year-round within the Project Area. The La Poile herd has no overlap with the Project Area, and only a small portion of the winter range of the Gaff Topsails herd overlaps with the Project Area (less than 1 km²). Further information on the existing conditions for caribou in the vicinity of the Project is provided in Section 11.2.2 (Caribou).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

For black bear, the bag limit is two (either sex) per licence in management areas open to hunting (NLDFLR 2019c). Hunting on the Island is permitted in either of the designated fall or spring seasons. There is also a fall bow hunting season that, in 2019, began on August 31. As discussed in Section 12.2.2.1 (Other Wildlife), black bears are distributed across the Island and are known to occur in the Project Area and have been confirmed by remote wildlife cameras (Stantec unpublished data). Black bears on the Island are considerably heavier than those on the mainland (Mahoney et al. 2001). This has contributed to the success of bear hunting guiding operations on the Island.

Small Game and Furbearers

Six small game species are currently managed and hunted in NL: snowshoe hare, Arctic hare (hunted in Labrador only), willow ptarmigan, rock ptarmigan, ruffed grouse, and spruce grouse. Up to 35,000 people in the province participate in small game hunting by snaring and shooting (NLDFLR 2019d). Small game licences issued for locations that overlap with the Project Area and LAA are indicated in Table 16.5. In peak years of snowshoe hare abundance, there have been approximately 600,000 to 1,500,000 hares harvested (NLDFLR 2019d).

Table 16.5 Small Game Licences Issued for 2019

Species	Zone Designation	2019 Season Dates	Daily Bag Limit	Possession Limit
Willow and Rock Ptarmigan	Remainder of Island ^A	Sept 21–Dec 1	12	24
Ruffed and Spruce Grouse	Island of Newfoundland	Sept 21–Dec 22	20	40
Snowshoe Hare	Remainder of Island ^A	Oct 05–Mar 08	-	40
Note: ^A Remainder of the Island refers to those areas not included within the Avalon, Burin, Topsail zones for these species Source: NLDFLR 2019d				

Trapping of furbearing species also occurs in zones that overlap with the Project Area and LAA. Eleven furbearer species are managed and trapped in NL including beaver, fox, Canada lynx, coyote, mink, muskrat, otter, red squirrel, weasel, marten, and wolf (NLDFLR 2019d). On the Island, American marten (Newfoundland population) is a threatened species and has been protected since 1934.

Approximately 16,000 people in NL trap and snare furbearers as a means of supplementing income (NLDFLR 2019d). Table 16.6 indicates the species being trapped and season opening dates. For the purpose of harvesting, the Island is divided into 11 Furbearer Zones. The Project Area is located in Newfoundland Beaver Fur Zone 7, and the mine site is fully encompassed in Trapline 83 (Figure 16-7).

Table 16.6 Furbearer Species and Season Dates for 2019–2020

Species	Opening Dates
Beaver	Oct 20/19–April 15/20
Muskrat	Nov 1/19–Mar 15/20
Otter	Nov 1/19–Mar 15/20
Mink	Nov 1/19–Feb 28/20



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Table 16.6 Furbearer Species and Season Dates for 2019–2020

Species	Opening Dates
Coyote	Nov 1/19–Feb 1/20
Fox, coloured	Nov 1/19–Feb 1/20
Fox, white	Nov 1/19–Feb 1/20
Wolf ^A	Nov 1/19–Feb 1/20
Ermine (weasel)	Nov 1/19–Feb 28/20
Squirrel	Nov 1/19–Feb 28/20
Canada lynx	Zone A-Jan 1/20–Feb 1/20
Notes: ^A Only occurs in Labrador Source: NLDFLR 2019d	

The number of pelts and associated dollar value for furbearers in NL is shown in Table 16.7 for 2009 (latest year this data is available). These values represent wild trapped animals only and exclude farmed furbearers. It is important to note that these values are for the Island of Newfoundland and Labrador combined. Marten represent the highest value of pelts in dollars; however, this data is from Labrador only, as marten are not trapped on the Island of Newfoundland. Fox, mink and beaver are important furbearer species, accounting for a combined value of \$107,094 in 2009. Canada lynx and wolf have the highest valued pelts, with an average value of \$96 and \$123 per pelt, respectively. Wolf only occurs in Labrador.

Table 16.7 Number and Value of Pelts Produced in NL in 2009

Type of Pelts (Wild Trapped Only ^A)	Number of Pelts	Value of Pelts in Dollars (\$)
Marten ^B	2,137	97,420
Cross and red fox	1,898	40,242
Mink	3,318	38,654
Beaver	1,718	28,198
Otter	623	27,147
Canada lynx	113	10,837
Coyote	379	10,657
Ermine	2,056	6,997
Muskrat	661	4,690
Wolf ^B	21	2,589
Squirrel	1,763	2,268
Wildlife pelts, total	14,687	269,699
Notes: ^A Does not include farmed animals ^B Trapped in Labrador only Source: Statistics Canada 2020		



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Bird Hunting

Migratory bird game hunting also occurs in NL and could occur within the RAA. Migratory birds that are of interest for hunting include ducks, geese, snipe, and turrs (NLDFLR 2019e). Hunting of migratory birds is managed by the Canadian Wildlife Service of Environment and Climate Change Canada (ECCC), and participants require a valid Migratory Bird Hunting Permit. Waterfowl are located throughout the Project Area and several types were recorded during baseline studies in 2011 and 2017 (Section 10.2.3.2).

Outfitting

Within the RAA, 21 outfitters are registered with Crown lands (Figure 16-3). The nearest active outfitter is the Notch Mountain Outfitters Lodge located at the end of Red Indian Lake where the lake joins with Lloyd's River (approximately 11 km from the LAA). Notch Mountain Outfitting also has three lodges located in the region that span multiple hunting management areas, and offers packages focused on moose, caribou and black bear hunting, as well as angling (Notch Mountain Outfitter n.d.). Notch Mountain Outfitters has been in operation for 37 years and reported that 80% of their clients are American (10% Other Canadian and 10% International), with an average of 37 clients per year (Notch Mountain Outfitters, pers. comm. 2020). In the vicinity of the Project, clients hunt bear in June and moose and caribou from September to November. Notch Mountain Outfitters has an outfitters camp on Valentine Lake that was used as a fly-in operation for non-resident big game hunters. The owner has reported that previous exploration activities by Marathon at the mine site have had a negative effect on this outfitters camp due to noise, traffic and increased access to the area provided by the access road (allowing other outfitters and local hunters ease of access) (Notch Mountain Outfitters, pers. comm. 2020). As noted above, in 2019, at the request of Notch Mountain Outfitters, Marathon assisted / supported the transfer of their Valentine Lake licences to their main lodge location on the Lloyd's River. Section 15.2.2.6 provides more details on outfitting in the province and in the vicinity of the Project.

Trapping

A variety of furbearer species that are subject to trapping activity are found in the area. Trapping seasons vary, although generally extend from late-October to mid-March (NLDFLR 2019c). The RAA overlaps with two Trap Zones in Fur Zone 4 and 16 Trap Zones in Fur Zone 7 (Table 16.8, Figure 16-7). The Project Area overlaps with Trap Zones 14, 83, 221 and 239, all of which are in Fur Zone 7. Information on the number of and status of traplines within the Trap Zones was requested from the NLDFFA-Wildlife Division; however, this information is considered confidential and therefore the status is unknown. The RAA also overlaps with Red Indian Lake Modified Snaring and Trapping Area, where land-based traps are prohibited in an effort to mitigate accidental mortality of American marten (Newfoundland population) in areas of known presence (NLDFLR 2019c).



Table 16.8 Trap Zones that Overlap with the RAA, LAA and Project Area

Fur Zone	Trap Zones Located within Project Boundaries		
	RAA	LAA	Project Area
7	8,14,29,43,44,83,115,123,128,134,176,221,239,244,262,263	14, 83, 134, 221, 239	14, 83, 221, 239
4	369, 1107	-	-

Angling / Fishing

Angling / fishing is regulated by DFO through the *Newfoundland and Labrador Fishery Regulations*. Licences issued by the Government of NL are required for both residents and non-residents for salmon, and non-residents only for trout and other sport fish, such as arctic char and northern pike.

The Bay d'Espoir system has undergone extensive development associated with the generation of hydroelectricity; resulting in a network of access roads that provide access to many of the reservoirs comprising the Bay d'Espoir system. These areas are commonly fished for brook trout and ouananiche. The lower portions of the Bay d'Espoir system is commonly fished for rainbow trout, an invasive species associated with escapes from aquaculture operations in the area.

Inland waters are divided into scheduled salmon rivers, scheduled rainbow and brown trout waters, and non-scheduled inland waters. Scheduled salmon rivers include: the main stem of a river (including tidal waters at the mouth of a river inside DFO caution signs); the waters of connected ponds or lakes within 90 m of the river's entrance and outlet (or as indicated by DFO signs); tributary streams; and certain lakes and ponds. There are 186 scheduled salmon rivers in NL. Scheduled trout waters are those waters listed by DFO. Non-scheduled inland waters are not individually listed by name in the regulations; they include saltwater areas inside of DFO caution signs (DFO 2019). Based on 2016 population surveys, the returns of Atlantic salmon to the Exploits River system have declined compared to previous five-year means (2011 to 2015), and the egg density was 37% of the conservation requirement (Veinott et al. 2018). Consequently, on July 20, 2018, all rivers in insular Newfoundland were closed to anglers retaining Atlantic salmon (DFO 2018a, 2018b). The salmon rivers in the vicinity of the Project Area are considered 'Class 0' (catch and release only) (DFO 2018c).

Angling occurs on a number of waterbodies in the RAA. There is an active recreational salmon fishery on the Exploits River, which flows northeast from Red Indian Lake. The Exploits River is a scheduled river (#46) for fishing Atlantic salmon, and attracts anglers from throughout the province, elsewhere in Canada and the United States. The Exploits River is included in Zone 4 and includes tributaries and restrictions as indicated in Table 16.9. In 2017, the final catch data recorded a catch of 8,457 Atlantic salmon, which included small (<63 cm) and large (>63 cm), retained and released fish. Catch per unit of effort (effort in rod days) was 0.47 in 2017 (DFO 2019).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Table 16.9 Exploits River Watershed Management Plan for 2019-2020

Exploits River (Zone 4)	
Classification	
Class 6 (six fish retention daily)	Main stem of Lower Exploits River, from Stoney Brook downstream to Exploits Bay
	September 8-October 7: fall fishery, catch-and-release only; fall angling not permitted on tributaries
Class 4 (four fish retention daily)	Lower Exploits River tributaries below Grand Falls, including Stoney Brook, Little Rattling Brook, Great Rattling Brook, Three Brooks and Greenwoods Brook
Class 2 (two fish retention daily)	Mid-Exploits River and tributaries, from the Grand Falls fishway to Red Indian Lake dam, including Harpoon Brook, Badger Brook, Noel Paul's Brook, Little Red Indian Brook, Tom Joe Brook, West Brook / Sandy Brook and tributaries
Class 0 (catch-and-release)	Exploits River Watershed above Red Indian Lake Dam, including Victoria River, Mary March Brook, Lloyds River and all other tributary streams flowing into Red Indian Lake
Special Management Section	
Main stem below Red Indian Lake Dam 25 metres below fishway, downstream to AbitibiBowater steel bridge	May 15-July 15: retention angling only for Ouananiche; no retention of Ouananiche 25 centimeters or less, or 35 centimeters or greater; no retention of Atlantic salmon
	July 16-September 7: catch-and-release angling permitted for salmon and Ouananiche only
	Anglers must possess a salmon angling licence; salmon angling regulations for scheduled rivers apply
Closed for the Season	
Exploits River main stem from Stoney Brook up to the Grand Falls dam	
Exploits River main stem below the Bishops Falls dam; on the south side from dam down 200 m to the foot of rapids; on the north side from dam downstream to the hydro-electric generating station tailrace	
Source: DFO 2019	

Brook trout, arctic char and Ouananiche (land-locked salmon) are also commonly fished in the RAA. The RAA comprises part of Trout Angling Zone 1, which includes all of insular Newfoundland. The 2020 winter fishing season in Zone 1 opened February 1 and closed April 15. The summer season runs from May 15 to September 7. The daily bag limit for trout in insular Newfoundland is 12 fish, which can be a combination of any of the species (speckled, brown, rainbow, Ouananiche) or 5 lbs (2.27 kg) round weight, plus one fish of any of those species, whichever is reached first. Star Lake is a Special Trout Management Area within the RAA and has different opening dates and bag limits. The summer season for this area is July 1 to July 31 and the winter season is between February 1 and April 15 (DFO 2019).

Currently, most salmon anglers fishing on the Exploits River use the lower river and tributaries from Grand Falls down to the river mouth. The middle river is used less often, and there is little access and angler activity at the upper river above Red Indian Lake Dam (SCNL, pers. comm. 2020).

The area along the Bishop's Falls Town Boundaries was identified as an area commonly used for salmon fishing (Bishop's Falls Town Council, pers. comm. 2020). The area is used by, and important to, local outfitting guides located in Bishop's Falls. Salmon fishing is a major tourist attraction in the Bishop's Falls region (Bishop's Falls Town Council, pers. comm. 2020).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

Outfitters in the region reported salmon angling occurring at the Exploits River near Grand Falls-Windsor and Bishop Falls, the mouth of Victoria River near Red Indian Lake and the head of the Exploits River (near Exploits dam). A single outfitter reported occasionally fishing for salmon at the mouth of the Victoria River near Red Indian Lake (Snow Shoe Lake Hunting and Fishing, pers. comm. 2020).

Select outfitting operations in the area offer fishing packages in spring and summer ranging from May 24th weekend to Labour Day Weekend, targeting Ouananiche (land locked salmon) and brook trout in Red Indian Lake (Notch Mountain Outfitters 2019). Snowshoe Lake Hunting and Fishing operates within the RAA and offers angling packages in June, and sometimes July and August. Species taken are Ouananiche (Landlock salmon), Atlantic salmon and brook trout. Areas for ouananiche and brook trout angling along the route between Victoria Lake Reservoir and Bay d'Espoir include Victoria River, Granite Lake, Meelpaeg Lake, Cowy Lake, Snowshoe Pond, Hospital Pond, Blizzard Pond, and Wilding Lake (Snow Shoe Lake Hunting and Fishing, pers. comm. 2020).

Mining and Quarrying

The Valentine Lake area has been subject to exploration and mineralogical studies since the 1960s. The first gold exploration was undertaken by Abitibi-Price in the early 1980s. More detailed subsequent exploration resulted in the delineation of zones of gold mineralization that are relevant to the Project (i.e., Leprechaun Pond and Valentine East).

The Buchans area has a history of mining activity with five copper-zinc mines in production between 1927 and 1984, operated by American Smelting and Refining Company. Atlantic Barite Ltd. recovered barite from mine tailings between 2006 and 2010. The underground Duck Pond Mine, which began producing copper and zinc concentrates in 2007, is located 30 km southeast of Buchans (Figure 16-3). Owned and operated by Teck Resources Limited, Duck Pond consisted of two small open pits, an underground mine, a concentrator (mill), tailings facilities, and a 100-person operations camp. Concentrate was trucked to a storage and shipping facility in St. George's. At peak, the Duck Pond mine employed over 350 people. Rehabilitation and closure of the mine site is currently ongoing.

The claim areas owned by Marathon account for 13% of the total claims area within the RAA (Figure 16-8). Canstar Resource Inc. accounts for 16% of the total claims area, and Buchans Mineral Corporation accounts for 13%. The total number of mineral claims and their area within the land and resources use spatial boundaries are shown in Table 16.10.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

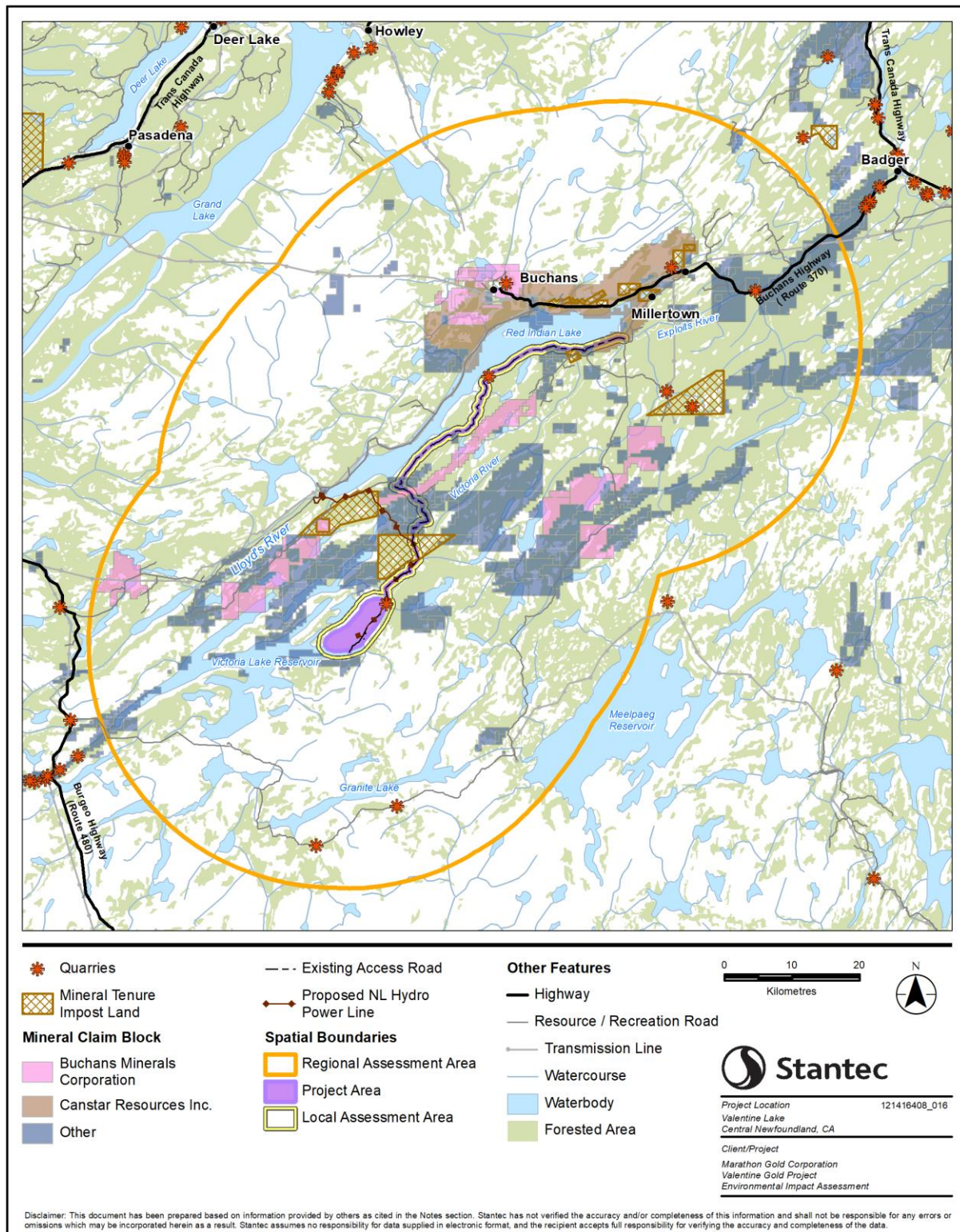


Figure 16-8 Mineral Claims, Quarries and Impost Land



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Table 16.10 Summary of Metrics for Mineral Claims within the RAA, LAA and Project Area

Metric	Project Area	LAA	RAA
Number of Total Mineral Claims	25	31	325
Number of Claim Holders	11	12	75
Total Area for all Claims (km ²)	33	91	1,784
Total Area Marathon Claims (km ²)	32	69	240
Percent Area of Marathon Claims of Total Claim Area	97%	75%	13%
Source: NLDNR2019			

There are nine quarry permits within the RAA, as indicated in Table 16.11. There are no quarries located in the Project Area. Two quarries are located within the LAA: one less than 10 m from the mine site, and the other along the proposed upgraded access road. Both are owned by Rob's Grader Service and General Contracting. These commercial quarries are located along the edges of highways and serve as gravel quarries for road maintenance.

Table 16.11 Quarry Permits in the RAA

Company	Size (ha)	Issue Date	Expiry Date	Within LAA
Nortech Construction Company Limited	0.2	3/4/2019	3/3/2020	No
J-1 Contracting Ltd.	50.	3/15/2019	3/14/2020	No
Teck Resources Ltd.-Duck Pond Operations	3.9	6/2/2019	6/1/2020	No
Teck Resources Ltd.-Duck Pond Operations	6.2	6/2/2019	6/1/2020	No
P & B Trucking & Rentals Inc.	2.0	7/11/2019	7/10/2020	No
Marine Contractors Inc.	1.0	7/16/2019	7/15/2020	No
Marine Contractors Inc.	4.0	7/16/2019	7/15/2020	No
Rob's Grader Services & General Cont.	0.5	8/23/2019	8/22/2020	Yes
Rob's Grader Services & General Cont.	1.0	8/23/2019	8/22/2020	Yes
Source: NLDNR 2019				

Impost lands are mineral areas with title given by the province of NL between 1834 and June 6, 1978 conveying the authority, concession or other right to minerals or to search for and win minerals or to acquire a right to do so within the area. These impost lands are governed by the *Mineral Holdings Impost Act*. There are 12 mineral tenure impost lands in the RAA, two of which also overlap with the Project Area and LAA. The names and holding companies for the impost lands located in the RAA are shown in Table 16.12.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Table 16.12 Impost Lands in the RAA

Land Grant Name	Company	Overlaps with Project Area and LAA
B.E.S. Dunfield Fee Simple Mining Grant Volume 2, Folio 29; Lot 4	Canstar Resources Inc.	No
B.E.S. Dunfield Fee Simple Mining Grant Volume 2, Folio 29; Lot 4	Canstar Resources Inc.	No
Fee Simple Mining Grant Reid Lot 234	Teck Resources Limited	No
Fee Simple Mining Grant Reid Lot 228	NorZinc-Newfoundland Ltd.	No
Terra Nova Properties Fee Simple Mining Grant Volume 2, Folio 25	NorZinc-Newfoundland Ltd.	No
Fee Simple Mining Grant Reid Lot 229	NorZinc-Newfoundland Ltd.	Yes
Terra Nova Properties Fee Simple Mining Grant Volume 1, Folio 62	Buchans Minerals Corporation	No
Terra Nova Properties Fee Simple Mining Grant Volume 1, Folio 61	Buchans Minerals Corporation	No
A.N.D. Company Fee Simple Mining Grant Volume 1, Folio 110	NorZinc-Newfoundland Ltd.	Yes
B.E.S. Dunfield Fee Simple Mining Grant Volume 2, Folio 29 Lot 2	Canstar Resources Inc.	No
Fee Simple Mining Grant Reid Lot 247	Canstar Resources Inc.	No
B.E.S. Dunfield Fee Simple Mining Grant Volume 2, Folio 29 Lot 1	Canstar Resources Inc.	No
Source: NLDNR 2019		

Forestry

Forestry has been an integral part of the NL economy, and a substantial portion of the province's forestry industry was once concentrated in the central area of the Island of Newfoundland. The Province of NL is divided into 24 FMDs, 18 of which are located on the Island of Newfoundland. Management of forestry activities include timber harvesting, construction of forest access roads and silviculture activities such as planting, thinning and site preparation. The Project is located in FMDs 12 and 13 (Figure 16-9) and is part of Planning Zone 5, which include FMDs 10, 11, 12, and 13. Planning Zone 5 has a 5-year operation plan, the most recent of which is from 2016 to 2020. During that time period, it is planned that 1,400 000 m³ of timber will be harvested from FMD 12 and approximately 140 km of forestry access roads will be constructed (Government of NL n.d.). For FMD 13, it is planned that 150,000 m³ of timber will be harvested and approximately 12 km of forest access road will be constructed. The total area and allocated annual cut for each FMD is shown in Table 16.13. The Project Area accounts for less than 1% of the total area of each FMD.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

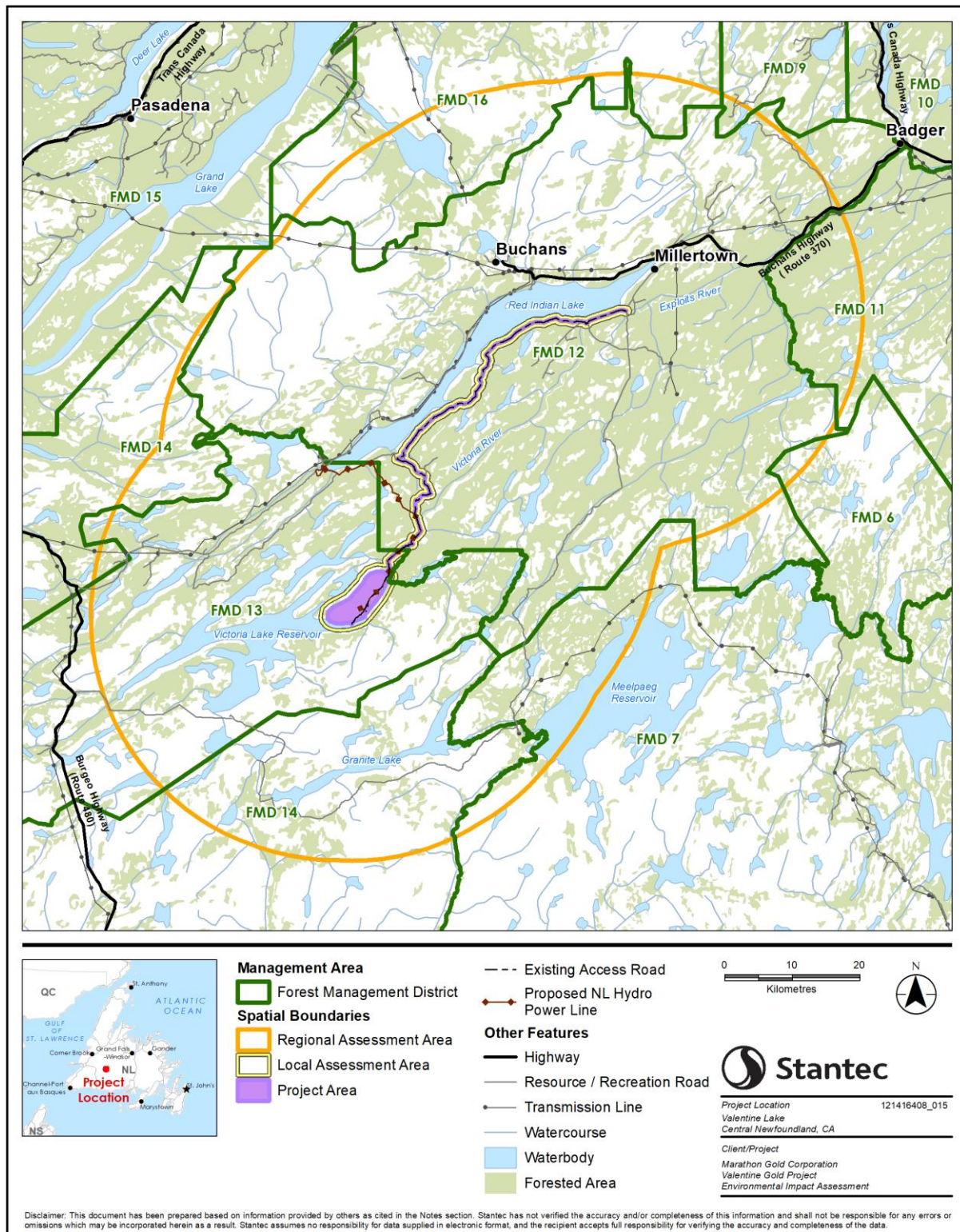


Figure 16-9 Forest Management Districts



Table 16.13 Total Area and Annual Allowable Cut for FMD 12 and 13

Forest Management District	Total Area (km ²)	Annual Allowable Cut (m ³)	
		Softwood	Hardwood
12	4,853	186,550	19,229
13	2,764	7,257	882

Source: NLDFLR 2019f

Within the LAA and Project Area, there are lands that were historically used by Abitibi-Consolidated Inc. for forestry resource use. Abitibi-Consolidated Inc.’s mill at Grand Falls-Windsor began operating in 1909 and closed in 2009 (CBC 2008). High energy and operating costs were amongst the reasons for closure. The land area surrounding the mill site has since been expropriated and is managed by the Crown. The provincial government continues to work towards an agreement on the use of forest resources in the central area of the Island that were formerly held by AbitibiBowater (formed by the merger of Bower and Abitibi-Consolidated Inc.). The unallocated wood supply available for development is 280,000 m³ per year (representing approximately 12% of the annual allowable wood supply for the Island portion of the province). The province issued a Call for Expressions of Interest in 2013 to develop these unallocated timber resources. Although the formal process of the Call for Expressions has concluded, the provincial government continues to consider proposals from other proponents for this region (NLDF 2016).

Power Generation and Transmission

The RAA is an area of substantial hydroelectric development (Figure 16-10); however only the Victoria Dam and spillway, which are part of the Bay d’Espoir Hydroelectric Development, are located within the LAA (Figure 16-10). Victoria Dam is discussed further in Chapter 19, Dam Infrastructure. The Bay d’Espoir Hydroelectric Generating Facility is the largest hydroelectric generation facility on the Island. It includes three generating stations, six reservoirs and associated dykes, dams, canals, and hydraulic structures. The generating stations comprising the Bay d’Espoir Development were built in stages beginning in 1967 (NL Hydro 2017). There are four remote hydraulic structures associated with the Bay d’Espoir development: Ebbegunbaeg Control Structure, Salmon River Spillway Structure, Victoria Control Structure, and Burnt Dam Spillway (NL Hydro 2012).

Infrastructure related to Star Lake, Buchans, Hinds Lake, Grand Falls, and Sandy Brook Hydroelectric Generation Stations are also present within the RAA (Figure 16-10).

Within the RAA, there are eight transmission lines with a combined total length of approximately 340 km (Figure 16-10; Table 16.14). These transmission lines are operated and maintained by Newfoundland Power. There are no transmission lines within the Project Area or LAA.



Table 16.14 Transmission Lines within the RAA

Transmission Line Label	Voltage (kV)	Route	Approximate Length within RAA (km)
TL 205	230	Buchans to Grand Falls	50
TL 232	230	Buchans to Grand Falls	50
TL 228	230	Buchans to Corner Brook	40
TL 233	230	Buchans to Bottom Brook	85
TL 243	138	Hinds Lake to Howley	15
TL 280	69	Star Lake to Buchans	50
TL 264	69	Duck Pond to Buchans	20
TL 263	230	Granite Canal to Bay d'Espoir	30

Source: Newfoundland Power 2018

16.2.2.3 Recreation Activities

The natural areas throughout the RAA host a variety of recreational land use activities which are closely linked to the some of the designated land uses and resource uses described above. In particular, recreational activities within the RAA primarily include hunting, trapping and fishing activities. These activities are discussed in Section 16.2.2.2.

Non-consumptive recreational activities that are likely to take place within the RAA include hiking, backcountry camping, snowmobiling, and ATV use. These activities occur throughout the RAA including, however not limited to, the T’Railway Provincial Park, the power line and trails between Buchans and Howley and the existing resource roads / trails surrounding Red Indian Lake (Figure 16-1). The T’Railway Provincial Park provides a trail system for hikers, bikers, horseback riders, cross country skiers, ATVs, and snowmobilers (NLTCII 2019). Red Indian Lake also hosts recreational activities, such as swimming, beach combing, boating, fishing, and sightseeing (Town of Buchans 2019). Canoeing and kayaking activities occur within the RAA in larger lakes and rivers. In the community of Buchans, there are hiking trails around the old mine sites, which also serve as cross country ski trails during the winter. This area is also a popular spot for berry picking (Town of Buchans 2019). Snowmobiling occurs throughout the Island of Newfoundland and is managed by the Newfoundland and Labrador Snowmobile Federation. The Newfoundland and Labrador Snowmobile Federation is the provincial governing body with volunteer clubs across the Island responsible for the maintenance of 3,300 km of trails (NLSF 2020). There are two groomed snowmobile trails in the RAA leading to the communities of Buchans and Millertown; however, there are no groomed trails in the LAA or Project Area (NLSF 2020).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

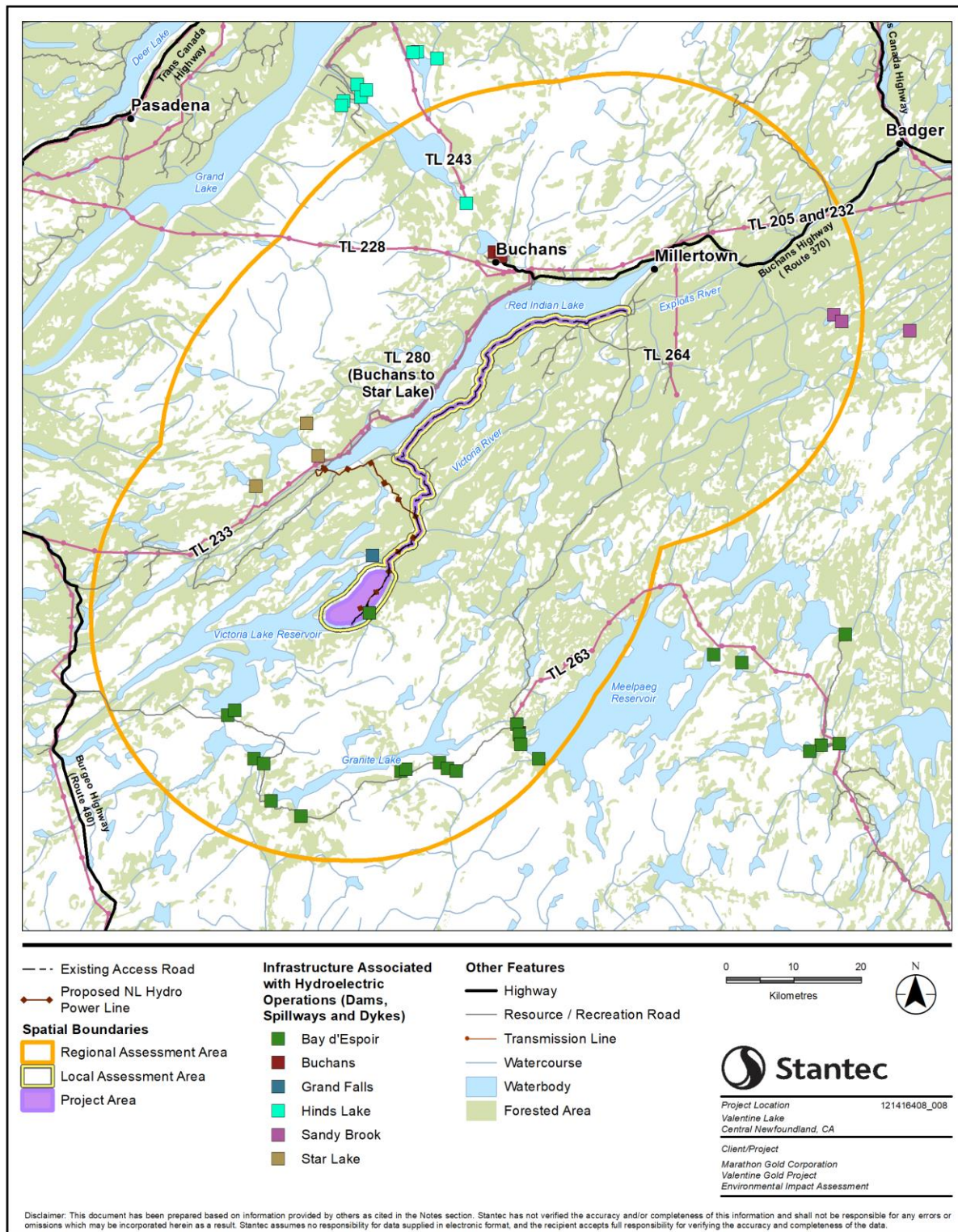


Figure 16-10 Location of Hydroelectric Infrastructure and Transmission Lines within the RAA



16.3 ASSESSMENT CRITERIA AND METHODS

This section describes the criteria and methods used to assess environmental effects on land and resource use. Residual environmental effects (Section 16.5) are assessed and characterized using criteria defined in Section 16.3.1, including direction, magnitude, geographic extent, timing, frequency, duration, reversibility, and ecological or socio-economic context. The assessment also evaluates the significance of residual effects using threshold criteria or standards beyond which a residual environmental effect is considered significant. The definition of a significant effect for the Land and Resource Use VC is provided in Section 16.3.2. Section 16.3.3 identifies the environmental effects to be assessed for land and resource use, including effect pathways and measurable parameters. This is followed by the identification of potential Project interactions with this VC (Section 16.3.4). Analytical assessment techniques used for the assessment of land and resource use are provided in Section 16.3.5.

16.3.1 Residual Effects Characterization

Table 16.15 presents definitions for the characterization of residual environmental effects on Land and Resource Use VC. The criteria are used to describe the potential residual effects that remain after mitigation measures have been implemented. Quantitative measures have been developed, where possible, to characterize residual effects. Qualitative considerations are used where quantitative measurement is not possible.

Table 16.15 Characterization of Residual Effects on Land and Resource Use

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	<p>Neutral – no net change in measurable parameters for the land and resource use relative to baseline</p> <p>Positive – a residual effect that moves measurable parameters in a direction beneficial to land and resource use relative to baseline</p> <p>Adverse – a residual effect that moves measurable parameters in a direction detrimental to land and resource use relative to baseline</p>
Magnitude	The amount of change in measurable parameters or the VC relative to existing (baseline) conditions	<p>Negligible – no measurable change in current land and resource use capacity</p> <p>Low – a small, measurable change in land and resource use capacity, however land and resource use activities can take place at or near current levels</p> <p>Moderate – a measurable change in land and resource use capacity that is greater than low, however land and resource use activities can take place at or near current levels</p> <p>High – a measurable change in land and resource use capacity, such that land and resource use activities cannot take place at or near current levels</p>



Table 16.15 Characterization of Residual Effects on Land and Resource Use

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Geographic Extent	The geographic area in which a residual effect occurs	Project Area – residual effects are restricted to the Project Area LAA – residual effects extend into the LAA RAA – residual effects interact with those of other projects in the RAA
Timing	Considers when the residual environmental effect is expected to occur. Timing considerations are noted in the evaluation of the residual environmental effect, where applicable or relevant.	Not Applicable – seasonal aspects are unlikely to affect land and resource use Applicable – seasonal aspects may affect land and resource use
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	Single event Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Duration	The period of time required until the measurable parameter or the VC returns to its existing (baseline) condition, or the residual effect can no longer be measured or otherwise perceived	Short-term – residual effect restricted to construction or decommissioning, rehabilitation and closure phases Medium term – residual effect extends through the operation phase (12 years) Long term – residual effect extends beyond the operation phase (greater than 12 years) Permanent - recovery to baseline conditions unlikely
Reversibility	Describes whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	Reversible – the residual effect is likely to be reversed after activity completion and rehabilitation Irreversible – the residual effect is unlikely to be reversed
Ecological and Socio-economic Context	Existing condition and trends in the area where residual effects occur	Resilient – VC is able to assimilate the additional change Not Resilient – VC is not able to assimilate the additional change because of having little tolerance to imposed stresses due to fragility or near a threshold

16.3.2 Significance Definition

A residual effect on land and resource use is considered significant if:

- The Project does not comply with established federal, provincial, or municipal land use designations, policies, or by-laws
- The Project will create a change or disruption that restricts or degrades present land and resource use capacity within the RAA to a point where activities cannot continue at or near current levels over the long term and where compensation is not possible



16.3.3 Potential Effects, Pathways and Measurable Parameters

Table 16.16 lists potential Project effects on land and resource use and provides a summary of the Project effect pathways and measurable parameters and units of measurement used to assess potential effects. Potential environmental effects and measurable parameters were selected based on review of recent environmental assessments (EAs) for mining projects in NL and other parts of Canada, comments provided during engagement and professional judgment.

It is anticipated that the Project has the potential to change land use, resource use and recreational activities during construction, operation and decommissioning, closure, and rehabilitation phases. Routine Project activities and components may be incompatible with land use designations, and/or affect the viability of, restrict access to, or cause loss of areas used for resource activity and/or recreational use. Resource and recreational users may consequently be displaced to other nearby areas, increasing competition for resource and recreational uses. Decommissioning, closure and rehabilitation activities have the potential to reverse adverse effects related to some local use of land and resources and may ultimately restore access.

Table 16.16 Potential Effects, Effects Pathways and Measurable Parameters for Land and Resource Use

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in land use	<ul style="list-style-type: none"> Project presence and site activities may affect use / future development Project activities and components may create disturbance effects to nearby properties / cabin owners (i.e., noise, dust, visual) 	<ul style="list-style-type: none"> Change / restriction of land use (km²) Change in sound levels (decibels [dBA]) Change in air quality (µg/m³ of particulate matter) Proximity to land use sites (km)
Change in resource use	<ul style="list-style-type: none"> Disruption to resource harvesting (i.e., hunting, trapping, fishing) success from effects to resource accessibility and availability (i.e., behavioural changes / mortality of targeted species) Project activities and components may create sensory disturbance effects (i.e., noise, dust, visual) to resource users, affecting the quality of outdoor experience Project may reduce productive forest land 	<ul style="list-style-type: none"> Attribute data on overlapping uses (e.g., hunting, trapping) within area affected (ha) Change or disruption affecting resource use (km²) Sensory disturbance to target species from change in traffic volumes during the life of the Project and likelihood of interactions with Project infrastructure, vehicles and equipment Sensory disturbance to resource users due to change in sound levels (dBA) and air quality (µg/m³ of particulate matter) Area of commercial forest (km²); reduction of annual allowable cut (AAC) (m³/ha/year)



Table 16.16 Potential Effects, Effects Pathways and Measurable Parameters for Land and Resource Use

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in recreational use	<ul style="list-style-type: none"> Project clearing may result in the loss of area available for recreational use Project presence and activities may reduce access to or quality of recreational use (i.e., noise, dust, visual) 	<ul style="list-style-type: none"> Area of current recreation use overlapped by the Project (km²) Qualitative use of area Access to recreational areas Change in sound levels (dBA) Change in air quality (µg/m³ of particulate matter)

16.3.4 Project Interactions with Land and Resource Use

Table 16.17 identifies the physical activities that might interact with land and resource use and result in the identified effect. These interactions are indicated by checkmark and are discussed in detail in Section 16.5, in the context of effect pathways, standard and Project-specific mitigation / enhancement, and residual effects. Following the table, justification is provided for where no interaction (and therefore no resulting effect) is predicted.

