# Appendix 8.A Groundwater Modelling Report

NEWFOUNDGOLD

# Queensway Gold Project Environmental Assessment – Groundwater Modelling

Final Report

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# Acronyms / Abbreviations

| | |
|---|---|
| CHD | constant head boundary condition |
| cm | centimetre |
| DEM | Digital Elevation Model |
| DRN | drain boundary conditions |
| ECCC | Environment and Climate Change Canada |
| GEMTEC | GEMTEC Consulting Engineers and Scientists Limited |
| GHB | general head boundary condition |
| GNL | Government of Newfoundland and Labrador |
| km | kilometre |
| L/min | litre per minute |
| m | metres |
| $m^3$ | cubic metres |
| $m^3$/day | cubic metres per day |
| m/m | metres per metre |
| m/s | metres per second |
| masl | metre(s) above sea level |
| mbgs | metres below ground surface |
| mm | millimetres |
| mm/year | millimetres per year |
| New Found Gold | New Found Gold Corp. |
| NL | Newfoundland and Labrador |
| The Project | Queensway Gold Project |
| RIV | river boundary conditions |
| RMS | root mean square |
| Stantec | Stantec Consulting Ltd. |

# 1 Introduction

Stantec Consulting Ltd. (Stantec) completed a preliminary numerical groundwater model for New Found Gold Corp. (New Found Gold) for the Queensway Gold Project (the Project), a proposed gold mine development near the Town of Appleton and west of the Town of Gander, Newfoundland and Labrador (NL). This groundwater modelling report has been prepared to assess the potential effects of the operation, and closure phases of the Project on groundwater resources and the potential indirect effects on surface water resources, using a model domain (Study Area) that extends beyond the Project Area that is defined in the Project Registration (New Found Gold 2026).

## 1.1 Project Objectives

To evaluate the potential effects of the Project on groundwater quantity, a three-dimensional numerical groundwater flow model has been developed to provide estimates of:

- Changes in groundwater levels (drawdown), including changes to water table elevation and groundwater flow directions, due to dewatering of the open pits
- The groundwater inflow rate to the open pits for the operation phase
- Groundwater filling rates into the open pits during closure phase
- Predicted groundwater drawdown at the end of operation and in closure, once the open pits are flooded, compared to baseline conditions
- Predicted change in baseflow to nearby surface water features during operation and in closure, once the mine is flooded, compared to baseline conditions
- Preliminary groundwater seepage and flow path tracking from the ore stockpile, waste rock storage facility and overburden storage facility. Effects of changes to hydraulic conductivity and recharge due to climate change on the above scenarios, including wet and drought conditions

# 2 Site Setting

## 2.1 Physiography, Topography, and Drainage

The Study Area, Project location, and topography are shown in Figure A.1 (Appendix A). The Project Area which includes the planned Project layout, existing infrastructure, topography and wetlands, and waterways is shown in Figure A.2 (Appendix A). The Study Area, as shown in Figure A.1 (Appendix A), is also the groundwater model domain, with chosen boundaries as described in later sections of this report. The Project Area and Study Area are located immediately adjacent to the Town of Appleton, NL, and approximately 6 km west of the municipal boundary of the Town of Gander, NL. Elevations in the Project Area range from approximately 9 metres (m) above sea level (masl) near the Gander River in the northeast, to a maximum of 138 masl in the southern and central parts of the Project Area.

The Study Area is characterized by broad, northeast-trending ridges separated by valleys containing linear bogs, brooks, and large ponds, which also follow a northeast alignment. Key hydrographic features include Gander Lake, which forms the southern boundary of the Study Area, and the Gander River, which originates at Gander Lake within the central portion of the Study Area. The Gander River flows approximately 45 kilometres (km) northeast to its outlet at Gander Bay.

## 2.2 Climate

Based on the 1991-2020 Canadian Climate Normals for the nearest weather station at the Gander International Airport (10 km east of the Project), the mean annual precipitation is 1,247 millimetres (mm) which includes a mean annual snowfall accumulation of 443 centimetres (cm) and 882 mm of rainfall. September typically receives the highest rainfall, averaging 121 mm, while January records the most snowfall, averaging 97 cm (Environment and Climate Change Canada [ECCC] 2024). This information was used to estimate recharge conditions for the numerical modelling.

## 2.3 Geology

### 2.3.1 Surficial Geology

As shown in Figure A.3 (Appendix A), surficial geology consists of bedrock concealed by vegetation in areas along the north coast of Gander Lake; glacial till veneers; lineated glacial tills; areas of poorly drained accumulations of organic matter (i.e., bogs), and glaciofluvial sand and gravel in areas along Joe Batts Pond and the outflow of Gander River (Liverman and Taylor 1990; Batterson 2000; Scott and Taylor 2012).

Using a subset of borehole logs available in 2023, the thickness of soil, which includes both mineral and organic soils, ranged from 0.1 m to 26.4 m, with an average thickness of approximately 5.7 m (GEMTEC Consulting Engineers and Scientists Limited [GEMTEC] 2024).

### 2.3.2 Bedrock Geology

The Project is located within the Exploits Subzone of the Dunnage Zone, a northeast-trending tectonostratigraphic region on the Island of Newfoundland associated with the Appalachian orogeny. The Project is situated west of the Gander River Complex fault which separates two major geological zones: the Dunnage Zone and the Gander Zone. The underlying geology primarily consists of interbedded marine mudstones, siltstones, and sandstones of the Cambrian–Ordovician Davidsville Group, with localized occurrences of unconformable ophiolitic sequences. The Davidsville Group is subdivided into the Hunt’s Cove and Outflow Formations, while the Barry’s Pond Formation occasionally appears between the Davidsville Group and the Gander River Complex (Blackwood 1982; Currie 1995). To the west of a fault system named the Dog Bay line (Sandeman 2021), the Indian Island Group (Ten Mile Lake formation) is characterized by shallow marine deposits containing Silurian–Devonian brachiopod and mollusc fossils (Figure A.4, Appendix A).

Two prominent northeast-striking fault zones traverse the Study Area: the Appleton Fault Zone and the Joe Batt’s Pond Fault Zone.

## 2.4 Regional Hydrogeology

Regional hydrogeological data were obtained from Hydrogeology of Central Newfoundland (AMEC 2013). The Project is located in Hydrostratigraphic Unit 2, which consists of siltstone, conglomerate, argillite, greywacke, with minor volcanic flows and tuff. Yields of wells drilled in Unit 2 are typically low to moderate, ranging from 0.1 litres per minute (L/min) to 491 L/min, with a median sustainable pumping rate of 7 L/min.

On the regional scale, groundwater recharge areas are expected at higher elevations, while discharge is anticipated in the lower elevations near surface water features (Freeze and Cherry 1979). Given the average overburden thickness of 5.7 m (Section 2.3.1) and groundwater is encountered between approximately 0.5 m below ground surface (mbgs) and 4.5 mbgs (Stantec 2025a), regional groundwater flow is expected to occur through both the overburden, which occurs through pore spaces between gravel, sand, silt, clay, and organic grains of material, and the bedrock, which is expected to occur mainly through secondary openings, such as fractures and joints, and will vary depending on the frequency and interconnection of these structures.

# 3 Conceptual Hydrogeological Model

The development of a conceptual hydrogeological model (or simply the conceptual model) is a fundamental step in the preparation of a numerical groundwater model that is designed to represent the groundwater flow system underlying the Project Area. The purpose of the conceptual model is to consolidate hydrogeologic and hydrologic data into a set of assumptions and concepts that can be evaluated quantitatively in the numerical groundwater flow model.

The conceptual model of the Study Area was developed by taking into consideration available borehole data and aquifer test results, as well as other relevant hydrogeologic and geological interpretations and hydrologic data (e.g., rivers, streams and lakes) (Anderson et al. 2015). These data sets were used to develop the conceptual hydrogeologic model and construct the geologic and hydrogeologic framework of the numerical groundwater flow model for the Study Area.

## 3.1 Water Levels

In August 2021, GEMTEC manually measured groundwater levels in 53 exploration boreholes drilled by New Found Gold using a Solinst® water level meter (GEMTEC 2023). For exploration wells, groundwater level ranged from -0.28 mbgs in drillhole NFGC-21-263 to 8.65 mbgs in drillhole NFGC-21-152, with an average groundwater level of 1.55 mbgs.

In 2023 and 2024, GEMTEC also drilled, installed, and developed 14 monitoring wells at 12 locations (GEMTEC 2024). For monitoring wells, based on manual groundwater level measurement by Stantec in November 2024, groundwater levels ranged from -0.42 mbgs in monitoring well 23MW-02D to 1.12 mbgs in monitoring well 23MW-10, with an average groundwater level of 0.42 mbgs (Stantec 2025b).

The locations of these exploration wells and monitoring wells are shown in Figure A.5 (Appendix A).

## 3.2 Groundwater Piezometric Contours

Groundwater elevation contour mapping was completed using static groundwater level data from shallow monitoring wells based on manual measurements collected in November 2024. Results indicate that shallow groundwater predominantly flows west and northwest toward the Gander River. Limited data from the southern and eastern portions of the Study Area suggest that shallow groundwater flow likely follows surface water drainage patterns, trending southward toward Gander Lake and eastward towards the Joe Batts Pond drainage system, respectively. Groundwater contours are presented in Figure A.5 (Appendix A).

## 3.3 Vertical Hydraulic Gradients

Groundwater level data from two pairs of monitoring wells (23MW-02S/D and 23MW-12S/D) were analyzed to evaluate vertical hydraulic gradients at these locations. Vertical hydraulic gradients are used to determine if groundwater in the area is flowing downward (indicating an area of recharge) or upward (indicating an area of discharge). The calculation was completed by dividing the head difference between paired wells by the vertical distance separating the midpoints of each screen.

In the 23MW-02D (deep) and 23MW-02S (shallow) monitoring well pair, measured groundwater levels for November 2024 were 37.26 masl and 36.47 masl, respectively, with vertical distance of 27 m, indicating a vertical hydraulic gradient of 0.03 metres per metre (m/m) resulting in upwards groundwater flow. For the 23MW-12D (deep) and 23MW-12S (shallow) monitoring well pair, measured groundwater levels were 32.54 and 32.81 masl, respectively, with vertical distance of 24 m, indicating a vertical hydraulic gradient of - 0.01 m/m resulting in downward groundwater flow (Table B.1, Appendix B).

## 3.4 Hydraulic Conductivity and Hydrostratigraphy

In 2021, GEMTEC performed hydraulic conductivity testing at four existing exploration boreholes: NFGC-21-110, NFGC-21-129, NFGC-21-167, and NFGC-21-261. Each borehole was pumped at variable rates between 0.25 L/min and 4.50 L/min, with an average rate of 0.92 L/min over a duration of approximately 45 minutes. The hydraulic conductivity (K) values obtained reflect the bulk hydraulic conductivity for the entire saturated section of each borehole, from the bottom of the surface casing down. The geometric mean bulk hydraulic conductivity values from test results for each borehole, presented in Table 3.1, span approximately one order of magnitude, ranging from $3.02 \times 10^{-9}$ metres per second (m/s) to $1.29 \times 10^{-8}$ m/s (GEMTEC 2023).

GEMTEC conducted *in-situ* hydraulic conductivity testing for overburden. Single well hydraulic response (slug) testing was performed in five monitoring wells with well screens installed within the overburden (23MW-02S, 23MW-03, 23MW-08, 23MW-09, and 23MW-11). Hydraulic conductivity values for overburden presented in Table 3.1, ranged over four orders of magnitude, from $4.52 \times 10^{-8}$ m/s to $1.04 \times 10^{-4}$ m/s, with a geometric mean of $1.96 \times 10^{-6}$ m/s (GEMTEC 2024).

A total of 13 hydraulic conductivity tests were successfully completed within the bedrock, including 4 packer tests and 9 sets of falling and rising head slug tests. These tests covered four distinct bedrock lithologies, comprising six tests in siltstone with mudstone interbeds, four in massive graphitic siltstone, two in massive siltstone, and one in greywacke with siltstone interbeds (Table 3.1). Tested bedrock depths ranged from 2.74 mbgs to 28.35 mbgs. Bedrock hydraulic conductivity values also varied over four orders of magnitude, ranging from $2.65 \times 10^{-8}$ m/s to $2.11 \times 10^{-4}$ m/s, with a geometric mean of $1.45 \times 10^{-6}$ m/s (GEMTEC 2024).

**Table 3.1 Hydraulic Conductivity Results for Exploration Boreholes and Monitoring wells**

| Lithology | Number of Tests | Hydraulic Conductivity (m/s) | | |
|---|---|---|---|---|
| | | Minimum | Maximum | Geometric Mean* |
| **Exploration Boreholes** | | | | |
| Siltstone / Quartz-Vein Zones | 1 | - | - | $3.02\times10^{-9}$ |
| Siltstone / Greywacke / Quartz-Vein Zone | 1 | - | - | $1.29\times10^{-8}$ |
| Graphitic Siltstone | 1 | - | - | $7.27\times10^{-9}$ |
| Graphitic Siltstone | 1 | - | - | $5.12\times10^{-9}$ |
| **Monitoring Wells-Overburden** | | | | |
| Till: Silty sand and gravel | 10 | $4.52\times10^{-8}$ | $1.04\times10^{-4}$ | $1.96\times10^{-6}$ |
| **Monitoring Wells-Bedrock** | | | | |
| Graphitic Siltstone | 4 | $2.65\times10^{-8}$ | $1.14\times10^{-6}$ | $1.64\times10^{-7}$ |
| Greywacke with Siltstone Interbeds | 1 | - | - | $4.94\times10^{-6}$ |
| Siltstone | 2 | $7.47\times10^{-7}$ | $2.84\times10^{-6}$ | $1.46\times10^{-6}$ |
| Siltstone with Mudstone Interbeds | 6 | $3.78\times10^{-7}$ | $2.08\times10^{-4}$ | $5.06\times10^{-6}$ |

Notes:
K = hydraulic conductivity; m/s = metre(s) per second
*For lithologies with only one test, the reported value equals the measured value
Source: GEMTEC (2023, 2024)

A plot of hydraulic conductivity versus depth, grouped by bedrock type, is presented in Figure 3.1. The plot suggests that the highest measured hydraulic conductivities were generally from the shallower depths, and the lowest hydraulic conductivities were generally from deeper depths.

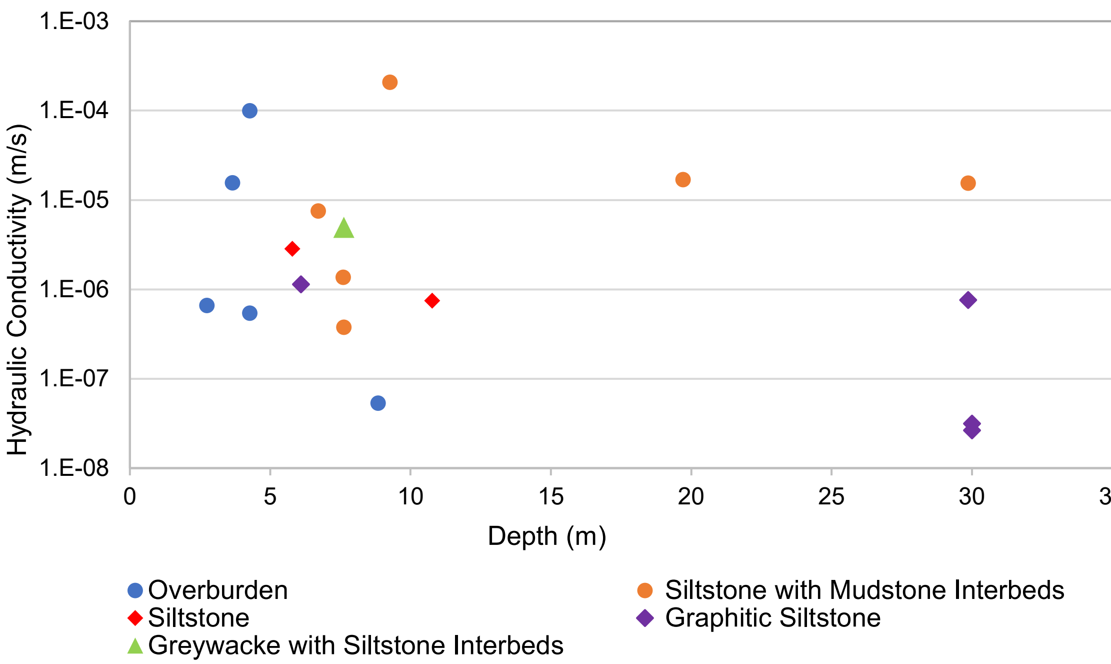


**Figure 3.1 Hydraulic Conductivity of Overburden and Bedrock vs. Depth**

The hydraulic conductivities described above were measured at depths of 30 m or less while the mine is planned to reach more than 200 m below ground. As such, it was necessary to make assumptions about how hydraulic conductivity varied with depth. A log-permeability-depth relationship was chosen such that permeability was assumed to decrease exponentially with depth (Jiang et al. 2010). Published hydrogeologic research supports this trend in fractured and crystalline bedrock. Woessner and Poeter (2020) noted that increasing lithostatic pressure with depth reduces fracture apertures and pore connectivity, resulting in lower hydraulic conductivity compared to near-surface materials. The hydrostratigraphy that was used as a starting point for numerical modelling is summarized in Table 3.2.

**Table 3.2 Hydrostratigraphy and Hydraulic Conductivity in Numerical Model**

| Hydrostratigraphic Unit | Depth (mbgs) | Hydraulic Conductivity (m/s) |
|---|---|---|
| Overburden and Outflow Formation | 0 – 5 | $1 \times 10^{-5}$ |
| | 5 – 15 | $1 \times 10^{-6}$ |
| Hunt's Cove Formation | 15 – 25 | $1 \times 10^{-6}$ |
| | 25 – 90 | $1 \times 10^{-7}$ |
| Barry's Formation | 90 – 200 | $1 \times 10^{-8}$ |
| Gander River Ultramafic Complex | 200 - 800 | $1 \times 10^{-9}$ |

Notes:
m/s = metre(s) per second; mbgs = metre(s) below ground surface

Overburden and bedrock were assumed to behave as equivalent porous media. Hydraulic conductivity was assumed to be isotropic and homogeneous at any given depth. The assumption that bedrock is homogenously fractured may be an oversimplification of the actual groundwater flow system where discrete fracture or bedding plane flow paths may be important. However, the simplification is considered appropriate for this stage of modeling considering the large scale of the modelled area and that preferential flow pathways have not yet been identified in the Study Area.

## 3.5 Baseflow and Estimates of Groundwater Recharge

Stream flow can be conceptualized as being comprised of two components: direct runoff (i.e., overland flow) and baseflow (i.e., groundwater discharge into the surface watercourse). Where baseflow can be measured within a surface water catchment and is known with some confidence to be comprised of groundwater, and where the groundwater catchment is similar to the surface water catchment (i.e., when the groundwater flow is mainly shallow), then it can be used to estimate groundwater recharge rate within that catchment.