Table 16.17 Project Environmental Effects on Land and Resource Use

Physical Activities	Environmental Effects to be Assessed		
	Change in Land Use	Change in Resource Use	Change in Recreational Use
CONSTRUCTION			
Access Road Upgrade / Realignment: Where required, road widening and replacement / upgrades of roads and culverts.	✓	✓	✓
Construction-related Transportation Along Site Access Road	✓	✓	✓
Mine Site Preparation and Earthworks: Clearing and cutting of vegetation and removal of organic materials, development of roads and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels. Also includes temporary surface water and groundwater management and the presence of people and equipment on site.	✓	✓	✓



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Table 16.17 Project Environmental Effects on Land and Resource Use

Physical Activities	Environmental Effects to be Assessed		
	Change in Land Use	Change in Resource Use	Change in Recreational Use
Construction / Installation of Infrastructure and Equipment: Placement of concrete foundations and construction of buildings and infrastructure as required for the Project. Also includes: <ul style="list-style-type: none"> • Installation of water control structures (including earthworks) • Installation and commissioning of utilities on-site • Presence of people and equipment on-site 	✓	✓	✓
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge, and hazardous and non-hazardous wastes.	✓	✓	✓
Employment and Expenditures^B	✓	✓	✓
OPERATION			
Operation-related Transportation Along Access Road	✓	✓	✓
Open Pit Mining: Blasting, excavation and haulage of rock from the open pits using conventional mining equipment.	–	–	–
Topsoil, Overburden and Rock Management: Five types of piles: <ul style="list-style-type: none"> • Topsoil • Overburden • Waste rock • Low-grade ore • High-grade ore Rock excavated from the open pits that will not be processed for gold will be used as engineered fill for site development, maintenance and rehabilitation, or will be deposited in waste rock piles.	✓	✓	✓
Ore Milling and Processing: Ore extracted from the open pits will be moved to the processing area where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes.	–	–	–
Tailings Management Facility: Following treating tails via cyanide destruction, tailings will be thickened and pumped to an engineered TMF in years 1 to 9, then pumped to the exhausted Leprechaun open pit in years 10 through 12.	–	–	–



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Table 16.17 Project Environmental Effects on Land and Resource Use

Physical Activities	Environmental Effects to be Assessed		
	Change in Land Use	Change in Resource Use	Change in Recreational Use
Water Management (Intake, Use, Collection and Release): Recirculated process water and TMF decant water will serve as main process water supply and raw water (for purposes requiring clean water) will be obtained from Victoria Lake Reservoir. Site contact water and process effluent will be managed on site and treated prior to discharge to the environment. Where possible, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent possible for use on site.	–	–	–
Utilities, Infrastructure and Other Facilities: <ul style="list-style-type: none"> • Accommodations camp and site buildings operation, including vehicle maintenance facilities • Explosives storage and mixing • Site road maintenance and site snow clearing • Access road maintenance and snow clearing • Power and telecom supply • Fuel supply 	–	–	–
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge, and hazardous and non-hazardous wastes.	✓	✓	✓
Employment and Expenditure^B	✓	✓	✓
DECOMMISSIONING, REHABILITATION AND CLOSURE			
Decommissioning of Mine Features and Infrastructure	–	–	–
Decommissioning, Rehabilitation and Closure-related Transportation Along Access Road	✓	✓	✓
Progressive Rehabilitation: Rehabilitating infrastructure or areas not required for ongoing operation (e.g., buildings, roads, laydown areas); covering and revegetating completed tailings areas, where practicable, including commencing closure of TMF beginning in Year 9 (when tailings deposition moves to Leprechaun open pit); erosion stabilization and revegetation of completed overburden and/or waste rock piles; infilling or flooding of exhausted mining areas; and completing revegetation studies and trials.	–	–	–
Closure Rehabilitation: Active rehabilitation based on successes of progressive rehabilitation activities. Includes: demolishing infrastructure (e.g., buildings, equipment, facilities, roads, laydown areas); grading and revegetating cleared areas, where practicable; breaching and regrading ponds to reestablish drainage patterns; completing closure of TMF (covering with overburden and revegetating); erosion stabilization and revegetation of completed overburden and/or waste rock piles; and infilling or flooding of open pits.	–	–	–
Post-Closure: Long term monitoring	✓	✓	✓



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Table 16.17 Project Environmental Effects on Land and Resource Use

Physical Activities	Environmental Effects to be Assessed		
	Change in Land Use	Change in Resource Use	Change in Recreational Use
Emissions, Discharges and Wastes ^A	✓	✓	✓
Employment and Expenditure ^B	✓	✓	✓
Notes: ✓ = Potential interaction – = No interaction ^A Emissions, Discharges and Wastes (e.g., air, waste, noise, light, liquid, and solid effluents) are generated by many Project activities. Rather than acknowledging this by placing a checkmark against each of these activities, “Wastes and Emissions” is an additional component under each Project phase ^B Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a checkmark against each of these activities, “Employment and Expenditures” is an additional component under each Project phase			

All Project activities during construction are anticipated to result in a change to land use, resource use and recreational use (Table 16.17) and are assessed in Section 16.5. During operation, there will be no additional loss of access to land or resources (i.e., through loss of natural habitats within the Project footprint) beyond those primarily incurred during mine construction; therefore, interactions with land and resource use with Project activities during operation are mainly associated with Emissions, Discharges and Wastes (i.e., noise and air emissions) as well as Topsoil, Overburden and Rock Management (i.e., visual effects). Similarly, during Project decommissioning, there will be no new residual effects on loss of area or access. Interactions during decommissioning are associated with Emissions, Discharges and Wastes, as well as the rehabilitation of land for the end users during Post-Closure. Therefore, the following activities or components are not anticipated to interact with land and resource use for the purpose of the effects assessment:

- While access to the site will be restricted throughout the life of the Project, Open Pit Mining and Ore Milling and Processing will not create additional restrictions for land and resource use beyond those realized during mine construction
- TMF and Water Management will not affect land and resource once operational, as there will be no further restriction on land and resource use beyond those realized during mine construction. Operational discharges associated with water and tailings management is discussed under Emissions, Discharges and Wastes
- Utilities, Infrastructure and Other Facilities will not affect land use during operation because they will not create additional restrictions for land and resource use beyond those realized during mine construction

16.3.5 Analytical Assessment Techniques

The assessment of land and resource use relied on spatial analysis to quantify the extent of land and resource use areas available in the Project Area, LAA and RAA, where practicable. Consideration of the nature of Project effects on land and resource use also relied on primary and secondary research, an



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

understanding of Project interactions and mitigation, information collected from other VCs, and professional judgement. The assessment of potential Project effects on land and resource use activities considered the interactions and relationship between the land and resource use VC and other socio-economic and biophysical VCs. For example, residual effects on wildlife and fish species and habitats are important considerations for commercial harvesting and recreational hunting and fishing activities. However, the assessment of the biological VCs is not repeated in this VC.

The assessment of effects related to sensory disturbance of land and resource users rely on the results of the air quality and noise modelling completed for the Project. Analytical methods for these models are provided in Chapter 5 (Atmospheric Environment). Visual impacts on land and resources users considered light emissions from the Project and change in the viewshed. A viewshed analysis was conducted to illustrate whether Project components would be visible from various viewpoints considered representative of nearby receptor locations (i.e., cabins). Again, analytical methods are provided in Chapter 5 (Atmospheric Environment).

16.4 MITIGATION AND MANAGEMENT MEASURES

A series of environmental management plans will be developed by Marathon to mitigate the effects of Project development on the environment. A full list of mitigation measures to be applied throughout Project construction, operation and decommissioning, rehabilitation and closure is provided in Section 2.7.4. Project planning and design and the application of proven mitigation measures will be used to reduce adverse effects to land and resource use. Mitigation measures to reduce potential effects to land and resources use are provided in Table 16.18. Mitigation measures identified in other VCs will also reduce the potential effects on land and resource use (Chapter 5 – Atmospheric Environment; Chapter 8 – Fish and Fish Habitat; Chapter 9 – Vegetation, Wetlands, Terrain and Soils; Chapter 10 – Avifauna; Chapter 11 – Caribou; and Chapter 12 – Other Wildlife).

Table 16.18 Mitigation Measures: Land and Resource Use

Category	Mitigation	C	O	D
Site Clearing, Site Preparation and Erosion and Sediment Control	• Project footprint and disturbed areas will be limited to the extent practicable.	✓	-	-
	• Merchantable timber will be salvaged and used, or it will be made available to local communities for fuelwood.	✓	-	-
	• Signage will be installed around the mine site to alert the public and land users of the presence of the Project and its facilities.	✓	✓	✓
Vehicles / Equipment / Roads	• Marathon will implement traffic control measures to restrict public access to the mine site, which may include gating approaches, placing large boulders and/or gated fencing.	✓	✓	✓
Noise Emissions	• Where practicable in accessible areas (e.g., along cleared rights-of-ways), trees and other vegetation will be left in place or encouraged to grow to obstruct the view of Project facilities, reducing the change in viewshed and muffling nuisance noise.	✓	✓	-



Table 16.18 Mitigation Measures: Land and Resource Use

Category	Mitigation	C	O	D
Employment and Expenditures	<ul style="list-style-type: none"> Hunting / fishing / harvesting of wildlife will be strictly prohibited on the mine site. Workers will not be permitted to hunt / fish / harvest while staying at the accommodations camp and will not be permitted to bring firearms or angling gear to site. 	✓	✓	✓
	<ul style="list-style-type: none"> Workers will be bussed from nearby designated communities to the mine site for rotations to reduce effects of traffic on roads in the communities and the access road. 	✓	✓	✓
Engagement with Stakeholders, Indigenous Groups and the Public	<ul style="list-style-type: none"> Marathon will continue to engage with cabin owners within the Project Area to discuss their occupancy, potential future use of these cabins, and potential applicable mitigation measures. 	✓	✓	-
	<ul style="list-style-type: none"> Marathon will consult with NLDDFA in advance of construction to incorporate the harvesting of forestry resources in the Project Area as part of site preparation. 	✓	-	-
	<ul style="list-style-type: none"> Marathon will continue to engage with local resource users (hunters, outfitters, trappers, anglers) regarding the overlap of the Project with hunting, trapping, and fishing areas in the Project Area. This will include the communication of Project information, updates on ongoing and planned activities, and a discussion of issues and concerns and a potential means of addressing them. 	✓	✓	✓
	<ul style="list-style-type: none"> Project activities, locations, and timing will continue to be communicated to Indigenous groups, affected land and resource users, environmental non-government organizations, the provincial government, and local authorities throughout the life of the Project. In particular, Marathon will communicate in advance with respect to Project activities that may limit / affect use of the access road (i.e., upgrading activities or transport of large loads or equipment). This information will be communicated through local town councils, local radio stations and social media. 	✓	✓	✓
Rehabilitation and Closure	<ul style="list-style-type: none"> Measures will be taken to address public health and safety requirements throughout rehabilitation and closure. 	✓	✓	✓
	<ul style="list-style-type: none"> Desired land and resource end-uses will be considered in the preparation of the Rehabilitation and Closure Plan. 	-	-	✓
Notes: C – Construction Activities O – Operation Activities D – Decommissioning, Rehabilitation and Closure Activities				

16.5 ASSESSMENT OF RESIDUAL ENVIRONMENTAL EFFECTS ON LAND AND RESOURCE USE

For each potential effect identified in Section 16.3.3, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The following sections first describe the pathways by which a potential Project effect could result from Project activities in the absence of mitigation during each Project phase (i.e., construction, operation and decommissioning, rehabilitation and closure). Mitigation and management measures



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

(Section 16.4) are applied to avoid or reduce these potential pathways and resulting environmental effects. Residual effects are those remaining following implementation of mitigation, which are then characterized using the criteria defined in Section 16.3.1. A summary of predicted residual effects is provided in Section 16.5.4.

16.5.1 Change in Land Use

16.5.1.1 Project Pathways

Construction

The assessment of change in land use considers Project activities that may be inconsistent with current and future land use designations in the Project Area and LAA. Mine site preparation and earthworks within the Project Area have the potential to change the use of lands through the loss of area and the restriction of access to designated lands, including provincial Crown lands and protected areas.

Construction activities, including mine site preparation and earthworks, construction / installation of infrastructure and equipment and the access road upgrade / realignment, may affect sensitive receptors (i.e., cabin users) due to sensory disturbances associated with noise emissions from the use of heavy equipment, transport of materials and increased traffic. Sources of sound within the Project Area are anticipated to be typical of construction activities. The operation of heavy equipment, upgrading of the road and increased traffic during construction may also affect access for occupants of cabins near the access road right-of-way.

Operation

Operation activities will not result in additional loss of area and/or the restriction of access to designated lands beyond that previously incurred during construction. Seasonal snow clearing of the existing access road may increase access to users, including cabin lots for some cabin owners, allowing year-round use.

Similar to construction activities, Project operation can affect sensitive receptors, such as cabins users, due to changes in air and sound quality from open pit mining and operation-related transportation along the access road. In addition, the development and presence of the topsoil, overburden, waste rock, low-grade ore, and high-grade ore piles may affect land use within the LAA through visual disturbance.

Decommissioning, Rehabilitation and Closure

Decommissioning, rehabilitation and closure activities have the potential to disrupt land use similar to construction activities; however, this phase will also allow for the restoration of affected land use and access.



16.5.1.2 Residual Effects

Construction

Site clearing and construction activities in the Project Area have the potential to change the use of lands through the loss of area and the restriction of access to designated lands. The mine site is located on provincial Crown land, outside of municipal planning areas and on an existing mineral claim area owned by Marathon. The mine site overlaps approximately 32 km² of provincial Crown land area. The existing access road, to be upgraded, is also on provincial Crown land. Marathon will engage with provincial Crown land use permit holders to address potential conflict, disturbance, or access restrictions to Crown land use areas. Land use associated with the Project is consistent with the resource use that has been occurring in the RAA and only a small area of Crown land will be affected by the site development (32 km²). Signage will be installed around the mine site to alert land users of the presence of the Project and its facilities, and gates will be established to restrict access to active areas of the Project. Therefore, adverse effects on land use associated with the loss / restriction of access to designated lands are anticipated to be low in magnitude.

The construction phase is not anticipated to affect current provincially protected areas as established under the Newfoundland and Labrador Parks and Protected Areas legislation. The Victoria Steadies Sensitive Wildlife Area is in an area currently identified by the provincial government as an area of interest for protection, and although the boundaries have been defined, there is no formal protection at the provincial government level. In addition, as described in Section 16.2.2.1, the focus of this designated area are the “steadies” on the Victoria River system located well to the north of the mine site, before the river drains into Red Indian Lake (B. Adams 2020, pers. comm.). This area will not be directly affected by activities at the mine site. The central conservation goals for the portion of the Sensitive Wildlife Area closest to the mine site is maintaining wetland / watershed integrity and drainage patterns (which can indirectly affect the quality of habitat in the area of the “steadies”). As discussed in Section 9.5.3, a reduction in wetland area and function near the TMF, as well as the diversion of water from that area to Victoria Lake, will result in a reduction in flow into the Victoria River; however, the mean annual flow of the Victoria River at the boundary of the Surface Water Resources LAA is expected to decrease by only 1% (Section 7.5.2.2). Changes to wildlife habitat within wetlands of concern that are part of the Victoria Steadies Sensitive Wildlife Area are not expected, as the habitat that is of primary focus for protection is located further downstream on the Victoria River than the Surface Water Resources LAA boundary (B. Adams pers. comm. 2020). Therefore, residual effects to designated lands are anticipated to be low in magnitude.

Clearing and construction activities may affect nearby cabin users due to sensory disturbances associated with noise from the use of generators, vehicles and other construction equipment. As discussed in Section 16.2.2.1, there are three cabins located within the Project Area. One cabin lot within the mine site area and two cabin lots within the Project Area are located along the existing access road within the 20 m buffer. There are an additional 14 cabin lots registered with the provincial Crown Lands Division in the LAA (500 m buffer) located along the existing access road.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

Sensory disturbances to the cabin users will occur from construction activities at the mine site and along the access road. Within the mine site, activities such as mine site preparation and earthworks and construction / installation of infrastructure and equipment, will result in increased sound levels. As assessed in Chapter 5 (Atmospheric Environment), in general, sound pressure levels related to Project construction activities were predicted to be generally below 35 decibels (dba) (background levels) at about 5 km from the mine, and 25 dBA about 8 km from the mine. There are no cabins located within 5 km of the mine site, and only one located within 8 km. The highest predicted sound pressure levels at the nearest receptors (i.e., the cabin located within 8 km of the mine site) was 47.9 dBA during the day, which is well below regulatory thresholds for noise.

The access road upgrade / realignment, while providing improved year-round access to cabin users, will also cause a temporary increase in sound levels. During Project construction, it is estimated that traffic could include six vehicles per day, with a peak of 18 vehicles per day on rotation change days. Sound pressure levels were predicted to be 25 dBA about 1 km from the access road during rotation changes. As noted above, there are three cabin lots within the Project Area, located within the 20 m buffer around the access road and an additional 14 cabin lots within the 500 m buffer. Marathon will continue to engage with cabin owners within the LAA to discuss their occupancy, potential future use of these cabins, and potential applicable mitigation measures. Given that Project construction results in a relatively small change in sound levels to nearby cabin users and the sound pressure levels are well below regulatory threshold, and with the implementation of mitigation measures, residual effects on land use as a result of sensory disturbances are therefore anticipated to be low in magnitude.

Operation

During operation, no new interactions with designated lands, including those associated with access, are anticipated. Signage will remain around the mine site to alert land users of the presence of the Project and its facilities.

Sensory disturbances, as described in the previous section, will continue through operation due to changes in sound quality from on-site mining activities and operation-related transportation along the access road. Within the mine site, activities such as open pit mining and ore milling and processing will result in increased sound levels. As assessed in Chapter 5 (Atmospheric Environment), Project operation activities were predicted to be generally below 35 dbA (background levels) at about 5 km from the mine, and 25 dBA about 10 km from the mine. During mine operation, it is estimated traffic on the access road would be an average of five vehicles per day, with a peak of ten vehicles per day on rotation change days (once a week). Sound pressure levels were predicted to be 25 dBA about 1 km from the access road during rotation changes. Sound levels from mining operation are anticipated to occur day or night, although noise from the access road was anticipated to occur only during the daytime. The highest predicted sound pressure levels at the nearest receptors was 45.5 dBA during the day and 25.4 dBA during the night. Both values are well below regulatory thresholds for noise.

For most air contaminants, maximum predicted concentrations due to Project activities combined with measured ambient background concentrations are below the NL Ambient Air Quality Standards (AAQS) outside the Project Area, with the exception of 24-hour PM₁₀. The maximum predicted 24-hour



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

concentrations of PM₁₀ (due to Project-related releases combined with background) are above the ambient air quality standard. However, exceedances are predicted to occur in a small area within 500 m of the eastern mine site boundary and are expected to be infrequent and of short duration (less than 1% of the time). The predicted exceedances of the PM₁₀ standard are likely a result of fugitive releases from the TMF, based on the location of occurrence of the maximum predicted concentrations. Generally, the predicted concentrations reach background levels within 10 to 15 km of the mine site. Maximum predicted air contaminant concentrations (including background) are also below the NL AAQS at the nearby cabin locations (at cabin locations within the LAA/RAA), as well as at the accommodation camp location (located at the mine site). The maximum predicted concentrations (including background) of PM_{2.5}, are also below the 24-hour Canadian Ambient Air Quality Standard (CAAQS).

Marathon will continue to engage with cabin owners within the LAA to discuss their occupancy, potential future use of these cabins, and potential applicable mitigation measures.

The viewscape can be altered by physical features or works associated with the Project that are visible from outside the Project Area. Visual effects from the development of the topsoil, overburden, waste rock, low-grade ore, and high-grade ore piles may alter land use within the LAA and result in visual disturbance to sensitive receptors (i.e., cabin users). A viewshed analysis was conducted to illustrate whether Project components would be visible from various viewpoints considered representative of nearby receptor locations (i.e., cabins). The viewshed analysis estimates the change in elevation from each viewpoint location to the highest point of the Project. This viewshed analysis focused on three viewshed scenarios, including:

- Viewpoints that could be observed from the highest Project component (i.e., the high-grade ore stockpile)
- Viewpoints that could be observed by each nearby receptor (i.e., cabin and/or outfitter location)
- Viewpoints that could be observed by the only cabin with a direct line of sight to the Project Area

Each of the viewshed analysis scenarios listed above are graphically presented in Figures 5-12 to 5-14.

As shown in the Figure 5-12, the high-grade ore stockpile would be visible from several viewpoints surrounding the Project Area; however, there is limited overlap with the nearby receptor locations that fall within the extent of the viewshed analysis. As shown in Figure 5-13, there is only one receptor (i.e., one cabin) location that would potentially have a direct line of sight to the Project Area. The viewpoint from this one location is further illustrated in Figure 5-14. The majority of the area that is illustrated to be potentially visible from the one cabin location with a potential direct line of sight to the Project Area does not overlap with Project components, with the exception of a small portion of the Marathon waste rock pile, the Marathon pit and an overburden stockpile. This analysis does not consider the presence of trees that may impede the line of sight. Permanent lighting will likely not be installed in the waste rock pile areas, so nighttime views should not be affected. Because of the limited visibility of Project components at receptor locations, the visual effects from Project-related activities are anticipated to be low.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Decommissioning, Rehabilitation and Closure

Decommissioning activities will ultimately lead to the restoration of access across most of the Project Area and will beneficially affect designated lands through the removal of Project infrastructure and restoration of lands to a natural condition for the use of resource and recreational activities. A description of the Rehabilitation and Closure Plan is provided in Section 2.6. During rehabilitation activities, hazardous materials will be removed, equipment and infrastructure cleaned and removed, natural drainage patterns re-established to the extent practicable, and areas graded to promote natural revegetation. Following post-closure and long-term monitoring, the site will be relinquished to the Crown when it is deemed physically and chemically stable. During decommissioning, rehabilitation and closure, the Project is anticipated to have a low effect on land use within the LAA.

Summary

With the implementation of mitigation measures, residual effects from the Project during all Project phases on change in land use are anticipated to be low in magnitude (i.e., a small, measurable change in land and resource use capacity, however activities can take place at or near current levels). Project effects on land use are expected to occur within the Project Area (from the direct loss of area accessible to land and resource users) and LAA (from indirect sensory disturbances). During construction and decommissioning, residual effects are expected to be short-term and irregular in frequency. During operation, residual effects are expected to be medium-term (permanent for visual) and continuous in frequency. The residual effects will be reversible upon Project rehabilitation, with the exception of the visual disturbance associated with the waste rock pile, which will be irreversible. Land use within the RAA is considered resilient as it has a moderate to high capacity to recover from disturbance, including predicted Project-related effects.

16.5.2 Change in Resource Use

16.5.2.1 Project Pathways

Construction

Construction activities may result in the direct loss of local resource use areas through mine site preparation and earthworks and construction / installation of infrastructure and equipment (i.e., the physical presence of the Project), and indirect loss through reduced and/or restricted access to the mine site. The Project may result in a sensory disturbance (e.g., noise, visual) to resource users and harvesting activities (hunting, trapping, outfitting, and fishing). There is also potential for behavioral changes and/or mortality of harvested wildlife species due to the presence of sensory disturbances and Project activities, as assessed in Chapters 10 to 12, which may cause a reduction in wildlife hunting success, as well as greater pressure on game resources. The presence of Project workers could also increase the competition for species harvested by local hunters, trappers, outfitters, and fishers. The overall experience of hunters, trappers, outfitters, and fishers may be altered as a result of Project activities (i.e., sensory disturbances) and personnel, as the remoteness is a large part of the draw and appeal of these activities.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

Mine site preparation and earthworks will remove potentially commercially harvestable timber in FMD 13. The removal of forest land from the commercial forest area could affect the determination of annual allowable cut (AAC) levels. Commercially harvestable timber is required to be managed as such by Marathon under a cutting permit and other authorizations required to be obtained for this component of the site works.

Operation

The loss of area and/or the restriction of access to resource use areas within the mine site will be incurred during the construction phase and remain throughout the operation phase.

As with construction, Project effect pathways for resource use include disturbance to hunting, trapping, outfitting, and fishing activities due to operation activities, including open pit mining, ore milling and processing and operation-related transportation along the access road. Sensory disturbance (e.g., noise, dust, visual) from the physical presence of the Project and increased traffic along the access road (e.g., heavy truck traffic) may affect the presence of wildlife (assessed in Chapters 10 to 12). This could result in the reduction of harvesting success due to the disruption of targeted species, which could lead to greater pressure on game resources in other nearby areas. The presence of Project workers could also increase the competition for species harvested by local hunters, trappers, outfitters, and fishers. The overall experience of hunters, trappers, outfitters, and fishers may be compromised from Project activities and personnel, as the remoteness is a large part of the draw and appeal of these activities. The upgraded access road may also provide improved year-round access to areas for hunters and resources users, increasing harvesting in the LAA.

Changes in water quality associated with emissions, discharges and wastes to the aquatic environment have the potential to affect fish health, growth, or survival (assessed in Chapter 8) which could, therefore, result in greater pressure on fishery resources.

In addition to the pathways identified for Project construction, the topsoil, overburden, waste rock, low-grade ore, and high-grade ore piles, as well as Project lighting, could be visible to resource users in the area. Viewscape can be altered by physical features or works associated with the Project and may alter the aesthetics of the environment resulting in a change of perception of the area and discourage use.

Decommissioning, Rehabilitation and Closure

Sensory disturbance (e.g., noise, dust, visual) to resource users engaged in hunting, trapping, outfitting, and fishing activities will continue throughout the decommissioning phase. The presence of workers could result in an increase in competition for species harvested by hunters, trappers, outfitters, and anglers. However, this phase will also allow for the restoration of affected land used for resource purposes.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

16.5.2.2 Residual Effects

Construction

Construction activities, such as mine site preparation and earthwork, will lead to a loss of area for resource use in the mine site. Restricted access zones surrounding construction activities will be implemented during construction and remain in place throughout the life of the Project. Signage will be installed around the Project Area to alert land users of the presence of the Project and its facilities. Marathon will implement traffic control measures which may include gating approaches to Project access roads, placing large boulders and/or gated fencing to restrict public access to the Project Area.

The Project Area overlaps with less than 1% of the Moose and Bear Management Areas 17 and 18 (Table 16.4, Figure 16-4) and less than 1% of the total area of Caribou Management Areas 62 and 63 (Table 16.4, Figure 16-5). The Project Area overlaps with Trap Zones 14, 83, 221, and 239 (Table 16.8, Figure 16-7). The nearest active outfitter lodge is located 15 km from the mine site, and harvesting activities associated with outfitting have been noted near the Project Area, including hunting activity for moose and black bear. One outfitter has commented that ongoing exploration activities at the mine site have already displaced their activities at a remote fly-in outfitter camp located on Valentine Lake. The outfitter attributed this to presence of exploration activities and increased access to the area creating competition for resources by other outfitters and local hunters. As these exploration activities have been ongoing since 2010, this outfitter has likely already adjusted their patterns of land use to alternate areas. However, Marathon has engaged with this outfitter to address effects to their business resulting from exploration activities to date and will continue to engage with the outfitter to address potential effects from the proposed Project.

Resource areas overlapped by the Project Area will be unavailable for harvesting during the life of the Project. The overlap with the Project Area is relatively small (i.e., less than 1% of each management area available), and there are alternate areas within the LAA where resource users could pursue these harvesting activities. Furthermore, the level of activity within the Project Area and the LAA is limited; therefore, adverse effects on resource use associated with the loss / restriction of access to designated lands are anticipated to be low in magnitude. Marathon will continue to engage with local resource users (hunters, outfitters, trappers, anglers) regarding the overlap of the Project with hunting, trapping and fishing areas in the Project Area. This will include the communication of Project information, updates on ongoing and planned activities and a discussion of issues and concerns and potential means of addressing them.

In addition to the loss of area available, Project construction activities (e.g., use of generators, vehicles and other construction equipment) may result in sensory disturbance effects (e.g., noise, dust, visual), which may displace targeted species and reduce harvesting success rates within the LAA for local harvesters and outfitters. Moose and black bear have been noted by local outfitters as being harvested near the Project Area, as well as caribou that migrate through the area and are harvested elsewhere. The Project is located within a caribou migration corridor that supports hunting activities in other parts of central NL, and as a result changes in wildlife abundance could affect hunting success beyond the Land and Resource Use LAA.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

An assessment of wildlife disturbance and mortality risk is provided in Chapters 10 to 12 (Avifauna, Caribou and Other Wildlife, respectively). Application of the mitigation measures described in Sections 10.4, 11.4 and 12.4 is predicted to reduce the magnitude and duration of Project effects on mortality risk and change in habitat. After application of these mitigation measures, the magnitude of change in mortality risk and change in habitat for avifauna, caribou and other wildlife is predicted to be low. Assuming the successful implementation of mitigation measures and the low levels of resource use within the LAA, it is therefore anticipated that associated effects to harvesting success rate is anticipated to be low in magnitude.

Sensory disturbances related to the Project have the potential to influence where users choose to pursue resource use activities. For example, Project activities could result in a decrease in interest in outfitting services near the Project Area, particularly if undisturbed or undeveloped areas are available elsewhere.

Because the quality of experience and success rate of hunting / angling activities are the primary factors affecting the success of local outfitting operations (in-turn affecting rates of customer satisfaction and the number of return customers), adverse changes on land and resource use are anticipated to result in similar magnitude adverse effects on the economic activities of outfitters. Over the short term (construction), reductions in clientele (due to adverse changes in the quality of outfitter experience and the success rates of hunts) and increased operating costs (associated with attracting new clientele and with adaptive measures taken by outfitters to secure new hunting / angling locations) are expected to result in low magnitude adverse effects on the economic activity of outfitters operating within the LAA. Effects extending to the RAA are anticipated to be negligible in magnitude. Marathon will continue to engage outfitters regarding the overlap of the Project with hunting, trapping and fishing areas in the Project Area. This will include the communication of Project information, updates on ongoing and planned activities and a discussion of issues and concerns and a potential means of addressing these.

Sport fishers in the LAA could also be affected by noise disturbances. The mouth of Victoria River and Red Indian Lake have been noted as areas used for fishing associated with local outfitters. The species harvested by outfitters are ouanaiche (landlock salmon), Atlantic salmon and brook trout. The main concentration of sport fishing occurs in Red Indian Lake and the tributaries of the Exploits River downstream of the dam at Millertown. The mine site, where clearing and construction activities will take place, are located approximately 50 km (70 km by road) from these areas at Red Indian Lake, and therefore, adverse effects from construction activities on sport fishers are anticipated to be negligible in magnitude.

While the presence of Project workers could lead to increased competition for wildlife and fish resources, hunting / harvesting of wildlife will be strictly prohibited on the mine site. Workers will not be permitted to hunt / harvest while staying at the accommodations camp and will not be permitted to bring firearms or angling gear to site. The work schedules for Project construction workers (longer workdays and two-week rotations, with a weekly rotation of employees) will deter them from hunting and fishing locally outside of working hours. Therefore, adverse effects from construction activities on increased competition for wildlife and fish resources are anticipated to be negligible in magnitude.

Land clearing at the mine site will remove commercially harvestable timber in FMD 13. As the mine site accounts for less than 1% of the total area of FMD 13, the AAC may still be achieved by relocating



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

harvesting activities. The adverse effect on AAC will be a continuous event because the affected productive forest land will remain deforested for the duration of the Project. Marathon will consult with NLDFLR prior to construction activities, and merchantable timber will be salvaged and used or it will be made available to local communities for fuelwood. The adverse effect on the AAC is, therefore, anticipated to be low in magnitude.

Operation

During Project operation, the loss of resource areas, access restrictions, disturbance effects (e.g., noise, dust, visual), and the reduction in AAC effected during the construction will continue during operation due to the presence of the Project, its workers and associated vehicle traffic.

Hunters, trappers, outfitters and fishers may experience adverse effects related to the availability of targeted species of interest in the LAA (e.g., effects from habitat avoidance due to disturbance and wildlife mortality – Chapters 10 to 12). As discussed in Chapter 12 (Other Wildlife), the primary pathways for change in mortality risk are vegetation clearing activities, vehicular collisions, and predation and harvest pressure. As discussed above, behavioural changes in wildlife species can result from sensory disturbances (e.g., noise, dust), thereby displacing targeted species from the LAA. Hunters within the LAA could therefore experience reduced harvesting success rates. Application of the mitigation measures described in Sections 10.4, 11.4 and 12.4 is predicted to reduce the magnitude and duration of Project effects on mortality risk and change in habitat. With application of mitigation measures and in consideration of the low levels of resource use within the LAA, associated effects to harvesting success rate related to availability of resources are anticipated to be low in magnitude in most cases.

Sensory disturbance (i.e., sound and air quality) from Project operation, including Project traffic on the access road, may also affect resource users. However, alternative areas within the RAA are available for users to pursue their chosen activities outside of the area affected by a change in sound and air quality (sound pressure levels related to Project operation activities were predicted to be generally below 35 dbA [background levels] at about 5 km from the mine, and 25 dBA about 10 km from the mine). It is assumed that during operation of the Project, outfitters will have adjusted their operations in response to the Project and that adaptive actions taken in the short term will mitigate or preclude the likelihood that Project operation will adversely affect guiding operations. As discussed in Section 16.5.1.2, sound and air emissions associated with operation activities are predicted to be well below the regulatory threshold and unlikely to adversely affect resource users. Should resource users choose to conduct harvesting activities in an alternate area, this may increase the competition for species harvested by local hunters, trappers, outfitters, and fishers within the LAA and RAA. Marathon will continue to engage with local resource users (hunters, outfitters, trappers, anglers) regarding the overlap of the Project with hunting, trapping and fishing areas in the Project Area. This will include the communication of Project information, updates on ongoing and planned activities, and a discussion of issues and concerns and a potential means of addressing them. Therefore, adverse effects from sensory disturbances on resource users are anticipated to be low in magnitude.

The presence of Project workers during operation could lead to increased competition for fish and wildlife resources. Workers, however, will be prohibited from bringing hunting and/or fishing gear to the site to



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

limit competition for harvested species to resource users. Therefore, adverse effects from operation activities on increased competition from Project workers for wildlife and fish resources are anticipated to be negligible in magnitude.

Change in water quality associated with Project emissions, discharges and wastes may also result in adverse effects to fish and, therefore, lead to additional pressure on fishery resources. However, residual effects on fish health, growth or survival, as assessed in Chapter 8, are predicted to be low in magnitude. Given this and the low levels of fishing activity in the LAA, adverse effects on fishery resources are anticipated to be negligible in magnitude.

Visual effects from the development of the topsoil, overburden, waste rock, low-grade ore, and high-grade ore piles may affect resource users operating and travelling in the area. The highest point in the Project Area will be the development of the high-grade ore stockpile, which will be visually apparent and could result in a visual disturbance to some resource users. As shown on Figure 5-13, the stockpile will be visible to resource users in the areas highlighted green. This includes several areas surrounding the mine site, including Victoria Lake Reservoir, which is conservatively assumed to be subject to resource use. Note, that the visual assessment does not take into consideration vegetation which may reduce the visibility of Project components. However, given there are low levels of resource activity identified within the LAA, residual effects are anticipated to be low in magnitude.

The access road upgrade / realignment will provide improved year-round access to harvesting areas. This may result in additional resources users within the LAA year-round, thereby increasing demand on resources in the LAA. However, given it is an existing access road, the number of additional resource users as a result of improved access is considered to be limited and the resulting change in harvesting success is predicted to be low. Therefore, adverse effects from increased competition due to improved year-round access is anticipated to be low in magnitude.

Decommissioning, Rehabilitation and Closure

During Project decommissioning, no new residual effects on areas or access for hunting, trapping, outfitting, and fishing are expected. Sensory disturbance (e.g., noise, dust, visual) to resource users engaged in hunting, trapping, outfitting, and fishing activities will continue at a reduced level throughout the decommissioning, rehabilitation and closure phase. The presence of workers could continue to result in increased competition for species harvested by hunters and trappers and anglers; however, workers will continue to be prohibited from bringing hunting and/or fishing gear to the site to limit competition for harvested species to resource users. A detailed description of the Rehabilitation and Closure Plan is provided in Section 2.6. During rehabilitation activities, hazardous materials will be removed, equipment cleaned and removed, natural drainage patterns re-established, and areas graded to promote natural revegetation. Following post-closure and long-term monitoring, the site will be relinquished to the Crown when it is deemed physically and chemically stable. This phase will allow for the restoration of affected land and for that land to become once again available for resource purposes. Residual effects on resource use from decommissioning, rehabilitation and closure are, therefore, anticipated to be low in magnitude.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

Summary

With the implementation of mitigation measures, residual effects from the Project on change in resource use are anticipated to be negligible to low in magnitude. The Project is located in a remote area, with low levels of resource use. Project effects on resource use are expected to occur within the Project Area (from the direct loss of area) and LAA (from indirect sensory disturbances). During construction and decommissioning, residual effects are expected to be short term and irregular in frequency. During operation, residual effects are expected to be medium-term (permanent for visual) and continuous in frequency. The adverse effect on AAC will be continuous and occur over the medium term because the affected forest land will remain deforested for the duration of the Project. The residual effects will be reversible upon Project rehabilitation, with the exception of the visual disturbance associated with the waste rock piles and TMF, which will be irreversible. Resource use within the RAA is considered resilient as it has a moderate to high capacity to recover from disturbance, including from predicted Project-related effects.

16.5.3 Change in Recreational Use

16.5.3.1 Project Pathways

Construction

Informal recreational activities, including recreational hiking, snowmobiling, ATV use, hunting, trapping, and fishing could be affected by Project construction activities. Construction activities, including mine site preparation and earthworks, may affect the use of lands available for outdoor recreation through a loss of area and/or change in access to areas used for recreational purposes. Land and water-based recreational users in the LAA may also be affected by sensory disturbance (i.e., noise, visual) resulting from construction activities potentially affecting the quality of the outdoor recreation experience. Population increase associated with the construction phase may increase competition for resources, which may likewise affect the quality of the outdoor recreation experience being pursued by recreational users.

Potential Project pathway effects on hunting, trapping and fishing are discussed in Section 16.5.2.

Operation

Restricted access to areas which may previously have been used for recreational purposes will remain through the operation phase. However, operation at the mine site will not result in additional ground disturbance or clearing, and therefore this loss of access will primarily occur in the context of the construction phase.

During operation, the physical presence of the Project will continue to affect recreational use and visual aesthetic values (e.g., recreational user's quality of experience). Sound emitted from open pit mining, ore milling and processing and, operation-related transportation along the access road will result in a change in sound pressure levels. The presence of the topsoil, overburden, waste rock, low-grade ore and high-



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use

September 2020

grade ore piles as well as continued Project-related traffic have the potential to affect recreational use (e.g., hiking / kayaking) through visual disturbance effects.

Decommissioning, Rehabilitation and Closure

Within the mine site, access restrictions will remain in place during decommissioning. Sensory disturbance from rehabilitation activities to recreational land users are also expected to continue throughout decommissioning. During decommissioning, the area will be restored and reincorporated into the land base. Rehabilitation will be undertaken to achieve desired end land uses.

16.5.3.2 Residual Effects

Construction

Residual effects related to hunting, trapping and fishing are assessed in Section 16.5.2.2.

There are a variety of recreational land use and water-based (i.e., canoeing / kayaking) activities that take place in the RAA, and to a lesser extent, the LAA. Within the Project Area, recreational activities are mainly restricted to ATV and snowmobile use along old forestry access roads and back country hiking / camping. Direct residual effects from Project construction will primarily occur at the mine site, where access will be restricted, which could displace recreationalists to other areas of the LAA and elsewhere. For safety and security reasons, informal recreational activities will be restricted near construction activities. Signage will be installed around the mine site to alert land users of the presence of the Project and its facilities. Given the limited existing recreational use occurring within the mine site, residual effects on the loss of area available for recreational use is anticipated to be low in magnitude.

Construction activities could result in sensory disturbance (i.e., noise, visual changes) to outdoor recreational users in the LAA potentially affecting the quality of the outdoor recreation experience. As discussed in Section 16.5.1.2, noise associated with construction activities is predicted to be below the regulatory threshold for noise. Sensory and visual disturbances will be reduced through the implementation of mitigation to reduce noise and light emissions, where feasible. Because alternative areas within the LAA and the RAA are available for recreational use, and given the low levels of existing recreational use in the LAA, the residual effects to the quality of recreational use is anticipated to be low in magnitude.

The temporary influx of construction workers to the LAA can increase competition for resources, which may also affect the quality of the outdoor recreation experience being sought by recreational users. The work schedules for Project construction workers (longer workhours and two-week rotations, with a weekly rotation of employees) will deter them from hunting and fishing locally outside of working hours. Hunting / harvesting of wildlife will be strictly prohibited on the mine site. Workers will not be permitted to hunt / harvest while staying at the accommodations camp and will not be permitted to bring firearms or angling gear to site. Therefore, increased pressure on resource use from the presence of Project workers is anticipated to be negligible in magnitude.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Operation

Residual effects described for the construction phase will continue throughout the operation phase. No new areas of ground disturbance or clearing are anticipated during operation at the mine site.

Operation of the Project is anticipated to affect recreational use and visual aesthetic values through Project presence (e.g., recreational user's quality of experience due to operation activities). During operation, sound emitted from blasting, operation of equipment, generators and vehicles will result in a change in sound pressure levels. As discussed in Section 16.5.1.2, changes to sound quality associated with operation activities are predicted to be below the regulatory threshold for human receptors. There are alternative areas within the RAA for recreational users to pursue their chosen activities outside of the area affected by elevated noise (i.e., within 5 km from the mine site). Therefore, residual effects on the quality of recreational use is anticipated to be low in magnitude.

Visual effects from the development of the topsoil, overburden, waste rock and low-grade ore piles may affect recreational users. As shown on Figure 5-13, the stockpile will be visible to recreational users in the areas highlighted green. This includes several areas surrounding the mine site, including Victoria Lake Reservoir which may be used for recreational purposes. Note, that the visual assessment does not take into consideration vegetation which may reduce the visibility of Project components. However, given there are low levels of recreational activity identified within the LAA, residual effects area anticipated to be low in magnitude.

Decommissioning, Rehabilitation and Closure

Within the Project Area, access restrictions and sensory disturbance to recreational land users will continue during decommissioning, although sensory disturbance may occur at a reduced level. The objective of this phase, however, will be to restore and reincorporate the Project Area into the land base, with rehabilitation undertaken to achieve desired end land uses. A detailed description of the Rehabilitation and Closure Plan is provided in Section 2.6. During rehabilitation activities, hazardous materials will be removed, equipment cleaned and removed, natural drainage patterns re-established, and areas graded to promote natural revegetation. Following closure and long-term monitoring, the site will be relinquished to the Crown when it is deemed physically and chemically stable. Rehabilitated land is likely to become available to recreational users. Residual effects on recreational use from decommissioning, rehabilitation and closure are, therefore, anticipated to be low in magnitude.

Summary

With the implementation of mitigation measures, residual effects from the Project on change in recreational use are anticipated to be negligible (i.e., no measurable change in current land and resource use capacity) to low (i.e., a small, measurable change in land and resource use capacity, although activities can take place at or near current levels) in magnitude. The Project is in a remote area with low levels of existing recreational use, and alternative areas are available outside of the Project Area to support these activities. Noise and dust effects to nearby users are anticipated to be below regulatory thresholds. Project effects on recreational use are expected to occur within the Project Area (from the direct loss of area due to restricted access to the mine site) and LAA (from indirect sensory disturbances).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

During construction and decommissioning, residual effects are expected to be short term and irregular in frequency. During operation, residual effects are expected to be medium term (permanent for visual) and continuous in frequency. The residual effects will be reversible upon Project rehabilitation, with the exception of the visual disturbance associated with the waste rock piles and TMF, which will be irreversible. Recreational use within the RAA is considered resilient as it has a moderate to high capacity to recover from disturbance, including from predicted Project-related effects.

16.5.4 Summary of Project Residual Environmental Effects

A summary of Project effects on land and resource use is provided in Table 16.19.

Overall, with the application of mitigation and management measures, residual effects on land and resources use range from negligible to low in magnitude. The residual effects are limited to the Project Area (direct loss of area) and LAA (sensory disturbances). Effects range in duration from short term (e.g., sensory disturbance due to during construction activities) to long term (e.g., visual impacts associated with Project operation) and are anticipated to occur at irregular and continuous frequencies. Effects are predicted to be mostly reversible upon Project rehabilitation. Land and resource use within the RAA is considered resilient as it has a moderate to high capacity to recover from disturbance, including from predicted Project-related effects. Existing land and resource use levels within the LAA are low, and there is capacity within the RAA to accommodate land and resource users displaced from the LAA.

Table 16.19 Project Residual Effects on Land and Resource Use

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Land Use	C	A	L	PA/LAA	ST	IR	R	R
	O	A	L	PA/LAA	MT-P	C	R / IR	R
	D	A	L	PA/LAA	ST	IR	R / IR	R
Change in Resource Use	C	A	N-L	PA/LAA	ST	IR	R	R
	O	A	N-L	PA/LAA	MT-P	C	R / IR	R
	D	A	N-L	PA/LAA	ST	IR	R / IR	R
Change in Recreational Use	C	A	N-L	PA/LAA	ST	IR	R	R
	O	A	N-L	PA/LAA	ST-P	C	R / IR	R
	D	A	N-L	PA/LAA	ST	IR	R / IR	R



Table 16.19 Project Residual Effects on Land and Resource Use

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
<p>KEY See Table 16.15Table 13.2 for detailed definitions</p> <p>Project Phase C: Construction O: Operation D: Decommissioning, Rehabilitation and Closure</p> <p>Direction: P: Positive A: Adverse</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p> <p>Geographic Extent: PA: Project Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short term MT: Medium term LT: Long term P: Permanent</p> <p>N/A: Not applicable</p> <p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological / Socio-Economic Context: R: Resilient N: Not Resilient</p>								

16.6 DETERMINATION OF SIGNIFICANCE

A significant effect on land and resource use is defined as one that results in a change or disruption that restricts or degrades present land and resource use capacity within the RAA to a point where activities cannot continue at or near current levels over the long-term and where compensation is not feasible and does not comply with established federal, provincial, or municipal land use designations, policies, or by-laws.

While Project activities and components will result in adverse effects to land and resource use during each phase of the Project, these effects are anticipated to be mainly low in magnitude. The Project does not conflict with established federal, provincial, or municipal land use designations, policies, or by-laws. Land and resource uses are anticipated to continue to occur at or near current levels over the long term, given the low level of activity occurring in the area and the alternative land available for resource and recreational pursuits. Project activities and components will not disrupt, restrict, or degrade land and resource use to a point where they cannot continue at or near current levels. With mitigation and environmental protection measures, the residual environmental effects on land and resource use are predicted to be not significant.



16.7 PREDICTION CONFIDENCE

The level of confidence in the predictions for Project-related residual effects on land and resource use is moderate to high. This is based on information collected as part of desktop data compilation and understanding of current existing conditions, GIS data analyses, understanding of Project activities, locations and described interactions, the known effectiveness of mitigation measures, and experience of the assessment team. A moderate level of confidence was given because some of the desktop data were limited in terms of availability (e.g., intensity of recreational usage) or scale (e.g., big game hunting areas to support harvest evaluation); however, environmental effects mechanisms are well-understood. The degree to which outfitters need to adjust existing operations in response to Project-related changes in land and resource use is also unknown and not easily measured. Many of the mitigation measures identified in Section 16.4 are standard practice and have been successfully implemented in previous mining projects, further increasing confidence.

16.8 PREDICTED FUTURE CONDITION OF THE ENVIRONMENT IF THE UNDERTAKING DOES NOT PROCEED

The predicted future condition of the environment for land and resource use if the Project does not proceed is not expected to differ markedly from the current condition. The future condition of land and resources use is largely influenced by the availability of harvested species and the economy, both local and international (outfitting). A discussion of population trends for harvested species is provided in Chapters 10 to 12 and a discussion of economy is provided in Chapter 15.

16.9 FOLLOW-UP AND MONITORING

A dedicated follow-up and monitoring plan is not proposed for the land and resource use VC. Marathon will develop a Project-specific Environmental Management System, Environmental Protection Plan and associated plans (Chapter 23) where mitigation measures will be stipulated for the construction, operation and decommissioning, rehabilitation and closure activities. These measures will be subject to regular review as to their effectiveness as part of a process of adaptive management related to Project monitoring and follow-up.

16.10 REFERENCES

16.10.1 Personal Communications

Adams, B. Director, Wildlife Division, Newfoundland and Labrador Department of Fisheries and Land Resources, E-mail communication to Marathon Gold, July 2020.

Bishop's Falls Town Council. Town Council Survey / Questionnaire [Microsoft Word Document], 2020

Notch Mountain Outfitters, Buchans, NL, Outfitter Survey / Questionnaire [PDF document], 2020.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

SCNL (Salmonid Council of Newfoundland and Labrador). Comments forwarded by Leo White, President, on behalf of the SCNL [Microsoft Word Document], 2020.

Pardy, S. 2020. Wildlife Division, Department of Fisheries and Land Resources. Email with Environmental Scientist, Stantec Consulting Ltd., St. John's Newfoundland, April 9, 2020.

Snowshoe Lake Hunting and Fishing, Grand Falls-Windsor, NL, Outfitter Survey / Questionnaire [Microsoft Word Document], 2020.

16.10.2 Literature References

CBC (Canadian Broadcasting Corporation). 2008. Abitibi pulls plug on Newfoundland newsprint mill. Available at: <https://www.cbc.ca/news/canada/newfoundland-labrador/abitibi-pulls-plug-on-newfoundland-newsprint-mill-1.697173>

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2014. COSEWIC assessment and status report on the Caribou Rangifer tarandus, Newfoundland population, Atlantic-Gaspésie population and Boreal population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiii + 128 pp. Available at: https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Caribou_NF_Boreal_Atlantic_2014_e.pdf.

DFO (Fisheries and Oceans Canada). 2019. Newfoundland and Labrador Angler's Guide 2019-2020. Available at: <http://www.nfl.dfo-mpo.gc.ca/folios/01019/docs/anglersguide-guidedepecheur-2017-18-eng.pdf>

DFO (Fisheries and Oceans Canada). 2018a. Notice to Anglers: Atlantic Salmon Management Change. News Release, July 19, 2018. Government of Canada, St. John's, NL. Available at: <http://www.nfl.dfo-mpo.gc.ca/NL/CP/Orders/2018/na18011SalmonManagementChange>

DFO (Fisheries and Oceans Canada). 2018b. Notice to Anglers: Correction – Atlantic Salmon Management. News Release, July 19, 2018. Government of Canada, St. John's, NL. Available at: <http://www.nfl.dfo-mpo.gc.ca/NL/CP/Orders/2018/na18012CorrectionSalmonManagement>

DFO (Fisheries and Oceans Canada). 2018c. Newfoundland and Labrador Angler's Guide 2018-2019. Available at: <http://waves-vagues.dfo-mpo.gc.ca/Library/40707647.pdf>

Government of Newfoundland and Labrador (Government of NL). N.d. Forest Management Districts 10, 11, 12, and 13 (Planning Zone 5) Five Year Operating Plan 2016-2020. Available at: <https://www.gov.nl.ca/mae/files/env-assessment-projects-y2015-1827-1827-main-text.pdf>

Government of Newfoundland and Labrador (Government of NL). 2015. 2015-2020 Newfoundland and Labrador Moose Management Plan. Newfoundland and Labrador Wildlife Division, Department of Environment and Conservation. Available online at: https://www.flr.gov.nl.ca/wildlife/wildlife/pdf/Moose_Plan_2015_2020.pdf



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Heritage NL (Heritage Newfoundland and Labrador). 2020. Buchans: The Making of a Company Town. Available at: <https://www.heritage.nf.ca/articles/economy/buchans-town.php>

Mahoney, S.P., J.A. Virgl, and K. Mawhinney. 2001. Potential mechanisms of phenotypic divergence in body size between Newfoundland and mainland black bear populations. *Canadian Journal of Zoology* 79: 1650-1660.

Marsh, B. 2015. Anglo Newfoundland Development Company: The History of Central Newfoundland. Available at: <https://anglonewfoundlanddevelopmentcompany.wordpress.com/2015/02/02/what-happened-to-the-millertown-mill/>

Mary March Wilderness Park. No Date. Home. Available at: <https://marymarchpark.wordpress.com/>

McLaren, B., L. Hermanutz, J. Goose, B. Collet, and C. Kasimos. 2009. Broadleaf competition interferes with balsam fir regeneration following experimental removal of moose. *Forest Ecology and Management* 257: 1395-1404.

Mercer, W.E., and B.E. McLaren. 2002. Evidence of carrying capacity effects in Newfoundland moose. *Alces* 38: 123-141.

NLDF (Newfoundland and Labrador Department of Finance). 2016. The Economic Review 2016. Available at: <https://www.economics.gov.nl.ca/pdf2016/theeconomicreview2016.pdf>

NLDFLR (Newfoundland and Labrador Department of Fisheries and Land Resources). 2019a. Protected Areas in Newfoundland and Labrador. Available at: <https://www.gov.nl.ca/ffa/natural-areas/apa/>

NLDFLR (Newfoundland and Labrador Department of Fisheries and Land Resources). 2019b. Hunting. Available at: <https://www.flr.gov.nl.ca/wildlife/hunting/index.html>

NLDFLR (Newfoundland and Labrador Department of Fisheries and Land Resources). 2019c. 2019-2020 Hunting and Trapping Guide. Available at: <https://www.gov.nl.ca/ffa/files/wildlife-pdf-hunting-trapping-guide.pdf>

NLDFLR (Newfoundland and Labrador Department of Fisheries and Land Resources). 2019d. Small Game Management in Newfoundland and Labrador. Available at: https://www.flr.gov.nl.ca/wildlife/wildlife_research/small_game.html

NLDFLR (Newfoundland and Labrador Department of Fisheries and Land Resources). 2019e. Migratory Game Bird Regulations. Available at: <https://www.flr.gov.nl.ca/wildlife/hunting/migratory.html>

NLDFLR (Newfoundland and Labrador Department of Fisheries and Land Resources). 2019f. Timber Resource Analysis. Available at: <https://www.faa.gov.nl.ca/forestry/timber/index.html>

Newfoundland and Labrador Department of Municipal Affairs and Environment. 2017. Water Resources Management. Available at: <https://www.gov.nl.ca/eccm/waterres/>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Newfoundland and Labrador Eastern Habitat Joint Venture. 2008. Eastern Habitat Joint Venture five-year plan for the implementation of the North American Waterfowl Management Plan in Newfoundland and Labrador (2008-2012). Newfoundland and Labrador Eastern Habitat Joint Venture. St. John's. 66pp.

NLDNR (Newfoundland and Labrador Department of Natural Resources). 2019. Geoscience Atlas. Available at: <https://geoatlas.gov.nl.ca/Default.htm>

NL (Newfoundland and Labrador) Hydro. 2017. Celebrating 50 Years of Reliable Power from the Bay d'Espoir Plant. Available at: <https://nlhydro.com/good-to-know/celebrating-50-years-of-reliable-power-from-the-bay-despoir-plant/>

NL (Newfoundland and Labrador) Hydro. 2012. Upgrade Burnt Dam Spillway Structure. Available at: <http://www.pub.nf.ca/applications/nlh2013capital/files/application/NLH2013Application-Volumell-Report8.pdf>

Newfoundland Power. 2018. Provincial Transmission Grid. Available at: <https://nlhydro.com/wp-content/uploads/2015/12/Provincial-Transmission-Grid.pdf>

NLSF (Newfoundland and Labrador Snowmobile Federation). 2020. Snowmobiling Map. Available at: <https://nlsf.org/trails-and-passes/snowmobiling-map.aspx>

NLTCII (Newfoundland and Labrador Tourism, Culture, Industry and Innovation). 2019. T-Railway Provincial Park. Available at: <https://www.tcii.gov.nl.ca/parks/trailway/index.html>

Notch Mountain Outfitters. No Date Home. Available at: <http://www.notchmountainoutfitters.com/index.html>

Notch Mountain Outfitters. 2019. Fishing. Available at: <https://www.notchmountainoutfitters.com/fishing>

Statistics Canada. 2020. Number and value of pelts produced. Table 32-10-0293-01. Available online at: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210029301&pickMembers%5B0%5D=1.2&pickMembers%5B1%5D=3.1>

Statistics Canada. 2016. Census Profile, 2016 Census. Available at: <http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>

The Newfoundland Marten Recovery Team. 2010. Recovery plan for the threatened Newfoundland population of American marten (*Martes americana atrata*). Wildlife Division, Department of Environment and Conservation, Government of Newfoundland and Labrador, Corner Brook, Canada. iii + 31 pp.

Town of Buchans. 2019. Town of Buchans website. Available at: <https://www.townofbuchans.com/>. Accessed April 2020.

Town of Millertown. 2008. Millertown: A Humble Community. Available at: <http://www.communityofmillertown.ca/about.html>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Use
September 2020

Water Resources Management Division. 2013. Management of Protected Water Supply Areas. Available at: <https://www.gov.nl.ca/eccm/files/waterres-regulations-appforms-designation-process-booklet-mar-2013.pdf>

Veinott, G.I., Robertson, M.J., Bradbury, I., Dempson, J.B., Grant, C., Kelly, N., Whalen, J., and Poole, R. 2018. Status of Atlantic Salmon (*Salmo salar* L.) stocks within the Newfoundland and Labrador Region (Salmon Fishing Areas 1-14B), 2016. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/008. v + 38 p. Available at: http://publications.gc.ca/collections/collection_2018/mpo-dfo/fs70-6/Fs70-6-2018-034-eng.pdf



17.0 INDIGENOUS GROUPS

17.1 SCOPE OF ASSESSMENT

Indigenous groups have been identified as a valued component (VC) in recognition of the cultural, social and economic importance of the environment and natural resources to the Indigenous groups on the Island of Newfoundland. Other factors in VC selection included requirements of the Federal Environmental Impact Statement (EIS) Guidelines (Appendix 1A), and the potential for the Project to affect activities, sites and resources identified as important by the Indigenous groups, as well as potential quality of life and socio-economic effects. The Indigenous Group VC assesses potential Project-related effects on Indigenous health and socio-economic conditions, Indigenous physical and cultural heritage and current use of lands and resources for traditional purposes (hereafter referred to as 'current use'). This scope is consistent with the Federal EIS Guidelines and section 5(1)(c) of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

Section 5(1)(c)(iii) of CEAA 2012 identifies "current use of lands and resources for traditional purposes" as an environmental effect to be considered in an environmental assessment. The Federal EIS Guidelines (Appendix 1A) indicate that current use may include activities such as hunting, trapping, fishing and plant gathering. In the context of this assessment, current use is understood to correspond to Indigenous traditional uses and pertains to the activities, practices and places, locations and areas related to use of traditional resources, from the collection of plants and organic materials, to practices including hunting, trapping and fishing. Current use also refers to travel that occurs to engage in such harvesting practices.

The Federal EIS Guidelines (Appendix 1A) identified two Indigenous groups with the potential to be affected by Project activities and therefore to be included within the scope of the environmental assessment: Miawpukek First Nation (Miawpukek) and Qalipu Mi'kmaq First Nation (Qalipu). Section 17.2 provides an overview of background information and context to support the assessment of Project-related effects to Indigenous groups, including: a description of the current land and resource use for these Indigenous groups; hunting and fishing areas; traditional travel routes; country foods; commercial activities (e.g., fishing, trapping, forestry, outfitting); recreational uses; burial sites; sacred, ceremonial or culturally important places; archaeological potential; and knowledge transmission. Country foods is defined as all foods sourced outside of commercial food systems, including any food that is trapped, fished, hunted, or harvested for subsistence or medicinal purposes outside of the commercial food chain (also referred to as traditional foods).

This VC includes an assessment of Indigenous health and socio-economic conditions, current use, and Indigenous physical and cultural heritage, and is closely linked to and informed by the conclusions of the effect assessments for the following VCs:



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

- Atmospheric Environment (Chapters 5) – given that Project-related activities may result in an increase in dust, lighting, sound, and vibration levels that may cause a disturbance to harvested resources and Indigenous people
- Surface Water Resources (Chapter 7) – given the importance of water quantity and quality to water-based activities and water quality to wildlife and Indigenous health
- Fish and Fish Habitat (Chapter 8) – given the connection with harvested fish species
- Vegetation, Wetlands, Terrain and Soils (Chapter 9) – given the removal or alteration of vegetation communities supporting vegetation-based activities (i.e., plant harvesting and gathering) and habitat for wildlife species
- Avifauna, Caribou, and Other Wildlife (Chapters 10, 11 and 12, respectively) – given the link with hunting and trapping activities
- Land and Resource Use (Chapter 16) – given shared use of land with nearby non-Indigenous groups
- Community Health (Chapter 14) – given the link with human health through direct consumption of vegetation, fish and wildlife gathered, hunted or caught for country food

17.1.1 Regulatory and Policy Setting

In addition to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and the NL *Environmental Protection Act*, the Project is subject to other federal and provincial legislation, policies and guidance. This section identifies the primary regulatory requirements and policies of the federal and provincial authorities which influence the scope of the assessment on Indigenous groups.

The assessment of Indigenous groups, including Indigenous health conditions, Indigenous socio-economic conditions, and Indigenous physical and cultural heritage, has been conducted in conformity with the requirements of CEAA 2012 section 5(1)(c) and the Federal EIS Guidelines (Appendix 1A). The following technical guidance documents issued by the federal and provincial governments have also been considered, where applicable, in this effects assessment:

- The Government of Newfoundland and Labrador (NL) Aboriginal Consultation Policy on Land and Resource Development Decisions (Government of NL 2013)
- Aboriginal Consultation and Accommodation - Updated Guidelines for Federal Officials to Fulfill the Duty to Consult (Aboriginal Affairs and Northern Development Canada 2011)
- Reference Guide: Considering Aboriginal Traditional Knowledge in Environmental Assessments Conducted Under the *Canadian Environmental Assessment Act, 2012* (CEA Agency 2015a)
- Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archaeological, Paleontological or Architectural Significance under the *Canadian Environmental Assessment Act, 2012* (CEA Agency 2015b)
- Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under the *Canadian Environmental Assessment Act, 2012* (CEA Agency 2016)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment (Health Canada 2019a)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods (Health Canada 2018)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada 2017)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality (Health Canada 2016a)
- Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality (Health Canada 2016b)

The Federal EIS Guidelines (Appendix 1A) require that consideration be given to potential impacts to Indigenous interests. Indigenous interests are inclusive of Indigenous and treaty rights as well as any other concerns or comments that may be identified by Indigenous people, such as environmental, economic, health, social and heritage elements. Indigenous and treaty rights are recognized and affirmed under section 35 of the *Constitution Act, 1982*. They are also part of the United Nations Declaration on the Rights of Indigenous Peoples, which the Government of Canada fully endorsed in May 2016. Through guidance from the federal and provincial governments, Marathon understands that the two groups listed in the Federal EIS Guidelines (Appendix 1A) (Miawpukek and Qalipu) do not currently have recognized or established Aboriginal or treaty rights to the lands and waters of the Island of Newfoundland where the Project components and activities will be located. Therefore, as prescribed in the Federal EIS Guidelines (Appendix 1A), the assessment considers potential adverse effects of the Project on Indigenous interests (rather than to Indigenous rights). As discussed further in Section 17.1.2, Marathon has engaged, and will continue to engage, with Miawpukek and Qalipu regarding their interests and concerns about the Project.

17.1.2 The Influence of Engagement on the Assessment

As part of engagement with nearby communities, governments, Indigenous groups and stakeholders, Marathon has documented interests and concerns that have been raised about the Project. An overview of Indigenous engagement activities by Marathon is outlined in Chapter 3. Marathon's Indigenous engagement activities have focused on establishing open, meaningful communication and information exchange through continuing dialogue with Miawpukek and Qalipu. Marathon's engagement with the Indigenous groups began prior to Project registration in 2019. Traditional Knowledge and land and resource use information was collected through meetings and information sharing with the Indigenous groups. To gain a better understanding of current use within the area of the Project, a study entitled, "The Collection of Current Land Use and Aboriginal Traditional Knowledge" (ATK Study) was conducted in 2020 by the Qalipu, with financial support from Marathon. Information collected through the ATK Study has been integrated into the assessment. In addition, each Indigenous group was provided draft versions of their respective sections of the existing environment information presented in the Indigenous Groups VC and invited to review and comment on the material. Marathon also met in person with representatives of Miawpukek to review and update this information.

Based on engagement activities completed to date, the key issues identified by Qalipu are summarized below.

- The need to balance economic benefits against potential adverse environmental effects of the Project
- Employment opportunities, including the targets for employment of women and Indigenous women, and the establishment of training funds and training programs



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

- Need to involve youth due to their interest in both the environmental and socio-economic aspects of the Project
- Design and operation of the tailing management facility, including use of earthen dams, long-term plans for the tailings pond, nature of “detox tailings”, use of a geo-membrane, and likelihood and consequences of a breach
- Processing onsite, including the use of cyanide and the heap leach process
- Whether Project infrastructure can be relocated to reduce the Project footprint
- Decommissioning, rehabilitation and closure of the Project, including disposition of camp infrastructure at end of mine life and ensuring remediation of the Project Area takes place
- Terrestrial environment including the disturbance of caribou migration routes and the potential for the introduction of invasive plant and wildlife species
- Atmospheric environment including the potential impact of tree clearing and increased emissions on air quality
- Water quality and water treatment
- Interference with fish and fish habitat through use of culverts on water courses
- Limitation of access to lands and resources for traditional use
- Interest in involvement in the environmental monitoring for the Project
- Need for ongoing engagement

Based on engagement activities completed to date, the key issues identified by Miawpukek are summarized below.

- Need for ongoing engagement
- Access to economic opportunities
- The impact of Covid-19 on the Project
- The size of the Project footprint
- The need for treatment to protect water quality
- Tailings, including questions about treatment, accidental events, and rehabilitation and closure
- Acknowledgement that interests of Miawpukek extend beyond caribou and include plants and waterfowl
- Potential impacts on pine marten and caribou migration as a result of increased industrial activity in the Central Region, and potential impacts of the Project on moose and salmon
- Need to consider buffers as a potential mitigation measure for Species at Risk
- Potential impact on Miawpukek land and resource use
- Potential loss of historic or cultural sites
- Interest in involvement in environmental monitoring for the Project

17.1.3 Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographical extent of potential effects) and temporal boundaries (i.e., timing of potential effects). Spatial boundaries for Indigenous groups were selected in consideration of the geographic extent over which Project activities, and their effects, are likely to occur on the VC. Temporal boundaries are based on the timing and duration of



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Project activities and the nature of the interactions with the VC. The spatial and temporal boundaries associated with the effects assessment for Indigenous groups are described in the following sections.

17.1.3.1 Spatial Boundaries

Routine Project and cumulative environmental effects of the Project on Indigenous groups are assessed using the following spatial boundaries (Figures 17-1 and 17-2):

Project Area: The Project Area encompasses the immediate area in which Project activities and components occur and is broken down into two distinct areas: the mine site and the access road. The mine site includes the area within which Project infrastructure will be located, and the access road is the existing road to the site, plus a 20 m buffer on either side. The Project Area is the anticipated area of direct physical disturbance associated with the construction and operation of the Project.

Local Assessment Area (LAA): The LAA includes a 40 km by 40 km buffer around the mine site and a 500-m buffer around the access road. This has been selected to capture the area where effects on current use are likely to be most prevalent (e.g., effects to harvested species and country foods, and sensory disturbance effects to nearby Indigenous land users). This LAA was selected based on the assessment of the atmospheric environment (VC representing the largest area of sensory disturbance) provided in Chapter 5.

Regional Assessment Area (RAA): The RAA (Figure 17-2) for the Indigenous Groups VC encompasses the largest extent of the RAAs of the various VCs identified in Section 17.1 to capture relevant potential effects.

17.1.3.2 Temporal Boundaries

The temporal boundaries for the assessment of potential effects on the Indigenous Groups VC include:

- Construction Phase – 16 to 20 months, beginning in Q4 2021, with 90% of activities occurring in 2022
- Operation Phase – Estimated 12-year operation life, with commissioning / start-up and mine / mill operation slated to start Q2 2023
- Decommissioning, Rehabilitation and Closure Phase – Closure rehabilitation to occur once it is no longer economical to mine or resources are exhausted

The temporal boundary for current use also considers each local Indigenous group's current and future use of lands and resources for traditional purposes during the Project construction and operation. Current use is defined as extending back from the present time to within the last 25 years (or one generation). Twenty-five years was chosen as the temporal boundary for considering effects of a change in the environment on Indigenous people because knowledge about traditional practices or locales may be lost or may not be passed on to younger members of the community if it goes unused for a generation. Future use pertains to the opportunities for generations of descendants to practice traditional activities (in modern form) and maintain traditional cultural and spiritual values.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

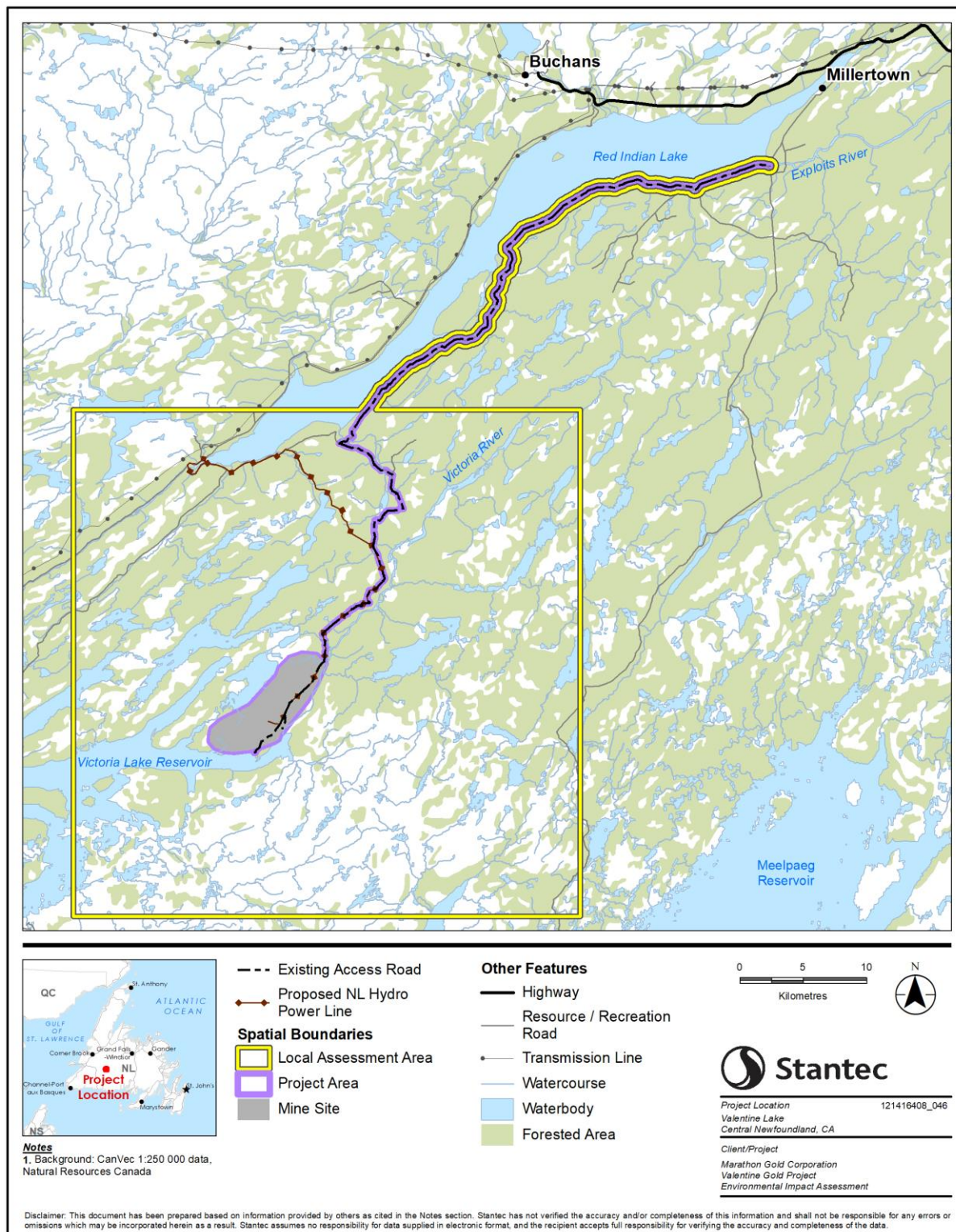


Figure 17-1 Local Assessment Area for Indigenous Groups



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

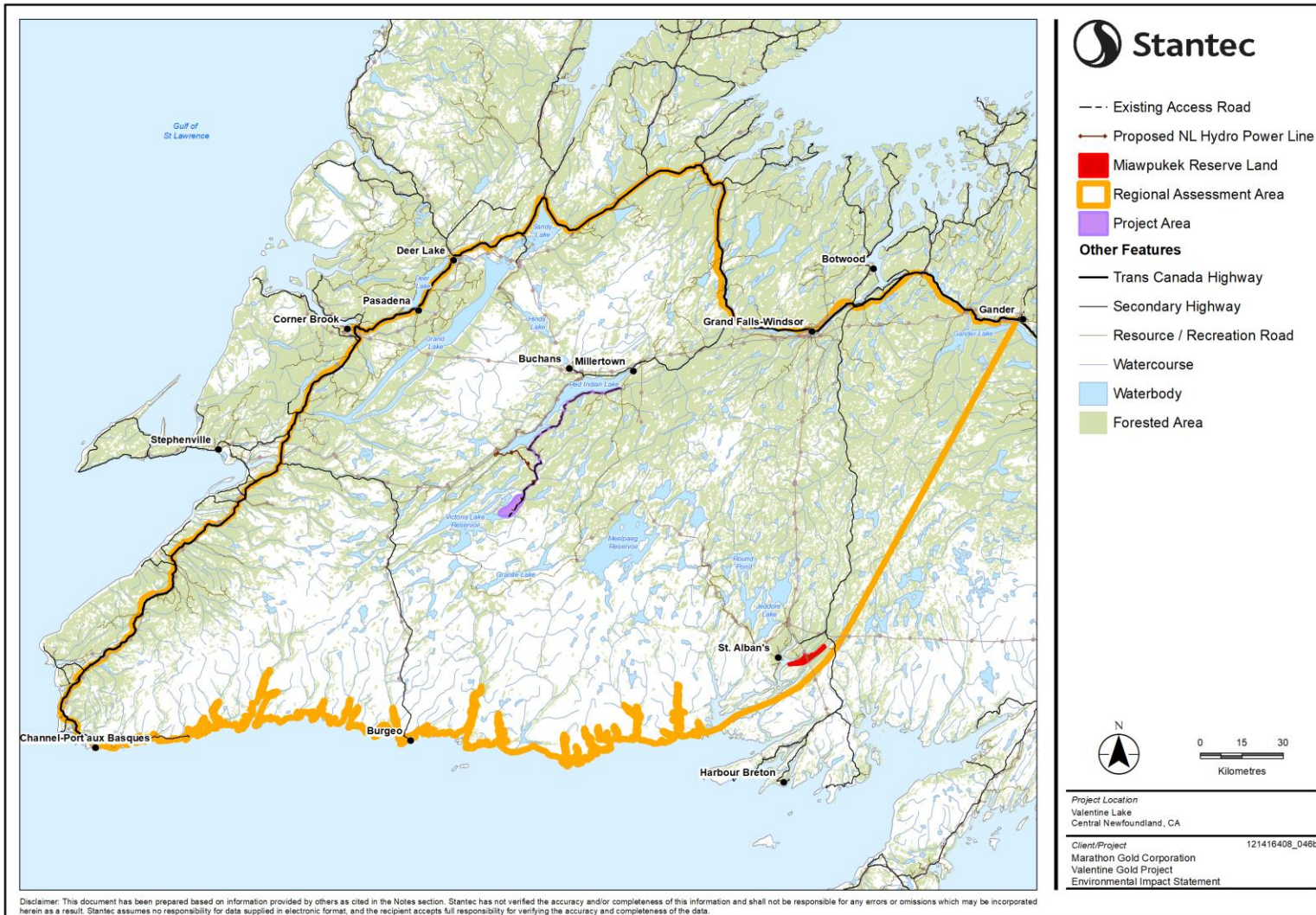


Figure 17-2 Regional Assessment Area for Indigenous Groups



17.2 EXISTING CONDITIONS FOR INDIGENOUS GROUPS

A characterization of the existing conditions within the spatial boundaries defined in Section 17.1.3.1 is provided in the following sections. This includes a discussion of the influences of past and present physical activities on the VC, leading to the present time. An understanding of the existing conditions for the VC within the spatial area being assessed is a key requirement in the prediction of potential Project effects provided in Section 17.5.

17.2.1 Methods

Information on existing conditions for Indigenous groups was obtained through primary and secondary research. Primary data was collected through Indigenous engagement activities undertaken for the Project, including community meetings (Chapter 3) and an ATK Study completed by Qalipu (Section 17.2.4). Secondary research included a desktop review of publicly available information, such as previous studies, other environmental assessments (EAs), and a review of existing traditional knowledge sources, where available. Information on existing conditions for Miawpukek and Qalipu was provided to the respective Indigenous groups prior to filing for validation. Marathon met with Miawpukek to review the existing conditions information and Miawpukek provided additional information at this time. Information provided during this meeting is cited as MFN 2020. Correspondence from Qalipu confirmed the information provided in the existing conditions.

Below is a list of primary and secondary sources that were used to develop the existing conditions section for this VC:

- Meetings and correspondence and other engagement activities with Indigenous leaders / councils / communities
- An ATK Study completed by Qalipu
- Other EAs (e.g., Maritime Link Environmental Assessment)
- Data from federal and provincial government agencies, including data with respect to Indigenous activities, such as fishing, hunting, and trapping
- Information from Qalipu and Miawpukek First Nations' websites
- Various environmental reports (e.g., Newfoundland and Labrador Regional Offshore Assessment, First Nations Food, Nutrition and Environment Study)

The sections below provide an overview of background information and context to support the assessment on Indigenous groups. Marathon will continue to engage with potentially affected Indigenous groups to understand issues or concerns, supplement information related to existing conditions, and incorporate information into Project planning, as applicable. As discussed in Chapter 3, Marathon has offered funding to Miawpukek and Qalipu to conduct land and resource use studies and to collect Indigenous Knowledge to enhance Marathon's understanding of the potential Project effects upon Indigenous interests and activities and to incorporate, as appropriate, into the EIS and Project planning.



17.2.2 Central Newfoundland Indigenous Peoples Overview

By at least the early-middle 17th century, Mi'kmaq from Cape Breton were travelling to the Island of Newfoundland to hunt. Through the 18th century, their favoured destinations on the Island included Placentia, Cape Ray, and Bay d'Espoir. Initially, Mi'kmaq on the Island of Newfoundland regularly returned to Cape Breton; however, by the end of the 18th century or early 19th century, Mi'kmaq families were settling permanently in southern and southwestern Newfoundland, hunting caribou, trapping and, later, serving as guides for European explorers and sportsmen (Pastore 1978). In the 19th century, Mi'kmaq hunters expanded their range to include much of the interior of the main portion of the Island, with camps found in St. George's Bay and Codroy River in the southwest; White Bear Bay and Bay d'Espoir on the Island's south coast; and Bonavista Bay, Gander Bay, and the Bay of Exploits in the northeast (Pastore 1998).

The hunting and trapping territories of individual Mi'kmaq families across the Island of Newfoundland interior were mapped in 1914. This included the large territory extending from Sandy Lake down through Red Indian Lake, Victoria River and Lake, and Lloyd's River; as far east as Meelpaeg; and as far south as the northern end of King George IV Lake (at that time, the territory of Frank Joe, a hunter and trapper of mixed Mi'kmaq and Innu descent) (Speck 1922).

As discussed in Chapter 18, ethnohistoric evidence indicates that important caribou migration corridors approach and traverse the Project Area. A review of regional archaeological data indicates that the Project Area has potential for archaeological resources, particularly those pertaining to the pre-contact and historical Beothuk sites, and historical Mi'kmaq occupations of the southwestern Newfoundland interior (Chapter 18 – Historic Resources). While this potential may have been reduced by the effects of flooding for commercial logging and hydroelectric development in the area, it has not been eliminated.

An archaeological survey of King George IV Lake led to the discovery of two sites at the delta of Lloyd's River at the southwest end of the lake (Penney 1987). At one site, two hearths were identified. One hearth was attributed to a Mi'kmaq occupation of the site ca. 1920. The second site included the remains of a fallen Mi'kmaq square wigwam with artifacts indicating a date of occupation ca. 1940.

The lake known to Newfoundland Mi'kmaq as "Temagen Gospen," situated southwest of Burnt Pond, was surveyed in 1989 (Penney 1990). Temagen Gospen had not been flooded by the diversion of Spruce Pond, Victoria Lake Reservoir and Burnt Pond into Granite Lake. One site, located at a prominent constriction midway along the lakeshore, yielded evidence for a late pre-contact site assumed to be ancestral to Beothuk, along with a mid-20th century Mi'kmaq hunting camp (Penney 1990). Two additional modern Mi'kmaq camps were also recorded at the southern end of the lake.

The Mi'kmaq of Newfoundland continue to use and harvest traditional resources in southwestern and central Newfoundland for subsistence purposes and to maintain cabins and camps in the country for subsistence activities, recreation, and cultural purposes such as visiting sacred grounds and collecting specialty woods and plants for crafts or healing purposes (Emera Newfoundland and Labrador 2013; FNI 2002).



Indigenous Groups
September 2020

There are currently two Mi'kmaq First Nation groups in Newfoundland and Labrador that are potentially affected by / interested in the Project: Miawpukek First Nation (Miawpukek) and Qalipu Mi'kmaq First Nation (Qalipu). Miawpukek reserve (Conne River) is approximately 113 km from the Project Area (Figure 17-3). As a 'landless' band, Qalipu First Nation does not manage any reserve lands. Its members reside within 67 communities across the island, with the nearest community where Qalipu members reside being Buchans located 49 km to the mine site (direct route) (Figure 17-3).

Profiles for each group are provided below in Sections 17.2.3 and 17.2.4 as per the requirements under subsection 5(1)(c) of CEAA 2012. Where community-specific information was not available, general information on the Mi'kmaq of the Island of Newfoundland is provided.

17.2.3 Miawpukek First Nation (Conne River)

The Miawpukek reserve is located at the mouth of the Conne River on the south coast of the Island of Newfoundland (Figure 17-3). The area of the reserve is approximately 620 ha. In addition, Miawpukek has a total of 10,000 ha for forestry management from the Province which cannot be harvested by non-Miawpukek members (MFN 2020). Within the forestry management area, Miawpukek conducts monitoring with Parks Canada and DFO related to forestry, traditional lands, species at risk, salmon, rivers, wildlife, fishery, caribou, song birds, bats, migratory birds, trap zones and other fur bearing animals, Boreal Felt Lichen (BFL), pine marten (MFN 2020; Indigenous Guardians Toolkit n.d.). According to traditional oral history, the Miawpukek reserve was established in 1870 and was one of many semi-permanent camping sites until around 1822 when Miawpukek became a permanent community (Miawpukek n.d.). The Miawpukek reserve was officially designated as an Indian Reserve under the federal *Indian Act* in 1987 (Miawpukek 2018). In 1976, the Federation of Newfoundland Indians (FNI), an aggregate group representing several communities including Miawpukek, asserted a claim of Aboriginal rights and title to the lands and resources of southern and central Newfoundland. This claim has not been accepted for negotiation by either the federal or provincial government. However, non-treaty self-government framework agreement negotiations began in 2004 between Miawpukek and the federal and provincial governments and an agreement was signed in 2005 (AADNC n.d.).

The Miawpukek reserve is approximately 168 km southwest of Grand Falls / Windsor Newfoundland (Chan et al. 2017). The total registered membership of Miawpukek is 3,063. In March of 2020, the reserve population was 1,000, approximately 33% of the total population (MFN 2020). The population on reserve has been noted as rapidly increasing with many families returning home to participate in various employment opportunities on reserve (MFN 2020). Miawpukek's population is also relatively young, with 34% of residents under the age of 25 (Michelin 2019). Approximately 540 members on reserve are of voting age (MFN 2020). Mi'kmaq living in the Miawpukek reserve speak the Mi'kmaw language (part of the Algonquian language family) and English (INAC 2020).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

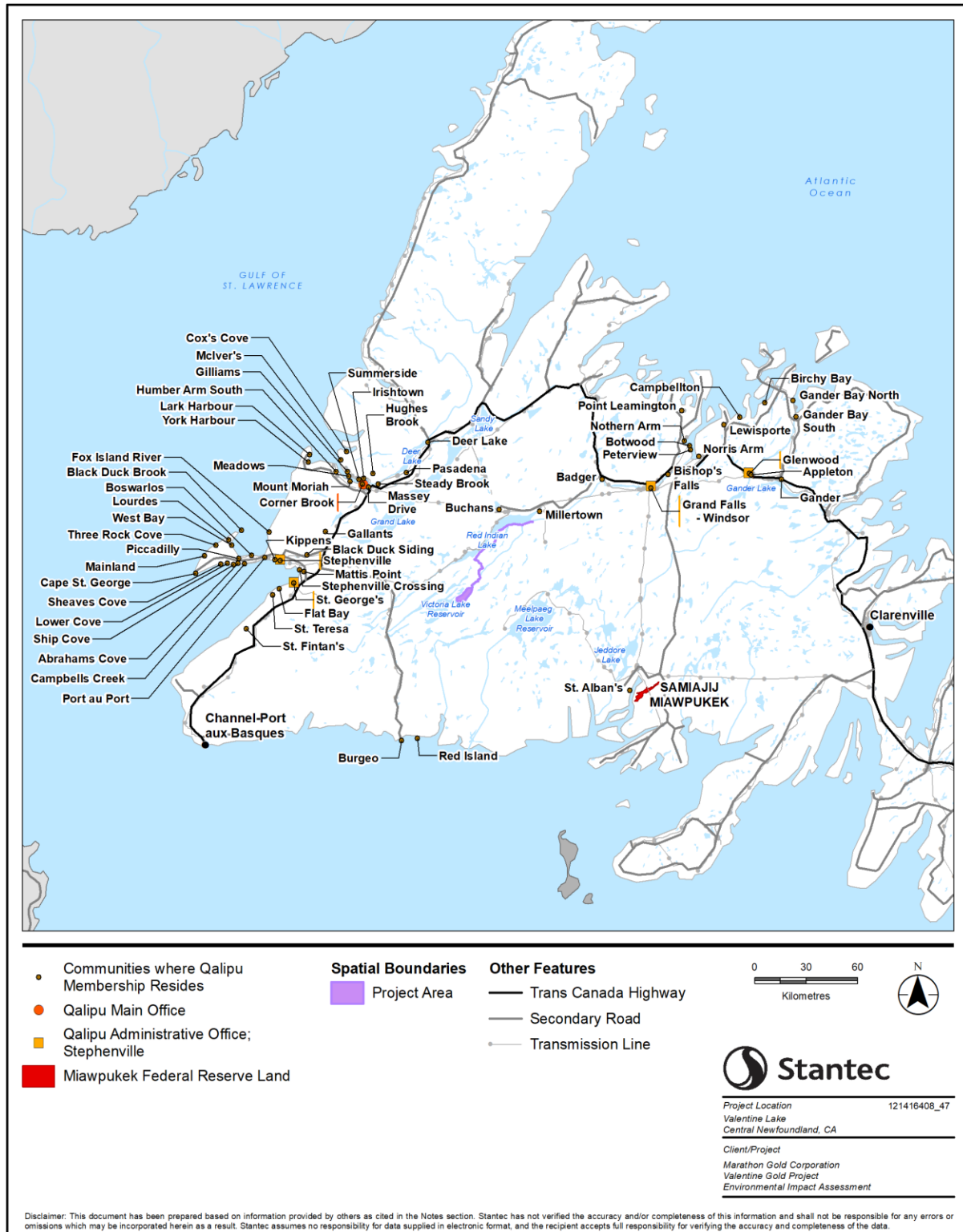


Figure 17-3 Location of Indigenous Groups



Indigenous Groups
September 2020

17.2.3.1 Health and Socio-Economic Conditions

The Miawpukek reserve is accessible year-round by road from the Trans-Canada Highway, as well as by water through the Bay d'Espoir fjord (Miawpukek n.d.). There are five departments managed by Miawpukek, including Conne River Health and Social Services (CRHSS), Education, Finance, Justice, and the Training and Economic Development Department (TEDD).

Health services have been provided to the community of Conne River since 1975 by the Miawpukek Band Government (CRHSS n.d.). CRHSS provides community health services, including clinical nursing services, a wellness centre, youth centre, nutrition centre, ambulance services, and on-call nurses (CRHSS n.d.). CRHSS delivers a range of community-based programs, including health promotion, health protection, continuing care, social work, childcare, mental health, and addictions counselling (CRHSS n.d.). A weekly nutritional supplement program for community members is provided through CRHSS to ensure community members assessed as being deficient with their nutritional intake receive one nutritious meal six days a week (CRHSS n.d.). The nutrition program is funded through the CRHSS Health Transfer Agreement (CRHSS n.d.). There is a volunteer fire department provided under the Conne River Health and Social Services Centre (MFN 2020).

The Education department is owned and operated by Miawpukek Mi'kmaw Mawi'omi of Conne River (Miawpukek n.d.). In 2017, Miawpukek opened a new school in the community, accommodating 240 students from pre-kindergarten to grade 12. The new school is located near the Powwow grounds, a salmon river and the forest, allowing students an opportunity to learn about their culture (MFN 2020). The school also includes a dental office and daycare centre (BP 2018). The Finance department is responsible for maintaining a system of internal accounting and administrative controls as well as managing financial records for the Miawpukek Band including its responsibilities for financial reporting (Miawpukek n.d.). The Justice department enforces Miawpukek First Nation by-laws, including the zoning bylaw which came into effect on August 13, 2015 (Miawpukek n.d.).

TEDD has four divisions managed by the administration division, including: post-secondary student support program (PSSSP); business; tourism, cultural and recreation; and career counselling (Miawpukek n.d.). The PSSSP, along with the Indigenous Skills and Employment Training Program, provides access to skills training and employment assistance to community members to gain access to postsecondary education to meet long term career goals (Miawpukek n.d.). TEDD's business division is responsible for managing community owned businesses. There are many Miawpukek owned and operated small businesses, such as Christmas tree farms, hunting camps and small fisheries, and the Miawpukek Gas Bar and Convenience Store (BP 2018). The community has also partnered with several outside communities and corporations in tourism and aquaculture ventures (INAC 2012). The tourism, culture, and recreation division is responsible for hosting the annual Powwow, as well as operating a number of cultural based operations such as Micmac Crafts and Jipuijij'kuei Kuespem Nature Park. Jipuijij'kuei Kuespem Nature Park provides camping, kayak / canoe rentals, walking trails, and float plane charters. Career counselling is provided to community members to learn about, and actively engage in the required steps associated with the career planning process.

Following establishment as a reserve in 1987, Miawpukek has become a self-proclaimed strong, vibrant community with nearly 100% full / part-time employment (Miawpukek n.d.). Members are employed in



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

various roles such as nurses, educators, trades people, business people, lawyers, and care givers (Joe 2007). Construction within the reserve is carried out by qualified Miawpukek members (Joe 2007).