Baseflow percentages for the region were evaluated using the Lyne and Hollick digital filtering method (Lyne and Hollick 1979). The analysis suggested that approximately 50 to 60 % of total streamflow was derived from sustained sources such as groundwater discharge, lake storage, wetland storage, and general watershed attenuation (Stantec 2025a).

Although these values reflected the proportion of total streamflow supported by groundwater and other long-duration storage mechanisms, they did not properly represent the proportion of precipitation that became groundwater recharge. The 50% to 60% range was influenced by the presence of lakes, wetlands, and other storage features that released water slowly to streams over extended periods. These features tended to amplify the low-frequency (baseflow-like) signal in the stream hydrograph, resulting in a higher calculated baseflow fraction even in areas where groundwater recharge may have been lower.

In a previous project for a municipality in NL, Stantec completed a review of 11 hydrometric stations on the Avalon Peninsula and determined that groundwater recharge approximated by baseflow in shallow groundwater systems was between 20% and 25% of total annual precipitation. This value reflected the effective recharge portion of the hydrologic cycle, accounting for evapotranspiration losses, limited infiltration capacity in some areas, and the relatively thin overburden and shallow bedrock conditions that restricted deeper percolation.

The Study Area was subdivided into seven surface water catchment areas, as shown in Figure A.6 (Appendix A). Three surface water catchment areas (Zone 2 to 4) were used for the purpose of baseflow estimation, that cover approximately 78 square kilometres ($km^2$). Based on the mean annual precipitation provided in Section 2.2, the volume of daily precipitation for this 78 $km^2$ combined catchment area is 266,315 cubic metres per day ($m^3$/day). Based on an assumed steady state groundwater recharge rate of 25% of precipitation, the total estimated baseflow for Zones 2 to 4 is 66,579 $m^3$/day, and the breakdown between zones is given in Table 3.3. Estimated baseflow values for Zones 2 to 4 were used as calibration targets for the model.

**Table 3.3 Estimated Baseflow for Surface Water Catchment Areas within the Study Area**

| Zone | Catchment Area ($km^2$) | Precipitation ($m^3$/day) | Estimated Baseflow ($m^3$/day) |
|---|---|---|---|
| Zone 2 | 7.34 | 25,077 | 6,269 |
| Zone 3 | 12.49 | 42,633 | 10,658 |
| Zone 4 | 58.17 | 198,605 | 49,651 |
| Total | 78 | 266,315 | 66,578 |

Notes:
$km^2$ = square kilometre(s); $m^3$/day = cubic metre(s) per day

## 3.6 Groundwater Flow Directions

The shallow groundwater flow within the Study Area is interpreted to follow the local topography and surface water runoff patterns. Based on the NL 5 m Digital Elevation Model (DEM) (Government of NL [GNL] 2020) (Figures A.1 and A.2, Appendix A), these flows are expected to travel along short flow paths, with recharge occurring near local ridges and discharge occurring in adjacent valleys, including surface water features such as Gander Lake and Gander River. Groundwater from the west and east flows toward the Gander River, while groundwater from the south flows toward Gander Lake. Groundwater was assumed to recharge everywhere, though at higher rates in upland areas and lower rates in lowland areas and except where “watercourse” and “waterbody” features appear on 1:250,000 scale provincial mapping published by the GNL) (2026).

The hydraulic conductivity values provided in Table 3.3 suggest that overburden and shallow bedrock are likely the zones of primary groundwater flow. As previously discussed, hydraulic conductivity is expected to decrease with depth, the intermediate and deep bedrock hydrostratigraphic units may not be considered as primary groundwater flow paths. Therefore, groundwater flow in bedrock is expected to be concentrated in shallow, more weathered horizons and decline with increasing depth below ground surface.

# 4 Numerical Model

The numerical groundwater model was developed as a steady-state baseline model by defining the model domain and grid, steady-state parameter zones and boundary conditions, and calibrating the groundwater model to average site conditions. Predictive scenarios were run by adjusting the calibrated model to reflect operational or closure conditions. The models were developed using the MODFLOW 2005 computer code (Harbaugh 2005) and run through the user interface program Groundwater Vistas (Version 9.04; ESI 2024).

## 4.1 Steady-State Model

### 4.1.1 Numerical Model Geometry and Grid

The 3D groundwater model domain encompasses an area of approximately 210 km², with boundaries chosen to be sufficiently far from the zone of influence of the Project. The model grid consisted of 304 rows by 315 columns with a minimum grid cell size of 25 m by 25 m near the Project components, increasing to 150 m by 150 m where no such features exist. The elevation of the top layer of the model was set to ground surface defined by the NL 5 m DEM (updated: Feb 2021). Fourteen (14) layers were used for vertical discretization, for a total of 1,340,640 grid cells, 1,042,637 of which were active (i.e., not outside of a no-flow boundary condition). Layer thicknesses were uniform throughout the model with Layer 1 being 5 m thick, Layers 2 and 3 being 10 m thick, Layers 4 to 6 being a total thickness of 65 m, Layers 7-9 being a total thickness of 110 m, and Layers 10-14 being a total thickness of 600 m.

### 4.1.2 Hydraulic Conductivity

A layer-cake hydraulic conductivity pattern was assigned to match the hydrostratigraphy assumed in the conceptual model. Layer 1 represented overburden and the Outflow Formation, Layers 2-6 the Hunt's Cove Formation, Layers 7-9 the Barry's Formation, and Layers 10-14 the Gander River Ultramafic Complex.

### 4.1.3 Boundary Conditions

This section provides a brief introduction to constant head (CHD), general head (GHB), river (RIV), and drain (DRN) boundary conditions, which are used to simulate interactions between groundwater and surface water within the numerical model.

CHDs can generate inflow (recharge) or outflow (discharge), as necessary considering the groundwater head ($H$) assigned to a model grid cell. Conversely, head dependent flux boundary conditions, such as GHBs, RIVs, and DRNs define flow as a function of the head difference between the model cell ($H$) and an external source or sink of groundwater ($H_{ref}$) which is separated from the groundwater regime by a conductance term. Conductance is expressed by a constant of proportionality between the flow rate and the difference in head between the model cell and the external source/sink ($H - H_{ref}$) and varies depending on the type of flux boundary.

A GHB has no limitations on flow, so it generates inflow (recharge) for a negative head difference or outflow (discharge) for a positive head difference. A RIV can generate inflow or outflow, but the inflow is limited as the groundwater head, $H$, cannot drop below the bottom of the river, $H_{bot}$. The DRN cannot generate inflow and can only generate outflow.

The differences between these types of boundary conditions are summarized in Table 4.1. Boundary conditions were assigned as described in the following sub-sections.

**Table 4.1 Summary of Boundary Conditions**

| Boundary Condition Type | Elevation Specified | Conductance Term Included | Limitations on Flow into or out of Model |
|---|---|---|---|
| Constant head (CHD) | Groundwater head, $H$ | No | None |
| General head (GHB) | External head, $H_{ref}$ | Yes | None |
| River (RIV) | River stage, $H_{ref}$ and river bottom elevation, $H_{bot}$ | Yes | Maximum inflow is limited to $H = H_{bot}$ |
| Drain (DRN) | Drain elevation, $H_{ref}$ | Yes | Maximum inflow is zero (i.e., outflow only) and outflow is only generated when $H - H_{ref}$ is positive |

Notes:
$H$ = groundwater head in the model cell
$H_{ref}$ = head of an external source or sink of groundwater (river stage, lake level, drain elevation)
$H_{bot}$ = riverbed bottom elevation

#### 4.1.3.1 Constant Head Boundary Condition

CHDs were assigned to the Gander River and Gander Lake, with the head specified as equal to the model surface. This condition assumes that water levels in these features remain relatively constant throughout the year, and that minor fluctuations would have limited impact on model results. According to the depth of Gander Lake (average depth of approximately 100 m) (O'Connell et al. 2005), the CHD boundary for the lake was applied from Layers 1 through 6. The CHD boundary for the Gander River was assigned only in Layer 1. A CHD boundary was also assigned along the western model boundary due to the proximity of several lakes and ponds located outside the model domain. The constant head boundaries defined in the model are shown on Figure A.7 (Appendix A).

#### 4.1.3.2 No-Flow

A no-flow boundary condition was assigned to the northern and eastern boundaries of the model domain to represent a groundwater flow line that will remain unaffected by the Project. A no-flow boundary condition was applied to the base of the model to simulate negligible vertical groundwater flow, especially in comparison to recharge rate applied at the top.

#### 4.1.3.3 General Head Boundary

Except within Catchment Zone 3 (see Section 4.1.3.5), GHB boundary conditions were applied in Layer 1 to represent ponds and lakes (Figure A.7, Appendix A). The reference head for each GHB boundary was obtained from the DEM, which captures the surface elevation of each surface water feature to the nearest metre. The conductance term was set to a high (unrestrictive) value of 10,000 metres squared per day ($m^2$/day). GHB assigned in this way were equivalent to CHD but were preferred over CHD for computational reasons related to automated inverse parameter estimation method using the software PEST (see Section 4.1.5.2).

#### 4.1.3.4 River Boundary

Except within Catchment Zone 3 (see Section 4.1.3.5), RIV boundary conditions were applied to Layer 1 to represent stream segments (Figure A.7, Appendix A). Stream segments were assigned an order based on how they connect moving downstream. When two first-order streams meet, the large downstream segment past where they converge becomes second-order. If a first-order stream flows into a second-order stream, the segment downstream of the joint remains second-order. Thus, the order of a stream remains the same until it joins with a higher-order stream. The order of the stream increases by one past the point where two streams of equal order meet.

Table 4.2 summarizes the characteristics of each order specified in the model. These values were assumed in the absence of field data. The hydraulic conductivity and thickness of the riverbed were set as to not restrict flow in or out of the groundwater domain through a RIV boundary. This means that the properties of the aquifer control the flow rate.

**Table 4.2 Prescribed Characteristics for River Boundaries in Layer 1**

| Order | Stage | Bottom Elevation | Width (m) |
|---|---|---|---|
| 1 | Top Elevation of Cell in Layer 1 from DEM | Top Elevation minus 0.2 m | 1 |
| 2 | | Top Elevation minus 0.5 m | 5 |
| 3 | | Top Elevation minus 1 m | 10 |
| 4 | | Top Elevation minus 2 m | 15 |

Note:
m = metre(s)

#### 4.1.3.5 Drain Boundary

Lakes, ponds, and rivers in Catchment Zone 3 were represented using DRN boundary conditions, with the hydraulic conductivity in the conductance term set equal to those of Layer 1. The drain thickness was defined as half of the aquifer thickness, and the drain stage was assigned to the ground surface elevation in each cell (Figure A.7, Appendix A).

DRN boundary conditions (as opposed to GHB or RIV boundary conditions) were used for surface water (lakes, ponds, rivers) in Catchment Zone 3 in the baseline model in preparation for the future operational and closure phase simulations. In the baseline model, DRN boundary conditions are a good choice as surface water features are generally the locations of groundwater discharge. However, for operational phases, when deep pits are present nearby to these features, the GHB and RIV boundary conditions may be more appropriate to allow surface water features to recharge the groundwater zone and supply water to the pits. Notwithstanding this, in Zone 3, it is understood that some of the watercourses, such as South Herman's Pond, will be entirely removed, or, at the very least, will be controlled, lined, moved, or otherwise prevented from recharging the groundwater zone and supplying water to the pits.

#### 4.1.3.6 Groundwater Recharge

Recharge was assigned to Layer 1 based on ground elevation as shown in Table 4.3 and Figure A.8 (Appendix A) and based on specified percentages of the climate normal (1990 to 2020) annual precipitation of 1,247 millimetres per year (mm/year) (ECCC 2024).

**Table 4.3 Initial and Calibrated Three Recharge Zone Parameters**

| Recharge Zone[1] | Ground Elevation (masl) | Initial Recharge (mm/year) | Percent of annual precipitation (%) |
|---|---|---|---|
| 1 | 1-40 | 100 | 8 |
| 2 | 40-80 | 150 | 12 |
| 3 | 80-140 | 300 | 25 |

Notes:
[1] Refer to Figure A.8 (Appendix A); masl = metre(s) above sea level; mm/year = millimetre(s) per year

### 4.1.4 Numerical Model Presentation

The implementation of the conceptual model into the numerical model through the model grid, parameter zones, and boundary conditions (RIV, DRN, CHD, GHB, No Flow Boundary) and hydrostratigraphics discussed above is illustrated in a block diagram (Figure A.9, Appendix A).

### 4.1.5 Steady-State Model Calibration

#### 4.1.5.1 Calibration Procedure

Stantec calibrated the steady-state baseline model by adjusting model parameters (all hydraulic conductivities and all recharge rates) to minimize the residuals (difference between) observed data and their simulated equivalents. The data used for this process included 116 hydraulic heads, as described in the following paragraphs, and baseflows at three defined catchment areas are summarized in Table 3.2. The parameter adjustments were made first manually, and then by the automated inverse parameter estimation method of PEST (Computing, Watermark Numerical 2004; Doherty 2004). For the PEST process, an in-house utility was used to obtain and sum flows from DRN, RIV and GHB boundary conditions for comparison to observed / estimated baseflows, and the residuals were weighted so that the heads and the flows were of similar importance within the objective function (the sum of the squares of the residuals).

The 116 head observations were distributed within Layers 1 through 9 and consisted of static water level measurements from 52 exploration boreholes (collected in August 2021), static water level measurements in 14 shallow monitoring wells (collected in November 2024), static water levels assumed one metre above ground surface at 14 artesian wells selected from the exploration wells database provided by the Client, and 34 additional hydraulic head targets (e.g., dummy wells) distributed across the more remote parts of the Study Area (Figure A.5, Appendix A). The hydraulic head at the dummy wells was estimated by subtracting the average depth to groundwater measured at the monitoring wells from the ground surface elevation at the dummy well location. Table B.1 (Appendix B) presents water level for each target and the simulated water level for the final calibrated model for steady state conditions.

#### 4.1.5.2 Calibration Results

The initial and final values of the calibration parameters are presented in Table 4.4.

**Table 4.4 Parameters Values Assigned from Model Calibration**

| Parameter | Initial Value | Calibrated Range | Calibrated Value |
|---|---|---|---|
| **Hydraulic Conductivity (m/s)** | | | |
| Overburden (Layer 1) | $1\times10^{-5}$ | $1\times10^{-6}$ - $1\times10^{-4}$ | $9\times10^{-5}$ |
| Upper Bedrock (Layer 2) | $1\times10^{-6}$ | $1\times10^{-9}$ - $1\times10^{-5}$ | $2\times10^{-8}$ |
| Upper Bedrock (Layer 3) | $1\times10^{-6}$ | $1\times10^{-9}$ - $1\times10^{-5}$ | $1\times10^{-8}$ |
| Upper Bedrock (Layer 4-6) | $1\times10^{-7}$ | $1\times10^{-10}$ - $1\times10^{-6}$ | $9\times10^{-9}$ |
| Intermediate Bedrock (Layer 7-9) | $1\times10^{-8}$ | $1\times10^{-10}$ - $1\times10^{-6}$ | $8\times10^{-9}$ |
| Deep Bedrock (Layer 10-14) | $1\times10^{-9}$ | $5\times10^{-10}$ - $1\times10^{-7}$ | $3\times10^{-9}$ |
| **Recharge (mm/year)** | | | |
| Recharge 1 | 100 | 80-200 | 186 |
| Recharge 2 | 150 | 150-300 | 285 |
| Recharge 3 | 300 | 250-400 | 399 |
| Notes: mm/year = millimetre(s) per year; m/s = metre(s) per second | | | |

Figure 4.1 is a scatter plot showing simulated head at each calibration target, plotted against its respective observed head, used for a quick assessment of model fit. Points on the 1:1 line would indicate a perfect match between simulated and observed head. The figure also summarizes the range of the observed data, the minimum and maximum residual, the mean of the absolute values of the residuals, and the scaled (normalized) root mean square (RMS) error, which is the square root of the objective function divided by the number of observations, divided by the range in the observed values (Spitz and Morena 1996; Anderson et al. 2015). The scaled RMS of 5.85% is within the recommended minimum threshold of 10% (Anderson et al. 2015), suggesting the steady state model calibration was suitable for the simulation of groundwater flow.

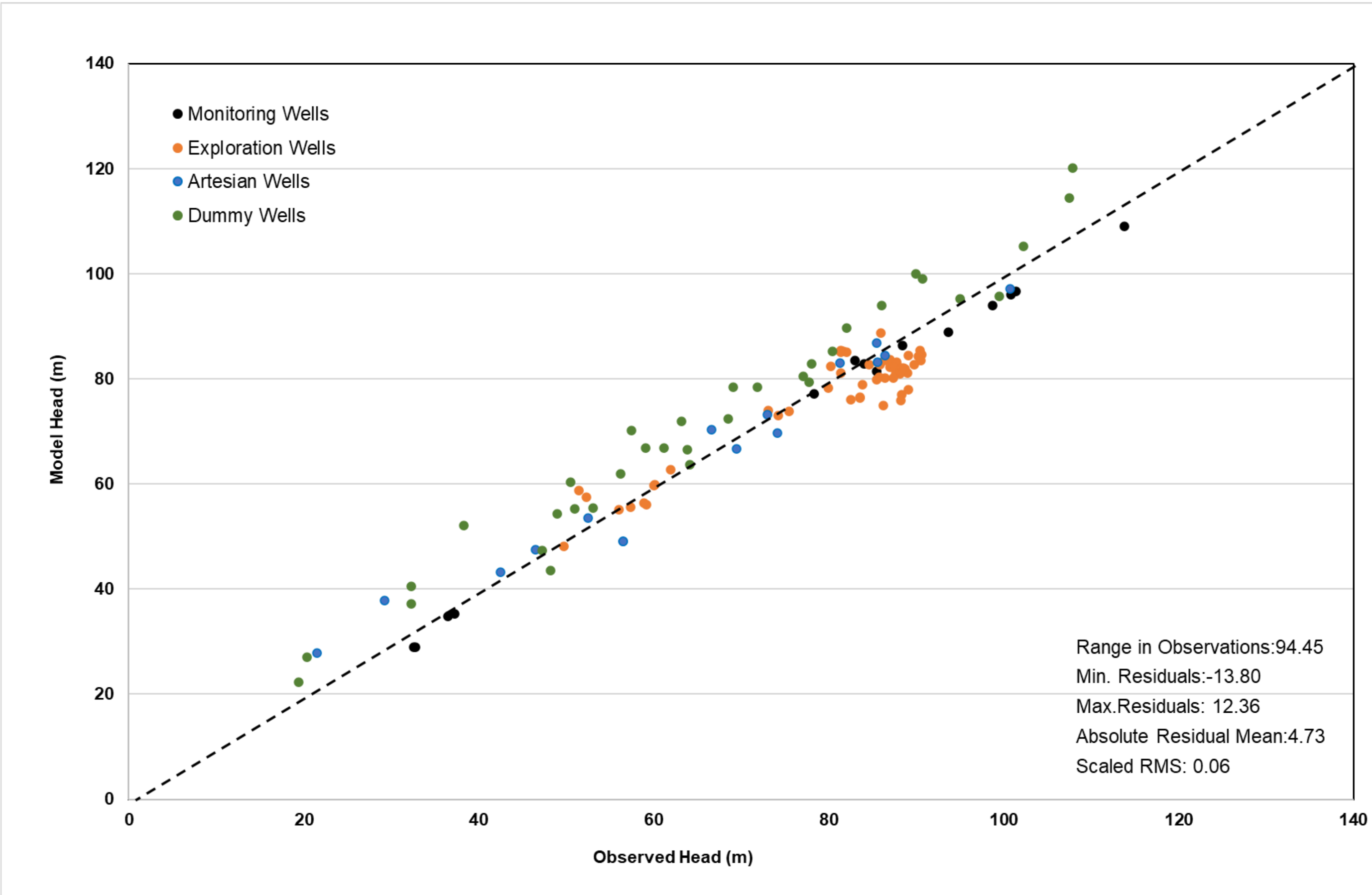


**Figure 4.1 Plot of Hydraulic Head Calibration Results**

The simulated baseflow for the baseline model calculated for Catchment Zones 2, 3, and 4 is presented in Table 4.5. The net inflows are negative numbers because they are outflows. These results were compared with the target baseflow and are presented as a residual (e.g., difference) between the target and simulated values in Table 4.5. All flow target residuals were less than 25% and are considered to be a good match.