A joint association between Miawpukek and Qalipu, the Mi'kmaq Alsumk Mowimsikik Koqoey Association (MAMKA), holds offshore communal commercial fishing licenses for different fish and marine species (BP 2018). Communal commercial licences are issued by DFO to an Indigenous group to carry out fishing and related activities. Miawpukek holds communal commercial licenses for a variety of species in the offshore area of the Island of Newfoundland including species such as groundfish, capelin, herring, mackerel, snow crab, squid, swordfish, scallop, select tuna species, and seal (BP 2018). Netukulimk Fisheries Ltd. is a fishery operation operated by Miawpukek which was initiated in 1999 when a crab licence was first obtained. The communal fishing licence is available to members to harvest for community consumption and to provide to members with disabilities (MFN 2020).

Public information on the current health conditions of the Miawpukek is unavailable. However, in 2014 a First Nations Food, Nutrition and Environment Study (FNFNES) was undertaken with eleven First Nations communities in New Brunswick, Nova Scotia, and the Island of Newfoundland participating, including Miawpukek. The FNFNES study describes the overall results and does not report on each community individually. In the study, participants were asked a series of health-related questions to understand the relationship between diet, lifestyle and health risks (Chan et al. 2017). Participants were asked to report on body mass index, obesity, diabetes, smoking, physical activity, and self-perceived health. With regard to self-perceived health, 30% of participants reported 'very good' or 'excellent', 38% reported health as 'good' and older adults (51+) were most likely to report 'fair' or 'poor' health (Chan et al. 2017). Obesity was identified as a concern and is a major risk factor for diabetes and heart disease. Twenty percent of the participants in the FNFNES study reported having been told by a health care provider that they had diabetes. Adults aged 40 and over were four times more likely to report having diabetes than younger adults. Half of First Nations adults in the FNFNES study reported that they smoked. This rate is more than double the rate reported on the Island (19.5%) (Chan et al. 2017). Miawpukek has indicated that these results related to health from the FNFNES are representative of current conditions on reserve (MFN 2020). Miawpukek has seen a decline in recent years in the number of diabetics due to the use of modern medicine, educational awareness and improved nutrition (MFN 2020). In addition to diabetes and heart disease, cancer was noted as an increasing health concern for the Miawpukek (MFN 2020).

In the FNFNES, over half (62%) of the households reported participating in traditional harvesting and gathering activities in the year preceding the interview. Almost half of the households reported fishing (49%), while 34% hunted, 26% collected wild plants, 21% collected seafood and 15% had a garden. While 15% reported gardening, 36% of the First Nations adults in the FNFNES study reported eating vegetables from a family or community garden. (Chan et al. 2017). More than three-quarters of adults (83%) reported eating traditional food in the year preceding the interview. Over 100 different traditional foods were harvested during the year, with the types varying across communities (Chan et al. 2017). In the FNFNES study, approximately 62% of participants reported harvesting for traditional food, of which approximately 26% are wild plants (Chan et al. 2017). The top barriers that have been reported by the participants were lack of time, knowledge, equipment or transportation, and the availability of the country foods (Chan et al. 2017).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Harvesting efforts are undertaken by a majority of on-reserve Miawpukek members. Approximately 75% participate in hunting activities, 60% participate in fishing activities and 60% participate in gardening (MFN 2020). In recent years, Miawpukek has seen an increase in traditional harvesting activity due in part to the increase in grocery costs (MFN 2020). A community garden was developed on reserve which is supported by community volunteers (MFN 2020). The garden grows potatoes, carrots, turnips, and cabbage, which were the crops requested by community members (MFN 2020).

17.2.3.2 Physical and Cultural Heritage

According to traditional oral history, the Miawpukek reserve was established in 1870 and was one of many semi-permanent camping sites used by their people travelling throughout the Mi'kmaq Domain of Newfoundland, Labrador, Quebec, New Brunswick, Nova Scotia, Prince Edward Island and Maine (Miawpukek n.d.). Miawpukek ancestries include Mi'kmaq, Innu, Abenaki, and European lines (Miawpukek n.d.). Land located in Conne River was set aside as a Colonial Reserve by Governor William McGregor in 1872 (Joe 2007). General physical and cultural heritage information related to the Mi'kmaq on the Island of Newfoundland is provided in Section 17.2.2.

17.2.3.3 Current Use of Lands and Resources for Traditional Purposes

Miawpukek harvest resources from the land and sea throughout extensive areas on the Island of Newfoundland following the principle of Netukulimk (MFN 2020). 'Netukulimk' is the use of resources to support the nutrition and economic well-being of an individual and community without jeopardizing the integrity, diversity, or productivity of the environment (UINR n.d.). Commonly consumed traditional foods by Miawpukek members include moose, caribou, beaver, rabbits, muskrats, grouse, geese, ducks, blueberry, raspberries, Newfoundland tea berries, partridge berries, and bakeapples (MFN 2020). Miawpukek has noted that, while in the past its members harvested for traditional purposes in the area in which the Project is located, use of land and resources in this area has declined in recent years (MFN 2020). Species that were harvested in the past by members of Miawpukek are present in the area in which the Project is located. Additional details on harvesting activities related to fishing, hunting and trapping, gathering and harvesting, and travel ways is provided in the following sections.

Fishing

Information on subsistence and recreational fishing activities within the LAA by Miawpukek is not publicly available. The most frequently consumed fish by Miawpukek include cod, American eel, redfish, herring, lobster, caplin, and squid (MFN 2020). The Miawpukek had a communal salmon licence, however have not harvested salmon for approximately 25 years due to concerns for the salmon population. Salmon were historically a staple and predictable food source and remain important for the Miawpukek; however, to conserve the salmon populations, salmon is now generally reserved for special occasions such as feasts, powwows, and other celebrations where the serving of a large fish like salmon is preferred (MFN 2020; Denny and Fanning 2016). There is little to no waste when salmon are harvested, and unusable parts would be buried so that the spirit and body of the salmon would be recycled. 'Netukulimk' continues to be the guiding principle to harvesting salmon (MFN 2020; Denny and Fanning 2016). Brook trout and landlocked Atlantic salmon are present within the Project Area / LAA (Fish and Fish Habitat – Chapter 8);



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

however, harvesting by the Miawpukek within the area in which the Project is located has declined in recent years.

Hunting and Trapping

Information on hunting and trapping activities within the LAA by the Miawpukek is not publicly available. Species typically harvested by Miawpukek include caribou, moose, partridge, beaver, rabbits, muskrats, and snowshoe hare (MFN 2020). A community hunt for moose occurs annually in Terra Nova, with moose provided first to elders, persons with disabilities, single parents and then community members. Caribou, moose, bear, small game, numerous waterfowl species, and snowshoe hare are present within the LAA (Other Wildlife – Chapter 12); however harvesting efforts by the Miawpukek within the Project Area has declined in recent years. Historical trapping grounds were identified directly to the east of the mineral claim area (MFN 2020). Miawpukek have noted that the caribou are an important species for harvest, including in areas near the Project (Miawpukek pers. comm. 2019).

Harvesting and Gathering

Traditional activities by the Mi'kmaq also include harvesting and gathering. Miawpukek harvest plants that support medicinal activities, such as cherry bark (used to treat sore throats, coughs and colds), lily pad roots (used to treat tumours, ulcers, and inflamed skin) and alder (used in a variety of medicinal purposes including treatment of headaches and migraines) (MFN 2020). White pine is also harvested for a variety of purposes including its use in torches, shelter and canoes (MNF 2020). Wild berry species are present in the Project Area / LAA (Vegetation, Wetlands, Terrain and Soil – Chapter 9); however, harvesting efforts by the Miawpukek within the Project Area has declined in recent years.

Travel Ways

The area of the current Miawpukek reserve was a frequent camping spot used by the semi-nomadic First Nation (Michelin 2019). This area is located 113 km from the Project Area. Information respecting travel routes used by Miawpukek members within the Project Area is not publicly available.

17.2.4 Qalipu First Nation

In 1972, the FNI was formed and its primary goal was to obtain Mi'kmaq recognition and claim status under the federal *Indian Act* (Qalipu First Nation n.d.(a)). In 2008, the Government of Canada and FNI signed the Agreement for the Recognition of the Qalipu Mi'kmaq Indian Band to establish a landless band (INAC 2017). In 2011, Qalipu was registered as a band under the federal *Indian Act*.

Qalipu members live and work in 67 communities throughout Newfoundland and Labrador. Of the 67 communities, those nearest to the mine site (direct distance) include Buchans (49 km), Millertown (60 km), Pasadena (76 km), and Steady Brook (80 km). Approximately 11% of Qalipu members live in central NL (Qalipu pers. comm. 2020). Qalipu maintains satellite administrative offices in Glenwood, Grand Falls-Windsor, Stephenville, and St. George's, with a head office in Corner Brook (Figure 17-3) (Qalipu First Nation n.d.(a)). Qalipu currently has approximately 22,000 members (Qalipu First Nation n.d.(a)), and includes the nine Mi'kmaq bands formerly represented by the FNI: Benois Cove First Nation (now named



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Elmastogoeg); Corner Brook Indian Band; Flat Bay Indian Band; Gander Bay Indian Band; Glenwood Mi'kmaq First Nation; Port au Port Indian Band; Exploits Indian Band; St. George's Indian Band; and the Stephenville / Stephenville Crossing Band (now Indian Head First Nations).

17.2.4.1 Health and Socio-Economic Conditions

Qalipu members live in communities throughout Newfoundland and Labrador which are occupied by Indigenous and non-Indigenous people, and therefore, use the infrastructure and services provided in these communities. Community members access services and programs, including health and educational services, provided by municipal and provincial agencies, private businesses, and service agencies in communities and regions where they reside (Qalipu First Nation n.d.(a)).

Qalipu members use the available health services within their communities, however, also are entitled to several non-insured health benefits from Indigenous Services Canada, such as the Medical Transportation Benefit and the Mental Health Counselling Benefit (Qalipu First Nation 2019). The Qalipu Health Department coordinates and oversees the administration of the federal non-insured health benefits to its membership. Qalipu members have identified health concerns such as chronic diseases including diabetes, mental health and addictions, and communicable diseases (BP 2018).

The Qalipu Development Corporation (QDC) leads economic and corporate development initiatives for the Qalipu (Qalipu First Nation n.d.(a)). The Qalipu have several wholly owned commercial enterprises including Mi'kmaq Commercial Fisheries Incorporated (MCF), Qalipu Management Services Incorporated, Qalipu Marine Holdings, and Qalipu Project Support Services Limited (Qalipu First Nation 2019). There are also business partnerships between the Qalipu and several construction firms including Marine Contractors Inc. Other business entities consist of the Qalipu Project Support Services, Qalipu Safety and Industrial Supply, and Eastern Door Logistics. In 2018-2019, the Band earned revenues of \$12.9 million and had total expenditures of \$12.7 million, resulting in a surplus of \$127,267 (Qalipu First Nation 2019).

The Qalipu are currently involved in several fishing enterprises, including one large commercial enterprise in coordination with MCF. The large commercial enterprise operates on a share-basis with MCF, which gathers a profit based on the monies earned from the vessels' catch (Qalipu First Nation, MAMKA, and Mi'kmaq Commercial Fisheries 2017). MCF also administers seven other small inshore fisheries, two of which are enterprises by the Qalipu. MAMKA, a joint association between Miawpukek and Qalipu, administers five inshore fishing enterprises for various fish and marine species (Qalipu First Nation, MAMKA, and Mi'kmaq Commercial Fisheries 2017). Other inshore enterprises are designated to individuals who pay an annual administration fee proportional to the number of licenses included in the enterprise (Qalipu First Nation, MAMKA, and Mi'kmaq Commercial Fisheries 2017). These fishery enterprises are located through western and central areas of the Island (Qalipu First Nation, MAMKA, and Mi'kmaq Commercial Fisheries 2017).

In addition to commercial fishing, Qalipu members harvest firewood, which makes up an important component of the subsistence economy. Items such as snowshoes, sleds, boats, axe handles, and baskets are crafted for sale (Emera Newfoundland and Labrador 2013).



Indigenous Groups
September 2020

The Qalipu First Nations Natural Resources Division (QNR) conducts research and monitoring on a number of species important to the community including the woodland caribou, arctic hare, American eel, glass eel, commercial eel, eelgrass, Atlantic salmon, European green crab, and the golden star tunicate (Qalipu First Nation n.d.(c)). QNR is part of a partnership with Miawpukek; this partnership (MAMKA), includes biological research, community / youth engagement, and research and monitoring of commercial activities (Qalipu First Nation n.d.(c)).

17.2.4.2 Physical and Cultural Heritage

The Qalipu are working to create teachings and new ceremonial ways, which integrate the core heritage values of the ancestral Mi'kmaq spirituality in the modern world (Qalipu First Nation n.d.(b)). A Culture and Heritage division has been developed for the preservation and promotion of culture, language, and traditions through involvement of youth and Elders in cultural activities within the Band. Information on physical and cultural heritage specific to Qalipu is not publicly available. General physical and cultural heritage information related to the Mi'kmaq on the Island of Newfoundland is provided in Section 17.2.2.

17.2.4.3 Current Use of Lands and Resources for Traditional Purposes

In 2002, the FNI published a Traditional Use Study as an attempt by the Mi'kmaq of the Island of Newfoundland outside of the Conne River Reserve (Miawpukek) to tell their story of the use of the land, sea, rivers, lakes and resources on the Island (FNI 2002). This study included members from what is now Qalipu First Nation. The Traditional Use Study describes the Mi'kmaq core use areas in western Newfoundland (Figure 17-4) and included several mentions of the Victoria Lake Reservoir area being visited by Mi'kmaq from the western Newfoundland area. Study participants identified land and resource use activities within the St. George's Bay / Port Au Port area of western Newfoundland, including Corner Brook and Stephenville, and extending to the Victoria Lake Reservoir area and the Project Area (Figure 17-4 and 17-5; FNI 2002).

An ATK Study was completed in 2020 by Qalipu to further Marathon's understanding of current use in central Newfoundland by the Qalipu. Survey topics included hunting moose, bear, caribou, and waterfowl, trapping furbearing animals, frequency of consumption of wild game, harvesting medicinal and food plants and berries as well as sacred Mi'kmaq sites. Twenty-two Qalipu members responded to the online survey. An Area of Interest (approximately a 10- to 20-km buffer of the Project Area; shown on Figure 3 of Appendix 17A) was identified in the area of the Project. A total of 466 points were placed on a map of central Newfoundland, illustrating areas of current use. As shown on Figure 3 of Appendix 17A (Qalipu 2020), of these 466 points, three were placed within the Area of Interest (0.64%) and zero were placed within the Project Area. Two of the three areas identified by the participants were related to trout harvesting (Figure 3.20 in Appendix 17A), while the third was related to ptarmigan harvesting (Figure 3.12 in Appendix 17A). No further information on the history of their activity in these areas were provided. Participants were asked if they actively participated in land use activities within the Area of Interest; all, except one participant, said no. The one participant indicated that they hunted moose and fished in the area.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

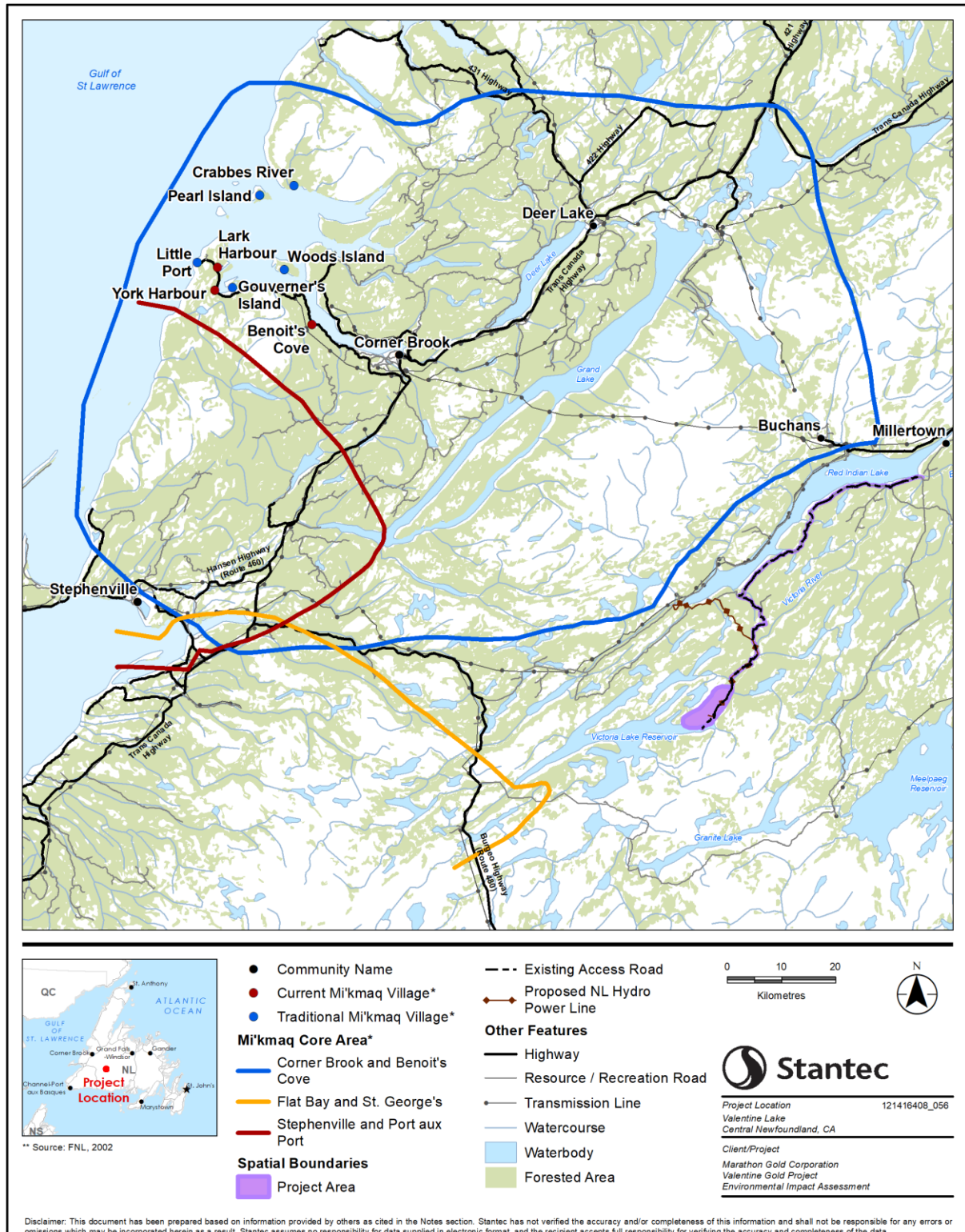


Figure 17-4 Mi'kmaq Core Use Areas in Western Newfoundland



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

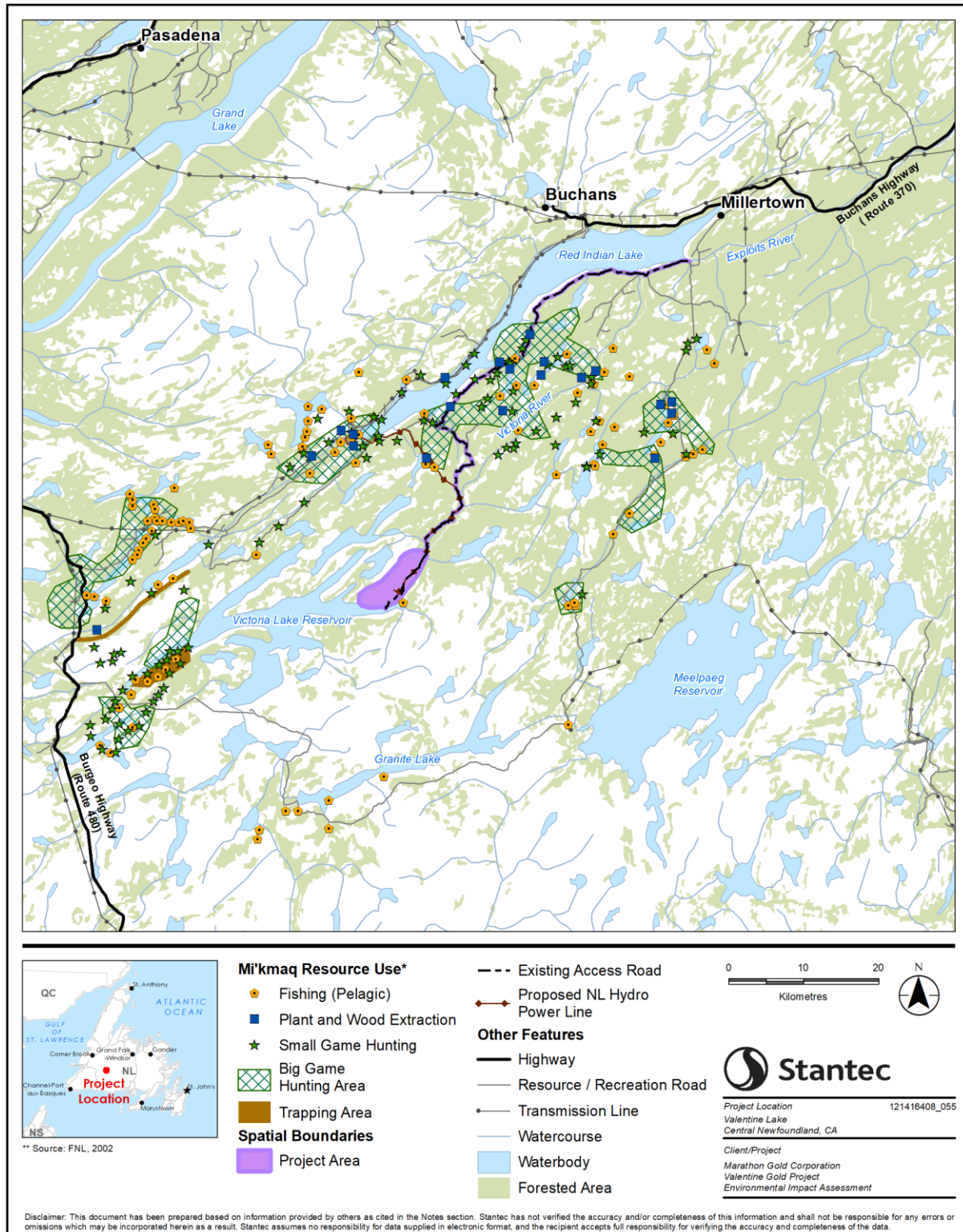


Figure 17-5 Mi'kmaq Land and Resource Use, Victoria Lake Reservoir Area



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

As noted in the ATK Study, 22 points were identified within 10 km of the Area of Interest, which included logging, wigwam, food plant, moose hunting, medicinal plants, harvesting ptarmigan / grouse, sacred areas, harvesting trout, Mi'kmaq village, wild berries harvesting, and harvesting waterfowl (Appendix 17A, Qalipu 2020). An additional 27 points were plotted within 25 km of the Area of Interest, which included a cabin, wigwam, harvesting caribou, logging, food plants, harvesting moose, medicinal plants, harvesting ptarmigan / grouse, harvesting rabbit, sacred area, harvesting salmon, specialty plants, harvesting trout, Mi'kmaq village, wild berries, and harvesting waterfowl. The majority of the points (70%) were plotted between 50 km to 100 km from the Area of Interest. Additional activities noted included bear hunting, burial sites, harvesting caribou, harvesting eel, farming, Elder overnights, medicinal fish and wildlife, spirits, specialty stones, harvesting trout, and trapping (Appendix 17A, Qalipu 2020). These points are shown in Figures 3.1 to 3.24 in Appendix 17A.

The ATK Study also identified the frequency in which participants consume wild game, ranging from never to every day or nearly every day. Species identified as being commonly consumed included moose meat, rabbit meat and trout, and to a lesser extent salmon and waterfowl (Qalipu 2020; Appendix 17A). Caribou meat and eel were noted as generally never being consumed or occasionally a few times a year.

Fishing

As noted above, trout harvesting was identified in the ATK Study as occurring in the Area of Interest, with another eight trout harvesting points plotted within 10 km of the Area of Interest (Figure 3.20 in Appendix 17A, Qalipu 2020). Also, as shown on Figure 17-5, fishing activity has been identified within the LAA in areas around Victoria Lake Reservoir, Red Indian Lake, and many of their associated tributaries. Fish typically harvested by the Mi'kmaq include Atlantic salmon, groundfish, pelagic fish and shellfish; seals are also harvested (Emera Newfoundland and Labrador 2013). Brook trout and landlocked Atlantic salmon are present within the LAA.

Hunting and Trapping

As discussed above, within 10 km of the Area of Interest, points were plotted for ptarmigan / grouse and waterfowl harvesting. Moose and rabbit harvesting were identified within 25 km of the Area of Interest, and caribou within 50 km of the Area of Interest (Figure 4.0 to 4.2 in Appendix 17A, Qalipu 2020). The Traditional Use Study indicates that trappers and hunters have noted trapping activities to the east and south of Red Indian Land, as well as near Victoria Lake Reservoir area for caribou migration in the fall (Figure 17-5; FNI 2002). Species typically harvested by the Qalipu include caribou, moose, partridge (ptarmigan) and snowshoe hare (Emera Newfoundland and Labrador 2013). Caribou, moose, bear, partridge, snowshoe hare and various waterfowl species are present within the LAA (Other Wildlife – Chapter 12).

Caribou have been identified as being of cultural importance to the Qalipu (Emera Newfoundland and Labrador 2013). The central interior of the Island of Newfoundland comprises the home range for a number of caribou herds, including the Buchans, Gaff Topsails, Grey River, and La Poile herds, that inhabit and migrate through the LAA and the Project Area (Caribou – Chapter 11). Caribou was identified as being harvested within 50 km from the Area of Interest (Figure 3.4 in Appendix 17A, Qalipu 2020).



Indigenous Groups
September 2020

Harvesting and Gathering

Harvesting firewood is a widespread activity amongst the Qalipu and makes up an important component of the subsistence economy of the Mi'kmaq. These harvests, for the most part, occur within a close distance of their communities. Specialty woods are gathered for making craft items, snowshoes, sleds, boats, axe handles, and baskets (Emera Newfoundland and Labrador 2013). Traditional plants with medicinal properties are harvested and used as preventive medicines and to treat injuries. Native plants still often used by the Qalipu include alder bush, balsam fir, bunchberry, cedar, coltsfoot, Labrador tea, yarrow, yellow birch, fireweed, and partridge berry (Qalipu First Nation n.d.(b)). Alder bush, balsam fir, bunchberry, Labrador tea, fireweed, and partridgeberry are present within the LAA (Vegetation, Wetlands, Terrain and Soil – Chapter 9). Food plants (Figure 3.7 in Appendix 17A), medicinal plants (Figure 3.9 in Appendix 17A) and wild berries (Figure 3.23 in Appendix 17A) were noted in the ATK Study as being harvested within 10 km of the Area of Interest (Qalipu 2020). Berries are harvested as a family activity, with blueberry picking occurring along the west coast, and partridge berry picking farther inland (FNI 2002).

Travel Ways

Rivers and waterways are important for travel, resource use, communal and spiritual activities, and recreation (Emera Newfoundland and Labrador 2013). Trappers, hunters, and gatherers who travel to the highlands, or far from home use tilts, tents, and lean-tos as overnight shelter (Emera Newfoundland and Labrador 2013). As in other areas on the Island of Newfoundland, major rivers, and their tributaries and valleys, become traditional routes for canoe and walking trails and, more recently, snowmobile and all-terrain vehicle routes. Several travel routes on the Island are important to the Qalipu. The use of King George IV Lake was noted as a walking route and, upon arriving at King George IV Lake, canoes were used to travel north, east, or south along a series of waterways (FNI 2002). This route is still used in the winter with snowmobiles and in the summer and autumn as walking routes (FNI 2002). Cabins and campsites were noted around Victoria Lake Reservoir in the 2002 study (FNI 2002).

17.3 ASSESSMENT CRITERIA AND METHODS

This section describes the criteria and methods used to assess environmental effects on Indigenous groups. Residual environmental effects (Section 17.5) are assessed and characterized using criteria defined in Section 17.3.1, including direction, magnitude, geographic extent, timing, frequency, duration, reversibility, and ecological or socio-economic context. The assessment also evaluates the significance of residual effects using threshold criteria or standards beyond which a residual environmental effect is considered significant. The definition of a significant effect for Indigenous groups is provided in Section 17.3.2. Section 17.3.3 identifies the environmental effects to be assessed for Indigenous groups, including effect pathways and measurable parameters. This is followed by the identification of potential Project interactions with this VC (Section 17.3.4). Analytical assessment techniques used for the assessment of Indigenous groups are provided in Section 17.3.5.



17.3.1 Residual Effects Characterization

Table 17.1 presents definitions for the characterization of residual environmental effects on Indigenous groups. The criteria are used to describe the potential residual effects that remain after mitigation measures have been implemented. Quantitative measures have been developed, where possible, to characterize residual effects. Qualitative considerations are used where quantitative measurement is not possible.

Table 17.1 Characterization of Residual Effects on Indigenous Groups

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	<p>Neutral – no net change in measurable parameters to Indigenous groups relative to baseline</p> <p>Positive – a residual effect that moves measurable parameters in a direction beneficial to Indigenous groups relative to baseline</p> <p>Adverse – a residual effect that moves measurable parameters in a direction detrimental to Indigenous groups relative to baseline</p>
Magnitude	The degree of change for each residual effect	<p>Indigenous Health Conditions</p> <p>Negligible – No measurable change from existing conditions to Indigenous health conditions and Project-related environmental exposures are less than the target benchmarks established by a recognized health organization</p> <p>Low – Measurable change from existing conditions, however, is below environmental and/or regulatory criteria, and Project-related environmental exposures marginally exceed target benchmarks established by a recognized health organization</p> <p>Moderate – A measurable change from existing conditions that exceeds the target benchmarks established by a recognized health organization and/or may result in a long-term, substantive change in human health</p> <p>High – A measurable change from existing conditions that exceeds the target benchmarks established by a recognized health organization and/or is likely to result in long-term, substantive change in human health</p>
		<p>Indigenous Socio-Economic Conditions</p> <p>Negligible – No measurable change in land or resource use capacity; use or access to, or interference with infrastructure; and/or baseline levels of local employment, goods and services, and economic activity</p> <p>Low – Means:</p> <ul style="list-style-type: none"> • Land and resource use and capacity can take place at or near similar levels as baseline • Capacity of community services and infrastructure will be at or near to existing conditions • A measurable change in employment and economy, however, residual effect cannot be distinguished from existing conditions within normal range of variability



Table 17.1 Characterization of Residual Effects on Indigenous Groups

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
		<p>Moderate – Means:</p> <ul style="list-style-type: none"> • Baseline land, resource use and capacity conditions can continue to occur with some reductions or restrictions • Demand for community services and infrastructure approaches current capacity, standard or threshold, however, will not result in a reduction in standards of service • Measurable change, however, not likely to pose a serious risk or benefit to employment and economy <p>High – Means:</p> <ul style="list-style-type: none"> • Baseline land, resource use and capacity conditions cannot take place at similar levels as under baseline conditions • Demand for community services and infrastructure exceeds current capacity, standard or thresholds that result in a reduction in standards of service • Measurable change that is likely to pose a serious risk or benefit to employment and economy <hr/> <p>Current Use and Physical and Cultural Heritage</p> <p>Negligible – no measurable change to availability and access to resources, culturally important sites, or the cultural value of sites currently used for traditional purposes</p> <p>Low – the residual effect will not reduce the ability to access or use resources and sites for traditional purposes. Current use is able to continue at current levels, with minor alteration of behavior required to continue current traditional practices</p> <p>Moderate – the residual effect will reduce the ability to access or use resources and sites for traditional purposes. Current use is able to continue at a reduced level or with some restrictions on current practice and some alteration of behavior to continue current use and traditional practices</p> <p>High – the residual effect will substantially diminish or remove the ability to access or use resources and sites for traditional purposes or substantially increase the difficulty and or travel distance to conduct traditional practices. Current use cannot continue or cannot continue without substantial changes to current practices and substantial restriction on ability to engage in current practice and use</p>
Geographic Extent	The geographic area in which a residual effect occurs	<p>Project Area – residual effects are restricted to the Project Area</p> <p>LAA – residual effects extend into the LAA</p> <p>RAA – residual effects interact with those of other projects in the RAA</p>



Table 17.1 Characterization of Residual Effects on Indigenous Groups

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Timing	Considers when the residual environmental effect is expected to occur. Timing considerations are noted in the evaluation of the residual environmental effect, where applicable or relevant.	Not Applicable – seasonal aspects are unlikely to affect Indigenous groups Applicable – seasonal aspects may affect Indigenous groups
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	Single event – effects occur once Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Duration	The period of time required until the measurable parameter or the VC returns to its existing (baseline) condition, or the residual effect can no longer be measured or otherwise perceived	Short-term – residual effect restricted to no more than the duration of the construction phase (18 to 24 months) or decommissioning, rehabilitation and closure phase Medium-term – residual effect extends through the operation phase (12 years) Long-term – residual effect extends beyond the operation phase (greater than 12 years) Permanent - recovery to baseline conditions unlikely
Reversibility	Describes whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	Reversible – the residual effect is likely to be reversed after activity completion and rehabilitation Irreversible – the residual effect is unlikely to be reversed
Ecological and Socio-economic Context	Existing condition and trends in the area where residual effects occur	Undisturbed – area is relatively undisturbed or not adversely affected by human activity Disturbed – area has been substantially previously disturbed by human development or human development is still present Resilient – VC is able to assimilate the additional change Not Resilient – VC is not able to assimilate the additional change because of having little tolerance to imposed stresses due to fragility or near a threshold

17.3.2 Significance Definition

Under CEAA 2012, there is a requirement to make a determination of significance for residual environmental effects on Indigenous groups. The lack of laws, policies, management plans or standard industry practice regarding thresholds for effects on the factors that may affect Indigenous groups makes selecting and applying significance thresholds challenging. The subjective nature of describing and understanding the importance of effects on Indigenous health, Indigenous socio-economic conditions, current use, and Indigenous physical and cultural heritage means that selected thresholds might not evenly apply across Indigenous groups and circumstances. Indigenous groups themselves may have



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

differing views on the meaning of significance that reflect oral history traditions and holistic understandings of natural phenomena.

In consideration of the descriptors listed in Table 17.1, the following threshold has been established to define a significant adverse residual environmental effect on Indigenous groups.

For the purposes of this effects assessment, a significant adverse residual effect on Indigenous groups is defined as a Project-related environmental effect that results in one or more of the following:

- Long-term loss of traditional use resources or access to lands relied on for current use practices or current use sites and areas, such that current use is critically reduced or eliminated from the LAA. This could also include substantial disruption to current use activities and practices where biological resources, or physical sites may not be significantly affected in the LAA
- Adverse effects on socio-economic conditions of affected Indigenous groups, such that there are associated detectable and sustained decreases in the quality of life of a community, including for subpopulations within a community, as applicable
- A reduction in the quality of air, water, country foods, or sound at levels predicted to result in exposures that are higher than the health-based guidelines established by regulatory organizations, and are likely to result in a substantive change in human health

17.3.3 Potential Effects, Pathways and Measurable Parameters

The selection of effects included in the assessment for Indigenous groups was based on the Federal EIS Guidelines (Appendix 1A), potential Project interactions, and key issues and concerns identified during the engagement process. It is anticipated that the Project could result in associated effects to Indigenous health through changes in air quality, noise, water quality, and country foods. There is also potential for health and socio-economic effects to Indigenous peoples through lack of availability and/or access to country foods to harvest, or effects to the perceived quality of country foods. Project activities may result in the disruption to physical and cultural heritage from the loss of or change in access to heritage sites and traditional cultural and spiritual sites and areas due to the changes in the environment as a result of the Project. Project activities may not be compatible with current use activities occurring in the area and may result in loss of access to areas currently used for hunting, trapping, fishing and/or gathering. Adverse effects on current use could indirectly lead to changes in health, socio-economic, and well-being conditions or cultural heritage of affected Indigenous groups.

The assessment of Project-related effects on Indigenous groups therefore focuses on the following potential effects:

- Change in current use
- Change in Indigenous health conditions
- Change in Indigenous socio-economic conditions
- Change in physical and cultural heritage



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

These potential effects are the primary potential outcomes which may result from the possible interaction of Project components and activities with Indigenous land and resource use activities that occur within the Project area or the LAA.

Effect pathways and measurable parameters used in the assessment of these effects is provided in Table 17.2. Measurable parameters are qualitative or quantitative measurements of potential Project effects and provide means to characterize potential effects to Indigenous groups. Measurable parameters used in qualitative analyses are defined in the absence of metrics or standards to support quantitative analyses.

Table 17.2 Potential Effects, Effect Pathways and Measurable Parameters for Indigenous Groups

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in Current Use	<ul style="list-style-type: none"> • Project activities causing a change in quantity, quality, and/or availability of harvested species • Project activities altering or restricting access to current use resources or areas • Disturbance of cultural or spiritual sites or areas from Project activities 	<ul style="list-style-type: none"> • Area (ha) of Crown lands taken up by the Project • Change in access to harvesting areas or navigable waters (qualitative) • Change in quantity, quality, or availability of resources and habitat (e.g., mortality or change in migration pattern of culturally significant species) (qualitative) • Change in fishing, hunting or trapping activities (qualitative) • Loss or alteration of trails and travel ways (qualitative) • Loss or alteration of current use harvesting, habitation, and cultural or sacred sites and areas (qualitative) • Indirect effects on the experience of Indigenous peoples which adversely alter the perceived value and cultural importance of current use lands and resources (qualitative)
Change in Indigenous Health Conditions	<ul style="list-style-type: none"> • Project activities causing a change in access to and availability of country foods to harvest • Emissions and discharges from the Project resulting in air, sound, and, water, quality changes, which could affect the health of Indigenous groups through direct exposure (e.g., inhalation of air) and indirect exposure (e.g., ingestion of contaminated food) to contaminants • A reduction in the value and perceived quality of country foods 	<ul style="list-style-type: none"> • Change in hunting, trapping or plant harvesting activities (qualitative) • Concentrations ($\mu\text{g}/\text{m}^3$ in air, $\mu\text{g}/\text{L}$ in water) or levels (dBA, %highly annoyed for sound)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Table 17.2 Potential Effects, Effect Pathways and Measurable Parameters for Indigenous Groups

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in Indigenous Socio-Economic Conditions	<ul style="list-style-type: none"> • Project activities causing a change in revenue for a community, through: <ul style="list-style-type: none"> – a change in physical access restrictions – a change in species distribution and abundance – creation of sensory disturbance effects (i.e., noise, dust, visual) which can influence the quality of experience (e.g., tourism) – creation of competition from other industries or commercial harvest • Project workforce may increase demand for services that Indigenous peoples use, including fire and police, health • Project-related construction and operation may increase traffic on roadways • Project-related employment and income 	<ul style="list-style-type: none"> • Area (ha) of Crown lands taken up by the Project • Change in commercial hunting or trapping activities (qualitative) • Change in community revenues (qualitative) • Loss of food sources (qualitative) • Sensory disturbance to resource users due to change in sound levels (dBA) and air quality ($\mu\text{g}/\text{m}^3$ of particulate matter) • Perceived quality of life and well-being (qualitative) • Project employment estimates (local and non-local workers)
Change to Physical and Cultural Heritage	<ul style="list-style-type: none"> • Project activities causing loss or disturbance to site contents and site contexts through ground disturbance vehicle traffic and use of workspaces during construction activities • Change to values or attributes of cultural and spiritual landscapes or areas that make it important • Indirect effects (i.e., sensory disturbances) on the experience of Indigenous peoples which adversely alter the perceived values of current use sites or areas 	<ul style="list-style-type: none"> • Change to the number or condition of heritage sites • Change to traditional cultural and spiritual landscapes or areas (qualitative) • Note: The experience of Indigenous peoples on the land, cultural identity, opportunities for intergenerational knowledge transmission, and spiritual connections represent intangible values, which are largely subjective and conditional, reflecting beliefs, perceptions, values, and qualitative experience. Given the complexities involved, it is not possible to establish meaningful and applicable measurable parameters or assess intangible values to current assessment conventions. Effects on intangible values, however, are discussed narratively and considered in assessment conclusions.



Indigenous Groups
September 2020

17.3.4 Project Interactions with Indigenous Groups

Table 17.3 identifies, for each potential effect, the physical activities that might interact with the VC and result in the identified environmental effect. These interactions are indicated by checkmark and are discussed in detail in Section 17.5, in the context of effect pathways, standard and Project-specific mitigation / enhancement, and residual effects. Justification where no interaction and, therefore, no resulting effect is predicted is provided following the table.

Table 17.3 Project-Environment Interactions with Indigenous Groups

Physical Activities	Environmental Effects to be Assessed			
	Change in Current Use	Change in Health Conditions	Change in Socio-economic Conditions	Change in Physical and Cultural Heritage
CONSTRUCTION				
Access Road Upgrade / Realignment: Where required, road widening and replacement / upgrades of roads and culverts.	✓	✓	✓	✓
Construction related Transportation along Access Road	✓	✓	✓	✓
Mine Site Preparation and Earthworks: Clearing and cutting of vegetation and removal of organic materials, development of roads and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials, and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels. Also includes temporary surface water and groundwater management, and the presence of people and equipment on site.	✓	✓	✓	✓
Construction / Installation of Infrastructure and Equipment: placement of concrete foundations, and construction of buildings and infrastructure as required for the Project. Also includes: <ul style="list-style-type: none"> • Installation of water control structures (including earthworks) • Installation and commissioning of utilities on-site • Presence of people and equipment on-site 	✓	✓	✓	–
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge and hazardous and non-hazardous wastes.	✓	✓	✓	✓
Employment and Expenditures^B	–	–	✓	–
OPERATION				
Access Road Maintenance: includes periodic road surface repair, snow clearing and dust control activities.	✓	✓	✓	–



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Table 17.3 Project-Environment Interactions with Indigenous Groups

Physical Activities	Environmental Effects to be Assessed			
	Change in Current Use	Change in Health Conditions	Change in Socio-economic Conditions	Change in Physical and Cultural Heritage
Operation-related Transportation Along Access Road	✓	✓	✓	✓
Open Pit Mining: Blasting, excavation and haulage of rock from the open pits using conventional mining equipment.	–	–	–	–
Topsoil, Overburden and Rock Management: Five types of piles: <ul style="list-style-type: none"> • Topsoil • Overburden • Waste rock • Low-grade ore • High-grade ore Rock excavated from the open pits that will not be processed for gold will be used as engineered fill for site development, maintenance and rehabilitation, or will be deposited in waste rock piles.	✓	✓	✓	✓
Ore Milling and Processing: Ore extracted from the open pits will be moved to the processing area where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes.	–	–	–	–
Tailings Management Facility: Following treating tails via cyanide destruction, tailings will be thickened and pumped to an engineered TMF in years 1 to 9, then pumped to the exhausted Leprechaun open pit in years 10 through 12.	–	–	–	–
Water Management (Intake, Use, Collection and Release): Recirculated process water and TMF decant water will serve as main process water supply, and raw water (for purposes requiring clean water) will be obtained from Victoria Lake Reservoir. Site contact water and process effluent will be managed on site and treated prior to discharge to the environment. Where practicable, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent practicable for use on site.	–	✓	–	–



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Table 17.3 Project-Environment Interactions with Indigenous Groups

Physical Activities	Environmental Effects to be Assessed			
	Change in Current Use	Change in Health Conditions	Change in Socio-economic Conditions	Change in Physical and Cultural Heritage
Utilities, Infrastructure and Other Facilities: <ul style="list-style-type: none"> • Accommodation camp and site buildings operation, including vehicle maintenance facilities • Explosives storage and mixing • Site road maintenance and site snow clearing • Access road maintenance and snow clearing • Power and telecom supply • Fuel supply 	–	–	–	–
Emissions, Discharges and Wastes^A: Noise, air emissions / greenhouse gases, water discharge and hazardous and non-hazardous wastes.	✓	✓	✓	✓
Employment and Expenditure^B	–	–	✓	–
DECOMMISSIONING, REHABILITATION AND CLOSURE				
Decommissioning of Mine Features and Infrastructure	–	–	–	–
Decommissioning, Rehabilitation and Closure-related Transportation Along Access Road	✓	✓	✓	✓
Progressive Rehabilitation: Rehabilitating infrastructure or areas not required for ongoing operation (e.g., buildings, roads, laydown areas); covering and revegetating completed tailings areas, where practicable, including commencing closure of TMF beginning in Year 9 (when tailings deposition moves to Leprechaun open pit); erosion stabilization and re-vegetation of completed overburden and/or waste rock piles; infilling or flooding of exhausted mining areas; and completing revegetation studies and trials.	–	–	–	–
Closure Rehabilitation: Active rehabilitation based on successes of progressive rehabilitation activities. Includes: demolishing infrastructure (e.g., buildings, equipment, facilities, roads, laydown areas); grading and revegetating cleared areas, where practicable; breaching and regrading ponds to reestablish drainage patterns; completing closure of TMF (covering with overburden and revegetating); erosion stabilization and revegetation of completed overburden and/or waste rock piles; and infilling or flooding of open pits.	–	–	–	–
Post-Closure: Long-term monitoring	✓	✓	✓	✓



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Table 17.3 Project-Environment Interactions with Indigenous Groups

Physical Activities	Environmental Effects to be Assessed			
	Change in Current Use	Change in Health Conditions	Change in Socio-economic Conditions	Change in Physical and Cultural Heritage
Emissions, Discharges and Wastes^A	✓	✓	✓	✓
Employment and Expenditure^B	–	–	✓	–
Notes: ✓ = Potential interaction – = No interaction ^A Emissions, Discharges, and Wastes (e.g., air, waste, noise, light, liquid, and solid effluents) are generated by many Project activities. Rather than acknowledging this by placing a checkmark against each of these activities, “Wastes and Emissions” is an additional component under each Project phase ^B Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a checkmark against each of these activities, “Employment and Expenditures” is an additional component under each Project phase				

All Project activities during construction are anticipated to interact with Indigenous health, socio-economic conditions, current use, physical and cultural heritage (Table 17.3). During operation, additional loss of access to land or resources (i.e., through loss of natural habitats within the Project footprint) beyond those primarily incurred during mine construction are not anticipated; therefore, interactions with Indigenous groups with Project activities during operation are primarily associated with Emissions, Discharges and Wastes (i.e., noise and air emissions), as well as the development of waste rock piles, ore and overburden stockpiles (visual effects), Project-related traffic along the existing access road, and road maintenance. Similarly, during Project decommissioning, there will be no new residual effects on loss of area or access. Interactions during decommissioning are associated with Emissions, Discharges and Wastes, as well as the rehabilitation of land for the end users post-closure. Therefore, the following activities or components are not anticipated to interact with Indigenous groups for the purpose of the effects assessment:

- While access to the site will be restricted throughout the life of the Project, the operation of the Open Pit Mine and Processing facilities will not create additional restrictions for Indigenous groups beyond those realized during mine construction
- Tailings management will not affect Indigenous groups once operational as there will be no further restriction on land and resource use beyond those realized during mine construction. Operational discharges associated with water and tailings management is discussed under Emissions, Discharges and Wastes
- Utilities, Infrastructure and Other Facilities will not affect Indigenous groups during operation because they will not create additional restrictions beyond those realized during mine construction



17.3.5 Analytical Assessment Techniques

The Miawpukek reserve is located 113 km from the mine site. Qalipu members reside within 67 communities across the Island of Newfoundland. The nearest community where Qalipu members reside is Buchans, 49 km to the mine site in a direct line. The Project Area does not overlap reserve lands. Potential environmental effects on these Indigenous groups were determined based on Project engagement activities, and literature review, results of linked VCs, and previous project experience. An ATK Study was completed by Qalipu (2020) with support from Marathon and results integrated into this assessment. Feedback received after filing will be reviewed in the context of the EIS and integrated into Project planning and regulatory reporting, as applicable.