**Table 4.5 Baseflow Calibration Residuals**

| Catchment Zone | Area ($km^2$) | Target Baseflow ($m^3$/day) | Baseflow Component | Simulated Baseflow ($m^3$/day) | Residual ($m^3$/day) | Percent Residual (%) |
|---|---|---|---|---|---|---|
| Zone 2 | 7.34 | -6,269 | Total<br>RIV as River<br>GHB as Pond and Lake | -6,310<br>-2,742<br>-3,568 | 42 | 1 |
| Zone 3 | 12.49 | -10,658 | Total<br>DRN as River<br>DRN as Pond and Lake | -12,960<br>-9,217<br>-3,743 | 2,301 | 22 |
| Zone 4 | 58.17 | -49,651 | Total<br>RIV as River<br>GHB as Pond and Lake | -48,832<br>35,042<br>13,790 | -819 | -2 |

Notes:
$km^2$ = square kilometre(s); $m^3$/day = cubic metre(s) per day

#### 4.1.5.3 Model Mass Balance

The mass balance for groundwater flow into and out of the steady-state baseline model simulating average groundwater flow conditions is provided in Table 4.6. Flow into the model is shown as a positive number and out of the model as a negative number. The inflows matched the outflows to within -0.04% and were well within the acceptability criteria of 1% as recommended by Reilly and Harbaugh (2004) indicating a numerically stable model.

In reviewing the results in Table 4.6, it is important to acknowledge that the net inflows at the CHDs, RIV, and GHBs can be small compared to either the inflows or outflows. This can be the result of flow between adjacent grid block cells with different specified heads (i.e., either $H$ in CHDs or $H_{ref}$ in the others). These localized boundary-related exchanges are confined to the immediate vicinity of the boundary cells and are not expected to materially influence simulated hydraulic heads away from the boundaries.

**Table 4.6 Steady-State Baseline Model General Mass Balance**

| Flow Component | Inflow ($m^3$/day) | Outflow ($m^3$/day) | Net Inflow ($m^3$/day) |
|---|---|---|---|
| Recharge | 180,892 | 0 | 180,892 |
| CHD as Gander River and Lake as aquifer at NW corner | 2,517 | -57,563 | -55,046 |
| RIV as rivers | 144,777 | -231,048 | -86,271 |
| GHB as ponds and lakes | 32,318 | -59,074 | -26,756 |
| DRN as rivers and ponds | 22 | -12,981 | -12,959 |
| **Model Total** | **360,526** | **-360,667** | **-141** |
| **Percent Discrepancy** | **-0.04%** | | |

Note:
$m^3$/day = cubic metre(s) per day

### 4.1.6 Parameter Sensitivity

PEST keeps track of parameter sensitivity during the calibration process. The final parameter sensitivity (Figure 4.2) provides an indication of the relative strength each parameter has on minimizing the objective function. Overburden horizontal hydraulic conductivity was by far the most sensitive parameter followed by the recharge to Catchment Zone 3. The flow solution was least sensitive to changes in the horizontal hydraulic conductivity of the deep bedrock.

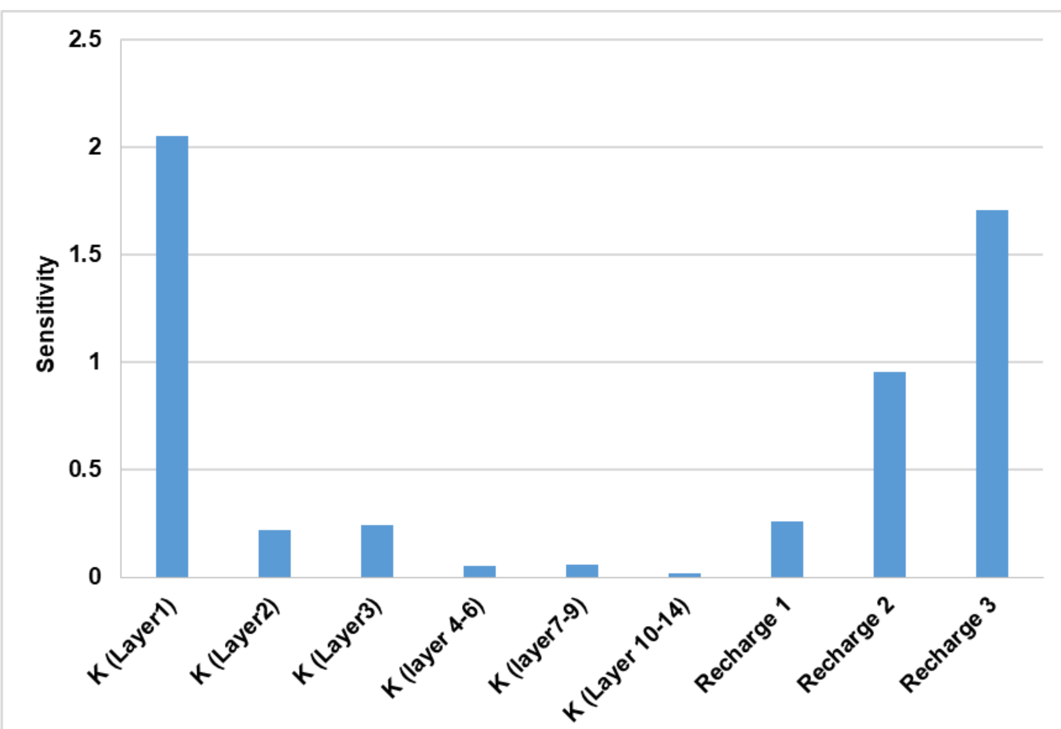


**Figure 4.2 Final Calibrated Parameters Sensitivity**

### 4.1.7 Baseline Model Result

The calibrated model was used to quantify groundwater levels and flow, and groundwater discharge to the receiving environment under baseline conditions. A plan of simulated water table contours for the calibrated steady-state baseline model is presented in Figure A.10 (Appendix A). The baseline model reasonably represents groundwater flow conditions, with flow occurring from areas of higher elevation toward the Gander River and nearby ponds and lakes.

## 4.2 Model Application

The parameters of the calibrated model were adjusted, as described in the following subsections to simulate the mine operation phase and the closure phase.

### 4.2.1 Mine Operation Phase (Environmental Assessment Mine Plan)

The baseline calibrated model was modified to include the following components of the Project:

- open pits: Keats, Iceberg, Jackpot, Dome
- waste rock storage facility
- overburden storage facility
- ore stockpile
- industrial terrace

The details of how each component was implemented in the model are provided below, the location of each component is presented on Figure A.2 (Appendix A).

#### 4.2.1.1 Open Pit Dewatering

To evaluate the effects of groundwater inflows to the open pits, the baseline model was modified to include the fully developed extents and depths of the four open pits.

Seepage into the pit was modelled by assigning DRN boundary conditions to model cells on the walls or floor of the open pits. The conductance of the drain cells was specified based on the hydraulic conductivity in the cells multiplied by the width, length and thickness of the cell. The drain elevation was set equal to the bottom elevation at the centre of each grid block cell.

#### 4.2.1.2 Mine Infrastructure Areas

The effect of the waste rock storage facility, overburden storage facility, ore stockpile (and the remaining pad in closure when the ore has been removed), and industrial terrace on groundwater levels was modelled by adjusting the groundwater recharge within the footprint of these features. The groundwater recharge within the footprint of these mine infrastructure areas was estimated based on site-specific water balance outputs from the GoldSim model, which account for surface runoff, evapotranspiration, and infiltration characteristics of the engineered materials during operation phase. The calculated recharge rates for each facility are presented in Table 4.7.

**Table 4.7 Calculated Recharge Adjustments Based on Water Balance Outputs from the GoldSim Model for Mine Features**

| Mine Infrastructure | Baseline Recharge (mm/year) | Operational Phase Recharge (mm/year) | Comment |
|---|---|---|---|
| Overburden Storage Facility | 342 | 81 | Decrease mainly due to stabilization (seeding) of the pile and runoff from its slope |
| Waste Rock Storage Facility | 399 | 479 | Increase consistent with lower runoff from very coarse materials |
| Ore Stockpile Storage (Operation) | 399 | 479 | Increase consistent with lower runoff from very coarse materials |
| Ore Stockpile Pad (Closure; when ore removed) | 399 | 199 | Decrease reflects increased runoff from graded surface |
| Industrial Terrace | 399 | 50 | Decrease reflects graded surface, buildings |

#### 4.2.1.3 Particle Tracking to Estimate Discharge to Surface Water Features

The model was used to estimate discharge rates to the receiving environment during the operation and closure phases. A forward particle tracking approach using the United States Geological Survey's particle tracking code MODPATH was applied, where a (groundwater-representing) particle was released from each model cell within the footprint of a given mine component (Pollock 2016). The travel paths of the particles were simulated through the model domain until they arrived at a receiver, such as a lake or stream/watercourse. The total flow from a given mine component to a given receiver was determined by multiplying the total groundwater recharge at the given mine component by the percentage of particle paths from that mine component arriving at the given receiver. This is a conservative approach as it assumes that all recharge through waste rock storage facility, overburden storage facility and ore stockpile is carried through to the downstream receivers.

#### 4.2.1.4 Results

Results of the simulated dewatering rates for the open pits during the operation phase are presented in Table 4.8. The total dewatering rate represents the combined flow from Layers 1 through 10 (i.e., the full mining depth). A safety factor of two was applied to pits located near watercourses or ponds (i.e., all pits except the Jackpot pit) to account for the fact that these surface water features were modelled as drain boundary conditions and could not, under any circumstances, provide aquifer recharge. This approach was taken only after substantial model testing and considerations.

**Table 4.8 Dewatering Rates for the Open Pits - Operation Phase**

| Open Pit | Depth (m) | Layer 1 (m³/day) | Layers 2-4 (m³/day) | Layers 5-10 (m³/day) | Layers 1-10 (m³/day) | Total with Factor of Safety (m³/day) |
|---|---|---|---|---|---|---|
| Keats | 241 | -687 | -154 | -337 | -1,179 | -2,358 |
| Iceberg | 119 | -193 | -147 | -176 | -515 | -1,030 |
| Jackpot | 70 | -119 | -63 | -40 | -222 | -222 |
| Dome | 44 | -182 | -63 | - | -245 | -490 |
| **Total** | **-** | **-1,181** | **-427** | **-553** | **-2,161** | **-4,100** |

Notes:
m= metre(s); m³/day = cubic metre(s) per day

Predicted groundwater elevation contours for the operation phase are shown in Figure A.11 (Appendix A) and the corresponding predicted groundwater drawdown surrounding the four open pits is illustrated in Figure A.12 (Appendix A). Drawdown near the pits ranges from 5 m to 60 m at the end of mining operation.

The mass balance for groundwater flow into and out of the steady-state model for the operation phase is provided in Table 4.9.

**Table 4.9 Groundwater Mass Balance - Operation Phase**

| Flow Component | Inflow (m³/day) | Outflow (m³/day) | Net Inflow (m³/day) |
|---|---|---|---|
| Recharge | 180,355 | - | 180,355 |
| CHD as Gander River and Lake and as aquifer at NW corner | 2,517 | -57,557 | -55,040 |
| RIV as rivers | 144,788 | -230,999 | -86,211 |
| GHB as Pond and Lake | 32,333 | -58,994 | -26,661 |
| DRN as rivers, ponds | - | -8,342 | -10,281 |
| DRN as pits | - | -2,161 | -2,161 |
| **Total** | **359,993** | **-359,992** | **1** |
| **Percent Discrepancy** | **0.00%** | | |

Notes:
m³/day = cubic metre(s) per day

The effect of the operation phase on baseflow is provided in Table 4.10. Simulated baseflow within the model domain generally remained consistent with baseline conditions, except for the surface water Catchment Zone 3, where a 21% reduction in baseflow was predicted (i.e., a reduction in the negative number for net inflow is a loss of outflow). This change corresponded to the presence of mine features and associated dewatering activities in this zone. The simulated percent reductions in baseflow for the surface water Catchment Zone 2 and Zone 4 were negligible (<2%), indicating limited influence of mine operation on groundwater discharge in these areas.

**Table 4.10 Simulated Baseflow - Operation Phase**

| Catchment Zone | Area ($km^2$) | Baseflow Component | Simulated Baseflow ($m^3$/day) | | Change ($m^3$/day) | Percent Reduction (%) |
|---|---|---|---|---|---|---|
| | | | Baseline | Operation | | |
| Zone 2 | 7.34 | Total<br>RIV as River<br>GHB as Pond and Lake | -6,310<br>-2,742<br>-3,568 | -6,177<br>-2,703<br>-3,474 | 133 | -2 |
| Zone 3 | 12.49 | Total<br>DRN as River<br>DRN as Pond and Lake | -12,960<br>-9,217<br>-3,743 | -10,281<br>-7,172<br>-3,109 | 2,679 | -21 |
| Zone 4 | 58.17 | Total<br>RIV as River<br>GHB as Pond and Lake | -48,832<br>-35,042<br>-13,790 | -48,832<br>-35,038<br>-13,794 | 0 | 0 |

Notes:
$km^2$ = square kilometre(s); $m^3$/day = cubic metre(s) per day

The particle traces at the end of the operation period are presented in Figure A.13 (Appendix A). The particle traces were used to quantify the discharge rates and travel times to the receiving environment during the operation phase and are summarized in Table 4.11.

For the overburden storage facility, the total predicted discharge was 100 $m^3$/day, primarily reporting to monitoring locations HP-14-11 (44 $m^3$/day), HP-14-16 (35 $m^3$/day), and HP-14-43 (16 $m^3$/day), with minor contributions to other receivers.

For the waste rock storage facility, the total predicted discharge was 1,067 $m^3$/day. The largest predicted discharges were to HP-12-41 (395 $m^3$/day), HP-8-25 (133 $m^3$/day), HP-13-44 (113 $m^3$/day), and Lake P8 (120 $m^3$/day), with additional contributions distributed among other receivers and outside the Catchment Zone 3 (19 $m^3$/day).

Seepage from the ore stockpile was predicted to discharge to the Iceberg Pit, which captured approximately 21% (60 $m^3$/day of 285 $m^3$/day) and Keats Pit which captured 3% of discharge (8 $m^3$/day of 285 $m^3$/day), with the remainder discharged toward Lake P9 (217 $m^3$/day).

**Table 4.11 Predicted Discharge Rates and Travel Times from Mine Infrastructure to Receiving Environment – Operation Phase**

| Source | Receiver | Discharge ($m^3$/day) | Travel time (year) | | |
|---|---|---|---|---|---|
| | | | 5th percentile | 50th percentile | 95th percentile |
| Overburden Storage Facility | HP-13-11 | 1 | 0.19 | 0.19 | 0.19 |
| | HP-14-11 | 44 | 0.05 | 0.08 | 35 |
| | HP-14-16 | 35 | 0.05 | 0.09 | 193 |
| | HP-14-43 | 16 | 0.05 | 0.11 | 48 |
| | HP-15-16 | 4 | 0.03 | 0.04 | 0.05 |
| | **Sum** | **100** | **-** | **-** | **-** |
| Waste Rock Storage Facility | HP-11-25 | 12 | 0.05 | 19 | 4,550 |
| | HP-12-41 | 395 | 0.02 | 0.06 | 93 |
| | HP-12-42 | 36 | 0.03 | 0.06 | 160 |
| | HP-13-11 | 19 | 0.04 | 0.10 | 297 |
| | HP-13-44 | 113 | 0.03 | 0.07 | 0.23 |
| | HP-14-11 | 26 | 0.07 | 0.12 | 845 |
| | HP-14-16 | 1 | 0.29 | 0.29 | 0.29 |
| | HP-16-16 | 3 | 0.26 | 0.29 | 20 |
| | HP-6-28 | 22 | 0.06 | 0.08 | 706 |
| | HP-7-29 | 64 | 0.03 | 0.08 | 63 |
| | HP-8-25 | 133 | 0.02 | 0.06 | 171 |
| | HP-9-25 | 27 | 0.07 | 1 | 1,066 |
| | P13 | 2 | 0.28 | 0.28 | 0.30 |
| | P8 | 120 | 0.02 | 0.06 | 19 |
| | P9 | 75 | 0.03 | 0.11 | 1,093 |
| | Out of Catchment Zone 3 | 19 | 0.09 | 9 | 10 |
| | **Sum** | **1,067** | **-** | **-** | **-** |
| Ore Stockpile | P9 | 217 | 0.05 | 0.09 | 190 |
| | Iceberg | 60 | 19 | 87 | 1,845 |
| | Keats | 8 | 58 | 114 | 1,102 |
| | **Sum** | **285** | **-** | **-** | **-** |
| **Total** | | **1,452** | **-** | **-** | **-** |

Note:
$m^3$/day = cubic metre(s) per day

### 4.2.2 Closure Phase

The groundwater model was subsequently modified from the operation phase to simulate the closure phase. During closure, the overburden storage facility will be removed and the material used to cover the various pads and piles (waste rock storage facility, industrial terrace, ore stockpile area). As such, the recharge rate within the overburden storage facility footprint was returned to its baseline rate. The groundwater recharge within the waste rock storage facility and ore stockpile area was estimated based on site-specific water balance outputs from the GoldSim model, which account for surface runoff, evapotranspiration, and infiltration characteristics of the engineered materials during closure phase. Recharge beneath the waste rock storage facility was estimated to decrease from 399 mm/year to 245 mm/year. Similarly, the recharge beneath the ore stockpile was estimated to decrease from 399 mm/year to 140 mm/year.

Groundwater inflow to the open pits following the termination of dewatering was quantified by removing the DRN boundary conditions representing seepage at the pit walls and floor and replacing them with CHD boundary conditions representing water at various specified stages of filling. The filled pit was simulated by setting the CHD elevation equal to the lowest point of the intersection of the pit shell and the ground surface. A negative inflow when the pit is filled indicates that the groundwater elevation is above the top of the pit and the pit is overflowing. A positive inflow indicates that groundwater alone would not cause overflow.

The inflow rates to the open pits at the various stages of filling are presented in Table 4.12. The results indicate that the groundwater alone will not cause Iceberg, Jackpot and Dome pits to overflow but will cause the Keats pit to overflow

**Table 4.12 Modelled Groundwater Inflow Rates to the Open Pits - Closure Phase**

| Pit | Inflow at End of Operation ($m^3$/day) | Inflow to Half-Filled Pit ($m^3$/day) | Inflow to Filled Pit ($m^3$/day) |
|---|---|---|---|
| Keats | -1,179 | -1,101 | -876 |
| Iceberg | -515 | -466 | 0[1] |
| Jackpot | -222 | -144 | 0[1] |
| Dome | -245 | -111 | 0[1] |
| **Total** | **-2,161** | **-1,822** | **-876** |

Notes:
[1]Indicates that the pit will not overflow by groundwater inflow alone, as groundwater equilibrated at an elevation lower than the overflow elevation
masl = metre(s) above sea level; $m^3$/day = cubic metre(s) per day

The effect of the closure phase on mass balance for groundwater flow into and out of the steady-state model is provided in Table 4.13.

**Table 4.13 Steady-State Model General Mass Balance - Closure Phase**

| Flow Component | Inflow ($m^3$/day) | Outflow ($m^3$/day) | Net Inflow ($m^3$/day) |
|---|---|---|---|
| Recharge | 179,914 | 0 | 179,914 |
| CHD as Gander River and Lake as aquifer at NW corner | 2,926 | -58,894 | -55,092 |
| CHD as Pits | | | -876 |
| RIV as rivers | 144,787 | -231,007 | -86,220 |
| GHB as Pond and Lake | 32,336 | -59,008 | -26,672 |
| DRN as rivers, ponds | 25 | -11,203 | -11,178 |
| **Total** | 359,988 | -360,112 | -124 |
| Percent Discrepancy (%) | -0.03 % | | |

Note:
$m^3$/day = cubic metre(s) per day

The effect of the closure phase on baseflow is provided in Table 4.14. The model results indicated that simulated baseflow during closure for surface water Catchment Zone 2 and Zone 4, were largely unchanged (≤2%) from the baseline values, suggesting negligible change in groundwater discharge. Surface water Catchment Zone 3 reported a 14% decrease in baseflow compared to baseline (i.e., -11,178 $m^3$/day versus -12,960 $m^3$/day), indicating a partial but incomplete recovery of groundwater discharge following pit flooding.

**Table 4.14 Simulated Baseflow - Closure Phase**

| Catchment Zone | Area ($km^2$) | Baseflow Component | Simulated Baseflow ($m^3$/day) | | Change ($m^3$/day) | Percent Reduction (%) |
|---|---|---|---|---|---|---|
| | | | Baseline | Closure | | |
| Zone 2 | 7.34 | Total<br>RIV as River<br>GHB as Pond and Lake | -6,310<br>-2,742<br>-3,568 | -6,199<br>-2,710<br>-3,489 | 111 | -2 |
| Zone 3 | 12.49 | Total<br>DRN as River<br>DRN as Pond and Lake | -12,960<br>-9,217<br>-3,743 | -11,178<br>-8,420<br>-2,758 | 1,782 | -14 |
| Zone 4 | 58.17 | Total<br>RIV as River GHB as Pond and Lake | -48,832<br>-35,042<br>-13,790 | -48,818<br>-35,031<br>-13,787 | 14 | -0.03 |

Notes:
$km^2$ = square kilometre(s); $m^3$/day = cubic metre(s) per day

The predicted groundwater elevation and drawdown contours at the end of the closure phase are presented in Figure A.14 and Figure A.15 (Appendix A). At the end of the closure phase, the water table is anticipated to return to near baseline conditions except in the vicinity of previous mine infrastructure (compared to Figure A.10, Appendix A). The drawdown contours (Figure A.15, Appendix A) suggest groundwater elevations at closure will return to near baseline conditions except the area within the pits.

Modeled residual drawdown of up to 7 m is reported around the pit perimeters, reflecting incomplete recovery likely due to the hydraulic connection between the flooded pits and the adjacent aquifers.

It is noted that the net inflow of -876 m³/day (Table 4.12) into the Keats pit at closure will overflow from the pit into the local surface water, replacing some (approximately 50%) of the 1,782 m³/day reduction in baseflow.

The fate of seepage that recharges beneath waste rock storage facility at closure was estimated by conducting forward particle tracking. The particle traces at closure are presented in Figure A.16 (Appendix A) and were used to quantify the discharge rates and travel times to the receiving environment from waste rock storage facility. The results are summarized in Table 4.15.

**Table 4.15 Predicted Discharge Rates and Travel Times from Mine Infrastructure to Receiving Environment - Closure Phase**

| Source | Receiver | Discharge (m³/day) | Travel time (year) | | |
|---|---|---|---|---|---|
| | | | 5th percentile | 50th percentile | 95th percentile |
| Waste Rock Storage Facility | HP-11-25 | 5 | 0.05 | 12 | 8,600 |
| | HP-12-41 | 100 | 0.04 | 0.12 | 268 |
| | HP-13-11 | 1 | 4 | 42 | 79 |
| | HP-13-44 | 63 | 0.04 | 0.09 | 6 |
| | HP-14-11 | 149 | 0.08 | 0.18 | 0.25 |
| | HP-16-16 | 4 | 0.28 | 1 | 167 |
| | HP-6-28 | 71 | 0.10 | 18 | 18 |
| | HP-7-29 | 25 | 0.03 | 0.13 | 230 |
| | HP-8-25 | 72 | 0.03 | 0.08 | 198 |
| | HP-9-25 | 14 | 0.07 | 0.10 | 344 |
| | Out of Catchment Zone 3 | 13 | 0.06 | 1 | 10 |
| | P9 | 28 | 1 | 3 | 569 |
| | **Sum** | **545** | | | |

Note:
m³/day = cubic metre(s) per day

## 4.3 Predictive Sensitivity Analyses

Sensitivity analyses were completed to assess the impact of uncertainty in hydraulic conductivity and recharge parameters on the model results. Parameter values were adjusted manually to higher and lower values relative to the calibrated parameters. Sensitivities were evaluated by comparing baseflow for surface water Catchment Zones 2 to 4 after varying the key parameters up and down.

### 4.3.1 Hydraulic Conductivity of Hydrostratigraphic Units

To assess the model's sensitivity to changes in hydraulic conductivity, the hydraulic conductivities of the subsurface layers were varied within a small enough range to allow other parameters to remain unvaried while still providing a reasonable calibration in the baseline model (i.e., the scaled RMS was within the recommended minimum threshold of 10% (Anderson et al. 2015)). An additional simulation was completed by decreasing the vertical hydraulic conductivity ($K_z$) by a factor of 10 to evaluate the influence of reduced vertical connectivity. The resulting changes in baseflow compared to the base case (i.e. using the parameters as described in sections 4.1 and 4.2) for baseline, operation, and closure phases are summarized in Table 4.16. The results suggest that, as expected based on the conceptual hydrogeologic model, predictions are most sensitive to small-scale changes in horizontal hydraulic conductivity. This suggests that horizontal hydraulic conductivity exerts dominant control on groundwater flow and baseflow discharge within the model domain, while vertical connectivity plays a comparatively less important role.

**Table 4.16 Predicted Sensitivity Analysis Summary: Varying Hydraulic Conductivity**

| Catchment Zone | Simulated Baseflow ($m^3$/day) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Base Case | Reduced Hydraulic Conductivity | | Increased Hydraulic Conductivity | | Reduced Vertical Hydraulic Conductivity | |
| | | Baseflow | Percent Change | Baseflow | Percent Change | Baseflow | Percent Change |
| **Baseline Model** | | | | | | | |
| Zone 2 | -6,310 | -6,826 | 8 | -5,603 | -11 | -6,556 | 4 |
| Zone 3 | -12,960 | -15,566 | 20 | -12,978 | 0.15 | -12,965 | 0.15 |
| Zone 4 | -48,832 | -48,762 | -0.14 | -48,779 | -0.11 | -48,824 | -0.02 |
| **Operation Phase** | | | | | | | |
| Zone 2 | -6,177 | -6,688 | 8 | -5,464 | -12 | -6,423 | 4 |
| Zone 3 | -10,281 | -10,397 | 1 | -10,248 | -0.32 | -10,333 | 1 |
| Zone 4 | -48,832 | -48,761 | -0.15 | -48,776 | -0.11 | -48,823 | -0.02 |
| **Closure Phase** | | | | | | | |
| Zone 2 | -6,199 | -6,706 | 8 | -5,489 | -11 | -6,445 | 4 |
| Zone 3 | -11,178 | -14,137 | 26 | -11,445 | 2 | -11,307 | 1 |
| Zone 4 | -48,818 | -48,747 | -0.15 | -48,766 | -0.11 | -48,810 | -0.02 |

Note:
$m^3$/day = cubic metre(s) per day

Despite using relatively small changes in hydraulic conductivity for the sensitivity analysis, it is noted that the mass balance in the reduced hydraulic conductivity case had a larger percent discrepancy error compared to the other two cases. The percent discrepancy in the mass balance of the reduced hydraulic conductivity case ranged from 0.85% in closure to 0.97 in operation was approximately 1%, which is higher than in the calibrated baseline model (0.04%), but still below the acceptability criteria for discrepancy error of <1% as recommended by Reilly and Harbaugh (2004).

### 4.3.2 Climate Change Effects

The primary climate change effect considered in this assessment was changing rates of precipitation. To carry out this analysis, recharge rates were adjusted using factors based on the historical climate data. Relative to the mean annual precipitation of 1,247 mm, the year 1958 (with a total recorded precipitation of 1,065 mm) was noted as particularly dry and the year 2013 (with a total recorded precipitation of 1,387 mm) was noted as particularly wet. Adjusting the recharge rates applied to the model proportionally based on the increase or decrease in precipitation compared to the mean annual value resulted in the model inputs presented in Table 4.17.

**Table 4.17 Recharge Zone Parameters for Dry and Wet Senerios**

| Recharge Zone | Ground Elevation Range (masl) | Initial (mm/year) | | |
|---|---|---|---|---|
| | | Normal | Dry | Wet |
| 1 | 1-40 | 186 | 159 | 207 |
| 2 | 40-80 | 285 | 243 | 317 |
| 3 | 80-140 | 399 | 340 | 443 |

Notes:
masl = metre(s) above sea level; mm/year = millimetre(s) per year

Tables 4.18 and 4.19 present the simulated baseflow results under normal, dry, and wet climatic conditions in the baseline model and operation phase, respectively. The results show expected and proportional baseflow variability in all catchments, with no particularly notable differences between Zone 3, where the majority of the Project will be located, and the other zones.

**Table 4.18 Simulated Baseflow Under Climate Change Scenarios – Baseline Model**

| Catchment Zone | Baseflow Component | Simulated Baseflow ($m^3$/day) | | | | |
|---|---|---|---|---|---|---|
| | | Normal | Dry Condition | Percent of Change (%) | Wet Condition | Percent of Change (%) |
| Zone 2 | Total<br>River<br>Pond and Lake | -6,310<br>-2,742<br>-3,568 | -5,166<br>-2,114<br>-3,052 | -18 | -7,162<br>-3,208<br>-3,954 | 13 |
| Zone 3 | Total<br>River<br>Pond and Lake | -12,960<br>-9,217<br>-3,743 | -1,1134<br>-7,948<br>-3,186 | -14 | -15,626<br>-11,467<br>-4,159 | 21 |
| Zone 4 | Total<br>River<br>Pond and Lake | -48,832<br>35,042<br>13,790) | -41,820<br>-29,592<br>-12,228 | -14 | -54,354<br>-39,332<br>-15,022 | 11 |

Note: $m^3$/day = cubic metre(s) per day

**Table 4.19 Simulated Baseflow Under Climate Change Scenarios – Operation Phase**

| Catchment Zone | Baseflow Component | Simulated Baseflow (m³/day) | | | | |
|---|---|---|---|---|---|---|
| | | Normal | Dry Scenario | Percent of Change (%) | Wet Scenario | Percent of Change (%) |
| Zone 2 | Total<br>River<br>Pond and Lake | -6,177<br>-2,703<br>-3,474 | -5,053<br>-2,080<br>-2,973 | -18 | -6,900<br>-3,077<br>-3,823 | 12 |
| Zone 3 | Total<br>River<br>Pond and Lake | -10,281<br>-7,172<br>-3,109 | -8,744<br>-6,122<br>-2,622 | -15 | -11,155<br>-7,737<br>-3,418 | 9 |
| Zone 4 | Total<br>River<br>Pond and Lake | -48,832<br>-35,038<br>-13,794 | -41,818<br>-29,588<br>-12,230 | -14 | -51,424<br>-37,225<br>-14,199 | 5 |

Note: m³/day = cubic metre(s) per day

Table 4.20 presents the simulated operation phase pit dewatering rate response to wet and dry climate scenarios. The results show expected and proportional variability in pit dewatering rates.

**Table 4.20 Dewatering Rates for the Open Pits Under Climate Change Scenarios – Operation Phase**

| Pit | Total Dewatering Rates (m³/day) with Factor of Safety | | | | |
|---|---|---|---|---|---|
| | Normal | Dry Scenario | Percent of Change (%) | Wet Scenario | Percent of Change (%) |
| Keats | -2,358 | 2,005 | -15 | -2,592 | 10 |
| Iceberg | -1,030 | 896 | -13 | -1,106 | 7 |
| Jackpot | -222 | 198 | -11 | -231 | 3 |
| Dome | -490 | 445 | -9 | -522 | 6 |

Notes: m³/day = cubic metre(s) per day

# 5 Prediction Confidence

The assessment of baseline conditions and the inferred conceptualization of groundwater processes are based on applying industry standards and practices under quality assurance and quality control programs.

The volume and quantity of the data used to calibrate the groundwater flow model (e.g., hydraulic conductivities and groundwater elevations measured in boreholes and monitoring wells, baseflow estimates based on catchments calculated from topographic mapping and from knowledge of local conditions) is considered typical and at industry standard. The groundwater flow modelling was calibrated to within an acceptable range of error (i.e., normalized RMS error of less than 10%) for both groundwater levels and baseflow. As such, the baseflow model is considered accurate to within industry standards.

Predictions made using the groundwater flow model were made by adjusting the boundary conditions, particularly by setting drain elevations at pits and by adjusting recharge at other mine features such as the ore stockpile and waste rock storage facility. Predictions of pit inflows were considered sensitive to how surface water will be managed within the mine area in the future, and assumptions were made that the mine operator will work to prevent interactions between ponded surface water and pits. Despite this, a factor of safety of two was applied to groundwater inflow estimates for pits that are close to the existing locations of watercourses and ponds. Other predictions, of baseflow reductions, travel times and groundwater flows between mine features and watercourses, were considered best estimates and were not adjusted using a factor of safety.

Travel times of particles from the waste rock storage facility, overburden storage facility, and ore stockpile to the receiving environments did not account for dispersion or geochemical reactions which impacts the accuracy of the estimated travel times. Considering the overall modelling results and how these results feed into the surface water models, any loss of accuracy that would result from adding dispersion or geochemical effects was considered acceptable.

The Appleton Fault is known to exist in alignment with South and North Herman’s Ponds, with ongoing borehole investigations aimed at determining its hydrogeological significance. This model was constructed using preliminary results of these investigations, which, in short, appear to support the current conceptual hydrogeological model with a (log-permeability)-depth relationship. The results of the model will need to be re-evaluated pending the final results of the ongoing fault investigations.

# 6 Summary and Conclusions

Hydrogeological modelling was conducted to identify changes to groundwater levels and flow pathways to inform the assessment of potential effects of the New Found Gold Queensway Gold Project on groundwater and surface water resources in the Study Area. The modelling was conducted using MODFLOW in Groundwater Vistas Version 9 (a pre-and post-processing software) and was calibrated to baseline conditions within acceptable industry standards.

The construction and operation of the open pits will require dewatering. Dewatering rates for the open pits during the operation phase ranged from a maximum of 2,358 $m^3$/day in the Keats Pit to a minimum of 222 $m^3$/day in the Jackpot Pit. Predicted drawdown near the open pits ranges from approximately 5 m to 60 m.

The modelling results indicated that dewatering the open pits during the operation phase will result in localized changes in groundwater discharge compared to baseline baseflow conditions. Model results suggested a 21% reduction in baseflow may occur within Catchment Zone 3, the catchment which encompasses the mine footprint. Simulated reductions in baseflow for Catchment Zones 2 and 4, the catchments outside the mine area, were negligible (less than 2%), suggesting that mine operation has a limited influence on groundwater discharge beyond the immediate vicinity of the pits.

During the closure phase, groundwater inflows to the open pits were predicted to occur as the pits fill and hydraulic equilibrium is gradually re-established with surrounding groundwater levels. Model results suggested that the Keats pit will overflow, whereas Iceberg, Jackpot, and Dome pits will not overflow due to groundwater inflow alone, as simulated groundwater levels equilibrated at elevations lower than the overflow elevations.

The effect of the closure phase on simulated baseflow for the surface water Catchment Zone 3, showed a 14% decrease in baseflow relative to baseline, however the decrease will be partially counterbalanced by overflow from the Keats pit.

During the closure phase, groundwater levels were predicted to recover as dewatering ceases and the open pits began to fill with groundwater and surface water inflows. Simulated drawdown contours suggest that the extent of the drawdown area will be substantially reduced compared to during operational conditions. Localized drawdown persisted in the immediate vicinity of the open pits, while groundwater levels across the remainder of the model domain return to near-baseline elevations. Residual drawdown of up to approximately 7 m remained around the pit perimeters, reflecting incomplete recovery likely due to the hydraulic connection between the flooded pits and adjacent aquifers.

Model results suggest that total groundwater recharge from mine infrastructure and subsequently discharging to the receiving environment will be on the order of 1,452 $m^3$/day (broken down as 7% from the overburden storage facility, 73% from the waste rock storage facility and 20% from the ore stockpile), during the operation phase. Model results suggest that the total groundwater discharge originating from waste rock storage facility will be 545 $m^3$/day in the closure phase.