The Indigenous Groups VC assessment is an integrated assessment of current use, Indigenous health, Indigenous socio-economic conditions, and Indigenous physical and cultural heritage. This assessment considers the conclusions of the assessments of related biophysical and socio-economic VCs, including Atmospheric Environment, Community Health, Land and Resource Use, Community Services and Infrastructure, Employment and Economy, and Historic Resources. Other VC assessments, therefore, provide additional relevant information regarding effects on resources, and aspects of the biophysical and socio-economic environment that may affect Indigenous groups.

A conservative approach was used to address uncertainty in the environmental effects assessment, which increases confidence in the final determination of significance by reducing the risk of understating Project effects. The prediction confidence of the assessment for Indigenous groups (Section 17.7) incorporates these assumptions and other elements that contribute to the conservative approach.

17.4 MITIGATION AND MANAGEMENT PLANS

A series of environmental management plans will be developed by Marathon to mitigate the effects of Project development on the environment. A full list of mitigation measures to be applied throughout Project construction, operation and decommissioning, rehabilitation and closure is provided in Section 2.7.4. Project planning and design and the application of proven mitigation measures will be used to reduce adverse effects to Indigenous groups. Mitigation measures to reduce potential effects on Indigenous groups are provided in Table 17.4. Mitigation measures identified in other VCs will also reduce the potential effects on Indigenous groups (Chapter 5 – Atmospheric Environment; Chapter 7 – Surface Water Resources; Chapter 8 – Fish and Fish Habitat; Chapter 9 – Vegetation, Landforms, Soil and Wetlands; Chapter 10 – Avifauna; Chapter 11 – Caribou; Chapter 12 – Other Wildlife); Community Services (Chapter 13); Community Health (Chapter 14); Employment and Economy (Chapter 15); and Land and Resource Use (Chapter 16).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Table 17.4 Mitigation Measures: Indigenous Groups

Category	Mitigation	C	O	D
Site Clearing, Site Preparation and Erosion and Sediment Control	<ul style="list-style-type: none"> Project footprint and disturbed areas will be limited to the extent practicable. 	✓	-	-
	<ul style="list-style-type: none"> Signage will be installed around the mine site to alert the public and land users of the presence of the Project and its facilities. 	✓	✓	✓
Vehicles / Equipment / Roads	<ul style="list-style-type: none"> Marathon will implement traffic control measures to restrict public access to the mine site, which may include gating approaches, placing large boulders and/or gated fencing. 	✓	✓	✓
Employment and Expenditures	<ul style="list-style-type: none"> Hunting / fishing / harvesting of wildlife will be strictly prohibited on the mine site. Workers will not be permitted to hunt / fish / harvest while staying at the accommodations camp and will not be permitted to bring firearms or angling gear to site. 	✓	✓	✓
	<ul style="list-style-type: none"> Workforce education will be provided to address topics such as: <ul style="list-style-type: none"> – healthy lifestyle choices – anti-harassment training – cultural awareness training – Marathon’s health and safety policies 	✓	✓	✓
	<ul style="list-style-type: none"> Workers will be bussed from nearby designated communities to the mine site for rotations to reduce effects of traffic on roads in the communities and the access road. 	✓	✓	✓
	<ul style="list-style-type: none"> A Gender Equity and Diversity Plan will be implemented that meets the approval of the Minister of Industry, Energy and Technology and Minister Responsible for the Status of Women and Marathon will engage with both Indigenous groups during the development of the Plan. A business access strategy for members of underrepresented populations will be included in the plan. 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will communicate employment information to local communities and Indigenous groups in a timely manner so that local and Indigenous residents have an opportunity to acquire the necessary skills to qualify for potential Project-related employment. 	✓	✓	✓
	<ul style="list-style-type: none"> Procurement packages will be developed with consideration for capacity and capabilities of local and regional Indigenous and non-Indigenous businesses. 	✓	✓	✓
Engagement with Stakeholders, Indigenous Groups and the Public	<ul style="list-style-type: none"> Project activities, locations, and timing will continue to be communicated to Indigenous groups, affected land and resource users, environmental non-government organizations, the provincial government, and local authorities throughout the life of the Project. In particular, Marathon will communicate in advance with respect to Project activities that may limit / affect use of the access road (i.e., upgrading activities or transport of large loads or equipment). This information will be communicated through local town councils, local radio stations and social media. 	✓	✓	✓



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Table 17.4 Mitigation Measures: Indigenous Groups

Category	Mitigation	C	O	D
Engagement with Stakeholders, Indigenous Groups and the Public	<ul style="list-style-type: none"> Marathon will continue to engage with Indigenous groups, including Indigenous resource users, throughout the life of the Project. This will include the communication of Project information, updates on ongoing and planned activities, and a discussion of issues and concerns and a potential means of addressing them. This will also include a discussion of the development and implementation of Project-specific environmental management and monitoring plans. 	✓	✓	✓
	<ul style="list-style-type: none"> Marathon will continue to engage with Indigenous groups for the identification, review, and analysis of existing and available information on Indigenous land and resource use activities, to consider this early and throughout Project planning, design and implementation. 	✓	-	-
Rehabilitation and Closure	<ul style="list-style-type: none"> Desired land and resource end-uses will be considered in the preparation of the Rehabilitation and Closure Plan. 	-	-	✓
Discovery and Protection of Heritage Resources	<p>Measures to be included in the Heritage and Cultural Resources Protection Plan to mitigate the potential of adverse effects on historic resources resulting from an accidental discovery:</p> <ul style="list-style-type: none"> Prior to construction, personnel will be made aware of potential historic resources in the area and understand their responsibility should they identify potential historic resources. Personnel will be advised to report unusual findings to the Site Supervisor and not to touch such findings. Work will be suspended in the immediate area should a potential resource be identified. If features are found using heavy equipment, the equipment will not be moved so that historical information and evidence is left intact and not further disturbed. The area of findings will be flagged to protect it from looting and further disturbance. A qualified archaeologist or historic resources professional will be contacted by the Site Supervisor to conduct an assessment of the site. 	✓	-	-
<p>Notes: C – Construction Activities O – Operation Activities D – Decommissioning, Rehabilitation and Closure Activities</p>				

Through Indigenous engagement activities for the Project, Indigenous groups have provided recommendations to mitigate potential effects. Mitigation measures provided in Table 17.4 and in the biological and socio-economic VCs align with several of the concerns and measures recommended by Miawpukek and Qalipu. Marathon will continue to engage with the Indigenous groups on the following items:

- Miawpukek identified the use of buffer zones as a potential mitigation measure to species at risk
- Miawpukek expressed interest in involvement in on site monitoring measures
- Miawpukek identified interest in access to economic opportunities
- Qalipu indicated an interest in Marathon establishing a training fund and other training programs



Indigenous Groups
September 2020

- Qalipu suggested Marathon balance economic benefits against potential adverse environmental effects
- Qalipu is interested in involvement in environmental monitoring initiatives, including the involvement of youth in these programs

Marathon is committed to ongoing engagement with Indigenous groups. To that end, Marathon and Qalipu have entered into negotiations with a view to concluding a socio-economic agreement that will provide a framework for the Parties' relationship throughout the Project. Marathon will continue to provide notice of employment and business opportunities to the Indigenous groups. Marathon will engage with Miawpukek and Qalipu in the development of the Gender Equity and Diversity Plan, which will address access to economic opportunities by Indigenous persons.

17.5 ASSESSMENT OF ENVIRONMENTAL EFFECTS ON INDIGENOUS GROUPS

For each potential effect identified in Section 17.3.3, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The following sections first describe the pathways by which a potential Project effect could result from Project activities (i.e., the Project-effect pathway) during each Project phase (i.e., construction, operation and decommissioning). Mitigation and management measures (Section 17.4) are applied to avoid or reduce these potential pathways and resulting environmental effects. Residual effects are those remaining following implementation of mitigation, which are then characterized using the criteria defined in Section 17.3.1. A summary of predicted residual effects is provided in Section 17.5.5.

The assessment of current use, Indigenous health conditions, Indigenous socio-economic conditions, and Indigenous physical and cultural heritage focuses on the interactions among changes to related biophysical and socio-economic VCs and change in conditions, attributes, sites, lands, resources, or structures of relevance for the Indigenous groups. The interrelationship among various related biophysical and socio-economic VCs plays an important role in how changes to the environment may affect the conditions and material circumstances for Indigenous groups. For example, changes in surface water quality may influence fish health, which could in turn affect country foods and Indigenous health conditions. The identification of Project pathways, therefore, relies on the assessments provided for the biophysical and socio-economic VCs.

17.5.1 Change in Current Use

17.5.1.1 Project Pathways

A change in current use can occur through loss of area or access to resources currently used for traditional purposes, change to traditional cultural and spiritual sites, and change to the availability of resources currently used for traditional purposes. As noted in Section 17.1.2, Miawpukek and Qalipu have expressed concern regarding effects to birds, plants, fish and other wildlife as a result of increased industrial development, as well as associated effects on current use of land and resources by the Indigenous groups.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Construction activities within Project Area will result in the loss of area or the restriction of access to lands, including those that may currently be used for traditional purposes. Restricted access to the Project Area will remain throughout operation and decommissioning activities. Sensory disturbances (e.g., noise, dust) are the primary pathways for an indirect change to cultural and spiritual sites during construction and operation, which can affect the quality of the outdoor experience. Project-related dust and noise from most construction activities (e.g., heavy equipment operation, infrastructure construction, increased traffic volumes) and operation activities (e.g., blasting, increased traffic volume) can disturb and/or alter the use of cultural and spiritual sites. Viewscapes can be altered by physical features or works associated with the Project and may alter the aesthetics of the environment resulting in a change of perception of the area and discourage use.

The availability of resources currently used for traditional purposes can be affected by a change in the landscape that removes habitat for wildlife, fish and plants relied upon for traditional food, medicine, or materials, or by a change in mortality or health of these resources potentially reducing their numbers.

Removal of vegetation during site clearing and construction activities may result in a direct change in availability of traditional resources, including the potential for the removal of country foods that are traditionally harvested by Indigenous groups. Once cleared, the Project Area will no longer provide suitable habitat for traditionally harvested wildlife, vegetation or fish resources. Vegetation clearing can also fragment habitats, creating an unnatural transition between the cleared Project Area and the surrounding environment (i.e., edge effects), as discussed in Chapter 9. Behavioral changes in wildlife species can also result from sensory disturbances (e.g., noise, dust, visual) around the site or access road, as discussed in Chapters 10, 11 and 12 (Avifauna, Caribou and Other Wildlife, respectively). Project-related noise from construction and operation can disturb wildlife and change the use of habitat around the mine site and access road also resulting in avoidance of the area by harvesters.

Project-related transportation along the access road may cause wildlife mortality (e.g., wildlife / vehicle collisions). Loss in availability of wildlife could affect harvesting activities in the LAA. The increase in traffic due to ore hauling to stockpile sites, and to the processing plant will result in a greater potential for wildlife / vehicle collisions and mortality along site roads.

The presence of workers during construction and operation could result in an increase in competition for harvested species. The upgraded access road may also provide improved year-round access to areas for hunters and resources users, increasing the demand on harvesting in the LAA.

Decommissioning, rehabilitation and closure activities will allow for the return of habitat for wildlife, fish and vegetation within the Project Area and the rehabilitation of affected land.

17.5.1.2 Residual Effects

Project activities in the Project Area have the potential to change the use of lands through the loss of area and the restriction of access to lands, including those used for traditional purposes. During construction activities, land within the mine site (32 km²) will be restricted for the life of the Project. The mine site is located on provincial Crown land. Vegetation clearing within the mine site will result in loss of habitat for harvested wildlife, plants and fish. It is Marathon's understanding, based on information provided by the



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Miawpukek and Qalipu, current use in the area of the mine site is limited. An ATK Study completed by the Qalipu resulted in a total of 466 points (which represented various land use activities) placed on a map of central Newfoundland by 22 respondents, of which three points were placed within the Area of Interest (0.64%), and zero were placed inside the Project Area. While there is limited current use at the mine site, resources harvested for traditional purposes may be present at the mine site, and once clearing occurs, it is conservatively assumed that the mine site will no longer provide suitable wildlife habitat (approximately 2% of the LAA and 0.08% of the RAA), except for a few species that may take advantage of developed sites and anthropogenic features. Marathon will continue to engage with Indigenous groups for the identification, review, and analysis of existing and available information on Indigenous land and resource use activities, to consider throughout Project planning and design. Given the above discussion, loss of access to areas currently used for traditional purposes is therefore anticipated to be low, with current use able to continue at current levels in the LAA and RAA.

Sensory disturbances (noise, visual) are the primary pathways for an indirect change to current use during construction and operation which can affect the quality of the outdoor experience. As noted in the ATK Study completed by Qalipu, few areas (0.64% of the areas identified during the survey) near the mine site were identified by respondents as being used for harvesting activities. These included areas identified by the participants related to trout harvesting (Figure 3.20 in Appendix 17A), and ptarmigan harvesting (Figure 3.12 in Appendix 17A). Current use activities and sites within 10 km of the Area of Interest (Figure 3.0 in Appendix 17A) were reported to include logging, wigwams, food plants, moose hunting, medicinal plants, harvesting ptarmigan / grouse, sacred areas, harvesting trout, Mi'kmaq village, wild berries harvesting, and harvesting waterfowl (Qalipu 2020). The effect of Project-related noise and dust are assessed in Chapter 5 (Atmospheric Environment). It has been predicted that sound pressure levels related to Project construction and operation activities will be well below the regulatory threshold for noise. As well, construction activities will only occur during the daytime. Noise control mitigation measures, further described in Chapter 5, will be installed (e.g., muffler systems) on construction and other mobile equipment, and equipment will be properly maintained, which will reduce Project-related noise. With the implementation of mitigation measures described in Chapter 5, the anticipated indirect effects associated with sensory disturbance from noise is low.

The viewscape can be altered by physical features or works associated with the Project that are visible from outside the Project Area and may also result in an indirect change to cultural and spiritual sites and areas used for resource and recreational activities. Visual effects from the development of the waste rock piles, overburden stockpiles, and low- and high-grade ore stockpiles may degrade the quality of land use within the LAA and cause visual disturbance. The highest point in the Project Area will be the development of the high-grade ore stockpile, which will be visually apparent and could result in a visual disturbance to Indigenous people using the land for traditional uses. As shown on Figure 5-12 (Chapter 5), the stockpile will be visible to resource / recreational users in the areas highlighted green. This includes several areas surrounding the mine site, including the Victoria Lake Reservoir which may be used for fishing and/or recreational (boating, canoeing) activities. Note, that the visual assessment does not account for vegetation which may reduce the visibility of Project components. However, given there are low levels of current use identified within the LAA, residual effects are anticipated to be low; however, they will occur over the long-term throughout the life of the Project.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Project activities can result in a change in quantity, quality or availability of resources and habitat (e.g., mortality or change in migration pattern of culturally significant species). As discussed in Chapter 12 (Other Wildlife), the primary pathways for change in mortality risk are vegetation clearing activities, vehicular collisions, human-wildlife conflicts, and predation and harvest pressure. Behavioural changes in wildlife species can also occur primarily from sensory disturbances (e.g., noise, dust). Mortality and/or behavioural changes may therefore result in the displacement of targeted species, increase harvesting pressure and reduce harvesting success rates within the LAA for traditional harvesters. Species traditionally harvested by Indigenous people (such as moose, bear, waterfowl) are known to occur in the LAA. The Project is also located within a caribou migration corridor that supports hunting activities in other parts of central NL. An assessment of wildlife disturbance and mortality risk is provided in Chapters 10 to 12. Successful implementation of the mitigation measures described in Sections 10.4, 11.4 and 12.4 is proposed to reduce the magnitude and duration of Project effects on mortality risk and change in habitat. After the implementation of these mitigation measures, the number of direct mortalities resulting from the Project is expected to be small relative to existing sources of mortality within the RAA, including the existing access road. It is anticipated that abundant suitable habitat will remain for all focal species in the Ecological Land Classification Area (Chapter 12). The magnitude of change in mortality risk and change in habitat is anticipated to be low.

Change and or loss of fish habitat and risk to mortality may result from the placement of infrastructure and equipment installation in streams or lakes, including the installation of water control structures. As discussed in Chapter 8 (Fish and Fish Habitat), the Project has been designed to reduce loss of fish habitat through careful planning of the placement of infrastructure and shifting of locations of activities away from waterbodies. Additionally, the installation of water crossing structures at road crossings will be conducted and designed to allow fish passage. Design standards and other mitigation measures to protect fish and fish habitat during the installation of infrastructure and equipment are well known and documented and are expected to successfully reduce or avoid adverse effects to acceptable levels. Effects to fish habitat are not expected to affect the sustainability and productivity of the recreational fisheries, and fish habitat offsetting measures will be applied (Section 8.5).

Assuming the successful implementation of mitigation measures and the low levels of current use within the LAA, associated effects to harvesting success rate is anticipated to be low in magnitude.

The presence of Project workers could lead to increased competition for wildlife and fish resources harvested by Indigenous groups. Increased competition for wildlife may also occur from improved year-round access to hunting area. Hunting / harvesting of wildlife will be strictly prohibited on the mine site. Workers will not be permitted to hunt / harvest while staying at the accommodations camp and will not be permitted to bring firearms or angling gear to site. The work schedules for Project construction workers (longer workdays and multi-week rotation of employees) will deter them from hunting and fishing locally outside of working hours. Given this, and the limited use of the LAA for resource use, adverse effects on current use associated with increased competition for wildlife resources are anticipated to be negligible.

During decommissioning, rehabilitation and closure, activities will be reduced, and therefore, residual effects are anticipated to be reduced compared to construction activities. This phase will also allow for the restoration of affected land used for traditional purposes. A description of the rehabilitation and closure



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

plan is provided in Section 2.6. During rehabilitation activities, hazardous materials will be removed, equipment cleaned and removed, natural drainage patterns will be re-established to the extent practicable, and areas covered with overburden materials and revegetated. During decommissioning, rehabilitation and closure, the Project is anticipated to have a low effect on current use within the LAA.

17.5.1.3 Summary

Residual effects on water, wildlife, fish, and vegetation can affect the activities that are supported by these resources, including hunting, fishing, trapping, plant harvesting, and camping. However, appropriate conditions for current use require more than the availability of traditional resources and this assessment acknowledges that Indigenous groups may choose not to pursue current use activities near the Project for a variety of practicable, cultural, aesthetic, and spiritual reasons.

With the implementation of mitigation measures, residual effects from the Project on changes in current use are anticipated to be negligible to low in magnitude for harvested species. Access will be restricted on site throughout the life of the Project and the Project is located in a remote area, with low levels of current use. Given adverse residual effects to harvested species is generally anticipated to be low, consequential effects to harvesting pressure and success are predicted to be low. Noise effects on nearby resource users are anticipated to be below regulatory thresholds. Project effects on current use are expected to occur within the Project Area (direct loss of area) and LAA (indirect sensory disturbances). Residual effects related to current use will be short-term (for construction disturbances) to medium-term (for restricted access at the mine site and sensory disturbance) and permanent for visual, irregular to continuous in frequency, and reversible following Project decommissioning, rehabilitation and closure, with the exception of the visual disturbance from the waste rock pile and TMF, which will be irreversible.

17.5.2 Change in Indigenous Health Conditions

17.5.2.1 Project Pathways

Emissions of air contaminants during construction and operation phases of the Project may result from combustion of fossil fuels, such as diesel and gasoline, by heavy mobile equipment and vehicles, and dust generated by land clearing and equipment movements on unpaved roads. Fugitive releases of dust during blasting, ore handling and processing, and wind erosion of stockpiles and tailings beach surfaces may occur during operation. The processing plant is also a potential source of air contaminants during operation. In the absence of mitigation, potential changes in air quality could directly affect the health (through inhalation) of Indigenous persons in the LAA engaged in fishing, hunting, trapping, harvesting, gathering, or camping. Particulates in air could settle onto the soil and vegetation, which could then affect the quality of country foods, resulting in contaminant exposure via ingestion.

In the absence of mitigation, Project construction, operation and/or decommissioning activities could affect the quality of surface water through the discharge or seepage of metal-enriched water into the environment. Changes in water quality could affect the health of Indigenous persons through dermal contact or incidental ingestion of surface water while in the LAA. Changes in stream water quality may also result in changes in fish tissue quality, resulting in indirect exposures via ingestion of fish. Indigenous health conditions may also be affected through changes in access to and the availability of wildlife, fish



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

and plants that are harvested for country foods. Access to the mine site will be restricted throughout the life of the Project. Site clearing and construction activities will remove vegetation that may be used as country foods by Indigenous groups, as well as remove habitat that is suitable for wildlife, vegetation or fish species harvested for consumption. Sensory disturbance (e.g., noise, dust, visual) from Project activities, including increased traffic along the access road (e.g., bus and truck traffic), could result in avoidance of the LAA by traditionally harvested wildlife species, such as caribou, and reduce the abundance of species available to traditional harvesters within the LAA. Perceived decreased quality of country foods as a result of Project activities may lead to conscious decisions by some people to forego consumption, therefore, decreasing consumption of country foods.

During construction and operation, noise emissions are expected from heavy mobile equipment and vehicles used for land clearing, earth moving activities, and material handling, as well as equipment delivery and rotation changes. Some noise emissions are anticipated during decommissioning, rehabilitation and closure; however, those emissions are expected to be lower in magnitude than during construction or operation. Changes in noise levels could affect the annoyance levels and disturb the sleep of Indigenous persons at camps within the LAA.

During the decommissioning, rehabilitation and closure phase, reduced levels of traffic and sensory disturbance are anticipated due to reduced levels of Project activities (in comparison to construction and operation). Habitat will ultimately be returned to natural conditions during post-closure, which will lessen the avoidance of the area by wildlife species.

17.5.2.2 Residual Effects

The assessment of potential effects of the Project on Indigenous health used an approach consistent with Health Canada guidance (Health Canada 2018, 2017; 2016a; 2016b) and focused on the identified Project pathways related to changes in air quality, changes in water quality, changes in country foods (quality, access and availability), and changes in sound quality.

Air Quality

The mine site is in a remote area with limited human activity. Approximately 35 seasonal dwellings (three active outfitters, two inactive outfitters and 30 cabins) were identified within 10 km of the mine site and 5 km of the access road (Figure 5-2, Chapter 5). The existing exploration camp is also located within this area. These seasonal dwellings represent the locations where persons are most likely to be exposed to air contaminants.

An inventory of air contaminant emissions associated with construction and operation activities was completed as part of the air quality assessment (Chapter 5 – Atmospheric Environment). Although some intermittent releases may occur during the decommissioning, rehabilitation and closure phase, the emissions are expected to be lower in magnitude than during construction or operation, and this phase was therefore not assessed quantitatively. Air contaminants that may be released from Project activities have been identified as:

- Particulate matter released during activities, such as ore handling and processing, wind erosion, blasting, and exhaust from internal combustion engines - total suspended particulate matter (TSP),



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

- respirable particulate matter (PM₁₀) with an aerodynamic diameter less than 10 µm; fine particulate matter (PM_{2.5}) with an aerodynamic diameter less than 2.5 µm, and diesel particulate matter (DPM)
- Other criteria air contaminants - carbon monoxide (CO), sulphur dioxide (SO₂), nitrogen oxides (NO_x) – from blasting and internal combustion engines
 - Ammonia (NH₃) and hydrogen cyanide (HCN) from processing plant sources
 - Trace metals within the dust released during ore handling and processing, wind erosion, and blasting – antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), bismuth (Bi), cadmium (Cd), Chromium (Cr), cobalt, copper (Cu), lead (Pb), lithium (Li), mercury (Hg), nickel (Ni), selenium (Se), strontium (Sr), tin (Sn), zinc (Zn)

Although construction activities would add to existing air contaminant concentrations in the Project Area, emissions (and resulting ground-level concentrations) would be lower in magnitude than during Project operation, and generally confined to the area surrounding the Project Area. Changes to air quality from Project-related releases of air contaminants during operation were assessed using an atmospheric dispersion model in combination with ambient background air contaminant concentrations. Details of the emissions estimates and dispersion modelling for the operation phase of the Project are provided in Section 5.5.1, Chapter 5 – Atmospheric Environment.

As per Health Canada (2016a), predicted air contaminant concentrations at the seasonal dwellings were compared to appropriate air quality standards, including Canadian Ambient Air Quality Standards (CAAQS) and NL Ambient Air Quality Standards (NLAAQS), where available. Predicted concentrations of HCN and some trace metals were compared to Ontario air contaminants benchmarks (ACBs). Both short-term (1-hour, 24-hour) and annual average concentrations were assessed, as appropriate. Maximum predicted concentrations at the seasonal dwellings and the applicable standards are provided in Table 5.17 (Chapter 5 – Atmospheric Environment).

Air quality standards are not “pollute up-to” levels; however, are meant to be protective of health and therefore provide important benchmarks. As indicated in Table 5.17, maximum concentrations are less than the applicable standard. Although the maximum 1-hour PM_{2.5} concentration during Project Operation is predicted to be higher than the Canadian Ambient Air Quality Standard (CAAQS), additional analysis confirmed that there are no exceedances of the CAAQS at locations outside of the Project Area. Predicted concentrations are also presented graphically in the form of isopleth plots (concentration contour plots) in Appendix 5B (Dispersion Modelling Strategy). The highest predicted concentrations generally occur within 1 to 2 km of the Project Area. Seasonal dwellings within this area include a cabin, an outfitter camp that is not in use, the existing exploration camp and the accommodations camp.

One air contaminant, DPM, is not shown in Table 5.17 because there are no federal or provincial ambient air quality standards for DPM. However, Health Canada (2016c) derived a short-term exposure (2 hour) guidance value of 10 µg/m³ and a chronic exposure guidance value of 5 µg/m³ for DPM. As indicated in Appendix 5E (Dispersion Modelling Strategy), the maximum predicted concentration of DPM at the seasonal dwellings is 6.9 µg/m³ for 2-hour exposures and 0.094 µg/m³ for annual average (chronic) exposures.

Based on these results, changes to air quality as a result of the Project are not expected to result in a change to Indigenous health conditions in the LAA or RAA.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Water Quality

As described in Chapter 7 – Surface Water Resources (Section 7.4.2), mine contact water (including discharge from sedimentation ponds and groundwater that is not captured by the contact water management infrastructure) and TMF effluent will ultimately discharge to one of three receiving waterbodies: Victoria Lake Reservoir, Valentine Lake, or Victoria River. Indigenous persons could be exposed to water from these water bodies through dermal contact or incidental ingestion while in the LAA for other activities, such as fishing. It is unlikely that Indigenous persons would drink water from the receiving water bodies, and information gathered through engagement has not identified Victoria Lake Reservoir, Valentine Lake, or Victoria River as potable water sources. As a result, occurrences of exposure to surface water are possible, however, are expected to be infrequent.

A list of parameters of potential concern for water quality was established for Surface Water Resources (Chapter 7) based on the following selection criteria:

- Parameters found to be present at concentrations higher than the Canadian Council of Ministers of the Environment (CCME) *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life* (CWQG-FAL) in the baseline monitoring program (aluminum, arsenic, cadmium, copper, iron, lead, nitrite, and zinc)
- Parameters listed in the *Metal and Diamond Mining Effluent Regulations* (MDMER) (ammonia, arsenic, copper, cyanide, lead, zinc)
- Parameters considered potentially present in mine effluent because of mining activities (ammonia, cyanide, fluoride, manganese, phosphorus, and sulphate)

The expected surface water quality for these parameters was assessed through an Assimilative Capacity Assessment (Appendix 7C). To assess the possible change in Indigenous health conditions associated with changes in surface water quality, expected water quality 100 m downstream of the receiving points of the three ultimate receivers (i.e., Valentine Lake, Victoria Lake Reservoir, and the Victoria River) under normal operating conditions (i.e., modeling based on mean concentrations of parameters of potential concern, mean concentrations for baseline water quality, and mean annual flow conditions) were compared to health-based screening levels.

The parameters of potential concern are considered inorganic chemicals. Health Canada (2012) has not established health-based guidelines for incidental exposures to inorganic chemicals although notes that ingestion would be considered the primary pathway of exposure. Therefore, health-based drinking water guidelines that are based on daily exposures over a lifetime were used as conservative screening levels. Preference was given to maximum acceptable concentrations (MAC) for parameter concentrations in drinking water established by Health Canada (2019b), followed by guidance from the United States (US) and the World Health Organization (WHO). These health-based screening levels are provided in Table 17.5. For some parameters, regulatory agencies have not established a health-based guideline for drinking water due to a lack of evidence that the parameter would be expected to cause adverse health effects. Where this is the case, the rationale for why a health-based screening level is not required is provided in Table 17.5.



Table 17.5 Health-Based Screening Levels for Identified Parameters of Potential Concern in Surface Water

Parameter	Units	Health-based Screening Level	Source or Rationale
Aluminum	µg/L	Not required	Health Canada concluded there is no consistent, convincing evidence that aluminum in drinking water causes adverse health effects in humans (Health Canada 2019b)
Ammonia	µg/L	Not required	Health Canada (2019b) indicates that a guideline value is not necessary as it is produced in the body and efficiently metabolized in healthy people and no adverse effects occur at levels found in drinking water.
Arsenic	µg/L	6	Health Canada MAC (Health Canada 2019b)
Cadmium	µg/L	5	Health Canada MAC (Health Canada 2019b)
Copper	µg/L	2000	Health Canada MAC (Health Canada 2019b)
Cyanide	µg/L	200	Health Canada MAC (Health Canada 2019b)
Fluoride	µg/L	1500	Health Canada MAC (Health Canada 2019b)
Iron	µg/L	Not required	Health Canada indicates that no evidence exists of dietary iron toxicity in the general population (Health Canada 2019b)
Lead	µg/L	5	Health Canada MAC (Health Canada 2019b)
Manganese	µg/L	120	Health Canada MAC (Health Canada 2019b)
Nitrite (as N)	µg/L	1,000	Health Canada MAC (Health Canada 2019b)
Phosphorus	µg/L	Not required	Phosphorus is an essential mineral that is naturally present in many foods and relatively non-toxic. Health Canada (2019b) does not provide a guideline for phosphorus and the United States National Research Council (1980) concluded that there is no basis for the regulation of phosphorus in drinking water supplies.
Sulphate	µg/L	Not required	Health Canada (2019b) does not provide a guideline for sulphate and the WHO (2004) concluded that the existing data do not identify a level of sulphate in drinking water that is likely to cause adverse human health effects.
Zinc (Total)	µg/L	Not required	Health Canada (2019b) notes that zinc is an essential element and is generally considered to be non-toxic.

To assess the possible change in Indigenous health conditions related to exposures to surface water, expected concentrations of the parameters of potential concern 100 m downstream of the receiving points at Victoria Lake Reservoir, Valentine Lake, and Victoria River (provided in Appendix 7C, Chapter 7) were compared to the health-based screening levels. Predicted concentrations at the receiving water bodies are less than the health-based screening levels. These results suggest that even if the surface water from the receiving water bodies was used for consumption, health risks would be negligible and would not result in a change to Indigenous health conditions.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Country Foods

Ingestion of contaminants via food can be an important pathway of exposure for people, especially when contaminants can bioaccumulate or biomagnify in the food chain and/or when the consumption of country foods makes up a significant portion of a person's diet (Health Canada 2018).

Parameters of potential concern in air emissions and water discharges associated with the Project subject to bioaccumulation are limited to heavy metals. The potential for heavy metals in air particulate to affect the quality of terrestrial foods through deposition is considered negligible, as indicated by the low predicted concentrations of TSP (predicted maximum annual concentration is 8% of guideline, as indicated in Table 5.15, Chapter 5 – Atmospheric Environment). The potential for heavy metals in water to affect the quality of aquatic foods (primarily fish) is also considered to be low. As indicated in Chapter 7 (Surface Water Resources) and Appendix 7C, modelled water quality results indicate that under average conditions, concentrations of heavy metals in water will meet CWQG-FAL within 200 m downstream of the receiving points and are unlikely to result in substantive changes to country foods.

As discussed in Sections 17.2.3 and 17.2.4, there are low levels of harvesting activities by Miawpukek and Qalipu within the Project Area and LAA/RAA; therefore, it is unlikely that the consumption of country foods from the LAA constitutes a substantial portion of an Indigenous person's diet. Given the low potential for air emissions and water discharges to affect the quality of country foods combined with the limited harvesting activities, the potential for the Project to result in a change in Indigenous health related to country foods consumption is considered to be low.

While there is limited current use at the mine site, resources harvested for traditional purposes may be present at the mine site. Once site clearing occurs and in combination with habitat fragmentation and sensory disturbance, it has been conservatively predicted that wildlife habitat within the mine site will be lost, affecting access and availability of country foods. As assessed in Section 17.5.1, the Project is located in a rural area with limited use for harvesting activities by the Miawpukek and Qalipu. Marathon will continue to engage with Indigenous groups for the identification, review, and analysis of existing and available information on Indigenous land and resource use activities, to consider this throughout Project planning and design. Given the relatively small area that will be restricted during the life of Project, and the alternative areas available for harvesting, the loss of access to areas currently used for country foods is anticipated to be low. As a result, the associated health effects related to access and availability of country foods is anticipated to be low.

Sound Quality

The mine site is in a remote area with limited human activity, and no substantive anthropogenic noise sources within 50 km. Approximately 35 seasonal dwellings (three active outfitters, two inactive outfitters and 30 cabins) were identified within 10 km of the mine site and 5 km of the access road, which represent the nearest sensitive receptors to the Project (Figure 5-2, Chapter 5). The existing exploration camp is also located within this area.

To assess possible change in Indigenous health condition associated with noise from the Project, predicted and baseline noise levels were screened against Health Canada (2017) targets for annoyance



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

(i.e., 6.5% highly annoyed (HA)) and sleep disturbance (45 dBA) for nearby receptor locations (i.e., locations where people are most likely to spend time). The noise levels associated with the Project were assessed (Section 5.5.3, Chapter 5 – Atmospheric Environment) for the construction and operation phases of the Project. While some noise emissions are anticipated during decommissioning, rehabilitation and closure, those emissions are expected to be lower in magnitude than during construction or operation.

During construction, existing nighttime sound levels will not be affected at the sensitive receptor locations because construction activities are not planned at night (and therefore would not affect sleep). During operation, sound pressure levels at receptors beyond the property boundary were not predicted to exceed the sleep disturbance threshold of 45 dBA recommended by Health Canada (2017). Nighttime sound pressure levels were greater than the nighttime target of 45 dBA at the accommodations camp and existing exploration camp. During both construction and operation phases, the change in %HA is not predicted to exceed the Health Canada criterion of 6.5%. Additional details of the assessment of sound quality and the modeling that was done is provided in Chapter 5 – Atmospheric Environment.

Based on the above, no residual adverse effects on Indigenous health (i.e., annoyance or sleep disturbance) due to change in sound quality are predicted.

17.5.2.3 Summary

With the implementation of mitigation measures, the overall residual effects from the Project on a change in Indigenous health conditions are anticipated to be negligible to low in magnitude, based on the low potential for air emissions and water discharges to affect the quality of country foods combined with the limited harvesting activities. Project effects on Indigenous health conditions are expected to occur within the Project Area (direct loss of area) and LAA (indirect sensory disturbances). Residual effects related to current use will be short-term (for construction-related disturbance) to medium-term (for restricted access to mine site and sensory disturbance), continuous in frequency, and reversible following Project rehabilitation.

17.5.3 Change in Indigenous Socio-economic Conditions

17.5.3.1 Project Pathways

The effects pathways considered for Indigenous socio-economic conditions are also addressed as part of the assessments for Community Services and Infrastructure (Chapter 13), Community Health (Chapter 14), Economy and Employment (Chapter 15), and Land and Resource Use (Chapter 16). Project pathways are anticipated to include effects to economic and financial conditions through changes to harvesting activities, as well as include changes to the use of and access to road infrastructure, medical, and other public services.

Project activities during construction and operation have the potential to cause a change in revenue for an Indigenous group through a change in physical access restrictions to harvesting areas, a change in harvested species distribution and abundance, the creation of competition for other industries or commercial harvest, and the creation of sensory disturbance effects (i.e., noise, dust, visual).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Construction and operation activities will result in the direct loss of land area and restriction of access to areas available for current use, thus affecting hunting and trapping activities. These Project-related activities will also result in a sensory disturbance (e.g., noise, dust, visual) which may result in a change in species distribution and abundance, as assessed in Chapters 10 to 12 (Avifauna, Caribou and Other Wildlife, respectively), which may cause a reduction in wildlife hunting success for Indigenous people. The harvesting of country foods has social and cultural importance to Indigenous peoples and is an important way for some individuals and families to increase food security. The change in access to or the change in wildlife and fish presence may, therefore, result in an effect on socio-economic conditions for the Indigenous groups who rely on these species.

There is potential for workers to engage in recreational land and resource activities during the construction and operation phases, putting additional demands on resources relied on by Indigenous groups and thereby affecting Indigenous socio-economic conditions. The overall experience of Indigenous groups using the area for resource activities (i.e., hunting, trapping, fishing) may be compromised by the presence of Project workers, as well as activities (i.e., sensory disturbances), as the remoteness is a large part of the draw and appeal of these activities.

Some Project-related activities during construction and operation could place increased demands on local community services and infrastructure. These effects can result from a Project-related population increase during construction and operation, which would place additional demands on existing services and infrastructure used by Indigenous and non-Indigenous people, including health, emergency, education, recreation, transportation, and utilities. The transportation of Project goods, services and workers could lead to additional use of existing transportation infrastructure by Indigenous people who may live and/or work in the area.

Indigenous socio-economic conditions could be affected through changes to employment and income as a result of the Project. Levels of disposable income and health practices could be affected in both positive and adverse ways. These effects could occur in a variety of manners, including through increased employment for local Indigenous people. Levels of income are also likely to increase with Project-related employment and increased disposable income could in turn lower financial barriers to accessing healthy market foods, resulting in a positive effect. Increased disposable income could also decrease financial barriers to harmful practices such as overeating, smoking, heavy drinking, and illicit drug use, resulting in adverse effects (Chapter 14). Project-related employment may also limit the amount of time harvesters are able to engage in current use, such as the harvesting of country foods, and increase reliance on purchased foods and paid employment.

17.5.3.2 Residual Effects

Residual effects are anticipated to include effects to economic and financial conditions through changes to harvesting activities, as well as include change to the use of and access to road infrastructure, medical, and other public services. These effects to Indigenous socio-economic conditions are anticipated to be limited to Indigenous people living and working in the RAA and may extend to Indigenous people who work and harvest in the area. As noted above, there are two Indigenous groups on the Island of Newfoundland, Miawpukek and Qalipu. Given the Miawpukek reserve is located 113 km from the Project Area, adverse effects to Indigenous socio-economic conditions are anticipated to be related to harvesting



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

activities that may occur in the area. Since some Qalipu members reside in Buchans (49 km to the mine site), they are considered to live and work in the RAA in addition to using the area for harvesting purposes.

Changes to harvesting can occur through restriction to or change in the land available for recreational activities, through effects to wildlife species and changes to harvesting success, which can result in socio-economic effects to Indigenous groups. Residual effects on harvesting activities is assessed in Section 17.5.1. As discussed in Sections 17.2.3 and 17.2.4, there is limited use within the Project Area and LAA for harvesting activities by Miawpukek and Qalipu. As assessed in Section 17.5.1, adverse effects on current use is anticipated to be low, and therefore, associated socio-economic effects related to harvesting success is anticipated to be low.

The overall experience of Indigenous groups using the area for resource (i.e., hunting, trapping, fishing) and recreational (e.g., hiking, canoeing, kayaking) activities may be compromised by Project activities (i.e., sensory disturbances) and the presence of personnel, as the remoteness is a large part of the draw and appeal of these activities. Project-related construction and operation activities may affect visual aesthetic values through Project presence (e.g., recreational user's quality of experience due to operation activities) and disturbance of trapping, and guiding hunters due to noise disturbance. As assessed in Section 17.5.1, sensory disturbance to resource users is anticipated to be low, and therefore, associated socio-economic effects related to the quality of experience is anticipated to be low.

Effects on local services and infrastructure can result from a Project-related population increase during construction and operation, which would place additional demands on existing services and infrastructure used by Indigenous and non-Indigenous people, including health, emergency, education, recreation, transportation, and utilities. Some Project-related activities during construction and operation could also place increased demands on local community services and infrastructure. The transportation of Project goods, services and workers could lead to greater traffic volumes along local road networks and increase travel times and the potential for accidents, which might place additional demands on local emergency services. As described in Section 13.5.2.1, Project construction and operation workers will live at the Project accommodations camp, which will reduce potential effects on communities and services. A variety of services will be provided at the accommodations camp, and this will reduce additional demands on health, emergency, transportation, and recreation services and infrastructure, as well as utilities. During construction and operation, standard procedures, including traffic management and control, will be implemented to reduce traffic delays on local road networks. Given the negligible overall increased demand on local services from the Project, including education, health, and emergency services (Chapter 13), adverse effects to local services and infrastructure that could affect Indigenous socio-economic conditions are anticipated to be negligible.

As discussed in Chapter 14, Project-related income could also result in positive effects on health status due to decreased use of drugs and alcohol and improved lifestyle choices and eating habits (Barron et al. 2010). However, many factors (such as working conditions, income inequalities, job stability) can influence health outcomes for Indigenous groups (Northern Health 2018). It has been observed that an increase in people and cash flow from resource development can cause it to be increasingly difficult to maintain traditional ways of life, negatively affecting social connectedness (Northern Health 2018).