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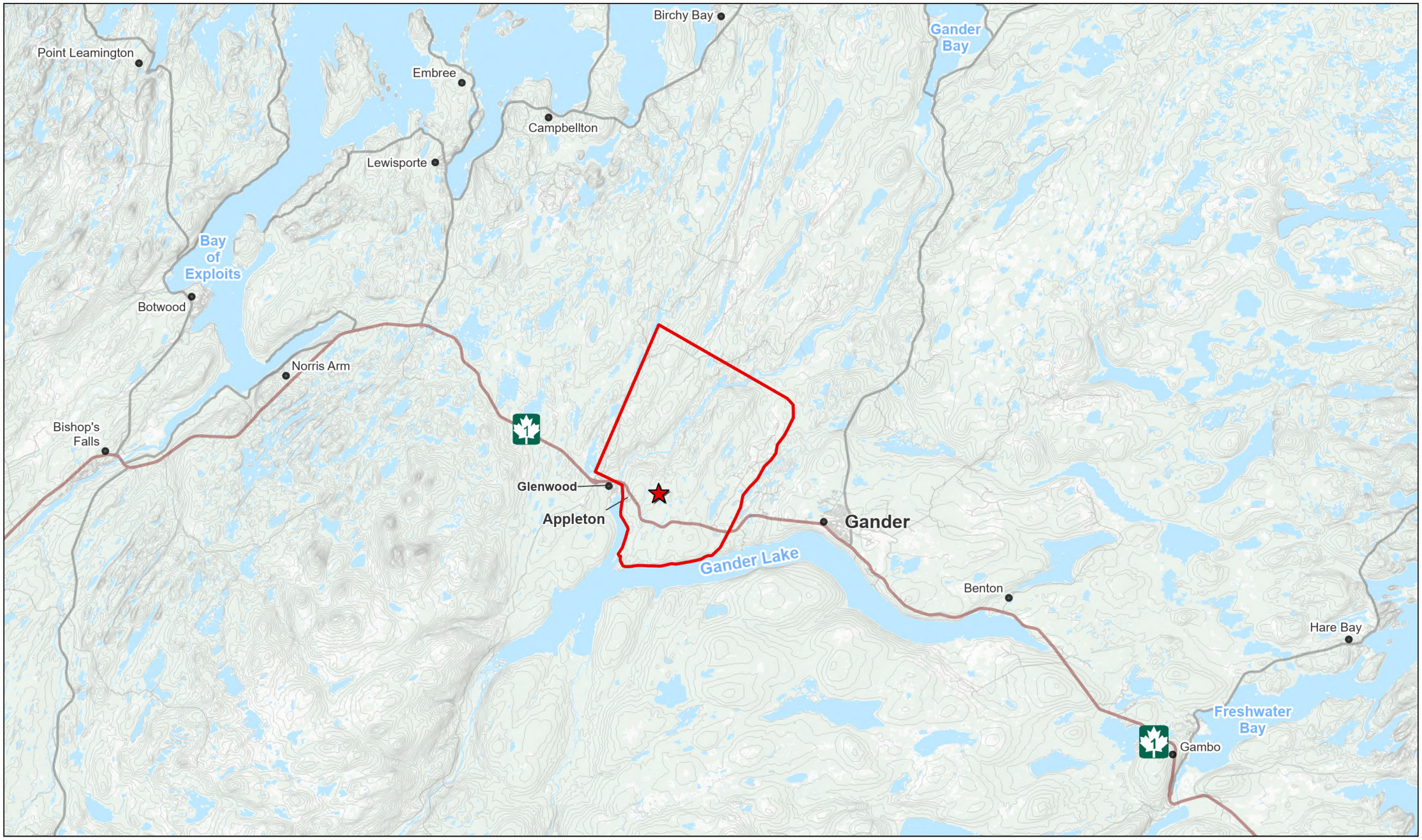
# Appendices

# Appendix A Figures





Legend

- ★ Project Location
- Study Area
- Community
- Trans-Canada Highway
- Highway
- Arterial / Collector
- Local Road
- Contour (10 m)
- Waterbody
- Forested Area

N

0 5 10 15 km

(At original document size of 8.5x11)
1:500,000

***Notes***

**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: Statistics Canada; Eddy, B.G., Muggridge, M., LeBlanc, R., Osmond, J., Kean, C., and Boyd, E. 2023. The CanEcumene 3.0 GIS Database. Federal Geospatial Platform (FGP), Natural Resources Canada. https://open.canada.ca
**3.** Background: NRCan CanVec

Stantec

*Project Location*
Gander,
Newfoundland and Labrador

Prepared by NW on 2026-01-02
TR by SS on 2026-04-28

*Client/Project*
121417976_410
Newfound Gold Corporation
Queensway Gold Project
Groundwater Modelling

*Figure No.*
**A.1**

*Title*
**Site Location Plan**

\\ca0151-PPFSS01\work group\1214\active\121417598\03 data\gis cad\mapping\ArcGIS Pro\121417976 NewFoundGold\121417976 NFG GW Baseline.aprx Revised: 2026-04-28 By: nwhite

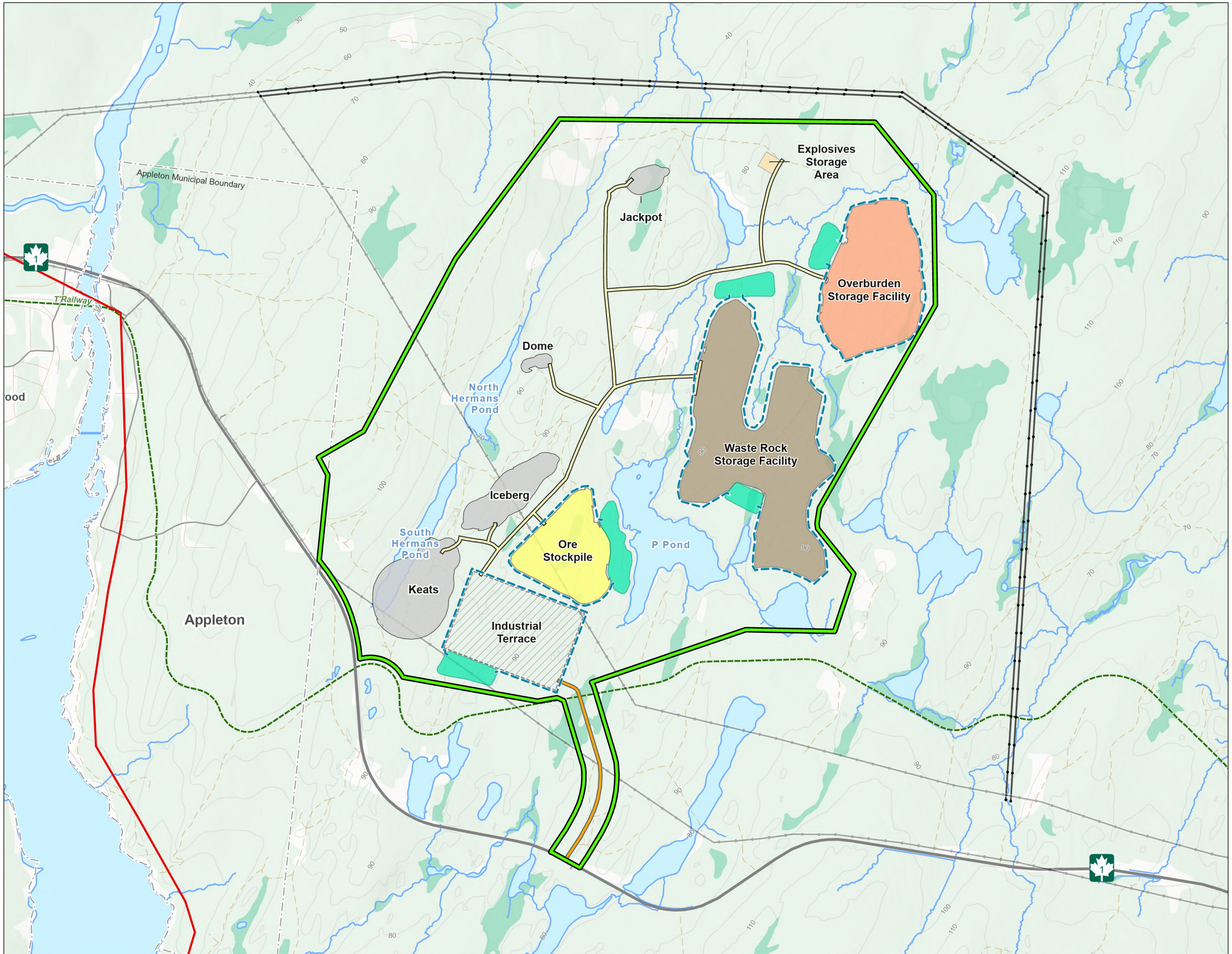



Figure No.
**A.2**

Title
## Site Overview

Client/Project 121417976_411
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake
Newfoundland and Labrador

Prepared by NW on 2026-01-02
TR by SS on 2026-03-23

N

0 250 500 1,000 m
(At original document size of 11x17)
1:24,000

- Project Area
- Study Area

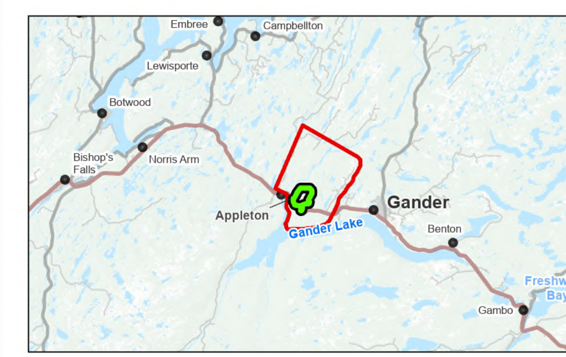
**Proposed Project Layout**
- Haul Road
- Access Road
- Ditch
- Sedimentation Pond
- Ore Stockpile
- Overburden Storage Facility
- Waste Rock Storage Facility
- Open Pit
- Other Mine Features
- Industrial Terrace

**Existing Infrastructure**
- Transmission Line
- Proposed Transmission Line (Re-routing)
- Highway
- Collector
- Local / Street
- Resource Road / Trail
- NL T'Railway Provincial Park

**Wetlands and Waterways**
- Watercourse
- Waterbody
- Wetland

**Land Cover**
- Forested Area
- Non-forested Area

**Other Features**
- Contour (10 m)
- Municipal Boundaries




***Notes***
1. Coordinate System: NAD 1983 CSRS MTM 2
2. Data Sources: New Found Gold Corp.; Stantec; Government of Newfoundland and Labrador, Department of Environment, Conservation and Climate Change, Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service, Department of Municipal and Community Affairs; National Road Network, Statistics Canada.
3. Background: Government of Newfoundland and Labrador, Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping. Esri, NASA, NGA, USGS, Esri, CGIAR, USGS

Stantec

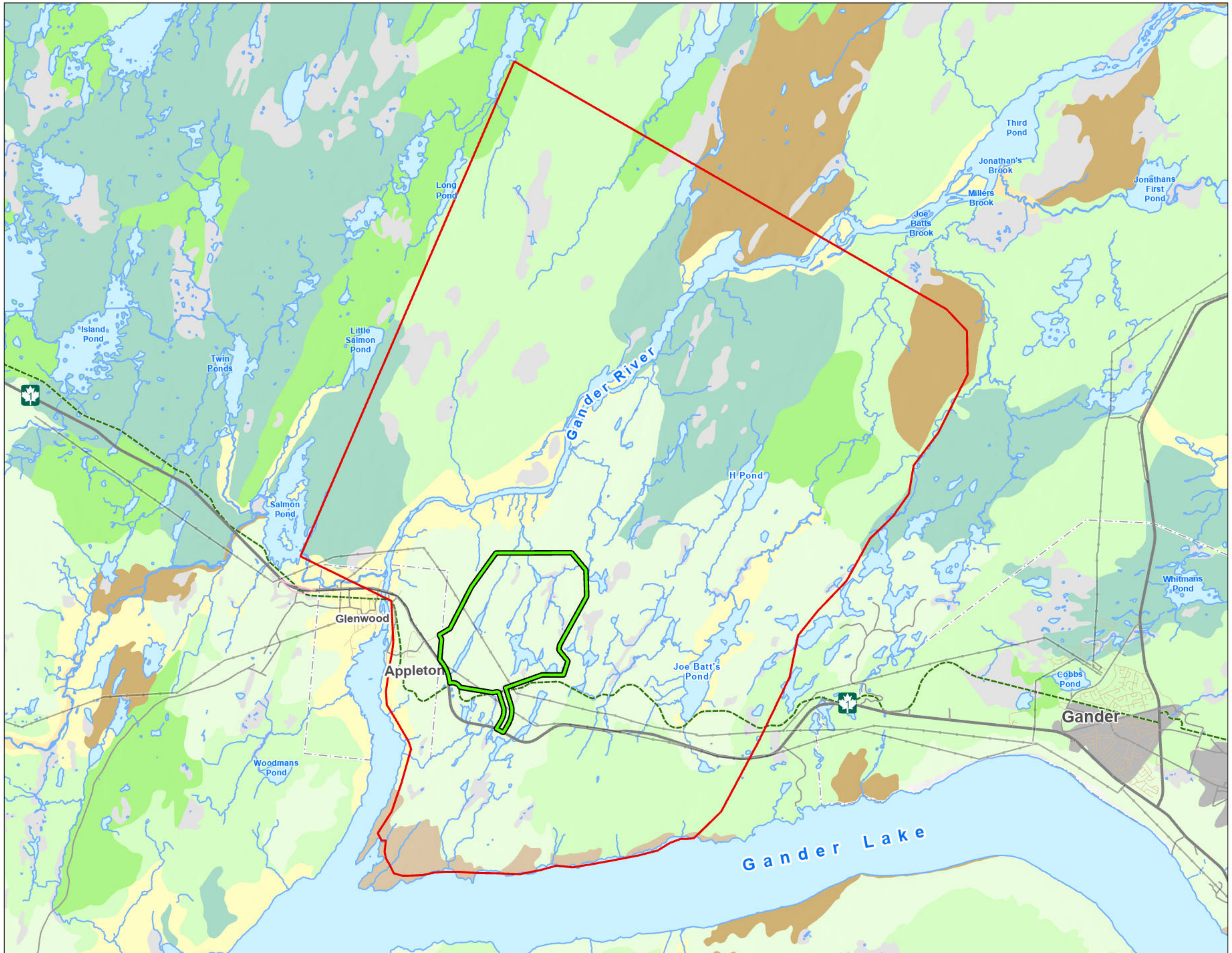



*Figure No.*

**A.3**

*Title*

## Surficial Geology

*Client/Project* 121417976_414

New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

*Project Location*
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2024-12-12
Revised by RT on 2026-01-30
TR by SS on 2026-03-23

N

0 1 2 4 km
(At original document size of 11x17)
1:100,000

- Project Area
- Study Area

**Surficial Geology**

- Municipality
- Organics
- Fluvial
- Glaciofluvial
- Rock
- Rock Concealed
- Till Veneer
- Thick Till
- Lineated Till
- Hummocky Till

**Existing Infrastructure**

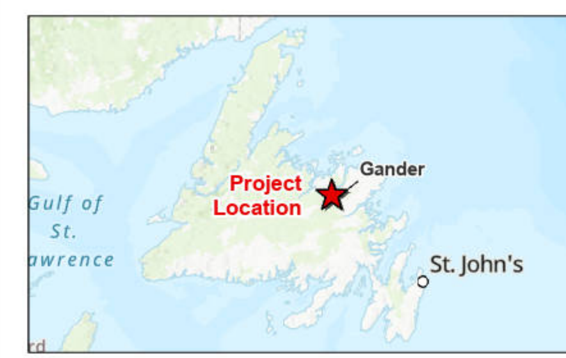
- Transmission Line
- Highway
- Collector
- Local / Street
- Local / Unknown
- Ramp
- NL T'Railway Provincial Park

**Administrative Boundaries**

- Municipal Boundary

**Wetlands and Waterways**

- Watercourse
- Waterbody




***Notes***

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: New Found Gold Corp.; Stantec.
3. Background: Government of Newfoundland and Labrador, Department of Energy and Mines - Geosciences Atlas; Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

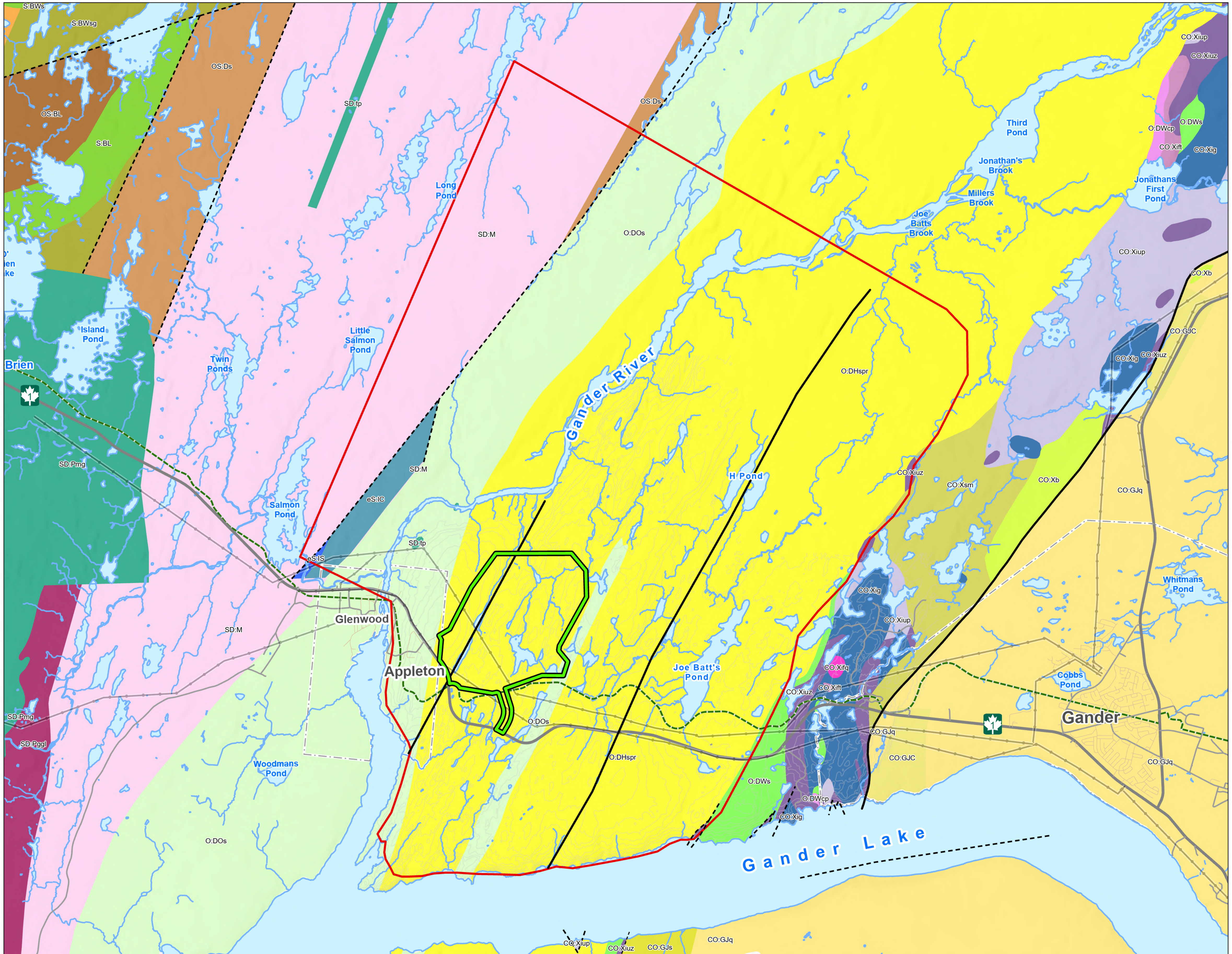



*Figure No.*

**A.4**

*Title*

# Bedrock Geology

*Client/Project* 121417976_415

New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

*Project Location*
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2024-12-12
Revised by RT on 2026-01-30
TR by AF on 2026-03-18

N

0 1 2 4 km
(At original document size of 11x17)
1:100,000

Project Area
Study Area

**Bedrock Geology**

Fault, defined
Fault, approximate
Fault, assumed
Thrust, approximate (barbs on the upthrust side)
Thrust, assumed (barbs on the upthrust side)

*Jonathan's Pond Formation*
CO:GJC
CO:GJq
CO:GJs

*Gander River Complex*
CO:Xb
CO:Xifq
CO:Xift
CO:Xig
CO:Xiup
CO:Xiuz
CO:Xsm

*Hunts Cove Formation*
O:DHspr

*Outflow Formation*
O:DOs

*Weir's Pond Formation*
O:DWcp
O:DWs

*Lewisporte Conglomerate*
OS:BL

*Duder Group*
OS:Ds

*Lawrenceton Formation*
S:BL

*Wigwam Formation*
S:BWs
S:BWsg

*Ten Mile Lake Formation*
SD:M

*Mount Peyton Intrusive Suite*
SD:Pggl
SD:Pmg
SD:tp

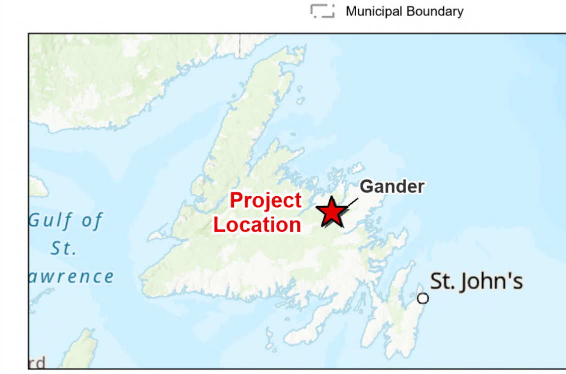
*Charles Cove Formation*
eS:IC

*Seal Island Formation*
eS:IS

**Existing Infrastructure**
Transmission Line
Highway
Collector
Local / Street
NL T'Railway Provincial Park

**Wetlands and Waterways**
Watercourse
Waterbody

**Administrative Boundaries**
Municipal Boundary




***Notes***
**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: New Found Gold Corp.; Stantec.
**3.** Background: Government of Newfoundland and Labrador, Department of Energy and Mines - Geosciences Atlas; Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

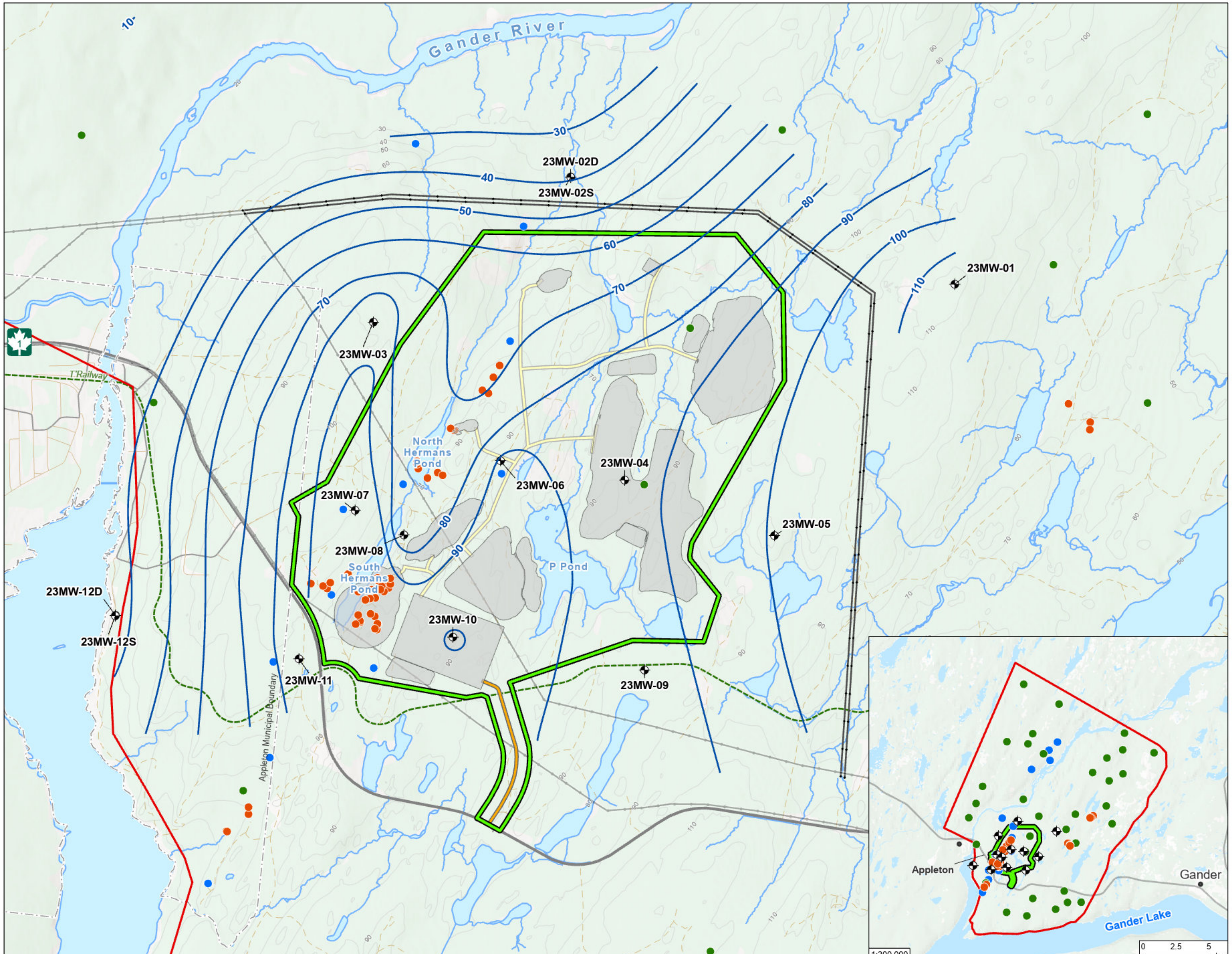



Figure No.
**A.5**

*Title*
## Well Locations and Groundwater Contours Map

*Client/Project* 121417976_412
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

*Project Location*
North Gander Lake
Newfoundland and Labrador

Prepared by NW on 2026-04-01
Revised by NW on 2026-04-28
TR by SS on 2026-04-28

N

0 250 500 1,000 m
(At original document size of 11x17)
1:30,000

- Project Area
- Study Area
- Artesian Well
- Dummy Well
- Exploration Well
- Monitoring Well
- Groundwater Contour (10m)

**Proposed Project Layout**
- Haul Road
- Access Road
- Proposed Site Features

**Existing Infrastructure**
- Transmission Line
- Proposed Transmission Line (Re-routing)
- Highway
- Collector
- Local / Street
- Resource Road / Trail
- NL T'Railway Provincial Park

**Wetlands and Waterways**
- Watercourse
- Waterbody
- Wetland

**Other Features**
- Contour (10 m)
- Municipal Boundaries


***Notes***
**1.** Coordinate System: NAD 1983 CSRS MTM 2
**2.** Data Sources: New Found Gold Corp.; Stantec; Government of Newfoundland and Labrador, Department of Environment, Conservation and Climate Change, Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service, Department of Municipal and Community Affairs; National Road Network, Statistics Canada.
**3.** Background: Government of Newfoundland and Labrador, Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping. Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

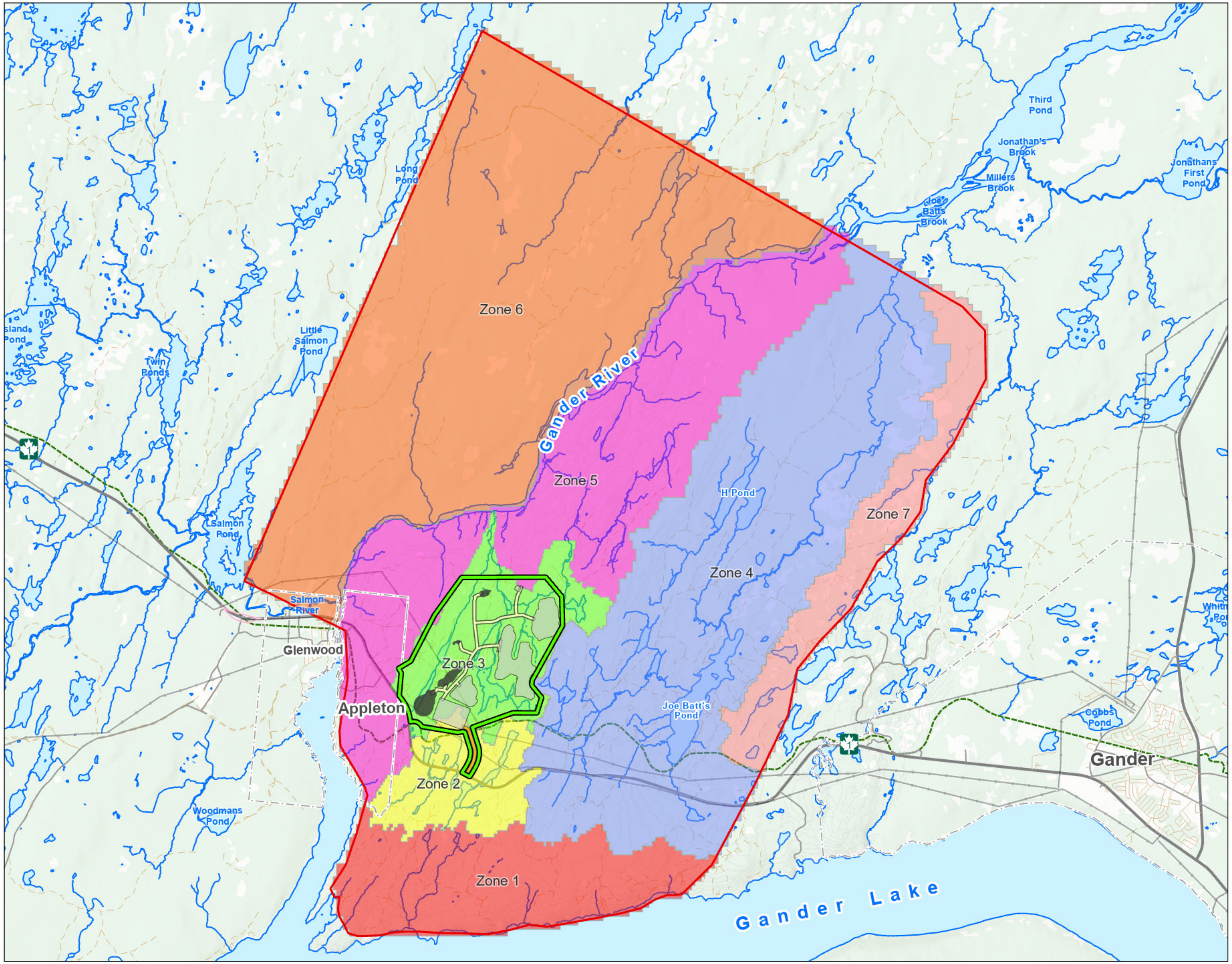



Figure No.
**A.6**

Title
## Surface Water Catchments

Client/Project 121417976_413

New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-01-02
TR by SS on 2026-03-23

N

0 1 2 4 km
(At original document size of 11x17)
1:90,000

- Project Area
- Study Area

**Surface Water Catchments for Baseflow Estimation**
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 6
- Zone 7

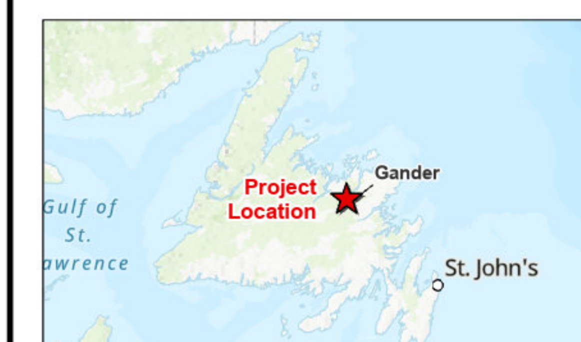
**Proposed Project Layout**
- Access Road
- Haul Road
- Proposed Site Features
- Open Pit

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Local / Unknown
- Ramp
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary

**Waterways**
- Watercourse
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




***Notes***
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: New Found Gold Corp.; Stantec.
3. Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

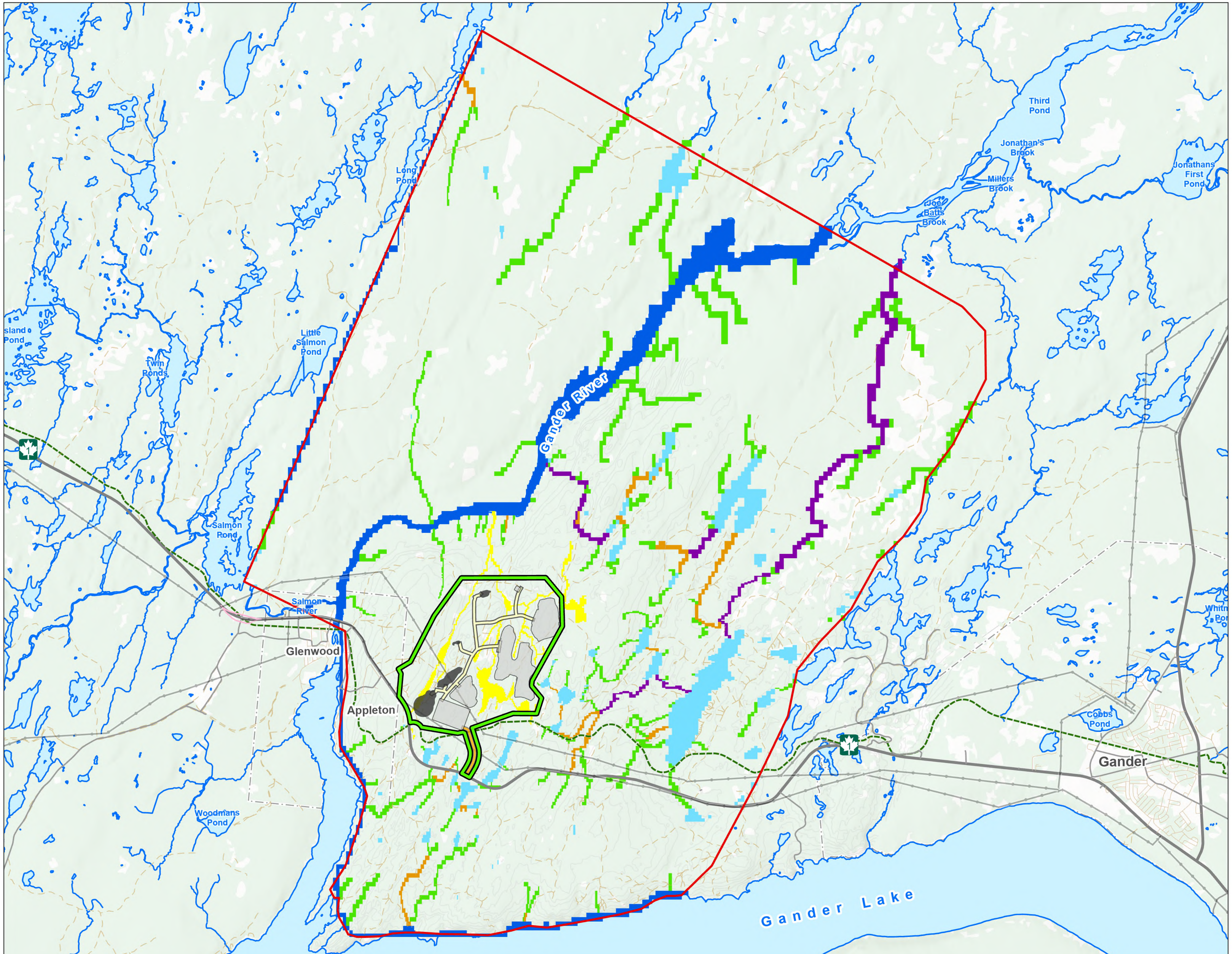



Figure No.
**A.7**

Title
## Model Boundaries

Client/Project 121417976_401
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-01-02
TR by SS on 2026-03-23

N

0 1 2 4 km
(At original document size of 11x17)
1:90,000

- Project Area
- Study Area

**Model Features**
- CHD
- DRN
- GHB
- WRD

River Order
- 1
- 2
- 3

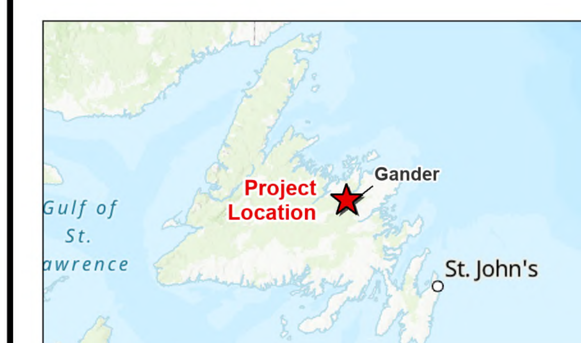
**Proposed Project Layout**
- Access Road
- Haul Road
- Open Pit
- Proposed Site Features

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Local / Unknown
- Ramp
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary

**Waterways**
- Watercourse
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




***Notes***
**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: New Found Gold Corp.; Stantec.
**3.** Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