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Employment-related stressors such as camp environments, shiftwork and other responsibilities could adversely reduce the ability of workers to have a healthy lifestyle, including limited access to dietary, physical activity, social, and recreational opportunities, as well as health and wellness supports (Northern Health 2018). Time available for participation in recreation, physical exercise, family activities, and subsistence practices may change as a result of the Project which could result in increased stress, strained family dynamics, and increase reliance on negative coping mechanisms (i.e., drug and alcohol misuse, unhealthy lifestyle choices). Workforce education to encourage healthy lifestyle choices will help reduce these potential adverse health effects. Employee training will include awareness about the potential effects that workers can have on their community and families through drug and alcohol use or other social concerns. Workers will also have access to an Employee Assistance Program.

Based on direct labour costs, a total of 4,861 full-time equivalents (FTEs) of direct employment are estimated over the life of the Project (Chapter 15, Table 15.17). Approximately 80% of direct employment effects are anticipated to occur in NL. Recognizing that the Indigenous population represents 6.5% of the LAA labour force (8.6% of the RAA [provincial] labour force), 6.5% of the population with an apprenticeship or trades certificate or diploma (9.3% of the RAA [provincial] population), and 5.7% of the population with educational attainment at or above the college diploma level (7.6% of the RAA [provincial] population), it is assumed that the Project will likely employ more non-Indigenous than Indigenous persons. As discussed in Section 15.5, Project expenditures on materials and equipment can result in both positive (increased business revenue) and adverse (contributions to labour drawdown and wage inflation) effects on regional business, including Indigenous businesses. Given the length of construction, operation, and decommissioning, rehabilitation and closure (Section 13.1.4.2), it is possible that local business could expand (workforce size) or new business establish (especially those seeking to fulfill operational service and supply contracts) to meet Project demands. However, given that expansion and establishment of local businesses would be largely dependent on one revenue source (i.e., the Project), the degree to which this will occur is assumed to be low. Therefore, associated socio-economic effects to Indigenous groups through changes to employment, income and business opportunities as a result of the Project is anticipated to be low. Marathon will engage with Miawpukek and Qalipu in the development of the Gender Equity and Diversity Plan which will address access to economic opportunities by Indigenous persons.

In April 2020, Marathon and Qalipu commenced negotiations toward conclusion of a socio-economic agreement by early fall, 2020. The agreement, which is confidential, will provide a framework for the relationship of the Parties over the life of the Project and addresses matters such as environmental stewardship, ongoing engagement and economic opportunities (education and training, employment, and contracting).

17.5.3.3 Summary

With the implementation of mitigation and enhancement measures, residual effects from the Project on change in Indigenous socio-economic conditions are anticipated to be negligible to low in magnitude. During construction and operation, positive effects will be low in magnitude (conservatively characterized based on uncertainty with respect to levels of local employment and the extent to which Project wages will be realized by Indigenous people). Project effects on socio-economic conditions are expected to



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

occur within the Project Area (direct loss of area), LAA (indirect sensory disturbances) and RAA (effects related to employment, economy, infrastructure, and services). Residual effects will be short-term (for construction disturbances) to medium-term (for sensory disturbance including operation) and permanent for visual, irregular to continuous in frequency, and reversible following Project rehabilitation, with the exception of the visual disturbance from the waste rock pile and TMF, which will be irreversible.

17.5.4 Change to Physical and Cultural Heritage

17.5.4.1 Project Pathways

Activities and physical works that entail initial ground disturbance during the construction phase (e.g., mine site preparation and earthworks and construction or installation of infrastructure or equipment) can result in the loss or disturbance of cultural heritage sites and areas. Alterations to the landscape and increased human activity resulting from improved access to the area also increase the potential that heritage resources, if present, may become more accessible to human disturbance.

The Project may also alter or change the value or perceived quality of cultural and spiritual sites. Changes to the environment from the Project can affect cultural values associated with current use including interference with cultural transmission of traditional practices.

Project-related light, dust and noise from construction and operation activities (e.g., heavy equipment operation, infrastructure construction, increased traffic volumes) can indirectly disturb and change the use of cultural heritage sites and areas. Project-related activities may indirectly affect the experience of Indigenous peoples and thus adversely alter the perceived value of access to traditional resources for current use or current use sites and areas.

Rehabilitation activities are expected to greatly reduce traffic and sensory disturbances and return the Project Area to as near-natural conditions as practicable during post-closure. This phase will also allow for the rehabilitation of affected land used for traditional purposes.

17.5.4.2 Residual Effects

Heritage sites are static and often situated upon or beneath the ground surface and therefore initial ground disturbance during the construction phase will have the greatest potential to adversely affect cultural and physical sites, if present. However, given there are no known registered heritage sites within the Project Area, no residual Project effect to heritage sites is anticipated. Marathon will implement a Heritage and Cultural Resources Protection Plan as part of the Environmental Protection Plan (EPP). The Plan will include measures to be implemented to identify and mitigate the unexpected discovery of heritage resources.

The mine site is approximately 32 km²; at the time of EIS submission, no cultural and spiritual sites within this area had been identified by Indigenous groups engaged on the Project. Therefore, no direct physical effects to cultural and physical sites are anticipated. However, during the construction and operation phases, the presence of workers and equipment in the Project Area will generate noise, dust and visual disturbance. These sensory disturbances will extend into the LAA and may affect the use and enjoyment



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

of cultural and spiritual sites within the LAA. As noted in Section 17.1.3, the experience of Indigenous peoples on the land, cultural identity, opportunities for intergenerational knowledge transmission, and spiritual connections represent intangible values, which are largely subjective and conditional, reflecting beliefs, perceptions, values, and qualitative experience. Given these complexities, it is impractical to characterize or further assess potential Project effects on these intangible values. Marathon is committed to further engagement with Indigenous groups throughout Project planning and construction and operation to understand and respond to concerns related to potential effects on these values.

17.5.4.3 Summary

No physical or cultural heritage features have been identified in the Project Area; therefore, no direct effects are anticipated. If physical or cultural heritage features are identified during construction these will be subject to implementation of the Heritage and Cultural Resources Protection Plan. If a valued physical or cultural heritage site was inadvertently destroyed or permanently altered, this could represent a high magnitude effect because once removed these sites cannot be restored. However, with implementation of mitigation measures, effects on physical or cultural heritage features are anticipated to be negligible to low in magnitude. Project effects on Indigenous physical and cultural heritage are expected to occur within the Project Area (direct loss of area) and LAA (indirect sensory disturbances). The magnitude of the indirect effects related to sensory disturbance (outside the Project footprint; however, inside the LAA) is expected to be low. Residual effects will be short-term (for construction disturbances) to medium-term (for restricted access to the mine site and sensory disturbance including operation) and permanent for visual effects, irregular to continuous in frequency, and reversible following Project rehabilitation, with the exception of the visual disturbance from the waste rock pile and TMF, which will be irreversible.

17.5.5 Summary of Project Residual Environmental Effects

A summary of Project effects on Indigenous groups is provided in Table 17.6.

With the implementation of mitigation and management measures, residual effects on Indigenous groups range from negligible to high (if a valued physical or cultural heritage site was inadvertently destroyed or permanently altered) in magnitude. The residual effects will extend to the Project Area (direct loss of area), LAA (sensory disturbances) and RAA (effects related to employment, economy, infrastructure and services). Effects range in duration from short-term (for construction disturbances) to long-term (visual) and are anticipated to occur at irregular and continuous frequencies. Most effects are predicted to be reversible upon Project rehabilitation, with the exception of the visual disturbance associated with the waste rock piles and TMF. In the event physical or cultural heritage features are inadvertently destroyed or permanently altered, effects are predicted to be irreversible. Given existing conditions, effects occur within a resilient socio-economic context.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

Table 17.6 Project Residual Effects on Indigenous Groups

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Current Use	C	A	N-L	PA / LAA	ST	IR / C	R	R
	O	A	N-L	PA / LAA	ST-P	IR / C	R / IR	R
	D	A	N-L	PA / LAA	ST-P	IR / C	R / IR	R
Change in Health Conditions	C	A	N-L	PA / LAA	ST	C	R	R
	O	A	N-L	PA / LAA	ST-MT	C	R	R
	D	A	N-L	PA / LAA	ST-MT	C	R	R
Change in Socio-economic conditions	C	A / P	N-L	PA / RAA	ST	IR / C	R	R
	O	A / P	N-L	PA / RAA	ST-P	IR / C	R / IR	R
	D	A	N-L	PA / RAA	ST-P	IR / C	R / IR	R
Change to Physical and Cultural Heritage (inside Project footprint)	C	A	N-H	PA	ST-P	S	R / IR	R
Change to Physical and Cultural Heritage (outside Project footprint)	C	A	N-L	PA / LAA	ST	IR / C	R	R
	O	A	N-L	PA / LAA	ST-P	IR / C	R / IR	R
	D	A	N-L	PA / LAA	ST-P	IR / C	R / IR	R
<p>KEY See Table 17.1 for detailed definitions</p> <p>Project Phase C: Construction O: Operation D: Decommissioning</p> <p>Direction: N: Neutral P: Positive A: Adverse</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p> <p>Geographic Extent: PA: Project Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short-term MT: Medium-term LT: Long-term P: Permanent N/A: Not applicable</p> <p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological / Socio-Economic Context: R: Resilient N: Not Resilient</p>								



17.6 DETERMINATION OF SIGNIFICANCE

A significant residual effect on Indigenous groups occurs when a Project-related effect results in one or more of the following:

- Long-term loss of traditional use resources or access to lands relied on for current use practices or current use sites and areas, such that current use is critically reduced or eliminated from the LAA. This could include substantial disruption to current use activities and practices where biological resources, or physical sites may not be significantly affected in the LAA
- Adverse effects on socio-economic conditions of affected Indigenous groups, resulting in associated detectable and sustained decreases in the quality of life of a community, including for subpopulations within a community, as applicable
- A reduction in the quality of ambient air, water, country foods, or sound at levels predicted to result in exposures that are higher than the health-based guidelines established by regulatory organizations, and are likely to result in a substantive change in the health of an identified receptor

Although the Project is anticipated to result in changes to air, water, and sound, direct exposures are expected to meet health-based guidelines, and therefore the risk of adverse effects to Indigenous health conditions from direct exposures is negligible while the potential for a change in Indigenous health related to country foods consumption is considered to be low. Indigenous socio-economic conditions, current use and physical and cultural heritage, adverse effects are predicted to be low in magnitude. Limited use of the Project Area has been identified by the Indigenous groups; however, while there is limited current use at the mine site, resources harvested for traditional purposes may be present in this area. With the implementation of mitigation measures, the Project is unlikely to cause a loss in areas relied upon for traditional use practices, or the loss of traditional use areas within the LAA or RAA. Socio-economic conditions of affected Indigenous groups are unlikely to be affected, such that there are associated detectable and sustained decreases in the quality of life of a community.

With mitigation and environmental protection measures, the residual environmental effects on Indigenous groups are predicted to be not significant.

17.7 PREDICTION CONFIDENCE

The level of confidence in the predictions for Project-related residual effects on Indigenous groups is moderate. This is based on information collected as part of ongoing engagement activities (Chapter 3), the ATK Study completed by Qalipu (2020), desktop data compilation and understanding of current existing conditions (validated by the Indigenous groups), GIS data analyses, understanding of Project activities, locations and described interactions, confidence in predictions related to air and surface water quality, the known effectiveness of mitigation measures, and experience of the assessment team. A moderate level of confidence was given because some of the desktop data were limited in terms of availability (e.g., intensity of current use) or scale (e.g., big game hunting areas to support harvest evaluation). Furthermore, given the qualitative and subjective nature of assessing Indigenous health conditions, Indigenous socio-economic conditions, and Indigenous physical and cultural heritage, the views of Indigenous groups may differ from the findings of this assessment. Many of the mitigation and



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

management measures identified in Section 17.4 are standard practice and have been implemented in previous mining projects. Marathon will continue to engage with Indigenous groups for the identification, review, and analysis of existing and available information on Indigenous land and resource use activities, to consider this throughout Project planning and design.

17.8 PREDICTED FUTURE CONDITION OF THE ENVIRONMENT IF THE UNDERTAKING DOES NOT PROCEED

Consideration of predicted future condition of the environment if the undertaking does not proceed is a requirement of the Provincial EIS Guidelines (Appendix 1B). Inclusion of Indigenous Groups as a VC is required by the Federal EIS Guidelines (Appendix 1A). Given this and the nature of this VC, the future conditions of Indigenous Groups if the undertaking does not proceed has not been predicted.

17.9 FOLLOW-UP AND MONITORING

Follow-up and monitoring requirements specific to Indigenous peoples have not yet been identified. Marathon will continue to engage with Indigenous groups, including Indigenous resource users, throughout the life of the Project. This will include the communication of Project information, updates on ongoing and planned activities, and a discussion of issues and concerns and a potential means of addressing them. This will also include a discussion of the development and implementation of Project-specific environmental management and monitoring plans.

17.10 REFERENCES

- AADNC (Aboriginal Affairs and Northern Development). No date (n.d.). Miawpukek First Nation Self-Government Agreement-in Principle. Available at: https://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-HQ-LDC/STAGING/texte-text/ldc_ccl_sgb_miaw_1402323649082_eng.pdf
- Aboriginal Affairs and Northern Development Canada. 2011. Aboriginal Consultation and Accommodation - Updated Guidelines for Federal Officials to Fulfill the Duty to Consult. Available at: https://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-HQ/STAGING/texte-text/intgui_1100100014665_eng.pdf
- Barron, T., Orenstein, M., & Tamburrini, A.-L. 2010. Health Effects Assessment Toll (HEAT): An Innovative Guide to HIA in Resource Development Projects. Available at: http://www.erm.com/globalassets/documents/publications/2010/erm_healtheffectsofresourcedevelopmentprojects.pdf
- BP. 2018. Newfoundland Orphan Basin Exploration Drilling Project – Environmental Impact Statement. Available at: <https://iaac-aeic.gc.ca/050/documents/p80147/125908E.pdf>
- CEA Agency (Canadian Environmental Assessment Agency). 2015a. Reference Guide: Considering Aboriginal Traditional Knowledge in Environmental Assessments Conducted Under the *Canadian Environmental Assessment Act, 2012*. Available at: http://publications.gc.ca/collections/collection_2013/acee-ceaa/En106-124-2013-eng.pdf



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

CEA Agency (Canadian Environmental Assessment Agency). 2015b. Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archaeological, Paleontological or Architectural Significance under *Canadian Environmental Assessment Act, 2012*. Available at: <https://www.canada.ca/content/dam/ceaa-acee/documents/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing/technical-guidance-assessing-physical-cultural-heritage-structure-site-thing-historical-archeological-paleontological-architectural-significance-2015.pdf>

CEA Agency (Canadian Environmental Assessment Agency). 2016. Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under the *Canadian Environmental Assessment Act, 2012*. Available at: https://www.canada.ca/content/dam/ceaa-acee/documents/policy-guidance/assessing-current-use-lands-resources-traditional-purposes/current_use_final_draft-eng.pdf

Chan, Olivier Receveur, Malek Batal, William David, Harold Schwartz, Amy Ing, Karen Fediuk and Constantine Tikhonov. First Nations Food, Nutrition and Environment Study (FNFNES): Results from the Atlantic. Ottawa: University of Ottawa, 2017. Print.

CRHSS. n.d. Conne River's Health and Social Service's website. Available at <https://crhss.com/>

Denny, S. K. and Fanning, L. M. 2016. A Mi'kmaw Perspective on Advancing Salmon Governance in Nova Scotia, Canada: Setting the Stage for Collaborative Co-Existence. *The International Indigenous Policy Journal*, 7(3). Available at: <https://ir.lib.uwo.ca/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1294&context=iipj>

Emera Newfoundland and Labrador. 2013. Maritime Link Environmental Assessment Report. Available at: https://www.novascotia.ca/nse/ea/maritime-link/1_ENL_ES_TOC.pdf

FNI (Federation of Newfoundland Indians). 2002. Traditional Use Study Final Report. Phase Three.

Government of NL (Newfoundland and Labrador). 2013. Aboriginal Consultation Policy on Land and Resource Development Decisions. Available at: http://lamp.makeit.com/resda/library/aboriginal_consultation%20policy.pdf

INAC (Indigenous and Northern Affairs Canada). 2012. Miawpukek (1996) - Claims and Assertions. Available at: https://sidait-atris.aadnc-aandc.gc.ca/atris_online/Content/ClaimsNegotiationsView.aspx

INAC (Indigenous and Northern Affairs Canada). 2017. Website. Available at: <https://www.aadncaandc.gc.ca/eng/1319805325971/1319805372507>

INAC (Indigenous and Northern Affairs Canada). 2020. First Nation Profiles. Available at: https://fnp-pfn.aadnc-aandc.gc.ca/fnp/Main/Search/FNMain.aspx?BAND_NUMBER=47&lang=eng

Indigenous Guardians Toolkit. No date. Miawpukek First Nation. Available at: <https://www.indigenousguardianstoolkit.ca/communities/miawpukek-first-nation-0>



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

- Health Canada. 2016a. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality.
- Health Canada. 2016b. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality.
- Health Canada. 2016c. Human Health Risk Assessment for Diesel Exhaust. Available at: http://publications.gc.ca/collections/collection_2016/sc-hc/H129-60-2016-eng.pdf
- Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise.
- Health Canada. 2018. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods.
- Health Canada. 2019a. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment.
- Health Canada. 2019b. Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
- Joe, G. 2007. Miawpukek First Nation (Conne River) Presentation at the 2007 National Conference for the Canadian CED Network. Available at: <https://ccednet-rcdec.ca/en/conference/past/2007>
- MFN (Miawpukek First Nation). 2020. Meeting with members of MFN and Marathon Gold Ltd. As part of the Indigenous engagement program for the Project. July 14, 2020. St. John's NL.
- Miawpukek. N.d. Miawpukek First Nation Website. Available at: <http://www.mfngov.ca/>.
- Michelin, O. 2019. Reserves in Newfoundland and Labrador. The Canadian Encyclopedia. Published on June 7, 2019. Available at: <https://www.thecanadianencyclopedia.ca/en/article/reserves-in-newfoundland-and-labrador>
- National Research Council (US) Safe Drinking Water Committee. 1980. Drinking Water and Health, Volume 3, Chapter V – The Contribution of Drinking Water to Mineral Nutrition in Humans. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK216589/>
- North Health. 2018. The SDOH impacts of resource extraction and development in rural and northern communities. Available at: https://www.northernhealth.ca/sites/northern_health/files/services/office-health-resource-development/documents/impacts-promising-practices-assessment-monitoring.pdf
- Pastore, R.T. 1978. The Newfoundland Micmacs. Newfoundland Historical Society Pamphlet 4, St. John's, NL.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

- Penney, G. 1987. An Archaeological Survey of King George IV Lake. Unpublished report submitted to Conne River Band Council, Conne River, Bay D'Espoir, Newfoundland and Labrador.
- Penney, G. 1990. An Archaeological Survey of Temagen Gospen: Archaeological Research Permit 90-04. Unpublished report submitted to Miawpukek Band, Conne River, Bay d'Espoir, NL.
- Qalipu First Nation, INAC. 2007. Agreement for the Recognition of the Qalipu Mi'kmaq Band
<http://qalipu.ca/site/wp-content/uploads/2011/07/2011sept-Agreement-In-Principle.pdf>
- Qalipu First Nation, MAMKA and Mi'kmaq Commercial Fisheries. 2017. Fisheries Designation Policy. Available at: <http://qalipu.ca/qalipu/wp-content/uploads/2018/01/Fishing-Designation-Policy-1.4-pages-1-6.pdf>
- Qalipu First Nation. 2019. Annual Report. Available at: <http://qalipu.ca/annual-report-2018-2019/>
- Qalipu First Nation. 2020. Collection of Current Land use and Aboriginal Traditional Knowledge. Final Report v.1.1. July 2020.
- Qalipu First Nation. n.d.(a). Qalipu First Nation website. Background Information. Available at: <http://qalipu.ca/about/background/>
- Qalipu First Nation. n.d.(b). Qalipu First Nation website. Cultural Heritage. Available at: <http://qalipu.ca/culture-heritage/qalipu-cultural-information/>
- Qalipu First Nation. n.d.(c). Qalipu First Nation website. Natural Resource Reports. Available at: <http://qalipu.ca/natural-resource-reports/>
- Speck, F. 1922. Beothuk and Micmac. Indian Notes and Monographs, Museum of the American Indian, Heye Museum, New York, NY.
- Statistics Canada. 2017. Samiajij Miawpukek, IRI [Census subdivision], Newfoundland and Labrador and Newfoundland and Labrador [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. Accessed: January 2018.
- UINR (Unama'ki Institute of Natural Resources). 2015. Fact Sheet for Plamu – Atlantic salmon *Salmo salar*. Available at: <http://www.uinr.ca/wp-content/uploads/2016/09/Plamu-Atlantic-Salmon-Fact-Sheet.pdf>
- UINR (Unama'ki Institute of Natural Resources). No date. Netukulimk. Available at: <https://www.uinr.ca/programs/netukulimk/#:~:text=Netukulimk%20is%20the%20use%20of,or%20productivity%20of%20our%20environment>
- WHO (World Health Organization). 2004. Sulfate in Drinking-water – Background document for the development of WHO Guidelines for Drinking-water Quality. Available at: https://www.who.int/water_sanitation_health/dwq/chemicals/sulfate.pdf



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Indigenous Groups
September 2020

WHO (World Health Organization). 2005. Nickel in Drinking-water – Background document for the development of WHO Guidelines for Drinking-water Quality. Available at:
https://www.who.int/water_sanitation_health/gdwgrevision/nickel2005.pdf



18.0 HISTORIC RESOURCES

18.1 SCOPE OF ASSESSMENT

Historic resources include sites, materials and, in certain instances, landscapes and/or places of historical, archaeological, cultural / spiritual, paleontological and architectural importance. Such resources can date to the distant past or to the precontact, historic or contemporary periods, and are valued for their cultural, spiritual, natural, and scientific importance.

Historic resources have been identified as a valued component (VC) because these can comprise the only physical information on Indigenous lifestyles prior to the arrival of Europeans in North America and help us understand the history, land-use, fossil record, and architectural history of a region. Moreover, they can provide insight into the interactions that took place between different cultural groups and the connections each had with the environment in which they lived.

There are linkages between the Historic Resources VC and the Land and Resource Use and Indigenous Groups VCs (Chapter 16 and Chapter 17, respectively). Evidence for contemporary land and resource use may serve as proxy indicators of potential for archaeological resources pertaining to the precontact and historic periods. In addition, historic resources pertaining to Indigenous groups are valued for their historical, educational, and cultural and spiritual importance.

The assessment of the potential of historic resources to be affected by the Project includes the identification of known sites of historical, archaeological, cultural and spiritual, paleontological, and architectural importance, along with identification of locations with potential to contain such sites. Where these sites may interact with the Project, the need for further assessment and mitigation can be determined.

18.1.1 Regulatory and Policy Setting

In addition to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and the Newfoundland and Labrador (NL) *Environmental Protection Act*, the Project is subject to other federal and provincial legislation, policies and guidance. This section identifies the primary regulatory requirements and policies of the federal and provincial authorities which influence the scope of the assessment on historic resources.

In the province of NL, historic resources are protected under the provincial *Historic Resources Act* (1985) (HRA), administered by the Provincial Archaeology Office (PAO) of the Department of Tourism, Culture, Industry and Innovation, and, in the case of architectural resources, by the Heritage Foundation of NL.

Historic resources are typically broken down into four broad categories:

- Archaeological sites and materials (e.g., remains of campsites and/or stone tools pre-dating 1960)
- Cultural / spiritual sites (e.g., indigenous and non-indigenous burial sites and other sacred places)
- Paleontological sites and materials (fossils)
- Architectural resources (e.g., historical buildings and properties)



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

Archaeological sites identified during field research in NL are recorded, inventoried and assigned numbers under the Borden System (the Canadian registry for archaeological resources).

Contemporary cultural and spiritual sites can include, for example, evidence of campsites or tilts, or remains suggestive of hunting, fishing or trapping locations. Though recorded by provincial regulators, contemporary sites are not assigned numbers under the Borden System, are not classified or inventoried as archaeological sites, and are not normally the subject of mitigation measures.

A paleontological resource means a construct, structure or work of nature consisting of, or being evidence of, prehistoric multicellular organisms and paleontological resources that are designated by regulation. These resources are important for their historical, cultural, spiritual, and scientific value. Only sedimentary rocks have the potential to be paleontological resources (i.e., fossils).

Structures or sites that are of architectural significance are designated Registered Heritage Structures by the Heritage Foundation of NL, established by the provincial government in 1985.

The Provincial Environmental Impact Statement (EIS) Guidelines (Appendix 1B) define historic resources as, “a work of nature or of humans that is primarily of value for its archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest, including an archaeological, prehistoric, historic or natural site, structure or object.”

The Federal EIS Guidelines (Appendix 1A) require, with respect to Indigenous peoples, the assessment of effects of changes to the environment on physical and cultural heritage, as well as any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Sites of archaeological or historic significance are defined for this assessment as sites that have elevated interest due to their cultural or spiritual importance to Indigenous groups or their importance to the historical record as defined by the HRA.

18.1.2 The Influence of Engagement on the Assessment

As part of ongoing engagement and consultation activities, Marathon has documented interests and concerns about the Project received from communities, governments, Indigenous groups and stakeholders. An overview of Marathon's engagement activities is provided in Chapter 3. To gain a better understanding of current use within the area of the Project, a study entitled, “The Collection of Current Land Use and Aboriginal Traditional Knowledge” (ATK Study) was conducted in 2020 by the Qalipu, with financial support from Marathon. Documented interests and concerns have influenced the design and operational plans for the Project and the development of the EIS, including the scope of assessment on the VCs. Only one concern was noted that specifically related to historic resources. Through Marathon's engagement efforts, Miawpukek identified a concern for the potential loss of historic or cultural sites.



18.1.3 Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographical extent of potential effects) and temporal boundaries (i.e., timing of potential effects). Spatial boundaries for the Historic Resources VC were selected in consideration of the geographic extent over which Project activities, and their effects, are likely to occur to the VC. Temporal boundaries are based on the timing and duration of Project activities and the nature of the interactions with the VC. The spatial and temporal boundaries associated with the effects assessment for the Historic Resources VC are described in the following sections.

18.1.3.1 Spatial Boundaries

The following spatial boundaries were used to assess Project effects, including residual environmental effects, on historic resources in areas surrounding the mine site and access road (Figure 18-1):

Project Area: The Project Area encompasses the immediate area in which Project activities and components occur and is comprised of two distinct areas: the mine site and the access road. The mine site includes the area within which Project infrastructure will be located, and the access road is the existing road to the site, plus a 20 metre (m) wide buffer on either side. The Project Area is the anticipated area of direct physical disturbance associated with the construction, operation and decommissioning, rehabilitation and closure of the Project. This is the most important spatial boundary related to potential adverse effects on historic resources during construction (Figure 18-1).

Local Assessment Area (LAA): The LAA includes the Project Area, as well as the remainder of the Marathon mineral claim area (Figure 18-1). This is the area within which archeological potential mapping was completed (Baseline Study Appendix [BSA] 10: Historic Resources [BSA.10]).

Regional Assessment Area (RAA): The RAA consists of the west-central and south-central Island of Newfoundland interior, including the Victoria River, Victoria Lake Reservoir and Lloyd's River drainages, as well as Red Indian Lake and surrounding areas. The RAA was selected as a reasonable sample of known archaeological sites to provide a regional context for the prediction of archaeological resource potential within the LAA and Project Area (Figure 18-1).

18.1.3.2 Temporal Boundaries

The temporal boundaries for the assessment of potential effects on the Historic Resources VC include:

- Construction Phase – 16 to 20 months, beginning in Q4 2021, with 90% of activities occurring in 2022
- Operation Phase – Estimated 12-year operation life, with commissioning / start-up and mine / mill operation slated to start Q2 2023
- Decommissioning, Rehabilitation and Closure Phase – Closure rehabilitation to occur once it is no longer economical to mine or resources are exhausted



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

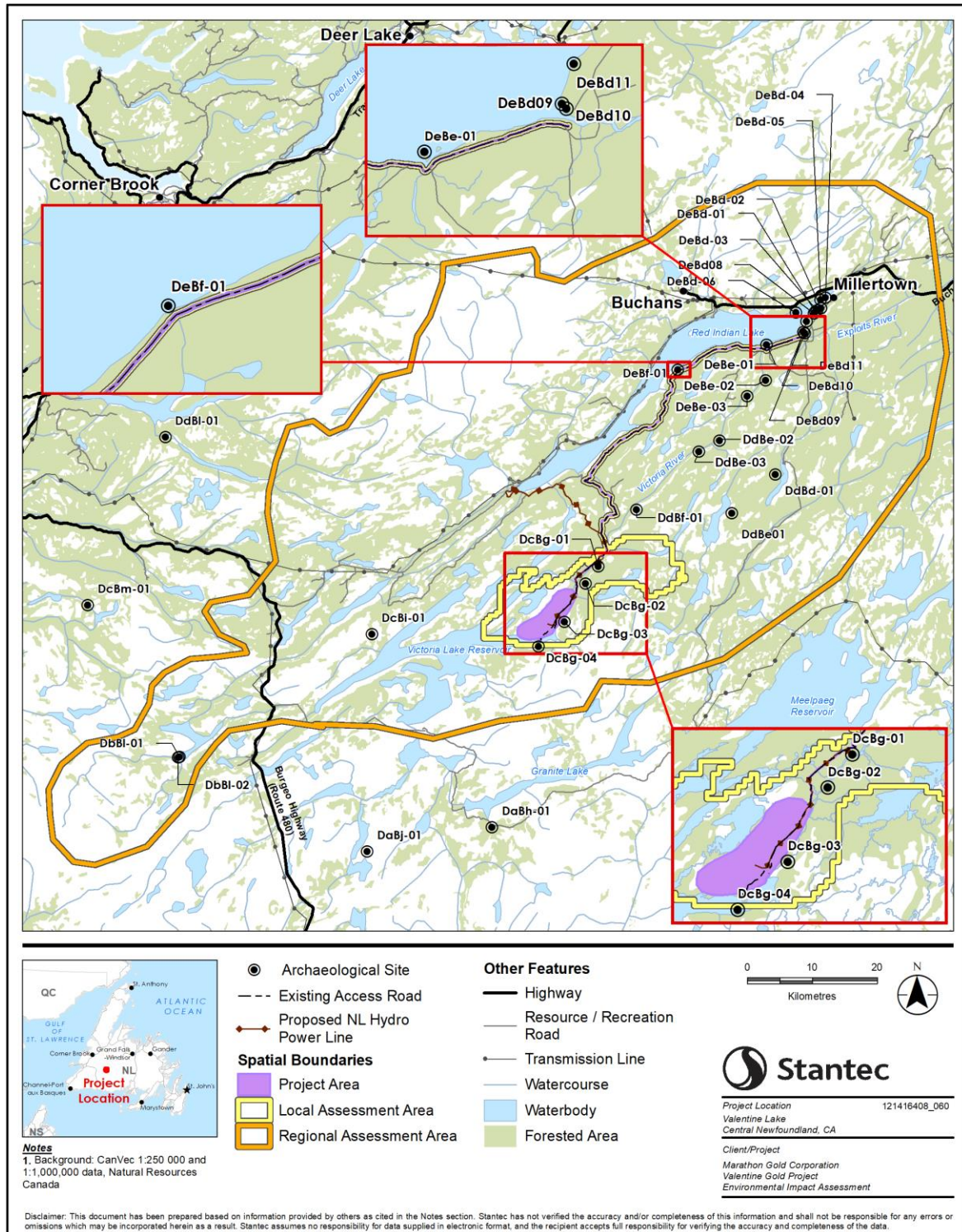


Figure 18-1 Historic Resources VC Spatial Boundaries



18.2 EXISTING CONDITIONS FOR HISTORIC RESOURCES

A characterization of the existing conditions within the spatial boundaries defined in Section 18.1.3 is provided in the following sections. This includes a discussion of the influences of past and present physical activities on the VC, leading to the current conditions. An understanding of the existing conditions for the VC within the spatial area being assessed is a key requirement in the prediction of potential Project effects provided in Section 18.5.

18.2.1 Methods

The initial assessment of archaeological potential for the Project Area (BSA.10, Attachment 10-A) consisted of a review of archaeological, historical and ethnohistorical literature, along with reports and site record forms provided by the PAO pertaining to known archaeological sites in the vicinity of the Project Area. Resources consulted included the following:

- General archaeological, historical and ethnohistorical literature pertaining to the broad culture-historical framework of precontact and historic-period settlement on the Island of Newfoundland, with particular reference to settlement in the interior of the Island
- Specific archaeological, historical and ethnohistorical literature bearing on the archaeology of the southwestern interior of the Island
- Literature and other information on environmental factors pertinent to archaeological potential within the Project Area, such as caribou abundance, lakeshore characteristics, and the effects of previous developments, including the diversion and flooding of waterways in the 1960s for the Bay d'Espoir Hydroelectric Development
- Aerial (Google Earth) imagery and topographic maps reviewed for preliminary identification of specific locations of elevated archaeological potential
- Review of photographs and observations recorded by Stantec personnel during helicopter overflight of the Project Area on June 6, 2017

A field assessment for historic resources has not been undertaken for this Project, as not being required by the PAO at this time and previous archaeological assessment of the LAA has been limited.

Following review of the Project Registration document submitted to the province in April 2019, the PAO instructed Marathon to assess, protect and, where necessary, mitigate potential Project-related effects on historic resources, including a commitment to undertake the following:

- Archaeological overflight surveys to identify high-potential locations not evident in aerial imagery
- Archaeological surveys including ground-truthing of selected areas as having enhanced archaeological potential within the Project Area
- Intensive ground-truthing of three of the sites newly registered by the PAO (DcBg-01, DcBg-02, and DcBg-03) located in close proximity to the Project Area
- Testing of power corridor, road routes and other infrastructure requirements (new and upgraded) at selected river crossings and lakeshores
- Archaeological assessment outside of the Project Area at locations where new development is, or may be, proposed



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

Following consultation with the PAO on October 16, 2019, Marathon has undertaken the following to meet the PAO's requirements:

- Light detection and ranging (LiDAR) data was reviewed to serve in lieu of the helicopter overflight. Based on consultation with the PAO, it was determined that a review of LiDAR data and incorporation of review results into an updated baseline study would meet the overflight commitment required by the PAO.
- Based on refinements in Project siting and lack of overlap between the Project footprint and locations identified as having elevated archaeological potential, it was determined in consultation with the PAO that a field assessment was not required at this time. Marathon will undertake field assessment if future Project refinements create the potential for the Project to interact with identified areas of high archaeological potential.
- Similar to the previous bullet, based on lack of overlap with Project activities, ground-truthing of the three Victoria River sites is not presently required. However, as required by the PAO, information on these sites has been incorporated into BSA.10, Attachment 10-B. Review of historic fieldnotes pertaining to these sites (presently housed in the Provincial Archives) has not yet been conducted due to the closure of the Provincial Archives in response to the COVID-19 pandemic. These fieldnotes will be reviewed once available. In addition, Marathon will undertake future ground-truthing of these sites should the Project Area expand to interact with these hypothesized locations.
- Archaeological assessment / testing of the power line corridor, road routes and other infrastructure (new and upgraded) located at selected river crossings and lakeshores will be conducted once detailed design of these Project features is finalized (including refinement of infrastructure siting). This will be conducted prior to the start of any construction activities. Note that the power line from Star Lake to the Project will be constructed and operated by NL Hydro. As the proponent for this power line, NL Hydro will be required to meet relevant regulatory requirements, including the assessment and mitigation of potential effects on historic resources.
- Should future Project refinements result in Project activities or infrastructure being planned for locations outside of the Project Area, Marathon will undertake an archaeological assessment of these areas, as recommended by the PAO.

An updated baseline study (BSA.10, Attachment 10-B) has been prepared which includes consideration of the series of 10 potential archaeological sites identified in 2018 by the PAO, and review of LiDAR imagery of the Project Area flown in 2019.

18.2.2 Overview

18.2.2.1 The Precontact Period

Archaeological investigations on the Island of Newfoundland, particularly over the last forty years, have provided a clear, if incomplete, understanding of the Island's long-term culture and history. The initial occupation of the Island appears to have occurred late in the Maritime Archaic period, ca. 5000 to 3200 B.P. (Before Present), although one site in the Deer Lake area may be older (Reader 1999). Southern Labrador shows evidence of occupation much earlier than the Maritime Archaic period, by 7,500 to 8,000 B.P. (McGhee and Tuck 1975; Schwarz 2010), and insular Newfoundland was theoretically habitable by



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources

September 2020

this time as well (Macpherson 1981). The scarcity of evidence for an early Archaic occupation of the Island, and the apparent delay in the expansion of Archaic hunters from Labrador to Newfoundland, has never been satisfactorily explained.

After a hiatus of several centuries, the Maritime Archaic occupation was followed by an Early Palaeo-Eskimo (Groswater) occupation, dating from 2800 to 2000 B.P. This in turn was followed by a distinct Late Palaeo-Eskimo (Middle Dorset) occupation beginning ca. 1900 B.P. Dorset sites in Newfoundland are both larger and more numerous than those of any other period, and although absolute population estimates are not possible, the Dorset occupation appears to have been the most extensive, and its population levels the highest in the Island's prehistory. While it may have seen the most extensive occupation, the Dorset period was also the briefest, apparently ending by ca. 1100 B.P. The "Recent Indian" occupation began with an early "Cow Head Complex" occupation, coeval with the Dorset, indicating shared occupation of the Island by both Amerindian and Palaeo-Eskimo peoples (Hartery 2007), and ended with the historically documented extinction of the Beothuk early in the nineteenth century. Beothuk sites of the early contact period (A.D. 1500 to 1700) have been identified on the Avalon Peninsula, Bonavista Bay and Notre Dame Bay. Later historic Beothuk sites (A.D. 1700 to 1829) are limited to the Exploits Valley, including Red Indian Lake, among the final refuges of the Beothuk prior to their extinction in 1829 (Devereux 1965, 1970; LeBlanc 1973).

Most archaeological work on the Island has been concentrated on the coastline, on the assumption that the archaeological potential of the interior is generally low. Archaeologists have tended to regard Newfoundland's marine resources as rich and stable, in contrast to an interior resource base which is limited, impoverished and prone to periodic fluctuations in abundance (cf. Tuck and Pastore 1985).

The Exploits Valley has long been recognized as having high archaeological potential. The historical resources of the Exploits Valley are dominated by the remains of the Beothuk, a people forced into a deep interior caribou-hunting adaptation by spreading European settlement along the coast. Pre-Beothuk remains are relatively scarce along the Exploits River.

Archaeological work since the 1980s, however, has somewhat modified the traditional view of the Newfoundland interior resource base. Investigations of the interior by several investigators (Schwarz 1994) have confirmed the archaeological potential of the Newfoundland interior for precontact sites, particularly on or near-coastal interior lakes, and along the major southwest-northeast-oriented river systems (most notably the Exploits River) which offer travel routes into the deep interior and to strategic locations from which to intercept migrating caribou. Most of the interior sites identified to date pertain to the Recent Indian period, although Maritime Archaic sites have also been identified, and increasingly, evidence for Early Palaeo-Eskimo occupations is being recovered, even from deep-interior locations such as Birchy Lake and the Exploits River (Erwin and Holly 2006). Late Palaeo-Eskimo (Dorset) sites in the interior remain relatively rare. In terms of micro-locational attributes, precontact interior sites appear to be particularly associated with points of land and constrictions in waterways, as well as with stream mouths and falls or rapids (Schwarz 1992, 1994).



Historic Resources
September 2020

18.2.2.2 The Historic Period

The Island of Newfoundland has had a long history of European settlement, and historical archaeology in Newfoundland has, not surprisingly, tended to focus on the province's unusually early European remains, and on the archaeology of the historic Beothuk.

The earliest known historic European site on the Island is the Norse site at L'Anse aux Meadows, dated ca. 1000 B.P. (Ingstad 1969), a period that archaeologists still generally regard as "prehistoric" in Newfoundland. The intensive European migratory fishery which developed and expanded through the sixteenth century is documented by the Basque and remains at Red Bay (Tuck and Grenier 1989). The seventeenth century has recently become a focus of investigation; outside of the Avalon, this century is still sparsely documented archaeologically, though there are likely many sites of this period along the Island's coastline, pertaining to the English, French and Basque migratory fisheries. For instance, possible seventeenth-century Basque material has been recovered on the west coast (Schwarz 1994). The eighteenth century, a period which saw substantial growth in the resident population of Newfoundland, is well-represented at archaeological sites across the Island. As with prehistoric archaeology, and for many of the same reasons, research in historic archaeology has been strongly focused on the coast. Historical European activities in the interior, such as trapping (Pastore 1987; Schwarz 1994) have not been investigated archaeologically, although archaeological research into European near-coastal interior "winterhousing;" (Smith 1987) has recently begun (Venovcevs 2016).

The Beothuk is the only Indigenous group in Canada to become extinct. From the period of the late fifteenth century to the death of the last-known Beothuk (Shawnadithit, in 1829), the English, Portuguese, Basque, and French fishermen encroached upon the coast and its rich resources, and also upon salmon-fishing rivers (Howley 1915, Marshall 1996). Mi'kmaq settlement from the mainland also deprived the Beothuk of hunting and fishing locations. The Beothuk rarely traded with Europeans, and their need for metal led to the raiding of seasonal fishing stations during the winters and retaliation by Europeans. This hostility, coupled with the Beothuk being displaced from the coastline and from favourite salmon-fishing spots, contributed to the decline of the Beothuk. By the nineteenth century, the remaining Beothuk were largely confined to the Exploits River and Red Indian Lake, along with the lakes in the interior hinterland of western Notre Dame Bay.

By this time, the Beothuk were not the only Indigenous people inhabiting the central Newfoundland interior. Mi'kmaq from Cape Breton had been travelling to the Island of Newfoundland to hunt since at least the early to mid-seventeenth century. Through the eighteenth century, their favoured destinations on the Island included Placentia, Cape Ray and Bay d'Espoir. Initially, Mi'kmaq in Newfoundland regularly returned to Cape Breton, and by the end of the eighteenth century or early nineteenth century, Mi'kmaq families were settling permanently in southern and southwestern Newfoundland, hunting caribou, trapping, and later serving as guides for European explorers and sportsmen (Pastore 1978b).

In the eighteenth and early nineteenth centuries, there was little territorial overlap between the Mi'kmaq and the Beothuk. Mi'kmaq settlement and harvesting was focused on the southern and southwestern interior from St. George's Bay to Placentia Bay, while the Beothuk ranged to the north, principally along the Exploits and Red Indian Lake (Pastore 1978b). In 1822, William Epps Cormack and his Mi'kmaq guide Joseph Sylvester, walked across the Newfoundland interior from Trinity Bay to St. George's Bay,



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

including the country between Meelpaeg, Granite Lake and George IV Lake south of the Project Area (Howley 1915). The Mi'kmaq families they encountered along their route informed them that at that time, the southern border of Beothuk territory lay some 15 to 25 km north of the Mi'kmaq camp on King George IV Lake (Marshall 1996). King George IV Lake marked the approximate eastern limit of Mi'kmaq canoe travel inland from St. George's Bay (Penney 1987).

Through the nineteenth century, following the demise of the Beothuk, the Mi'kmaq extended their range to encompass most of the central and western Newfoundland interior, as far north as the Bay of Exploits and Gander Bay. Although there was some competition with white trappers in the hinterlands of the northeast coast through the second half of the nineteenth century and the beginning of the twentieth century, the Mi'kmaq had the interior of the Island largely to themselves (Pastore 1978a). In 1914, the anthropologist Frank Speck mapped the hunting and trapping territories of individual Mi'kmaq families across the Newfoundland interior. For example, the large territory extending from Sandy Lake down through Red Indian Lake, Victoria River and Lake, and Lloyd's River, as far east as Meelpaeg, and as far south as the northern end of King George IV Lake was at that time the territory of Frank Joe, a hunter and trapper of mixed Mi'kmaq and Innu descent (Speck 1922).

Archaeologically, the historic Mi'kmaq occupation of the Newfoundland interior is attested by a number of recorded twentieth century tilt sites (BSA.10, Attachment 10-A). Two historic Mi'kmaq sites, both situated on Middle Ridge east of the Bay d'Espoir Highway have been excavated (Penney and Nicol 1984). Burnt Knaps 1 (DbAv-01) yielded the remains of a rectangular wigwam dating to the first quarter of the twentieth century, and Burnt Knaps 2 (DbAv-02) appeared to be slightly older, dating to the last half of the nineteenth century.