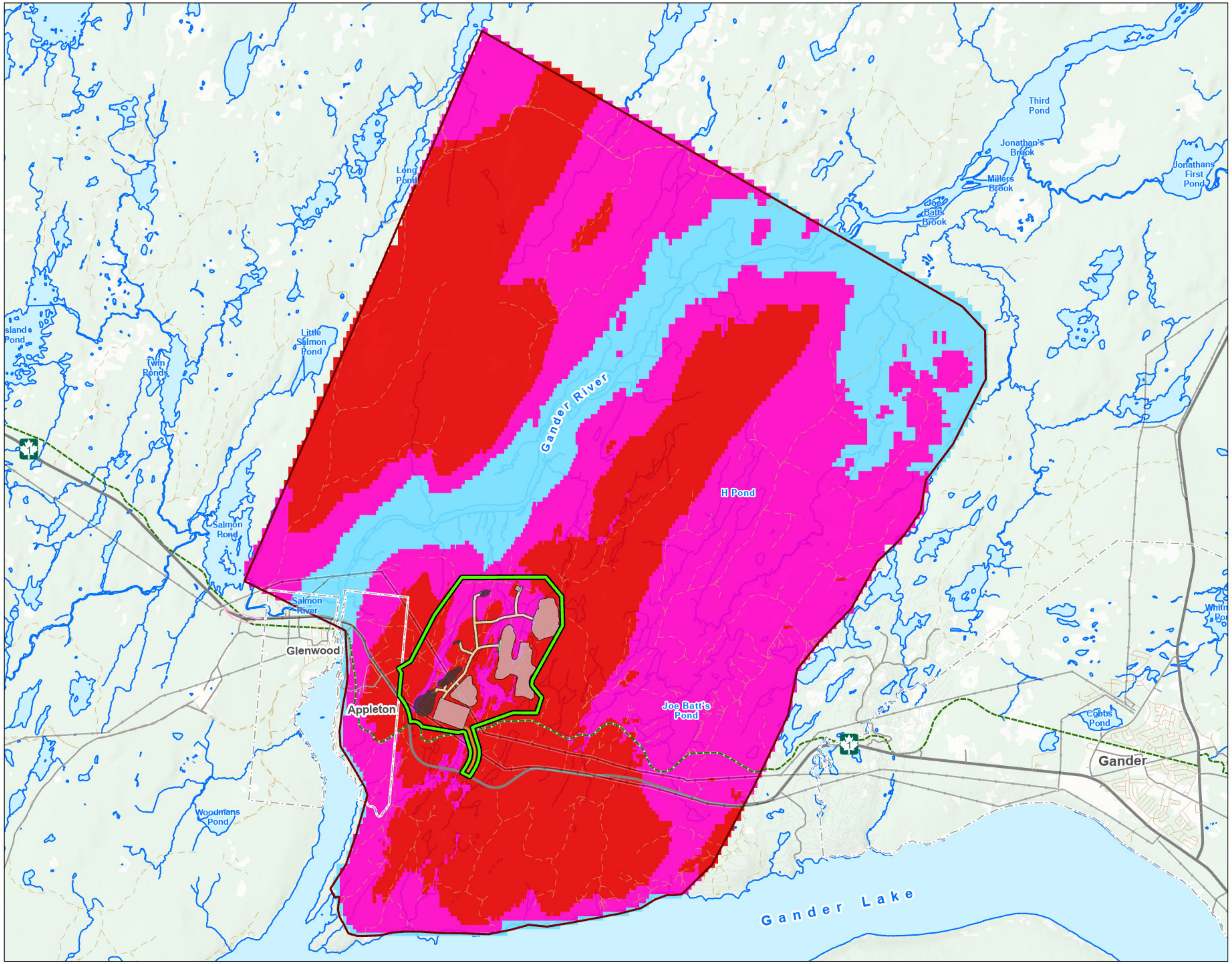



Figure No.
**A.8**

Title
## Three Recharge Zones

Client/Project 121417976_402
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-01-02
TR by SS on 2026-03-23

N

0 1 2 4 km
(At original document size of 11x17)
1:90,000

Project Area
Study Area

**Model Features**
Recharge Zone
1
2
3

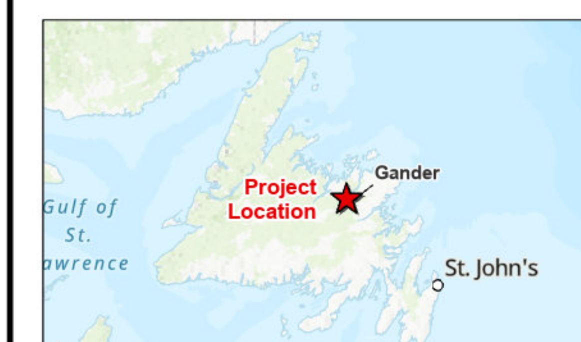
**Proposed Project Layout**
Access Road
Haul Road
Proposed Site Features
Open Pit

**Existing Infrastructure**
Transmission Line
Highway
Collector
Local / Street
Local / Unknown
Ramp
Resource Road / Trail
NL T'Railway Provincial Park

**Administrative Boundaries**
Municipal Boundary

**Waterways**
Watercourse
Waterbody

**Land Cover**
Forested Area
Non-forested Area




***Notes***
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: New Found Gold Corp.; Stantec.
3. Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

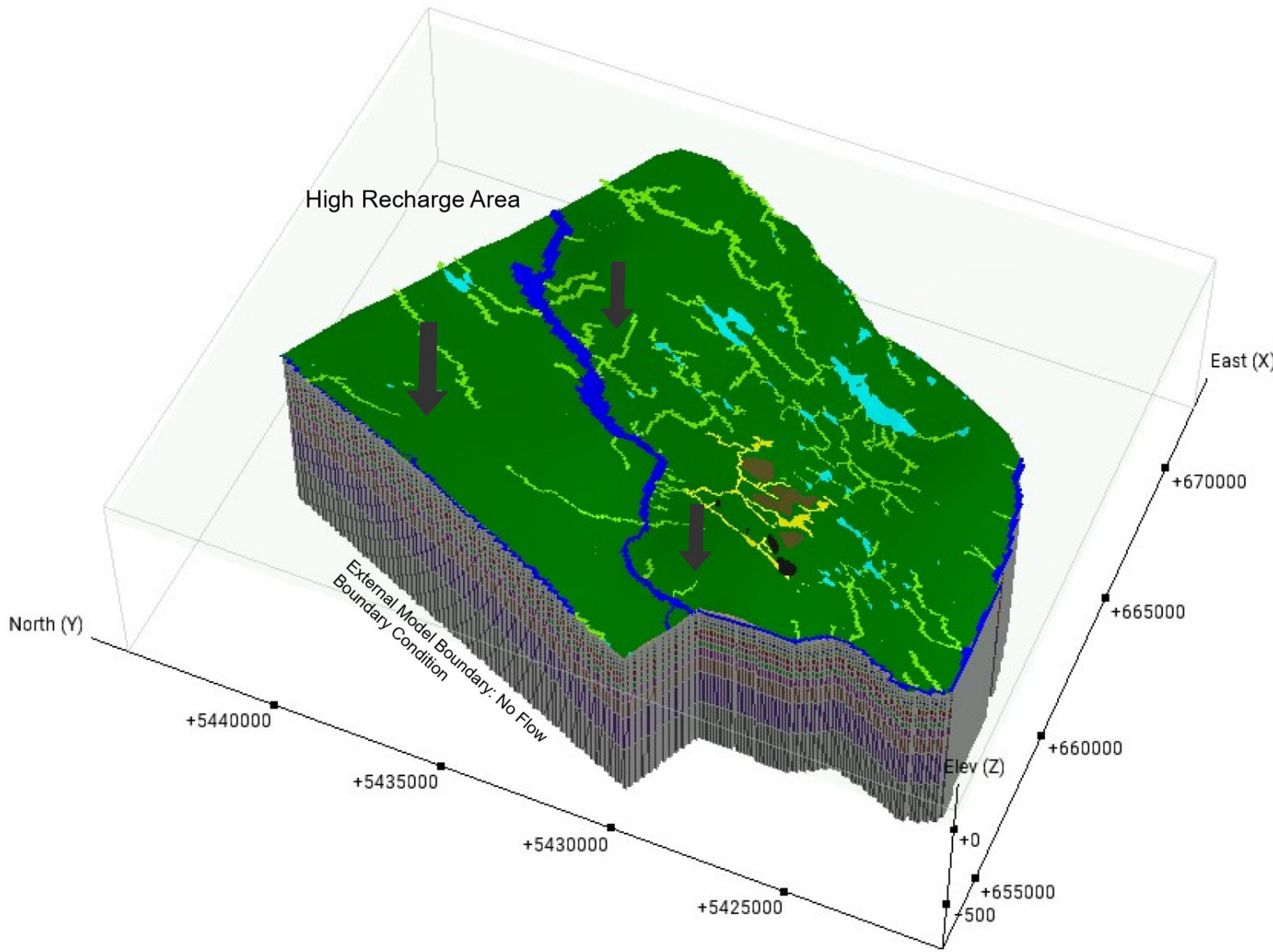



Figure No.
**A.9**

Title
**Block Diagram of Conceptual Site Model as Represented in the Numerical Model**

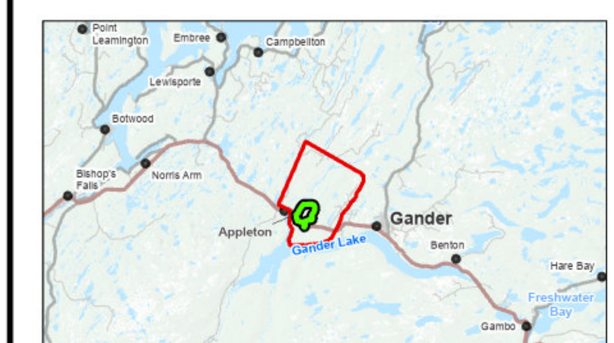
Client/Project 121417976_410
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by NW on 2026-04-06
TR by SS on 2026-04-06

Project Area
Study Area

**Model Features**
CHD
DRN
GHB
Pit
River
WRD




**Notes**
**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: New Found Gold Corp.; Stantec.
**3.** Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Esri, CGIAR, USGS

Stantec

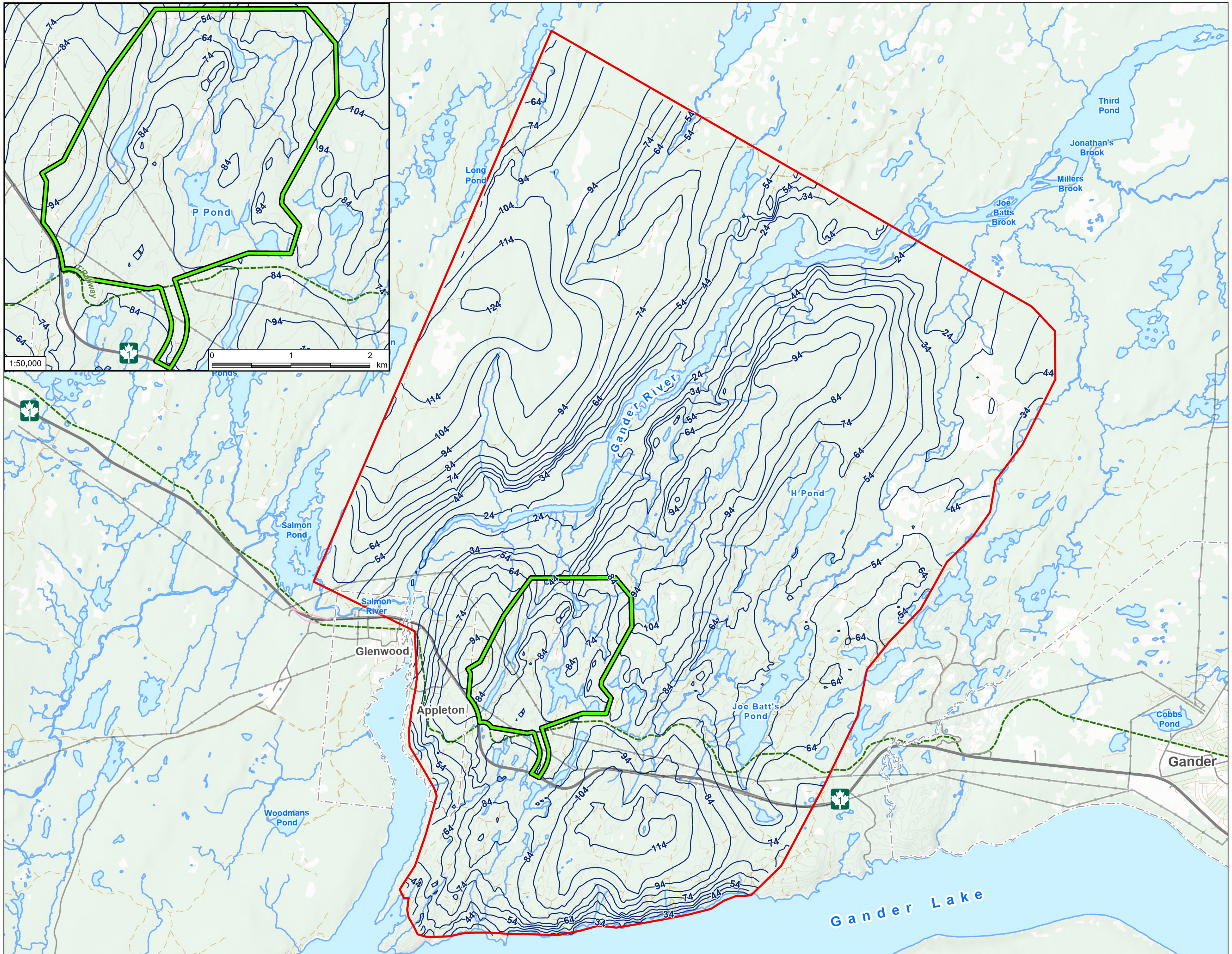



Figure No.
**A.10**

Title
## Steady State Baseline Model, Equipotential Contours

Client/Project 121417976_403
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-04-01
TR by SS on 2026-03-23

N

0 1 2 4 km
(At original document size of 11x17)
1:90,000

Study Area
Project Area

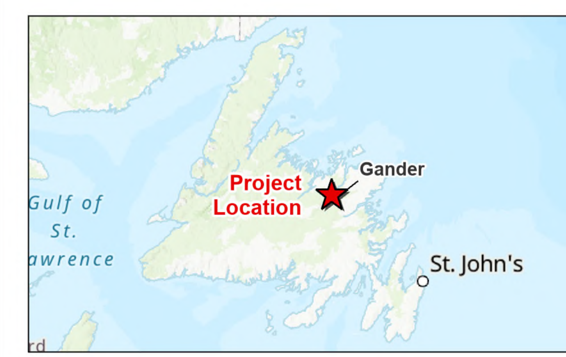
**Model Features**
Equipotential Contour (m)

**Existing Infrastructure**
Transmission Line
Highway
Collector
Local / Street
Local / Unknown
Ramp
Resource Road / Trail
NL T'Railway Provincial Park

**Administrative Boundaries**
Municipal Boundary

**Waterways**
Watercourse
Waterbody

**Land Cover**
Forested Area
Non-forested Area




***Notes***
**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: New Found Gold Corp.; Stantec.
**3.** Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

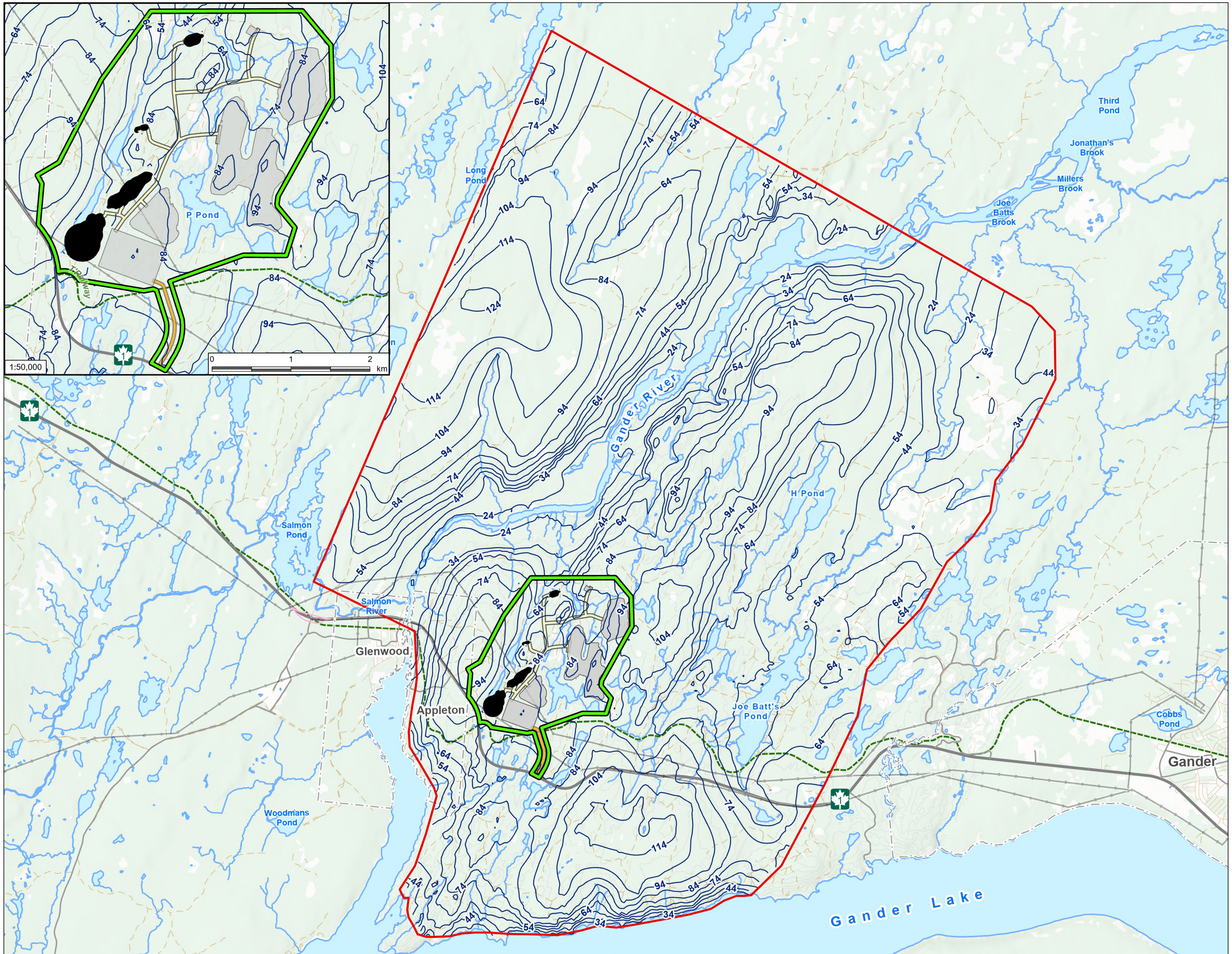



Figure No.
**A.11**

Title
## Predicted Water Table Elevation Contours - Operation Phase

Client/Project — 121417976_404
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-04-01
TR by SS on 2026-03-23

N

0 1 2 4 km
(At original document size of 11x17)
1:90,000

- Project Area
- Study Area

**Model Features**
- Groundwater Elevation Contour (m)
- Open Pit - No Flow

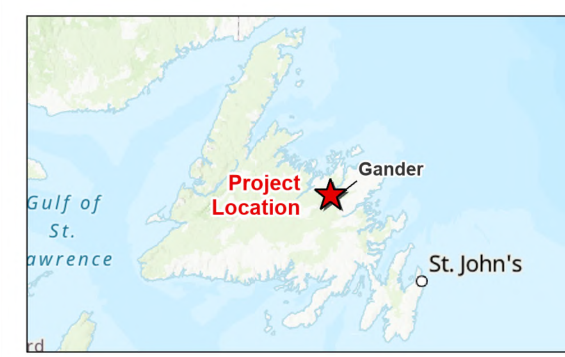
**Proposed Project Layout**
- Access Road
- Haul Road
- Proposed Site Features

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Local / Unknown
- Ramp
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary

**Waterways**
- Watercourse
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




***Notes***
**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: New Found Gold Corp.; Stantec.
**3.** Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