18.2.2.3 Summary

Previous archaeological work on the Island indicates approximately 5,000 years of precontact Indigenous occupation in four distinct periods: two Palaeo-Eskimo and two of Amerindian affiliation. Indigenous occupation was demonstrably intensive along the coast. Interior occupation, primarily by Amerindian groups, and increasingly including some evidence for Palaeo-Eskimo occupation, appears to have been focused on near-coastal interior lakes, and major northeast to southwest-oriented lakes and rivers traversing the deep interior. Along these waterways, specific site locations tend to be associated with sandy coves and points of land, prominent constrictions in major waterways, stream confluences and stream mouths, and locations above or below falls and rapids. Historic European archaeological sites are known primarily from coastal areas until the twentieth century, although historic Mi'kmaq and Beothuk sites have been recorded, and may be anticipated, in deep interior settings on the Island.

18.2.3 Archaeological Potential within the Project Area

Within the Project Area, ethnohistoric evidence indicates that important caribou migration corridors approach and traverse the Project Area, and that there is theoretical potential for precontact sites of all periods, particularly for sites of Maritime Archaic and late precontact Amerindian peoples, and also, to a lesser extent, potential for Palaeo-Eskimo sites. With respect to historic resources, there is potential for Beothuk sites as the Project Area lies within the territory of the Beothuk prior to the second quarter of the



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

nineteenth century, and potential for historic Mi'kmaq sites dating to the second half of the nineteenth century into the twentieth century.

Archaeological assessment within the LAA has been limited; therefore, the assessment of archaeological potential in the Project Area is based in part on a review of archaeological sites recorded to date within the RAA (Figure 18-1) (BSA.10, Attachment 10-A). These sites may be classified into four main groupings, as described in greater detail below:

- A cluster of historic-period Beothuk and precontact sites on Red Indian Lake, northeast of the Project Area
- A widely dispersed group of sites recorded on various interior lakes south and southwest of the Project Area
- Miscellaneous sites from the twentieth century recorded in locations surrounding the Project Area
- A series of ten archaeological sites recently identified on an 1875 map of Victoria River, believed to have been drawn and/or annotated by geologist J.P. Howley. These sites include both observed Beothuk wigwams dating to the eighteenth or nineteenth centuries, and the locations of Howley's own campsites. These sites have not been ground-truthed, however, they have been registered as archaeological sites, with approximate coordinates, in the PAO site inventory. Three of these sites potentially lie in the vicinity of the Project Area (Table 18.1).

An inventory of the closest sites (Figure 18-1) and their measured distance from the Project Area is provided in Table 18.1.

Table 18.1 Registered Archaeological Sites, Proximity to the Project Area

Archaeological Site	Distance to Project Area (km)
DeBf-01	0.13
DcBg-01	0.50
DcBg-03	0.53
DeBe-01	0.57
DeBd09	0.67
DeBd10	0.82
DcBg-04	1.09
DcBg-02	1.29
DeBd11	2.53
DdBf-01	3.08
DeBd-06	3.77
DeBd08	3.96
DeBd-01	4.31
DeBd-03	4.58
DeBe-02	4.63
DeBd-02	5.11



Table 18.1 Registered Archaeological Sites, Proximity to the Project Area

Archaeological Site	Distance to Project Area (km)
DeBd-05	6.26
DeBd-04	6.92
DeBe-03	7.30
DdBe-03	7.65
DdBe-02	9.63
DdBe01	17.67
DdBd-01	19.11
DcBi-01	22.33
DaBh-01	29.31
DaBj-01	40.39
DbBI-01	55.21
DbBI-02	55.39
DdBI-01	61.52
DcBm-01	66.12

18.2.3.1 Historic Beothuk and Precontact Sites on Red Indian Lake

Ten precontact and/or Beothuk archaeological sites have been recorded on Red Indian Lake (Figure 18-1). One site (DeBf-01) contained a single purple rhyolite Maritime Archaic biface fragment surface-collected from a beach on the south side of Red Indian Lake. The remaining nine sites are situated primarily on the south side of the northeast arm of the lake, between the Red Indian Lake dam and Buchans Junction. These include two precontact sites on a point near the former outflow of the lake: Tacamahacca Point (DeBd-09) and Tacamahacca Point 2 (DeBd-10). On another point to the north along the shore of the arm is a Beothuk housepit site at Sabbath Point (DeBd-08), and a precontact site (Sabbath Point 2: DeBd 11), which yielded surface-visible lithic artifacts on the beach and also in test pits behind the beach. Two sites on the north side of the arm are Red Indian Lake North 1 (DeBd-04), an historic and possibly precontact Beothuk site, and the site of the “Nonosabasut and Demasduit Burial Hut” (DeBd-05), a Beothuk gravesite visited by Cormack in 1827; the precise location of this site has not been verified on the ground.

The largest and best-known site on the northeastern arm of Red Indian Lake is Indian Point (DeBd 01). The site was excavated in the 1960s (Devereux 1970) and found to include substantial Beothuk housepit remains, possibly including “longhouses” or communal feasting structures with linear hearths. In addition, the site yielded evidence for precontact occupation in the Dorset and late precontact Amerindian periods. Unfortunately, this highly archaeologically significant site has been subjected to a variety of destructive impacts, including the flooding of Red Indian Lake for hydroelectric power generation. Nevertheless, revisits to this site by numerous researchers since the 1960s have confirmed that, despite flooding, portions of the site remain intact above the high-water mark (PAO site inventory record form). Indian Point is flanked by smaller outlier sites that may belong to the same site complex. These include the historic Beothuk “Three Wigwam Site” (DeBd-02), and June's Cove 1 (DeBd-03), a multi-component precontact



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

and historic Beothuk site, which is normally inundated though occasionally re-emerges in dry years when lake levels are low.

The Red Indian Lake sites are relatively distant from the Project Area, however the archaeological resources from Red Indian Lake do have implications for the archaeological potential of the Project Area:

- The association of archaeological sites with points of land projecting out into lakes and waterways, generally evident in the Newfoundland interior, is repeated in other areas around the Project
- Palaeo-Eskimo components are less abundant than those of the precontact and historic Beothuk in deep interior settings, although are present nevertheless
- While previous impoundment of lakes for hydroelectric development may have impacted archaeological resources, this does not necessarily eliminate the potential for archaeological sites, or portions of sites, to survive intact

18.2.3.2 Archaeological Sites South and Southwest of the Project Area

Archaeological work in the southwestern interior of Newfoundland has been limited, however even the limited surveys undertaken to date have yielded archaeological sites from the precontact and historic periods. Four sites have been recorded on lakes south and southwest of the Project Area (Figure 18-1).

An archaeological survey of King George IV Lake (Penney 1987) led to the discovery of two sites at the delta of Lloyd's River at the southwest end of the lake. At one site, DbBI-01, two hearths were identified. One contained lithic artifacts pertaining to the late precontact period, and the other an assemblage of historic artifacts, including clay tobacco pipes, nails, gunflints and the decayed remains of a spruce-bough floor. This latter hearth was attributed to a Mi'kmaq occupation of the site ca. 1920. The second site, DbBI-02, included the remains of a fallen Mi'kmaq square wigwam with artifacts indicating a date of occupation ca. 1940.

In 1989, an archaeological survey was conducted of the lake known to Newfoundland Mi'kmaq as "Temagen Gospen," situated southwest of Burnt Pond (Penney 1990), which had been previously surveyed with negative results. Unlike Burnt Pond, Temagen Gospen had not been flooded by the diversion of Spruce Pond, Victoria Lake and Burnt Pond into Granite Lake. One site, DaBj-01 (Figure 18-1), located at a prominent constriction midway along the lakeshore, yielded evidence for a late precontact site, along with a mid-twentieth century Mi'kmaq hunting camp. Two additional modern Mi'kmaq camps were also recorded at the southern end of the lake.

One unusual site has been recorded on a small lake high in the Long Range Mountains in the near-coastal interior (i.e., less than 30 km from salt water) hinterland of Flat Bay (Penney 1980). This site, Long Pond (DcBm-01), yielded surface finds of precontact (Dorset Palaeo-Eskimo) lithic artifacts along the beach at a constriction between Long Pond and Cross Pond. The original site appears to have been destroyed when the pond was flooded in the early 1950s for power generation.

Finally, a fourth site was recorded during an archaeological assessment of Little Grand Lake, near the southwest end of Grand Lake, in 1984 (Northland Associates Limited 1989). This site, Little Grand Lake 1



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

(DdBI-01), consisted of a cluster of four low rock mounds of indeterminate function, cultural affiliation or date.

The implications for archaeological assessment of the Project Area are similar as those noted in Section 18.2.3.1 above:

- The association of archaeological sites with points of land and constrictions in lakes and waterways is repeated, although river mouth deltas also have potential for archaeological sites
- Palaeo-Eskimo components are less abundant than those of the late precontact period in deep interior settings, although are present nevertheless
- Although many of the recorded sites in the Newfoundland interior are situated on major lakes or rivers, small ponds (as at DcBm-01) also have potential to yield archaeological sites
- While previous impoundment of lakes for hydroelectric development impacts archaeological resources and may destroy those sites, there remains potential for identifying the deflated remains of sites which were formerly present
- Historic Mi'kmaq sites are anticipated in the southwestern interior

18.2.3.3 Miscellaneous Twentieth Century Sites in Locations Surrounding the Project Area

The PAO inventory references five sites near the Project Area that are known, or inferred to be, of relatively recent twentieth century date (Figure 18-1).

One site is situated in proximity to the cluster of Beothuk sites on Red Indian Lake. This site, Millers Point Wharf (DeBd-08), consists of the remains of wooden crib works, ballast piles and artifacts across a beach, attesting to early twentieth century industrial logging in central Newfoundland.

The Granite Lake site (DaBh-01) similarly consists of abandoned machinery and possible remains of a milling operation of twentieth century date (Cultural Resource Management Group Limited 2011, Penney et al. 2015).

Another unique site situated on a small pond northeast of the Project Area is the Rogerson Lake Site (DdBe-01). This site consists of the wreck of a tug believed to be "Alligator Annie," an Alligator Warring Tug (a paddle steamer), one of two such tugs used on Red Indian Lake in the logging industry in the twentieth century. If this wreck is indeed that of "Annie," then it was originally purchased in 1900 (PAO site inventory record form).

Site DcBi-01, located northwest of Victoria Lake, is the site of a World War II aircraft wreck. The site contains the remains of a Lockheed Hudson A-28 BW 719, which was lost on December 18, 1943 (Deal and Hillier 2007).

Finally, site DdBd-01 ("Gerald Coomb's Shoe") is the site of a stray find of a leather shoe or boot collected between Beaver and Ambrose Lakes (PAO site inventory record form). The exact provenience of the find is unknown, as is the precise age and cultural affiliation.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

The implications of these finds for the assessment of archaeological potential of the Project Area are difficult to specify. In some cases, the general locations of such sites may be elucidated by further archival or oral history research, however the precise locations are difficult to model or predict.

18.2.3.4 Areas of Archaeological Potential within the Project Area and LAA

A review of aerial imagery and LiDAR imagery (BSA.10, Attachment 10-A and 10-B) identified 24 locations within the LAA with potential to yield archaeological resources. The majority of these sites are associated with points of land, constrictions in lakes, stream confluences and river mouths. High-potential locations may, in many cases, have been affected by previous logging activities and hydroelectric development in the region; however, evidence from Red Indian Lake in particular indicates that sites may survive in whole or in part, despite these effects.

Although these areas lie within the Marathon mineral claim area, only one of these locations (in the area of Marathon's exploration camp) lies within the Project Area (Figure 18-2). While this area of potential is within the Project Area, it does not overlap with the current footprint of Project infrastructure.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

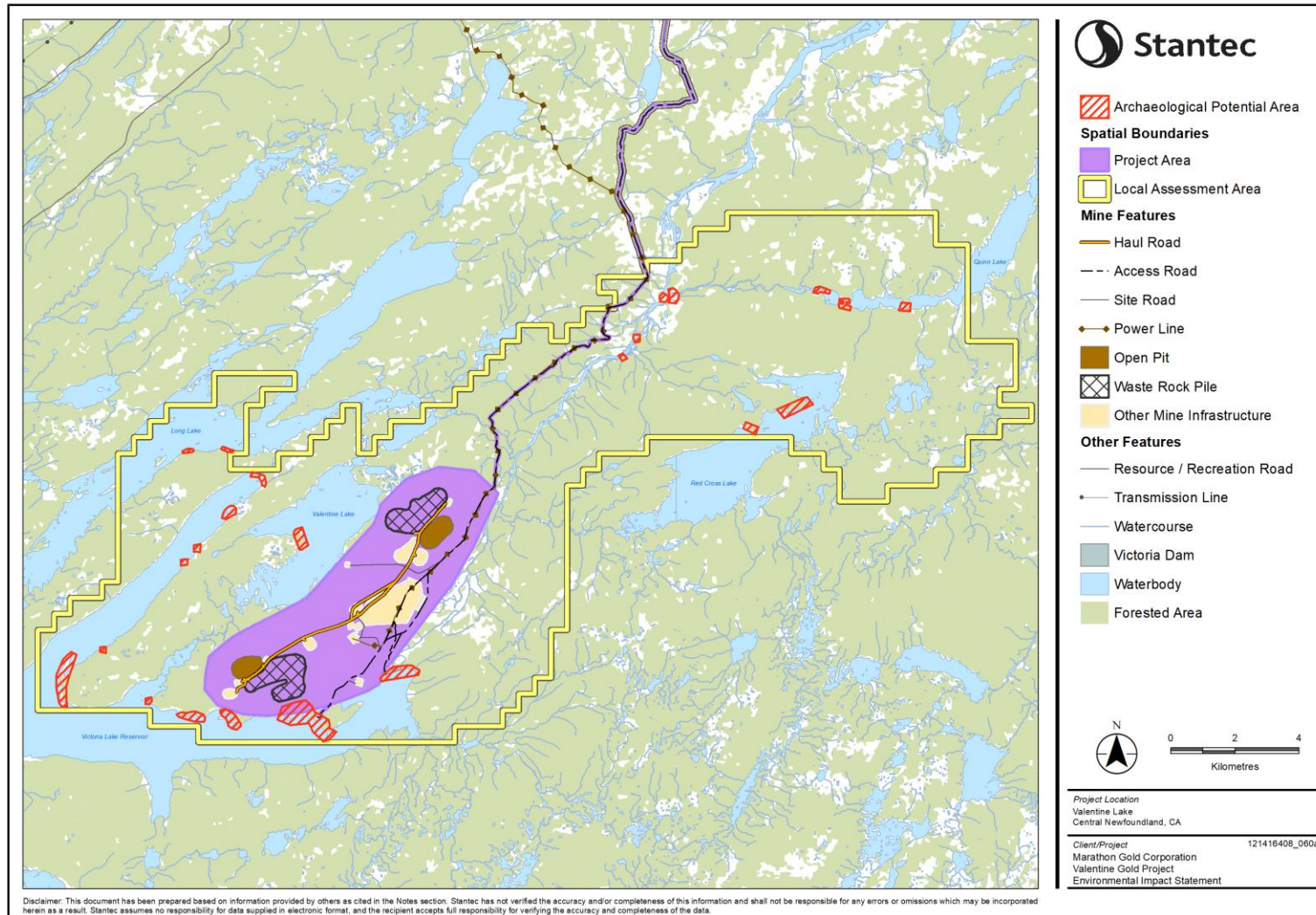


Figure 18-2 Identified Areas of Archaeological Potential within the LAA



18.3 ASSESSMENT CRITERIA AND METHODS

This section describes the criteria and methods used to assess environmental effects on historic resources. Residual environmental effects (Section 18.5) are assessed and characterized using criteria defined in Section 18.3.1, including direction, magnitude, geographic extent, timing, frequency, duration, reversibility, and ecological or socio-economic context. The assessment also evaluates the significance of residual effects using threshold criteria or standards beyond which a residual environmental effect is considered significant. The definition of a significant effect for the Historic Resources VC is provided in Section 18.3.2. Section 18.3.3 identifies the environmental effects to be assessed for historic resources, including effect pathway and measurable parameters. This is followed by the identification of potential Project interactions with this VC (Section 18.3.4). Analytical assessment techniques used for the assessment of historic resources are provided in Section 18.3.5.

18.3.1 Residual Effects Characterization

Table 18.2 presents definitions for the characterization of residual environmental effects on historic resources. The criteria are used to describe the potential residual effects that remain after mitigation measures have been implemented. Quantitative measures have been developed, where possible, to characterize residual effects. Qualitative considerations are used where quantitative measurement is not possible.

Table 18.2 Characterization of Residual Effects on Historic Resources

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	<p>Neutral – no net change in measurable parameters for historic resources relative to baseline</p> <p>Positive – a residual effect that moves measurable parameters in a direction beneficial to historic resources relative to baseline</p> <p>Adverse – a residual effect that moves measurable parameters in a direction detrimental to historic resources relative to baseline</p>
Magnitude	The loss or disturbance of historic resources relative to existing conditions	<p>Negligible – no likely loss or disturbance of significant (as determined by the PAO) historic resources</p> <p>Low – disturbance of historic resources determined to be significant by the PAO, although with implementation of archaeological mitigation for effective recovery (i.e., no loss) of the resource and associated information, and with all necessary regulatory approvals</p> <p>Moderate – moderate disturbance or loss of all or a portion of a historic resource determined to be significant by the PAO, and its associated information, or a direct effect on a known historic resource, which is of interest and concern to the associated community, that does not reduce the overall integrity and cultural value of the site</p> <p>High – disturbance or loss of a historic resource determined to be significant by the PAO, with no retrieval of the resource and its associated information, or a direct effect on a historic resource, which reduces the overall integrity and cultural value of the site</p>



Table 18.2 Characterization of Residual Effects on Historic Resources

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Geographic Extent	The geographic area in which a residual effect occurs	Project Area – residual effects are restricted to the Project Area LAA – residual effects extend into the LAA RAA – residual effects interact with those of other projects in the RAA
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	Single event Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Duration	The period of time required until the measurable parameter or the VC returns to its existing (baseline) condition, or the residual effect can no longer be measured or otherwise perceived	Permanent – because historic resources are static and finite, residual effects are always permanent, with no return to original conditions
Reversibility	Describes whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	Irreversible – the residual effect will not be reversible
Ecological and Socio-economic Context	Existing conditions and trends in the area where residual effects occur	Undisturbed – area is relatively undisturbed or not adversely affected by human activity Disturbed – area has been substantially previously disturbed by human development or human development is still present

18.3.2 Significance Definition

For the Historic Resources VC, and in consideration of the HRA, the threshold criterion beyond which a residual environmental effect is considered significant is the unauthorized disturbance or destruction of a historic resource that is determined by the provincial regulator (PAO) to be an archaeologically significant historic resource and that cannot be mitigated.

18.3.3 Potential Effects, Pathways and Measurable Parameters

Historic resources are assessed in this EIS in consideration of the HRA and the requirements of the Federal EIS Guidelines (Appendix 1A) and the Provincial EIS Guidelines (Appendix 1B), as well as existing knowledge of archaeological potential in the Project Area. The assessment of historic resources includes consideration of the following categories:

- Archaeological sites and materials
- Cultural / spiritual sites



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

- Paleontological sites and materials
- Architectural resources

No registered heritage structures are located in the Project Area; therefore, architectural resources are not assessed further.

The paleontological resources in the vicinity of the RAA date from the Carboniferous Period (360 to 290 million years ago), which was a time when the Island of Newfoundland was located close to the equator and the warm climate resulted in lush vegetation dominated by large trees and swamp plants. This vegetation, along with many small animals, died and were buried in deposits that became peat and much later, coal. There are three major lithological units that underlie the Project Area. These include, from northwest to southeast, the Valentine Lake Intrusive Complex, the Rogerson Lake Conglomerate, and mixed sedimentary units and lesser gabbroic and mafic volcanic rocks of the Victoria Lake Group. As an intrusive volcanic deposit, it is unlikely that fossils will be present in the Valentine Lake Intrusive Complex. Fossils may have been present in the Victoria Lake Group and the Rogerson Lake Conglomerate, although metamorphic processes from the intrusion of the Valentine Lake Intrusive Complex are likely to have altered or destroyed the fossils that may have been present.

The paleontological resources known to be in closest proximity to the RAA are the Carboniferous deposits found at Blanche Brook near Stephenville, approximately 104 km from the Project Area. These deposits form the oldest known fossil bed of mountain trees that produced seeds, dating from 305 million years ago. The area is protected under the provincial HRA. Given the distance between this site and the Project Area, no interactions or subsequent Project-related effects on these resources are predicted to occur. Therefore, paleontological sites and materials are not assessed further.

The assessment of historic resources is focused on potential Project-related loss or disturbance of historic and cultural resources. Table 18.3 lists the potential Project effects on historic resources and provides a summary of the Project effect pathways and measurable parameters and units of measurement to assess potential effects. Potential environmental effects and measurable parameters were selected based on review of recent environmental assessments (EAs) for mining projects in NL and other parts of Canada, comments provided during engagement, and professional judgment.

Table 18.3 Potential Effects, Effect Pathways and Measurable Parameters for Historic Resources

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Loss of information about or alteration to historic resource(s) and their context	Project interactions whereby physical works result in the disturbance or destruction of historic resource(s)	<ul style="list-style-type: none"> • Significance of the historic resource(s) affected in the Project Area and LAA • Integrity of historic resource site(s) in Project Area and LAA



18.3.4 Project Interactions with Historic Resources

Table 18.4 identifies the physical activities that might interact with the VC and result in the identified environmental effect. These interactions are indicated by checkmark and are discussed in detail in Section 18.5, in the context of effect pathways, standard and Project-specific mitigation / enhancement, and residual effects. Following the table, justification is provided for where no interaction (and therefore no resulting effect) is predicted.

Table 18.4 Project-Environment Interactions with Historic Resources

Physical Activities	Environmental Effects to be Assessed
	Loss or Disturbance of Historic Resources
CONSTRUCTION	
Access Road Upgrade / Realignment: Where required, road widening and replacement / upgrades of roads and culverts.	✓
Construction related Transportation along Access Road	–
Mine Site Preparation and Earthworks: Clearing and cutting of vegetation and removal of organic materials, development of roads and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials, and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels. Also includes temporary surface water and groundwater management, and the presence of people and equipment on site.	✓
Construction / Installation of Infrastructure and Equipment: Placement of concrete foundations, and construction of buildings and infrastructure as required for the Project. Also includes: <ul style="list-style-type: none"> • Installation of water control structures (including earthworks) • Installation and commissioning of utilities on-site • Presence of people and equipment on-site 	✓
Emissions, Discharges and Wastes^A: Noise, air emissions / greenhouse gases (GHGs), water discharge, and hazardous and non-hazardous wastes.	–
Employment and Expenditures^B	–
OPERATION	
Operation-related Transportation Along Access Road	–
Open Pit Mining: Blasting, excavation and haulage of rock from the open pits using conventional mining equipment.	–
Topsoil, Overburden and Rock Management: Five types of piles: <ul style="list-style-type: none"> • Topsoil • Overburden • Waste rock • Low-grade ore • High-grade ore 	–



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

Table 18.4 Project-Environment Interactions with Historic Resources

	Environmental Effects to be Assessed
	Loss or Disturbance of Historic Resources
Physical Activities	
Rock excavated from the open pits that will not be processed for gold will be used as engineered fill for site development, maintenance and rehabilitation, or will be deposited in waste rock piles.	
Ore Milling and Processing: Ore extracted from the open pits will be moved to the processing area where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes.	–
Tailings Management Facility: Following treating tails via cyanide destruction, tailings will be thickened and pumped to an engineered TMF in years 1 to 9, then pumped to the exhausted Leprechaun open pit in years 10 through 12.	–
Water Management (Intake, Use, Collection and Release): Recirculated process water and TMF decant water will serve as main process water supply, and raw water (for purposes requiring clean water) will be obtained from Victoria Lake Reservoir. Site contact water and process effluent will be managed on site and treated prior to discharge to the environment. Where possible, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent possible for use on site.	–
Utilities, Infrastructure and Other Facilities <ul style="list-style-type: none"> • Accommodations camp and site buildings operation, including vehicle maintenance facilities • Explosives storage and mixing • Site road maintenance and site snow clearing • Access road maintenance and snow clearing • Power and telecom supply • Fuel supply 	–
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge, and hazardous and non-hazardous wastes.	–
Employment and Expenditure^B	–
DECOMMISSIONING, REHABILITATION AND CLOSURE	
Decommissioning of Mine Features and Infrastructure	–
Decommissioning, Rehabilitation and Closure-related Transportation Along Access Road	–
Progressive Rehabilitation: Rehabilitating infrastructure or areas not required for ongoing operations (e.g., buildings, roads, laydown areas); covering and revegetating completed tailings areas, where practicable, including commencing closure of TMF beginning in Year 9 (when tailings deposition moves to Leprechaun open pit); erosion stabilization and re-vegetation of completed overburden and/or waste rock piles; infilling or flooding of exhausted mining areas; and completing revegetation studies and trials.	–



Historic Resources
September 2020

Table 18.4 Project-Environment Interactions with Historic Resources

Physical Activities	Environmental Effects to be Assessed
	Loss or Disturbance of Historic Resources
Closure Rehabilitation: Active rehabilitation based on successes of progressive rehabilitation activities. Includes: demolishing infrastructure (e.g., buildings, equipment, facilities, roads, laydown areas); grading and revegetating cleared areas, where practicable; breaching and regrading ponds to reestablish drainage patterns; completing closure of TMF (covering with overburden and revegetating); erosion stabilization and revegetation of completed overburden and/or waste rock piles; and infilling or flooding of open pits.	–
Post-Closure: Long-term monitoring	–
Emissions, Discharges and Wastes^A	–
Employment and Expenditure^B	–
Notes: ✓ = Potential interaction – = No interaction ^A Emissions, Discharges, and Wastes (e.g., air, waste, noise, light, liquid and solid effluents) are generated by many Project activities. Rather than acknowledging this by placing a check mark against each of these activities, “Wastes and Emissions” is an additional component under each Project phase ^B Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a check mark against each of these activities, “Employment and Expenditures” is an additional component under each Project phase	

Historic resources are located on or immediately beneath the ground surface. Because these resources are static and finite, Project interactions are restricted to physical works that are associated with ground disturbance and are primarily associated with construction activities. Project activities on post-construction ground surfaces are unlikely to interact with historic resources.

18.3.5 Analytical Assessment Techniques

The assessment of residual environmental effects on historic resources is based on historic resources as static and situated upon or beneath the ground surface. It is assumed that ground disturbance, particularly extensive ground disturbance, has the potential to adversely affect historic resources if present.

No known historic resources are present within the Project Area, although several registered archaeological sites are in proximity to the Project Area (Table 18.1), and the potential exists for the presence of additional historic resources based on the spatial attributes of known historic resources registered within the RAA. In the case of archaeological resources, archaeological potential is highest on dry, level terrain adjacent to streams and waterbodies, particularly at constrictions, confluences and rapids. Twenty-four high-potential locations have been identified within the LAA. Potential may be reduced, though not necessarily eliminated, by the effects related to disturbance from previous impoundments associated with historic-period logging activities and hydroelectric developments.



Historic Resources
September 2020

Archaeological field assessment of high-potential locations prior to ground disturbance can verify the potential of these locations and enable the implementation of further mitigation measures. However, field assessment cannot guarantee identification of historic resources which may be present, and moreover, it is feasible for historic resources to be present in areas other than high-potential locations. Consequently, mitigation must also include development and implementation of measures to enable identification and mitigation of unanticipated future discoveries.

18.4 MITIGATION AND MANAGEMENT MEASURES

Measures to mitigate potential adverse effects on historic resources include measures to be undertaken with approval and appropriate permits issued by the PAO. In addition, the Environmental Protection Plan (EPP) will include a Heritage and Cultural Resources Protection Plan, which will outline mitigation for potential adverse effects on historic resources resulting from accidental discovery, and will incorporate the response measures mandated by the HRA. These mitigation measures are outlined below in Table 18.5.

Table 18.5 Mitigation Measures: Historic Resources

Category	Mitigation	C	O	D
Discovery and Protection of Heritage Resources	Mitigation measures to be applied with approval and appropriate permits issued by the Provincial Archaeology Office: <ul style="list-style-type: none"> Field assessment surveys will be undertaken prior to construction wherever the Project Area has potential to interact with identified areas of high potential for archaeological resources. Ground-truthing of the three identified Victoria River sites will be undertaken in the event that the Project Area expands to interact with their hypothesized locations. Review of historical fieldnotes pertaining to the Victoria River sites that are presently housed in the Provincial Archives will be undertaken in association with further field assessment. Archaeological field assessment and testing of road routes and other required infrastructure (new and upgraded) at selected river crossings and lakeshores will be undertaken prior to construction once development plans are finalized. 	✓	-	-
	Measures to be included in the Heritage and Cultural Resources Protection Plan to mitigate the potential of adverse effects on historic resources resulting from an accidental discovery: <ul style="list-style-type: none"> Prior to construction, personnel will be made aware of potential historic resources in the area and understand their responsibility should they identify potential historic resources. Personnel will be advised to report unusual findings to the Site Supervisor and not to touch such findings. Work will be suspended in the immediate area should a potential resource be identified. If features are found using heavy equipment, the equipment will not be moved so that historical information and evidence is left intact and not further disturbed. 	✓	-	-



Historic Resources
September 2020

Table 18.5 Mitigation Measures: Historic Resources

Category	Mitigation	C	O	D
Discovery and Protection of Heritage Resources	<ul style="list-style-type: none"> • The area of findings will be flagged to protect it from looting and further disturbance. • A qualified archaeologist or historic resources professional will be contacted by the Site Supervisor to conduct an assessment of the site 			
Notes: C – Construction Activities O – Operation Activities D – Decommissioning, Rehabilitation and Closure Activities				

18.5 ASSESSMENT OF RESIDUAL ENVIRONMENTAL EFFECTS ON HISTORIC RESOURCES

For each potential effect identified in Section 18.3.3, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The following sections first describe the pathways by which a potential Project effect could result from Project activities in the absence of mitigation during each Project phase (i.e., construction, operation and decommissioning, rehabilitation and closure). Mitigation and management measures (Section 18.4) are applied to avoid or reduce these potential pathways and resulting environmental effects. Residual effects are those remaining following implementation of mitigation, which are then characterized using the criteria defined in Section 18.3.1. A summary of predicted residual effects is provided in Section 18.5.2.

18.5.1 Loss or Disturbance of Historic Resources

18.5.1.1 Project Pathways

Since historic resources, particularly archaeological resources, are present either immediately upon or close beneath the present ground surface, construction activities that involve initial ground disturbance have the greatest potential to adversely affect them. Ground disturbance may disturb or destroy objects of historical value and, equally importantly, may disturb or destroy the context (the horizontal and vertical depositional relationships between historical objects), from which they derive much of their value. Subsequent ground disturbance at greater depth (e.g., open pit mining), or Project activities that do not involve initial ground disturbance, are unlikely to adversely affect historic resources.

Alterations to the landscape and increased human activity resulting from improved access to the area also increase the likelihood of adverse effects to historic resources that may be present as they become available to human disturbance.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

Activities and physical works that entail initial ground disturbance and have the potential to result in the loss or disturbance of historic resources include:

- Mine Site Preparation and Earthworks – removal of organic materials, development of roads, and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels.

No interaction is anticipated for historic resources during Project operation (aside from construction-related activities that occur during the operation phase) or decommissioning, rehabilitation and closure, as activities associated with these would occur in areas already disturbed by construction.

18.5.1.2 Residual Effects

Construction of the Project is unlikely to result in residual effects on historic resources primarily because there are no known registered archaeological sites within the Project Area. In addition, mitigation measures (Table 18.5) will reduce the potential for finds of presently unknown sites to be discovered during the archeological survey or during the construction phase, and mitigation measures will be implemented in the event of an unexpected discovery of historic resources. Interaction will be limited to the Project Area where Project-related ground disturbance could occur.

Because historic resources are static and situated upon or beneath the ground surface, initial ground disturbance during construction activities has the greatest potential to adversely affect historic resources if present. However, there are no known registered sites within the Project Area and identified high-potential locations within the LAA do not overlap with the current footprint of Project infrastructure. Previous disturbance of high-potential areas by past logging activities and hydroelectric development also reduce the likelihood of interaction between historic resources and the Project. Mitigation measures, including field assessment prior to construction should Project activities or infrastructure shift to overlap with high-potential locations or known sites, will further reduce the potential for presently unknown sites to be inadvertently disturbed or lost. Measures will also be implemented to identify and mitigate the unexpected discovery of historic resources.

Given the above, residual effects on historic resources resulting from Project construction activities are not likely to occur. If disturbance or loss of historic resources did occur, it would occur as a single event(s) during construction activities and within the Project Area, during initial ground disturbance. Because historic resources are static and finite, residual environmental effects which did occur would be adverse, permanent and irreversible. However, with mitigation (including implementation of a HCRPP), the Project will result in a low (i.e., there is prior recovery of the resource and associated information with necessary regulatory approvals) or negligible (i.e., no loss or disturbance anticipated) loss or disturbance of historic resources within the Project Area.



18.5.2 Summary of Project Residual Environmental Effects

Project residual effects (the loss or disturbance of historic resources) would be limited spatially and temporally, however would be adverse and irreversible. While these adverse effects would be associated only with ground disturbance during construction activities, some construction activities will occur during the operation phase, with the same residual effects predicted. Residual environmental effects that are likely to occur as a result of the Project are summarized in Table 18.6. The significance of residual adverse effects is considered in Section 18.6.

Table 18.6 Project Residual Effects on Historic Resources

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Loss or Disturbance of Historic Resources	C	A	N/L	PA	P	S	I	U/D
	O	A	N/L	PA	P	S	I	U/D
<p>KEY See Table 18.2 for detailed definitions</p> <p>Project Phase C: Construction O: Operation D: Decommissioning</p> <p>Direction: P: Positive A: Adverse N: Neutral</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p> <p>Geographic Extent: PA: Project Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short term MT: Medium term LT: Long term P: Permanent N/A: Not applicable</p> <p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological / Socio-Economic Context: D: Disturbed U: Undisturbed</p>								

18.6 DETERMINATION OF SIGNIFICANCE

Residual effects resulting from the Project on historic resources will be limited to the Project Area during construction activities, during initial ground disturbance. There are no known registered archaeological sites within the Project Area, though 24 locations with high potential for historic resources have been identified in association with waterbodies and river courses within the LAA. One of these locations lies within the Project Area, however it does not overlap the Project infrastructure footprint. The potential for historic resources within the LAA is reduced by the effects of past logging activities and hydroelectric development, which may have led to the loss or disturbance of historic resources along waterways;



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

however, past loss or disturbance of historic resources cannot be assumed. Regardless, mitigation procedures will reduce the potential for presently unknown sites to be inadvertently disturbed or lost. Measures will also be implemented to identify and mitigate the unexpected discovery of historic resources.

The threshold criterion beyond which a residual environmental effect is considered significant is the unauthorized disturbance or loss of a historic resource that is determined by the provincial regulator (PAO) to be a significant historic resource, and that cannot be mitigated. Although considered unlikely, disturbance or loss of historic resources may potentially occur as a single event(s) during construction activities, and only within the Project Area during initial ground disturbance. Because historic resources are static and finite, environmental effects which did occur would be adverse, permanent and irreversible. However, with mitigation, the Project will result in a low (i.e., there is prior recovery of the resource and associated information with necessary regulatory approvals) or negligible (i.e., no loss or disturbance anticipated) loss or disturbance of known historic resources within the Project Area, while implementation of the HCRPP will result in low disturbance or loss of unknown historic resources within the Project Area. Therefore, with mitigation and environmental protection measures, residual environmental effects on historic resources are predicted to be not significant.

18.7 PREDICTION CONFIDENCE

There is a high degree of confidence in this effects prediction. If archeological resources are discovered during archeological field assessment of the Project, they will be handled appropriately and removed from the site in keeping with government protocols and archaeological methods. Once archaeological field assessment has been completed where required (Table 18.5), there will be low potential for interaction with unidentified sites. The planned effects management and mitigation measures are anticipated to be effective.

18.8 PREDICTED FUTURE CONDITION OF THE ENVIRONMENT IF THE UNDERTAKING DOES NOT PROCEED

Because historic resources are static and finite, the distribution of historic resources will not be altered, nor will their abundance increase if the Project does not proceed. If the Project does not proceed, there is decreased likelihood that historic resources, which may be present in the Project Area or the LAA, will be identified, located and brought under provincial management and regulation.

18.9 FOLLOW-UP AND MONITORING

As outlined in Table 18.5, the EPP will include a Heritage and Cultural Resources Protection Plan to mitigate the potential for adverse effects on historic resources resulting from accidental discovery. The implementation of the Heritage and Cultural Resources Protection Plan will allow Marathon to verify the accuracy of this EA and demonstrate the effectiveness of recommended mitigation measures. Marathon and its contractors will follow the Heritage and Cultural Resources Protection Plan, which will include requirements issued by the provincial regulator (PAO) for site avoidance, excavation or monitoring of historic resources, if accidentally discovered.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

18.10 REFERENCES

- Cultural Resource Management Group Limited. 2011. Emera Newfoundland and Labrador, the Maritime Link Project. Archaeological Screening & Reconnaissance, Bay d'Espoir to Cape Ray, Preliminary Report. Unpublished report on file, Provincial Archaeology Office, St. John's, NL.
- Deal, M. and D. Hillier. 2007. Newfoundland and Labrador Aviation Resource Inventory. Unpublished report on file, Provincial Archaeology Office, St. John's, NL.
- Devereux, H. 1965. The Pope's Point Site, Newfoundland. Report on file, Memorial University Center for Newfoundland Studies, St. John's.
- Devereux, H. 1970. A Preliminary Report on the Indian Point Site, Newfoundland. A Stratified Beothuk Site. Report on file, Memorial University Center for Newfoundland Studies, St. John's.
- Erwin, J. and D.H. Holly. 2006. Birchy Lake Survey. Provincial Archaeology Office Newsletter 4: 11.
- Hartery, L. 2007. The Cow Head Complex. Occasional Papers in Northeastern Archaeology 17, Copetown Press, St. John's, NL.
- Howley, J.P. 1915. The Beothucks or Red Indians: The aboriginal Inhabitants of Newfoundland. Cambridge University Press, Cambridge.
- Ingstad. 1969. Westward to Vinland: The Discovery of Pre-Columbian Norse Housesites in North America [translated]. New York: St. Martin's Press.
- LeBlanc. 1973. The Wigwam Brook Site and the Historic Beothuk Indians. Master's thesis, Department of Anthropology, Memorial University, St. John's.
- Macpherson, J.B. 1981. The Development of the Vegetation of Newfoundland and Climatic Change During the Holocene, in A.G. Macpherson and J.B. Macpherson (eds.), The Natural Environment of Newfoundland, Past and Present, pp. 189-217. Memorial University Department of Geography, St. John's, NL.
- Marshall, I. 1996. A History and Ethnography of the Beothuk. McGill-Queen's University Press, Montreal, QC and Kingston, ON.
- McGhee, R. and J.A. Tuck. 1975. An Archaic Sequence from the Strait of Belle Isle, Labrador. National Museum of Man Mercury Series 34, Ottawa, ON.
- Northland Associates Limited. 1989. Corner Brook Pulp and Paper Limited: Little Grand Lake Wood Harvesting Operation Environmental Impact Statement. Report on file, Provincial Archaeology Office, St. John's, NL.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Historic Resources
September 2020

- Pastore, R.T. 1978a. Indian Summer: Newfoundland Micmacs in the Nineteenth Century, in R. Preston (Ed.) Papers from the 4th Annual Congress of the Canadian Ethnology Society. Canadian Ethnology Service Mercury Series Paper 40: 167-178, National Museums of Canada, Ottawa, ON.
- Pastore, R.T. 1978b. The Newfoundland Micmacs. Newfoundland Historical Society Pamphlet 4, St. John's, NL.
- Penney, G. 1980. A Report on an Archaeological Survey of Bay d'Espoir
- Penney, G. 1987. An Archaeological Survey of King George IV Lake. Unpublished report submitted to Conne River Band Council, Conne River, Bay d'Espoir, NL.
- Penney, G. 1990. An Archaeological Survey of Temagen Gospen: Archaeological Research Permit 90-04. Unpublished report submitted to Miawpukek Band, Conne River, Bay d'Espoir, NL.
- Penney, G. and H. Nicol 1984. Burnt Knaps: A Micmac Site in Newfoundland. Canadian Journal of Archaeology 8(1): 57-69.
- Penney, G., B. Temple, and R. Cuff. 2015. Gerald Penney Associates (GPA) Limited 2014 Archaeological Activities. Provincial Archaeology Office 2014 Archaeology Review (13): 130-138.
- Reader, D. 1999. Revisiting the Maritime Archaic Component at South Brook Park (DjBI-09)- 1998 Archaeological Investigations. Report on file, Provincial Archaeology Office, St. John's, NL.
- Schwarz, F. 1992. Archaeological Investigations in the Newfoundland Interior. Report on file, Provincial Archaeology Office, St. John's.
- Schwarz, F. 1994. Palaeo-Eskimo and Recent Indian Subsistence-Settlement Patterns on the Island of Newfoundland. Northeast Anthropology 47: 55-70.
- Schwarz, F. 2010. Salvage Archaeological Excavations at the Pinware Hill Site (Ejbe-10), Strait of Belle Isle, Labrador: PAO Permit# 09.42. Report on file, Provincial Archaeology Office, St. John's, NL.
- Smith, P. 1987. In Winter Quarters. Newfoundland Studies 3 (1): 1-36.
- Speck, F. 1922. Beothuk and Micmac. Indian Notes and Monographs, Museum of the American Indian, Heye Museum, New York, NY.
- Tuck, J.A., and R. Grenier. 1989. Red Bay, Labrador: World Whaling Capital A.D. 1550-1600. Atlantic Archaeology Ltd, St John's.
- Tuck, J.A., and R.T. Pastore. 1985. A Nice Place to Visit but... Prehistoric Human Extinctions on the Island of Newfoundland. Canadian Journal of Archaeology 9(1): 69-80.
- Venovcevs, A. 2016. Newfoundland Winter House Investigation: Final Report Permit No. 14.46 & 15.10. Report on file, Provincial Archaeology Office, St. John's, NL.



19.0 DAM INFRASTRUCTURE

Dam Infrastructure has been identified as a valued component (VC) because of the importance of dam operation and safety, particularly with respect to hydroelectric dam infrastructure near and downstream of the Project. The mine site is located directly adjacent to, and could potentially affect, the Victoria Lake Reservoir and the Victoria Dam, which form the headwater of a major hydroelectric system draining to Bay d'Espoir. Dam infrastructure is also a critical component of many mining projects, as mining dams are often required to manage tailings, contact water and effluent. A description of the design, operation and maintenance of planned Project dams is provided in Chapter 2.

This assessment focuses on the potential Project effects on non-Project dam infrastructure. Dam infrastructure is a critical component of hydroelectric projects where artificial reservoirs are created using natural waterbodies to develop hydraulic energy to drive power generators. Proper design, construction and operation of these dams are required to protect the surrounding natural and human environment, and the protection of workers and the general public. This VC is linked to Surface Water Resources (Chapter 7), as it relies on the prediction of Project effects on water quality and quantity within Victoria Lake Reservoir.

The focus of this VC is on potential effects of routine Project activities on non-Project dam infrastructure (e.g., the Victoria Dam). The potential environmental effects of Project-related accidents and malfunctions (e.g., tailings management facility [TMF] dam breach and related inundation) on non-Project dam infrastructure are addressed in Accidental Events (Chapter 21).

19.1 SCOPE OF ASSESSMENT

Dam infrastructure has been identified as a VC in accordance with the Provincial Environmental Impact Statement (EIS) Guidelines (Appendix 1B) and follow-up discussions with provincial regulatory officials (Environmental Assessment Committee and the Water Resources Management Division of the Newfoundland and Labrador Department of Environment, Climate Change and Municipalities [NLDECCM]).

This identification was primarily based on the potential interaction between the location of the TMF identified at the time of publication of the *Valentine Gold Project EA Project Description / Registration* (Marathon 2019) and the nearby and downstream location of the Victoria Dam. Based on consultation with key stakeholders and further engineering assessment and design since submission of the Project Description / Registration, the Project TMF has been re-located downstream of the Victoria Dam which has reduced or eliminated some of the potential interactions between the Project and the Victoria Dam.

The potential Project – VC interactions as outlined in the Provincial EIS Guidelines (Appendix 1B) include:

- Proximity of the Project site to the Victoria Dam and Victoria Lake Reservoir
- Effects of a possible tailings dam failure and cascade effects on the Victoria Lake Reservoir, Victoria Dam, other downstream dams, and downstream communities, infrastructure and environment
- Impacts of non-tailings dam failures



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

- Impact on the operational reservoir levels of the Victoria Lake Reservoir
- Impact of blasting activities at the mine site on the Victoria Dam
- Impacts of the Project on water quality in the Victoria Lake Reservoir and downstream watersheds, and whether this may impact downstream dams
- Need for communication, coordination and cooperation between Marathon and Nalcor on issues such as dam safety and site access

As indicated above, Project-related dam engineering, engineering standards, codes and guidelines are described in the Project Description (Chapter 2) and not described in this section. Details on the proposed design and operation of the TMF, including alternatives to the design, are provided in the relevant sections in the Project Description (Chapter 2, includes alternatives analysis) and Baseline Study Appendix (BSA) 1: Dam Safety (BSA.1).

Effects from Project related accidents, malfunctions and upset conditions, including a TMF failure, are addressed in Accidental Events (Chapter 21) and not repeated in this section. This chapter assesses Project effects on non-Project dam infrastructure from routine Project activities.

Dam infrastructure is typically not considered as a VC in environmental assessments (EAs), and therefore, this assessment varies in scope, technique and description as compared to standard environmental and socio-economic VCs. The general assessment layout and process, however, are followed where relevant for consistency with the other VCs assessed in this EIS.

19.1.1 Regulatory and Policy Setting

In addition to the *Canadian Environmental Assessment Act, 2012* and the Newfoundland and Labrador (NL) *Environmental Protection Act*, the Project is subject to other federal and provincial legislation, policies and guidance. This section identifies the primary regulatory requirements and policies of the federal and provincial authorities which influence the scope of the assessment on dam infrastructure.

Canada does not have a federal department or regulatory act that governs dam safety. The regulation of dams is a provincial / territorial responsibility. In the province of NL, dam improvements and new construction are regulated via the *Water Resources Act, 2002*, which is administered by the Water Resources Management Division of the NLDECCM. A permit to construct a dam is required under the *Water Resources Act*. The Act does not contain any specific dam safety regulations and the province looks to the Canadian Dam Association (CDA) for guidance on dam safety, and references the *CDA Dam Safety Guidelines* (CDA 2013) and associated bulletins specifically for any proponent / project contemplating developing or operating a dam for any purpose.

The CDA is a group of owners, operators, regulators, consultants, and suppliers interested in dams and reservoirs. CDA provides a forum for the exchange of ideas and experience in the field of dam safety, public safety and protection of the environment (CDA 2020). The *CDA Dam Safety Guidelines* (CDA 2013) and associated technical bulletins provide dam stakeholders with a framework for the design, construction, operation, maintenance, surveillance, and decommissioning using a risk-informed approach to dam safety decisions.



19.1.2 The Influence of Engagement on the Assessment

As part of ongoing Project engagement activities, Marathon has documented interests and concerns about the Project received from communities, governments, Indigenous groups and stakeholders. An overview of Marathon's engagement activities is provided in Chapter 3. Documented interests and concerns have influenced the design and operational plans for the Project and the development of the EIS, including the scope of assessment on the VCs.

In general, feedback with respect to dam infrastructure was primarily provided by three stakeholder groups, including:

- Salmonid protection groups (the Atlantic Salmon Federation, the Salmonid Council of Newfoundland, the Salmonid Association of Eastern Newfoundland, the Environment Resources Management Association) provided information on salmon in the Exploits River and outlined their concerns regarding potential impacts to surface water resources and fish habitat via Project operation and/or accidental events.
- Water Resources Management Division of NLDECCM is the primary regulator of dams in the province, and identified their concerns with respect to dam safety and tailings management in general, and also concerns with respect to Marathon's initial plans to construct the TMF immediately upstream of the Victoria Dam.
- Marathon has met and exchanged information with NL Hydro (Nalcor) regarding their hydroelectric assets, as well as power supply to the Project throughout the ongoing EA and engineering process. NL Hydro provided information regarding their concerns with Marathon's initial plans regarding the TMF location (upstream of the Victoria Dam). Subsequent information provided by NL Hydro has been used in the re-location of the TMF and the overall EA as it relates to the Victoria Dam and Victoria Lake Reservoir. Marathon and NL Hydro continue to consult and exchange information regarding Marathon's Project and any interactions with NL Hydro's assets.

As a result of this engagement and additional environmental baseline information, Marathon completed a new, full scope siting study and design review for the TMF. This work resulted in a change in the location of the TMF, downstream of the Victoria Lake Reservoir and Dam, and a reconfiguration of the Project site layout to be more responsive to key environmental aspects including fish habitat and caribou. The revised site layout is presented in further detail in the Project Description (Chapter 2).

Marathon will continue to engage with NL Hydro over the life of the Project. The engagement will be required to keep NL Hydro fully informed and given the opportunity to review and provide feedback on aspects of the Project that may affect NL Hydro's assets and operation. This information will include design details and the results of monitoring (e.g., blast monitoring, water monitoring, Project dam inspections / safety reviews) to confirm that Project performance conforms with the design. Marathon and NL Hydro will also engage with respect to NL Hydro's access to the Victoria Dam along the shared access road, and NL Hydro's emergency notification procedures with respect to the Victoria Dam, noting that in the event of an issue, the Project access road crosses the Victoria River and Exploits downstream of NL Hydro dams.



In addition to the above, interests and concerns noted through Marathon's engagement efforts included concern raised by Qalipu with respect to the impact of blasting on dam integrity. Other concerns raised through engagement efforts related to the potential effects of an accidental event (i.e., TMF breach) on the Victoria Dam. These are discussed further in the assessment of accidental events (Chapter 21). This chapter focusses on the assessment of routine Project activities.

19.1.3 Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographic extent of potential effects) and temporal boundaries (i.e., timing of potential effects). Spatial boundaries for the Dam Infrastructure VC were selected in consideration of the geographic extent over which Project activities, and their effects, are likely to occur on the VC. Temporal boundaries are based on the timing and duration of Project activities and the nature of the interactions with the VC. The spatial and temporal boundaries associated with the effects assessment for the Dam Infrastructure VC are described in the following sections.

19.1.3.1 Spatial Boundaries

The following spatial boundaries were used to assess Project effects, including residual environmental effects, on dam infrastructure in areas surrounding the mine site and access road (Figure 19-1):

Project Area: The Project Area encompasses the immediate area in which Project activities and components occur and is comprised of two distinct areas: the mine site and the access road. The mine site includes the area within which Project infrastructure will be located, and the access road is the existing road to the site, plus a 20-metre (m) wide buffer on either side. The Project Area is the anticipated area of direct physical disturbance associated with the construction, operation and decommissioning, rehabilitation and closure of the Project.

Local Assessment Area (LAA): The LAA for dam infrastructure was considered to incorporate the Project Area and watersheds that intersect with the Project Area, as shown in Figure 19-1. The LAA also includes portions of Victoria Lake Reservoir in the expected effluent mixing zones (with respect to potential changes in water quality), which are typically considered to be up to several hundred metres from points of discharge in the lake. The LAA includes Valentine Lake and Victoria River to the point downstream where Project-affected tributaries converge with the main branch of the river.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

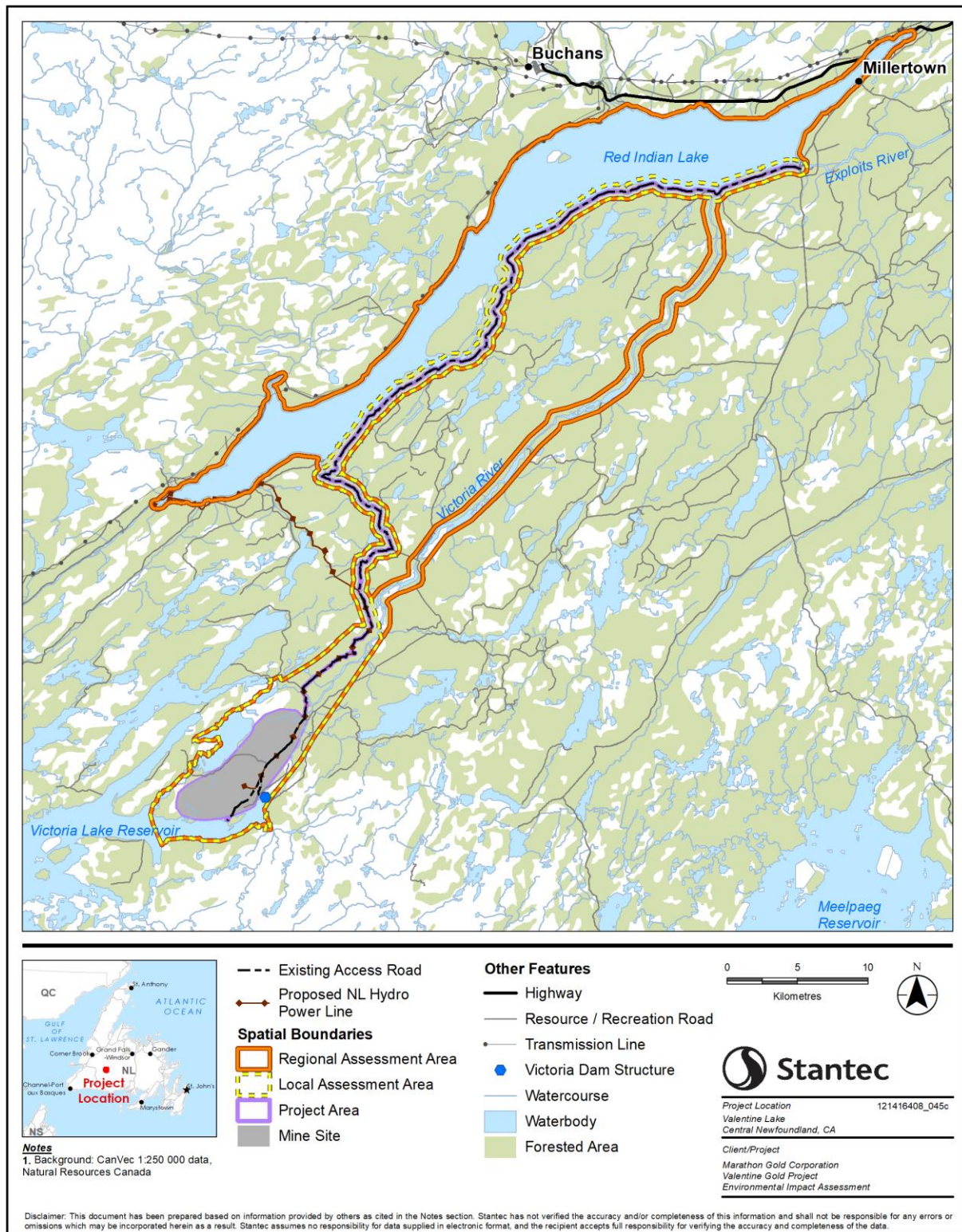


Figure 19-1 Dam Infrastructure Spatial Boundaries



Regional Assessment Area (RAA): The RAA for dam infrastructure incorporates the Project Area and LAA, and extends to include areas where potential Project interactions may be observed, as shown in Figure 19-1. The RAA includes a portion of Victoria Lake Reservoir, Victoria River and Red Indian Lake, including its discharge at the head of the Exploits River.

19.1.3.2 Temporal Boundaries

The temporal boundaries for the assessment of potential effects on the Dam Infrastructure VC include:

- Construction Phase – 16 to 20 months, beginning in Q4 2021, with 90% of activities occurring in 2022
- Operation Phase – Estimated 12-year operation life, with commissioning / start-up and mine / mill operation slated to start Q2 2023
- Decommissioning, Rehabilitation and Closure Phase – Closure rehabilitation to occur once it is no longer economical to mine or resources are exhausted

19.2 EXISTING CONDITIONS FOR DAM INFRASTRUCTURE

A characterization of the existing conditions within the spatial boundaries defined in Section 19.1.3 is provided in the following sections. This includes a discussion of the influences of past and present physical activities on the VC, leading to the current conditions. An understanding of the existing conditions for the VC within the spatial area being assessed is a key requirement in the prediction of potential Project effects provided in Section 19.5.

The Victoria Lake Reservoir and Victoria Dam structure are part of the Bay d’Espoir Hydroelectric Development. The Bay d’Espoir Hydroelectric Generating Facility is the largest hydroelectric plant on the Island of Newfoundland and includes three generating stations, six reservoirs, and associated dykes, dams, canals, and hydraulic structures. The generating stations comprising the Bay d’Espoir Development were built in stages beginning in 1967. There are four remote hydraulic structures associated with the Bay d’Espoir development: Ebbegunbaeg Control Structure; Salmon River Spillway Structure; Victoria Control Structure (i.e., the Victoria Dam); and Burnt Dam Spillway (NL Hydro 2012).

The Victoria Dam is a dam at the outlet of Victoria Lake Reservoir to the Victoria River, which naturally flowed north to Red Indian Lake (prior to construction of the dam). With a crest elevation of 326 m, this dam raised the natural lake elevation from 290 m to 325 m. The low supply level of the lake was set at 319 m by the Victoria Canal. In the late 1960s, Victoria Lake was diverted to the Victoria Canal, which flows into the White Bear drainage basin to the south. The Victoria Canal was designed to convey between 34 m³/s (at low supply level) and 170 m³/s (at full supply level) (Read and Cole 1972). The dam was constructed as a zoned rolled earth fill type with a central impervious core and a cutoff trench sealed on cleaned bedrock, grouted, where necessary. The maximum height of the dam above the river level is 58 m and the crest length is approximately 400 m.

Victoria Lake Reservoir water levels are recorded by a Water Survey of Canada (WSC) station (ID 02YN005) and reported online. The Victoria Lake Reservoir is typically charged to maximum annual operating level following the spring melt (June) and subsequently is drawn down to a minimum operating



level in the March and April. NL Hydro provided the stage storage relationship of the Victoria Lake Reservoir. This relationship and the Victoria Lake Reservoir WSC data are shown on Figure 7-15.

19.3 ASSESSMENT CRITERIA AND METHODS

This section describes the criteria and methods used to determine Project environmental effects on non-Project dam infrastructure. Residual environmental effects (Section 19.5) are assessed and characterized using criteria defined in Section 19.3.1, including direction, magnitude, geographic extent, timing, frequency, duration, reversibility, and ecological or socio-economic context. The assessment also evaluates the significance of these effects using threshold criteria or standards beyond which a residual environmental effect is considered significant. The definition of a significant effect for the Dam Infrastructure VC is provided in Section 19.3.2. Section 19.3.3 identifies the Project environmental effects to be assessed for dam infrastructure, including effect pathway and measurable parameters. This is followed by the identification of potential Project interactions with this VC (Section 19.3.4).

19.3.1 Residual Effects Characterization

Table 19.1 presents definitions for the characterization of residual environmental effects on dam infrastructure. The criteria are used to describe the potential residual effects that remain after mitigation measures have been implemented. Quantitative measures were developed, where possible, to characterize residual effects. Qualitative considerations were used where quantitative measurement was not possible.

Table 19.1 Characterization of Residual Effects on Dam Infrastructure

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	<p>Neutral – no net change in measurable parameters for non-Project dam infrastructure relative to baseline</p> <p>Positive – a residual effect that moves measurable parameters in a direction beneficial to non-Project dam infrastructure relative to baseline</p> <p>Adverse – a residual effect that moves measurable parameters in a direction detrimental to non-Project dam infrastructure relative to baseline</p>
Magnitude	The change in non-Project dam infrastructure relative to existing conditions	<p>Negligible – no measurable change in non-Project dam infrastructure</p> <p>Low – a measurable change is detectable for non-Project dam infrastructure but within the limits of normal variability that would be expected (baseline)</p> <p>Moderate – a measurable change occurs for non-Project dam infrastructure that is considered above baseline but within acceptable limits</p> <p>High – a measurable change occurs for non-Project dam infrastructure that is considered elevated above acceptable limits (e.g., CDA Dam Safety Guideline)</p>



Table 19.1 Characterization of Residual Effects on Dam Infrastructure

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Geographic Extent	The geographic area in which a residual effect occurs	Project Area – residual effects are restricted to the Project Area LAA – residual effects extend into the LAA RAA – residual effects extend into the RAA
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a specific phase	Single event Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Duration	The period of time required until the measurable parameter or the VC returns to its existing (baseline) condition, or the residual effect can no longer be measured or otherwise perceived	Short term – residual effect restricted to construction or decommissioning, rehabilitation and closure phases Medium term – residual effect extends through Project operation but is expected to subside when operations cease Long term – residual effect extends beyond the life of the Project Permanent – recovery to baseline conditions unlikely
Reversibility	Describes whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	Reversible – the residual effect is likely to be reversed after activity completion and rehabilitation Irreversible – the residual effect is unlikely to be reversed
Ecological and Socio-economic Context	Existing conditions and trends in the area where residual effects occur	Undisturbed – area is relatively undisturbed or not adversely affected by human activity Disturbed – area has been substantially previously disturbed by human development or human development is still present

19.3.2 Significance Definition

For the Dam Infrastructure VC, a significant adverse residual effect is defined as a measurable change in conditions potentially affecting non-Project dam infrastructure (e.g., vibrational loading) such that the infrastructure no longer conforms with applicable operation and design criteria. For example, if the seismic (vibration) load to the Victoria Dam from Project blasting activities resulted in a decrease in the factor of safety for seismic loading below that recommended for long term stability per the CDA *Dam Safety Guidelines* (CDA 2013).

19.3.3 Potential Effects, Pathways and Measurable Parameters

There are two key interactions with respect to non-Project dam infrastructure and routine Project activities. The first is the potential direct effect of ground vibration from Project blasting on the nearby Victoria Dam. The second is the potential for indirect effects of Project-related changes to water quality and water quantity (e.g., changes to water levels and water chemistry) that could result in adverse effects



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

to the Victoria Dam or on the Reservoir. These potential interactions and the associated potential effects, pathways, and measurable parameters are described below.

The potential for Project interactions with dam infrastructure is therefore considered in terms of the following potential effects:

- A change in water quality in Victoria Lake Reservoir
- A change in water balance in Victoria Lake Reservoir
- A change in dam stability for the Victoria Dam

As indicated above, effects from Project-related accidents, malfunctions and upset conditions, including a TMF failure, are addressed in Accidental Events (Chapter 21) and not repeated in this section. Table 19.2 lists potential Project environmental effects on dam infrastructure and provides a summary of the Project effect pathways and measurable parameters and units of measurement used to assess potential effects. Potential Project environmental effects and measurable parameters were selected based on review of recent EAs for mining projects in NL and other parts of Canada, comments provided during engagement, and professional judgment.

Table 19.2 Potential Effects, Effect Pathways and Measurable Parameters for Dam Infrastructure

Potential Project Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in water quality in Victoria Lake Reservoir	<ul style="list-style-type: none"> • Project activities may have an effect or alter water quality through changes to the natural flow regime, contact water seepage and runoff, sedimentation and erosion rates, and process water discharges. These changes in water quality could potentially affect the Victoria Dam infrastructure. 	<ul style="list-style-type: none"> • Water quality parameter concentrations entering Victoria Lake Reservoir • Sedimentation and erosion potential and TSS loads entering Victoria Lake Reservoir
Change in water quantity in Victoria Lake Reservoir	<ul style="list-style-type: none"> • Project activities may have an effect or alter the natural flow regime through changes to surface vegetation cover, imperviousness, topography and drainage divides, slopes, open pit dewatering, seepage from stockpiles, and management of surface water runoff. Water withdrawal from Victoria Lake Reservoir for Project activities could also affect operational water levels for the Victoria Dam. 	<ul style="list-style-type: none"> • Water withdrawal from Victoria Lake Reservoir for Project activities • Alteration of flows to Victoria Lake
Change in dam stability for the Victoria Dam	<ul style="list-style-type: none"> • Project activities may result in induced seismic (vibrational) loading from blasting activities. 	<ul style="list-style-type: none"> • Seismic (vibrational) load transmitted to Victoria Dam



19.3.4 Project Interactions with Dam Infrastructure

Table 19.3 identifies the physical activities that might interact with the VC and result in the identified environmental effect. These interactions are indicated by checkmark and are discussed in detail in Section 19.5, in the context of effect pathways, standard and Project-specific mitigation / enhancement, and residual effects. Following the table, justification is provided for where no interaction (and therefore no resulting effect) is predicted.

Table 19.3 Project Environmental Interactions with Dam Infrastructure (Victoria Dam)

Physical Activities	Environmental Effects to be Assessed		
	Change in Water Quantity	Change in Water Quality	Change in Dam Stability
CONSTRUCTION			
Access Road Upgrade / Realignment: Where required, road widening and replacement / upgrades of roads and culverts.	–	–	–
Construction-related Transportation along Access Road	–	–	–
Mine Site Preparation and Earthworks: Clearing and cutting of vegetation and removal of organic materials, development of roads and excavation and preparation of excavation bases within the mine site, grading for infrastructure construction. For the open pits, earthworks include stripping, stockpiling of organic and overburden materials, and development of in-pit quarries to supply site development rock for infrastructure such as structural fill and road gravels. Also includes temporary surface water and groundwater management, and the presence of people and equipment on site.	✓	✓	✓
Construction / Installation of Infrastructure and Equipment: Placement of concrete foundations, and construction of buildings and infrastructure as required for the Project. Also includes: <ul style="list-style-type: none"> • Installation of water control structures (including earthworks) • Installation and commissioning of utilities on-site • Presence of people and equipment on-site 	✓	✓	–
Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge, and hazardous and non-hazardous wastes.	✓	✓	–
Employment and Expenditures^B	–	–	–
OPERATION			
Operation-related Transportation Along Access Road	–	–	–
Open Pit Mining: Blasting, excavation and haulage of rock from the open pits using conventional mining equipment.	✓	✓	✓



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

Table 19.3 Project Environmental Interactions with Dam Infrastructure (Victoria Dam)

Physical Activities	Environmental Effects to be Assessed		
	Change in Water Quantity	Change in Water Quality	Change in Dam Stability
<p>Topsoil, Overburden and Rock Management: Five types of piles:</p> <ul style="list-style-type: none"> • Topsoil • Overburden • Waste rock • Low-grade ore • High-grade ore • Rock excavated from the open pits that will not be processed for gold will be used as engineered fill for site development, maintenance and rehabilitation, or will be deposited in waste rock piles. 	✓	✓	–
<p>Ore Milling and Processing: Ore extracted from the open pits will be moved to the processing area where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes.</p>	–	–	–
<p>Tailings Management Facility: Following treating tails via cyanide destruction, tailings will be thickened and pumped to an engineered TMF in years 1 to 9, then pumped to the exhausted Leprechaun open pit in years 10 through 12.</p>	✓	✓	–
<p>Water Management (Intake, Use, Collection and Release): Recirculated process water and TMF decant water will serve as main process water supply, and raw water (for purposes requiring clean water) will be obtained from Victoria Lake Reservoir. Site contact water and process effluent will be managed on site and treated prior to discharge to the environment. Where possible, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent possible for use on site.</p>	✓	✓	–
<p>Utilities, Infrastructure, and Other Facilities:</p> <ul style="list-style-type: none"> • Accommodations camp and site buildings operation, including vehicle maintenance facilities • Explosives storage and mixing • Site road maintenance and site snow clearing • Access road maintenance and snow clearing • Power and telecom supply • Fuel supply 	✓	✓	–
<p>Emissions, Discharges and Wastes^A: Noise, air emissions / GHGs, water discharge, and hazardous and non-hazardous wastes.</p>	✓	✓	–
<p>Employment and Expenditure^B</p>	–	–	–



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

Table 19.3 Project Environmental Interactions with Dam Infrastructure (Victoria Dam)

Physical Activities	Environmental Effects to be Assessed		
	Change in Water Quantity	Change in Water Quality	Change in Dam Stability
DECOMMISSIONING, REHABILITATION AND CLOSURE			
Decommissioning of Mine Features and Infrastructure	✓	✓	–
Decommissioning, Rehabilitation and Closure-related Transportation Along Access Road	–	–	–
Progressive Rehabilitation: Rehabilitating infrastructure or areas not required for ongoing operations (e.g., buildings, roads, laydown areas); covering and revegetating completed tailings areas, where practicable, including commencing closure of TMF beginning in Year 9 (when tailings deposition moves to Leprechaun open pit); erosion stabilization and re-vegetation of completed overburden and/or waste rock piles; infilling or flooding of exhausted mining areas; and completing revegetation studies and trials.	✓	✓	–
Closure Rehabilitation: Active rehabilitation based on successes of progressive rehabilitation activities. Includes: demolishing infrastructure (e.g., buildings, equipment, facilities, roads, laydown areas); grading and revegetating cleared areas, where practicable; breaching and regrading ponds to reestablish drainage patterns; completing closure of TMF (covering with overburden and revegetating); erosion stabilization and revegetation of completed overburden and/or waste rock piles; and infilling or flooding of open pits.	✓	✓	–
Post-Closure: Long-term monitoring	–	–	–
Emissions, Discharges and Wastes^A	✓	✓	–
Employment and Expenditure^B	–	–	–
Notes: ✓ = Potential interaction – = No interaction ^A Emissions, Discharges, and Wastes (e.g., air, waste, noise, light, liquid and solid effluents) are generated by many Project activities. Rather than acknowledging this by placing a check mark against each of these activities, “Wastes and Emissions” is an additional component under each Project phase ^B Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a check mark against each of these activities, “Employment and Expenditures” is an additional component under each Project phase			

The following activities will not interact in a substantive way with water quality and quantity in the Victoria Lake Reservoir, and therefore, effects from these activities are not considered further in this assessment:

- The Access Road Upgrade / Realignment during construction will not substantively alter surface water flow patterns, in particular to Victoria Lake Reservoir



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

- Transportation along the Access Road throughout the life of the Project will occur along defined corridors and will not interact in a substantive way with surface water resources
- Employment and Expenditures throughout the Project will not directly result in changes to the physical environment, including surface water

The following activities will not interact in a substantive way with the stability of the Victoria Dam, and therefore, effects from these activities are not considered further in this assessment:

- The Access Road Upgrade / Realignment during construction is not expected to require blasting in proximity to the Victoria Dam
- Construction / Installation of Infrastructure and Equipment is not expected to affect the stability of the Victoria Dam as any blasting for site development would be completed prior to this during Mine Site Preparation and Earthworks
- Emissions, Discharges and Wastes are not expected to directly impact the stability of the Victoria Dam during construction, operation, or decommissioning, rehabilitation and closure. Consideration of these activities with respect to discharges to Victoria Lake Reservoir are considered under the water quantity and quality effects
- Transportation along the Access Road throughout the life of the Project will occur along defined corridors and will not affect dam stability
- Operation activities, including Topsoil, Overburden and Rock Management, Ore Milling and Processing, Tailings Management, Water Management, and Utilities, Infrastructure and Other Facilities are not expected to directly affect the stability of the Victoria Dam
- Decommissioning, rehabilitation and closure activities, including Progressive Rehabilitation, Closure Rehabilitation and Post-Closure Monitoring are not expected to directly affect the stability of the Victoria Dam as there are no blasting requirements anticipated for these activities
- Employment and Expenditure throughout the Project will not directly result in changes to the physical environment, including dam stability

19.4 MITIGATION AND MANAGEMENT MEASURES

The primary mitigation measure to reduce potential effects on the Victoria Dam or Victoria Lake Reservoir included the relocation and redesign of the TMF previously proposed. As a result of engagement with NL Hydro, the Water Resources Management Division of NLDECCM and stakeholders, and new environmental baseline information, Marathon completed a new, full scope siting study and design review for the TMF (as described in Chapter 2). This work resulted in changing the location of the TMF to downstream of the Victoria Lake Reservoir and Dam and reconfiguring the mine site layout. The revised mine site layout is presented in further detail in the Project Description (Chapter 2).

Marathon will continue to engage with NL Hydro over the life of the Project. The engagement will be required so that NL Hydro is fully informed and has the opportunity to review and provide feedback on all aspects of Marathon's Project that may affect NL Hydro's assets and operation, including the Victoria Dam and Reservoir.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

In addition to Project redesign, mitigation measures have been developed with respect to water quality management, surface water management and blasting activities at the mine site. Mitigation for surface water quantity and quality is presented in Section 7.4 and not repeated here.

The Water Management Plan (Appendix 2A) provides additional details on the key site-specific mitigation measures to reduce the potential for Project effects on surface water quantity and quality noted above. The Water Management Plan will be implemented during construction, operation and decommissioning, rehabilitation and closure, and will provide details on runoff and seepage collection strategies and systems (e.g., local seepage collection ponds, berms, drainage ditches, pumps) to collect and contain surface water runoff, and groundwater discharge from major Project components (open pit, waste rock piles, TMF, ore stockpile and overburden stockpiles, process plant) during climate normal and extreme weather conditions.

A series of environmental management plans will be developed by Marathon to mitigate the effects of Project development on the environment. A full list of mitigation measures to be applied throughout Project construction, operation and decommissioning, rehabilitation and closure is provided in Section 2.7.4. Mitigation for blasting and associated ground vibration is provided in Table 19.4.

Table 19.4 Mitigation Measures: Dam Infrastructure

Category	Mitigation	C	O	D
Blasting	<ul style="list-style-type: none"> An Explosives and Blasting Management Plan (EBMP) will be developed by Marathon and its selected, licenced blasting contractor(s) to provide direction for the safe storage, handling and use of explosives and explosive components at the Project site, to address the safety of the public and Project personnel, and protection of both the environment, Project components and the Victoria Dam. The EBMP will include requirements for Blast Design vibration limits and seismic monitoring for blasting activities. 	✓	✓	-
	<ul style="list-style-type: none"> Blasting activities will be included under a contract service agreement with the explosives supplier and who will have a valid blasters certificate issued by the NL Department of Environment, Climate Change and Municipalities (NLDECCM). 	✓	✓	-
	<ul style="list-style-type: none"> Blasting activities will be limited to only those areas required to achieve foundation grades for site development or open pit pioneering. 	✓	-	-
	<ul style="list-style-type: none"> Blasting for site development will be done by a certified blasting contractor who will develop a conservative Blast Design for engineering review and approval prior to carrying out the work. The Blast Design will be required to meet strict seismic (vibrational) limits at appropriate distances from any existing structures (Victoria Dam), developing infrastructure, and fish habitat. 	✓	✓	-
	<ul style="list-style-type: none"> Engagement with NL Hydro regarding blasting requirements, timing, vibration thresholds and monitoring 	✓	✓	-
Notes: C – Construction Activities O – Operation Activities D – Decommissioning, Rehabilitation and Closure Activities				



19.5 ASSESSMENT OF RESIDUAL PROJECT-ENVIRONMENTAL EFFECTS ON DAM INFRASTRUCTURE

For each potential effect identified in Section 19.3.3, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The following sections first describe the pathways by which a potential Project effect could result from Project activities in the absence of mitigation during each Project phase (i.e., construction, operation and decommissioning, rehabilitation and closure). Mitigation and management measures (Section 19.4) are applied to avoid or reduce these potential pathways and resulting environmental effects. Residual effects are those remaining following implementation of mitigation, which are then characterized using the criteria defined in Section 19.3.1. A summary of predicted residual effects is provided in Section 19.5.4.

19.5.1 Change in Water Quantity

As noted in Table 19.2, routine Project activities could affect or alter the natural flow regime thereby affecting operational flows required by the Victoria Dam and reservoir system. These changes could be caused by Project-related changes to surface vegetation cover, imperviousness, topography and drainage divides, slopes, open pit dewatering, seepage from stockpiles, and management of surface water runoff. Water withdrawal from Victoria Lake Reservoir for Project activities could also affect operational water levels for the Victoria Dam.

A detailed assessment of Project effects on surface water quantity for construction, operation, decommissioning, rehabilitation and post-closure is provided in the Surface Water VC (Chapter 7) and is not repeated here. The results of the assessment as related to Victoria Lake Reservoir is summarized in the following:

- Expected mean annual flows (MAFs) for the construction and operation phases were calculated for the local watersheds impacted by the mine site and contributing to Victoria Lake Reservoir. This assessment predicts Victoria Lake Reservoir inflows will increase negligibly by <1%. The increase in expected MAF to Victoria Lake Reservoir is driven primarily by the TMF area being discharged to Victoria Lake Reservoir, whereas the area of the TMF would have naturally drained to the Victoria River.
- To expedite the time required to fill the Leprechaun pit, water is proposed to be withdrawn from Victoria Lake Reservoir. Active mining from the Leprechaun pit will cease in Year 9 of operation. In Year 10, pits were modelled to begin filling with water. However, natural filling of the Leprechaun pit via meteoric and hydrogeological sources would take approximately 37 to 42 years to fill. To accelerate pit filling and reduce TMF volume requirements, tailings and tailings effluent generated from processing in Years 10 through 12 will be piped to the Leprechaun pit. It is also proposed to withdraw water from Victoria Lake Reservoir (0.178 m³/s) over an eight-year period to aid in flooding the pit. For Victoria Lake Reservoir, this corresponds to 0.5% of the Low Supply Level outlet flow and 0.1% of the High Supply Level outlet flow.
- Surface water quantity changes assessed at the boundary of the LAA for the Victoria River, Valentine Lake and Victoria Lake Reservoir are predicted to be below 10% MAF.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

- With the implementation of mitigation measures, the residual effect on surface water quantity is anticipated to be adverse, with the Project predicted to cause a reduction in surface water quantity at several watercourses downstream of mine infrastructure and within the LAA during all phases of mine life. Other watercourses will receive an increase in flow that may provide a positive change. The predicted magnitude of residual adverse effects is low. Predicted changes in water quantity at the LAA boundary during construction, operation and post-closure phases are considered to be within the range of natural variability. The change in surface water quantity is predicted to extend to the boundaries of the LAA and be continuous and long term in duration. The natural seasonal variations including precipitation, surface runoff and groundwater flows could affect the surface water quantity within LAA. However, these variations would not be considered a Project-related effect. Changes to some watersheds within the LAA will be realized post-closure, therefore these are considered long term effects. Effects on water quantity for most of the watercourses / waterbodies assessed are considered reversible as conditions will return to predevelopment flow patterns for the majority of the site in post-closure. Effects on water quantity for watercourses overprinted by the Project components, such as the open pits, are considered irreversible. The ecological context is disturbed, with the ecological function considered typical compared to other lake systems in the region and pre-development conditions.

Project-related environmental effects will not cause a change in water quantity in Victoria Lake Reservoir greater than natural variability. Therefore, predicted residual effects on the Victoria Dam and Victoria Lake Reservoir operations associated with changes in water quantity are considered to be negligible. The nearest downstream dam from the Project is the Millertown Dam on Red Indian Lake, which drains to the Exploits River and other dams further downstream. This dam will not be affected by routine Project-related effects on water quantity.

19.5.2 Change in Water Quality

As noted in Table 19.2, routine Project activities could potentially affect water quality through changes to the natural flow regime, contact water seepage and runoff, sedimentation and erosion rates, and process water discharges. These changes in water quality could potentially affect the Victoria Lake Reservoir and dam infrastructure. A detailed assessment of Project environmental effects on surface water quality for construction, operation, decommissioning, rehabilitation and closure is provided in the Surface Water VC (Chapter 7) and is summarized below:

- Mine contact water discharged from the final discharge points (FDPs) is expected to meet *Metal and Diamond Mining Effluent Regulations* criteria prior to entering the receiving environment and non-contact water is expected to remain at baseline conditions
- Localized effects are expected in the receiving watercourses and bodies immediately downstream of several FDPs. These local effects will extend into the ultimate receiving waterbodies (Victoria Lake Reservoir, Valentine Lake, Victoria River) for only several hundred meters before water quality is expected to return to either baseline levels or below *Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life*. It is noted that these localized effects may be overestimated due to the conservative approach taken in the supporting water quality modelling and assimilative capacity assessment, further discussed in Section 7.3.5.2. Specific parameters of potential concern that have



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

been identified as having the largest required mixing zones (i.e., up to 300 m) include aluminum, arsenic, copper, iron, lead, manganese, zinc, and fluoride.

- With the implementation of mitigation measures, the residual effects on surface water quality are anticipated to be adverse in direction. Taking into consideration proposed mitigation and management measures, it is predicted that the Project is likely to cause increased concentrations of some parameters of potential concern in watercourses downstream of some FDPs, and into the ultimate receivers within the LAA. The magnitude or residual adverse effects is considered low, as predicted changes in water quality at the LAA boundary during construction, operation and closure conditions are within the range of natural variability. The changes in surface water quality are predicted to extend to the boundaries of the LAA, with localized effects experienced within the LAA. Effects will be continuous and both short term (large storms, one-off events) and long term (seepage from waste rock piles and TMF) in duration. Effects on water quality for most of the watercourses / waterbodies assessed are considered reversible as conditions will return to baseline conditions once Project discharges cease. Irreversible effects may occur as a result of seepage from mine infrastructure (TMF and waste rock piles). The ecological context is considered to be disturbed. The ecological function is typical compared to other lake systems in the region and pre-development conditions.

Project-related environmental effects on the water quality in Victoria Lake Reservoir are not expected greater than 300 m from the discharge location into the lake and therefore should not affect Victoria Lake Reservoir operations or Victoria Dam. Therefore, effects on the Victoria Dam and Victoria Lake Reservoir operations associated with changes in water quality are considered to be negligible. The nearest downstream dam from the Project is the Millertown Dam on Red Indian Lake, which drains to the Exploits River and other dams further downstream. This dam will not be affected by routine Project-related effects on water quality.

19.5.3 Change in Dam Stability

As noted in Table 19.2, routine Project-related activities could affect the stability of the Victoria Dam through induced seismic (vibrational) loading from Project blasting activities. Other downstream dams are also briefly considered below. Project-related blasting requirements is a key concern related to potential effects on the Victoria Dam and related non-Project infrastructure.

An initial blasting impact assessment has been completed for the Project by Golder (Golder 2020 in BSA.1, Attachment 1-C) to evaluate the potential effects of open pit blasting on the Victoria Dam. The Victoria Dam is approximately equidistant from the two Project open pits at just under 3,800 m. Based on a conservative assessment, the estimated peak particle velocity transmitted to the Victoria Dam is 0.16 mm/s, which is well below the threshold at which a reduction in dam stability is likely to occur (50 mm/s). The estimated vibrational loading is considered minor and is not expected to affect the stability of the Victoria Dam. This information has been provided to NL Hydro for consideration by their engineers. This initial assessment will continue to be reviewed as further design and operation planning information is available for the Project.



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

The nearest downstream dam from the Project is the Millertown Dam on Red Indian Lake which drains to the Exploits River and other dams further downstream. This dam will not be affected by routine Project-related effects, such as Project blasting.

Considering the proposed mitigation and management measures (primarily blasting management), the magnitude of residual effects from routine Project-related activities on the stability of non-Project dam infrastructure are anticipated to be negligible for all Project phases and limited to the LAA, as there are no impacts on downstream dams. The negligible residual effects are characterized as regular (pit production blasting), long-term in duration and reversible. The ecological / socio-economic context is considered to be undisturbed.

19.5.4 Summary of Project Residual Environmental Effects

Residual environmental effects that are likely to occur as a result of the Project are summarized in Table 19.5. The significance of residual adverse effects is considered in Section 19.6. A proposed program for follow-up and monitoring for dam infrastructure is provided in Section 19.9.

Table 19.5 Project Residual Effects on Dam Infrastructure

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Surface Water Quantity	C	A	N	LAA	LT	C	R	U
	O	A	N	LAA	LT	C	R	U
	D	A	N	LAA	LT	C	R	U
Change in Surface Water Quality	C	A	N	LAA	LT	C	R	U
	O	A	N	LAA	LT	C	R	U
	D	A	N	LAA	LT	C	R	U
Change in Dam Stability	C	A	N	LAA	LT	R	R	U
	O	A	N	LAA	LT	R	R	U
	D	A	N	LAA	LT	R	R	U



Table 19.5 Project Residual Effects on Dam Infrastructure

Residual Effect	Residual Effects Characterization							
	Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
<p>KEY</p> <p>See Table 19.1 for detailed definitions</p> <p>Project Phase C: Construction O: Operation D: Decommissioning</p> <p>Direction: P: Positive A: Adverse N: Neutral</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p> <p>Geographic Extent: PA: Project Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short term MT: Medium term LT: Long term P: Permanent</p> <p>N/A: Not applicable</p> <p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological / Socio-Economic Context: D: Disturbed U: Undisturbed</p>								

19.6 DETERMINATION OF SIGNIFICANCE

For the Dam Infrastructure VC, a significant adverse residual effect is defined as a measurable change in conditions potentially affecting non-Project dam infrastructure (e.g., vibrational loading), such that the infrastructure no longer conforms with applicable operation and design criteria.

The predicted residual changes in water quantity or quality in Victoria Lake Reservoir associated with the Project construction, operation and decommissioning, rehabilitation and closure are not significant as they are not anticipated to result in a change in quantity or quality that result in an adverse effect on the operation of the Reservoir or the Victoria Dam.

The predicted residual changes in dam stability for non-Project dams associated with Project construction, operation and decommissioning, rehabilitation and closure are not significant as they are not anticipated to result in a reduction in operating conditions or stability of non-Project infrastructure that would contradict CDA *Dam Safety Guidelines* (CDA 2013).

Therefore, with mitigation and environmental protection measures, residual Project-environmental effects on dam infrastructure from routine Project-related activities are predicted to be not significant.



19.7 PREDICTION CONFIDENCE

As described in the Surface Water VC (Chapter 7), the level of confidence in the assessment of residual environmental effects on surface water resources is high. The predicted effects are common to mining operations and are well-understood. A conservative approach to characterizing surface water quantity and quality effects was taken to represent a credible worst-case of environmental effects. It is likely that environmental effects of the Project will be less than predicted as a result of the assumptions and conservatism applied in the assessment.

The level of confidence in the assessment of residual project-environmental effects on dam stability is high. The dam safety guidance and requirements for the Project dams are well understood. The blast impact assessment used conservative approaches and worst-case scenarios to predict potential impacts to adjacent and downstream dam infrastructure, as described in BSA.1, Attachment 1-C.

19.8 PREDICTED FUTURE CONDITION OF THE ENVIRONMENT IF THE UNDERTAKING DOES NOT PROCEED

The Project is in an area with a long history of mining and mineral exploration, and it is likely that other mining projects will occur in this area if this Project were not to proceed. Future projects are anticipated to have similar effects on dam infrastructure given the extent of hydroelectrical infrastructure in the region. Should mineral reserves associated with the Project remain undeveloped, the predicted future condition of dam infrastructure would be relatively unchanged from existing, although surface water resources including design storms relative to reservoir / dam water control structures will change over time as a result of climate change.

19.9 FOLLOW-UP AND MONITORING

Follow-up and monitoring are intended to verify the accuracy of the effects assessment, assess the implementation and effectiveness of mitigation and the nature of the residual effects, and to manage adaptively, if required. Follow-up monitoring related to Project-related effects on water quality and quantity are outlined in Chapter 7. Monitoring related to routine blasting will include:

- Seismic (blast) monitoring at the Victoria Dam and Project dams, and possibly at closer distances to the blasting activity to measure vibrations directly at the structures
- Use of other Project TMF monitoring data (settlement / movement, pore pressure) to further assess the potential blast impact
- Use of the data collected to further assess and confirm the results of the current assessment by Golder

Marathon will continue to engage with NL Hydro over the life of the Project. Engagement will be required to ensure that NL Hydro is fully informed and has the opportunity to review and provide feedback on all aspects of Marathon's Project that may impact NL Hydro's assets and operation. This will include reviewing the results of the monitoring (e.g., blast monitoring, water monitoring, Project dam inspections / safety reviews) to confirm that performance is in line with the design. Marathon and NL Hydro will also



VALENTINE GOLD PROJECT: ENVIRONMENTAL IMPACT STATEMENT

Dam Infrastructure
September 2020

engage with respect to Hydro's access to the Victoria Dam (shared access road), and NL Hydro's emergency notification procedures with respect to the Victoria Dam, noting that in the event of an issue, the Project access road crosses the Victoria River and Exploits downstream of NL Hydro dams.

19.10 REFERENCES

CDA (Canadian Dam Association). 2020. CDA Website. Accessed at: <https://www.cda.ca/>.

CDA (Canadian Dam Association). 2013. Dam Safety Guidelines, 2007 (Revised 2013).

Golder Associates Ltd. 2020. Valentine Gold Project Blast Impact Assessment. Prepared for Marathon Gold Corporation.

Marathon Gold Corporation. 2019. Environmental Assessment Registration/Project Description. Valentine Gold Project, Newfoundland and Labrador. April 5, 2019.

NL (Newfoundland and Labrador) Hydro. 2012. Upgrade Burnt Dam Spillway Structure. Available at: <http://www.pub.nf.ca/applications/nlh2013capital/files/application/NLH2013Application-Volumell-Report8.pdf>.

Read, W.S. and L.J. Cole. 1972. The Bay D'espoir Hydro Electric Development. Presented at Canadian Electrical Association Engineering And Operating Division Hydraulic Power Section. Montreal, Quebec. March 13, 1972. Accessed at: <https://nlhydro.com/wp-content/uploads/2018/11/Bay-DE-1972-paper-CEA.pdf>.