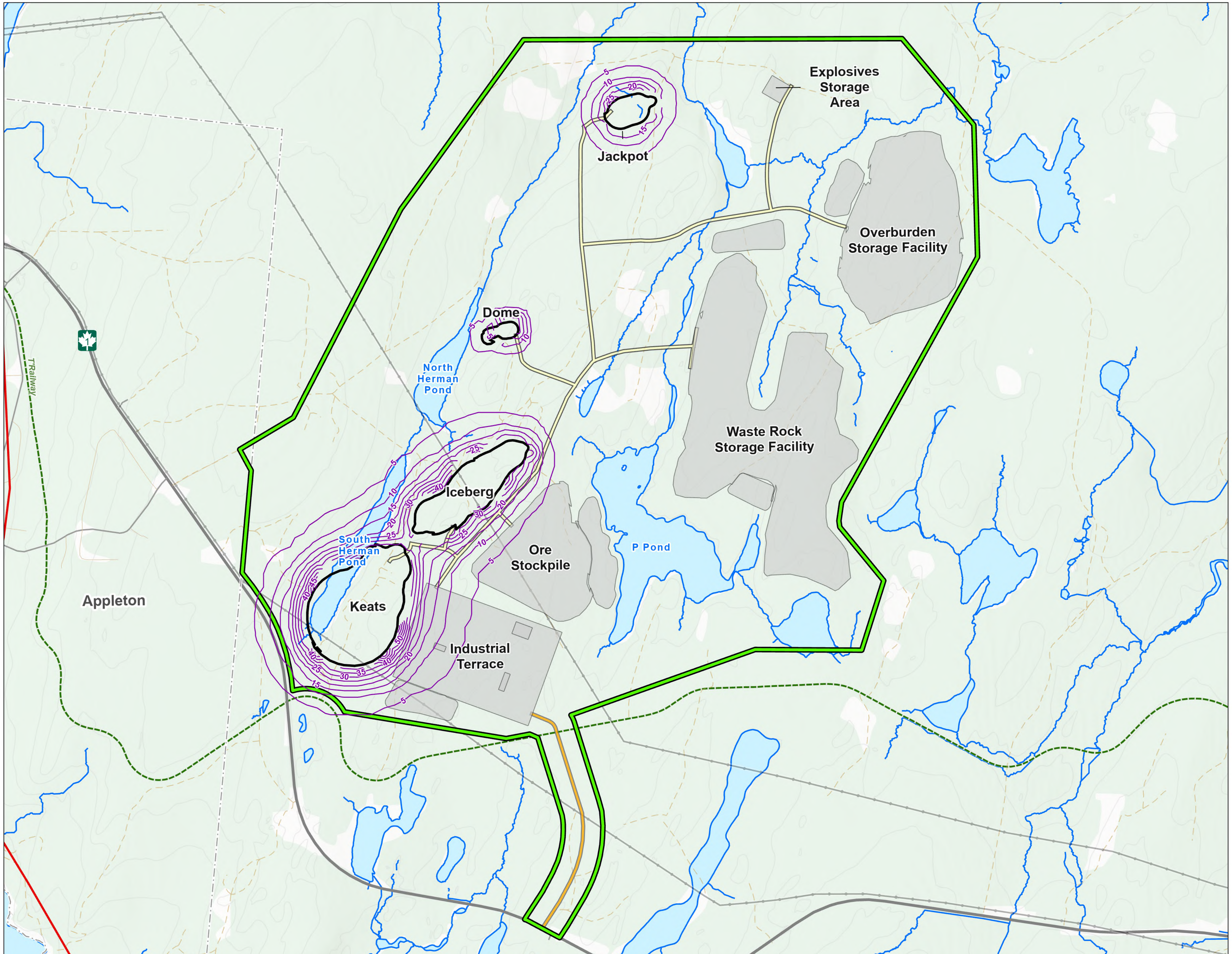
Figure No.
**A.12**

Title
## Predicted Water Table Drawdown - Operation Phase

Client/Project 121417976_405
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-04-01
TR by SS 0n 2026-03-23




N

0 200 400 600 800 m
(At original document size of 11x17)
1:20,000

**Proposed Project Layout**
- Project Area
- Study Area

**Model Features**
- Predicted Water Table Drawdown Contour (m)

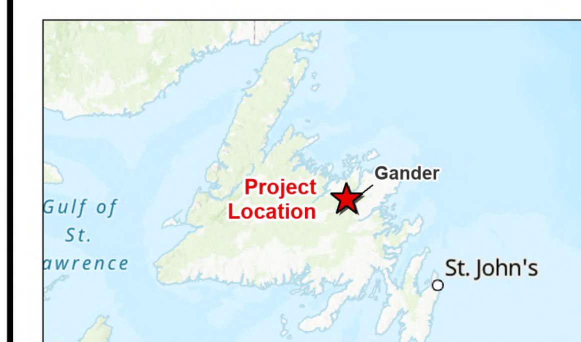
**Proposed Project Layout**
- Access Road
- Haul Road
- Proposed Site Features
- Open Pit

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary

**Waterways**
- Watercourse
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




**Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: New Found Gold Corp.; Stantec.
3. Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

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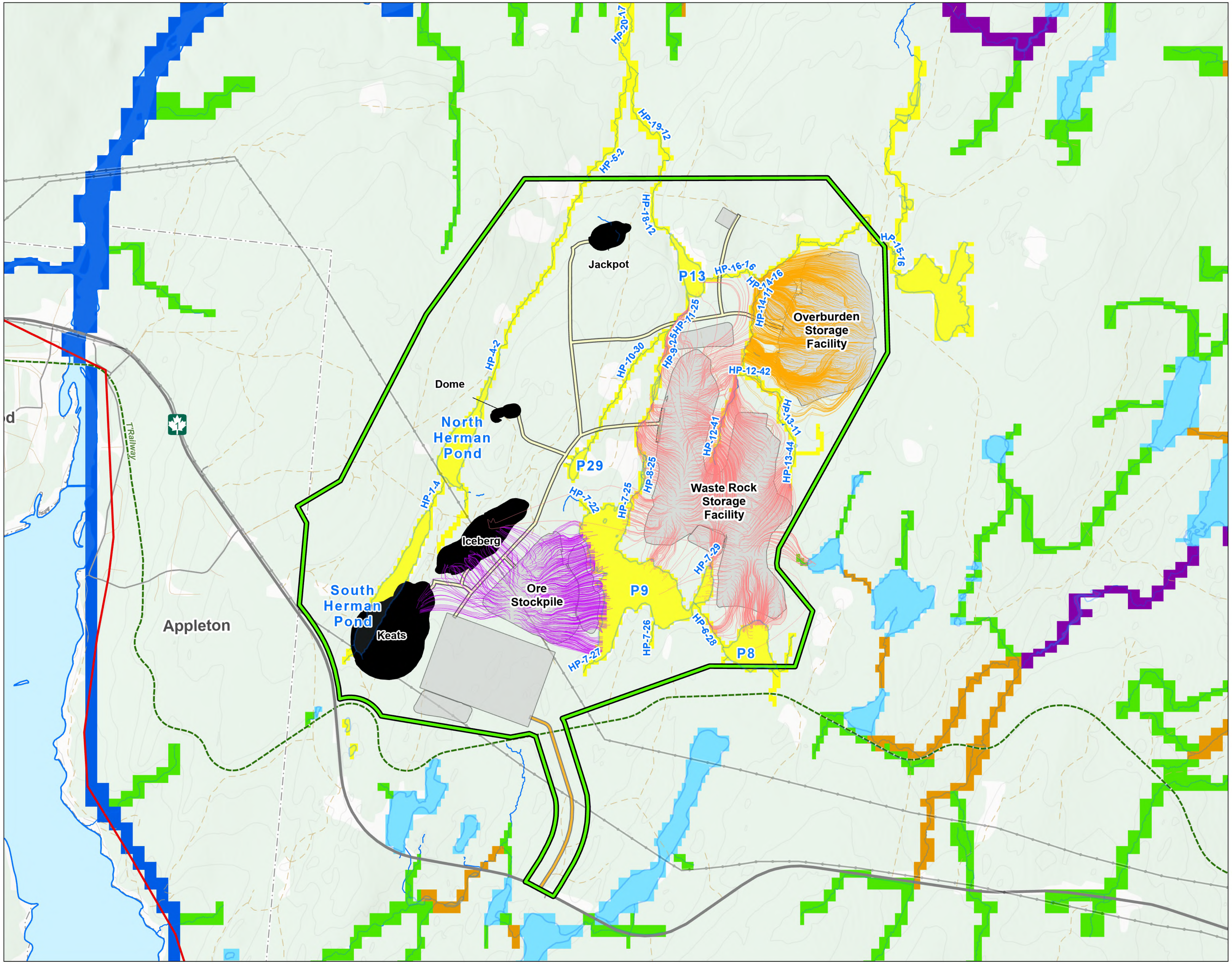



*Figure No.*
**A.13**

*Title*
**Predicted Particle Traces from WRSF, OSF, and OS to the Receiving Environment - Operation Phase**

*Client/Project* 121417976_406
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

*Project Location*
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-04-01
TR by SS on 2026-03-23

N

0 0.5 1 km
(At original document size of 11x17)
1:25,000

Project Area

**Model Features**

Particle Tracking (Operations)
- Ore Stockpile
- Overburden Storage Facility
- Waste Rock Storage Facility

River Order
- 1
- 2
- 3

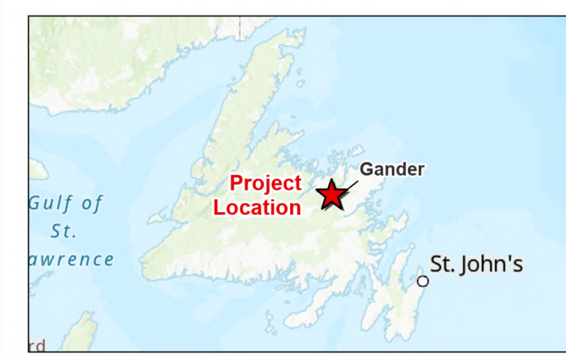
Model Boundaries
- CHD
- GHB (Ponds and Lakes)
- DRN
- Open Pit - No Flow

**Proposed Project Layout**
- Access Road
- Haul Road
- Proposed Site Features

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




***Notes***
**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: New Found Gold Corp.; Stantec.
**3.** Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

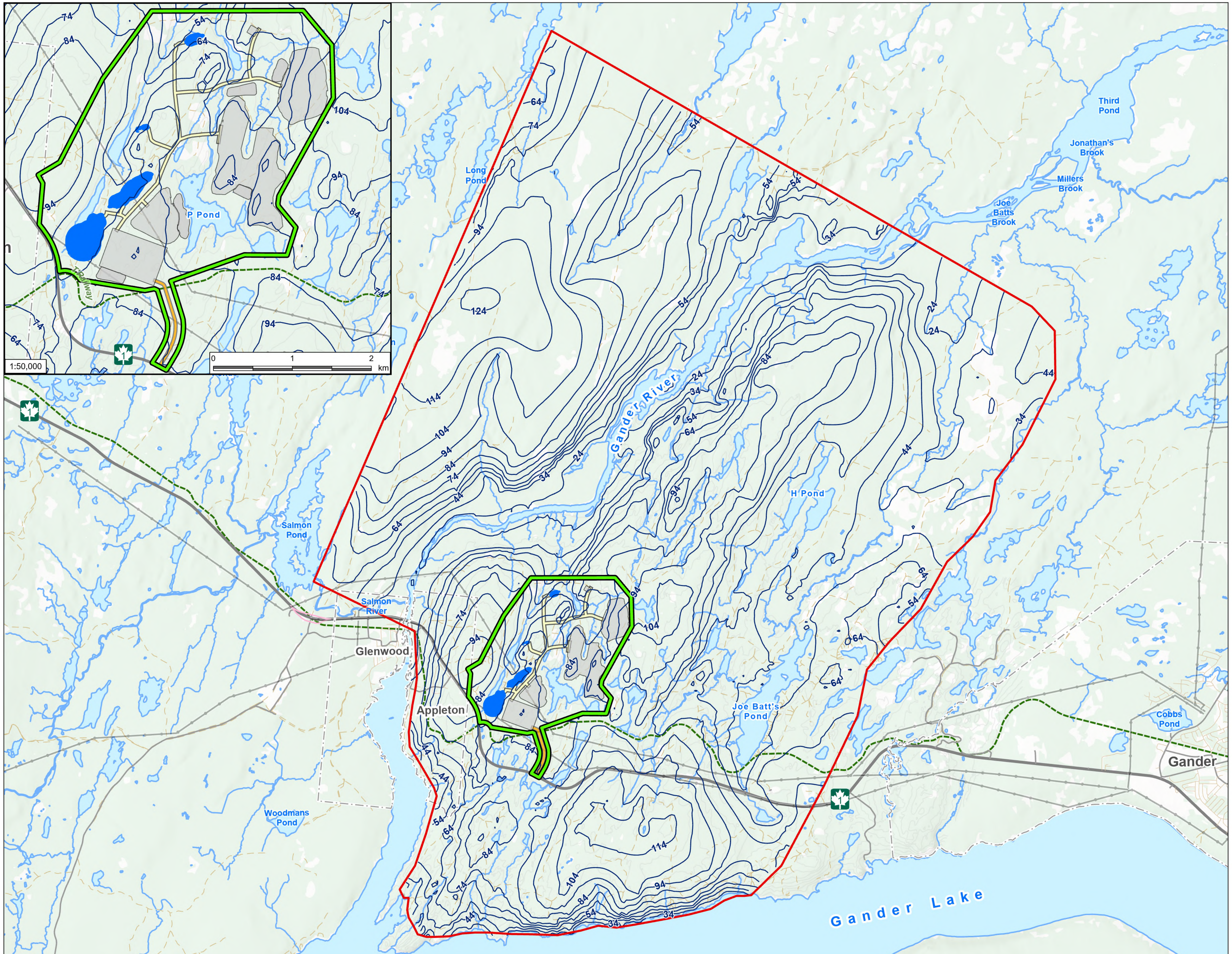
Figure No.
**A.14**

Title
## Predicted Water Table Elevation Contours - Closure Phase

Client/Project 121417976_407
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-04-01
TR by SS on 2026-03-23




N

0 1 2 4 km
(At original document size of 11x17)
1:90,000

- Project Area
- Study Area

**Model Features**
- Groundwater Elevation Contour (m)
- Open Pit - CHD

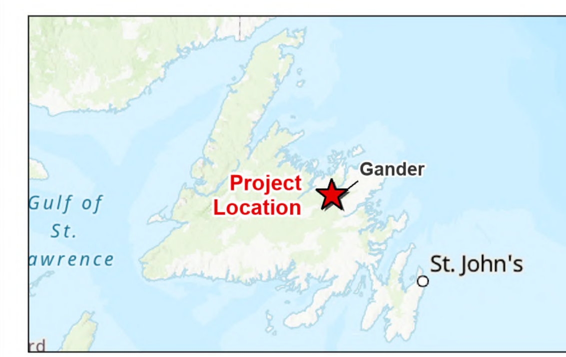
**Proposed Project Layout**
- Access Road
- Haul Road
- Proposed Site Features

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Local / Unknown
- Ramp
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary

**Waterways**
- Watercourse
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




***Notes***
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: New Found Gold Corp.; Stantec.
3. Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

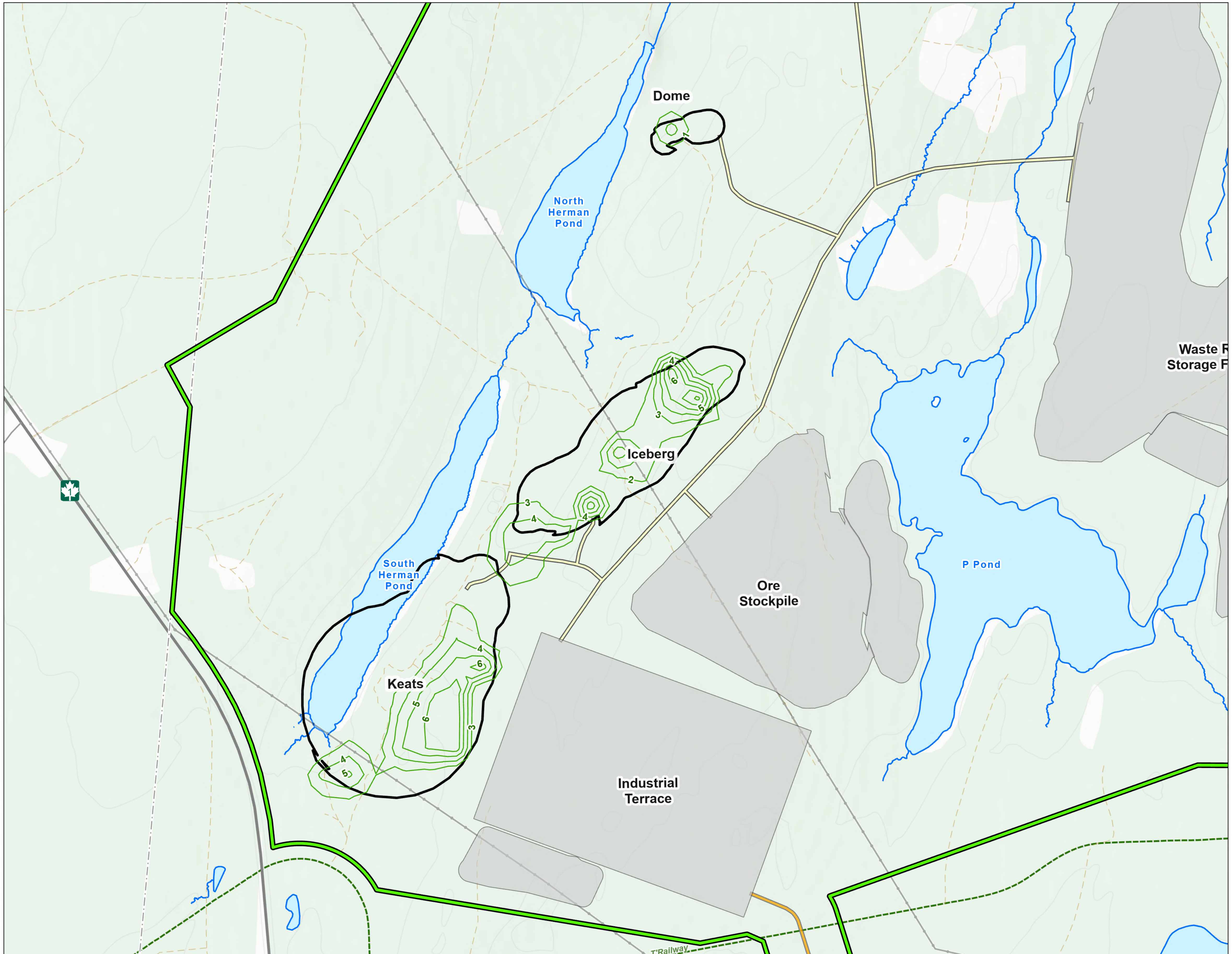



*Figure No.*
**A.15**

*Title*
## Predicted Water Table Drawdown - Closure Phase

*Client/Project* 121417976_408
New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

*Project Location*
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-04-01
TR by SS on 2026-03-23

N

0 200 400 m
(At original document size of 11x17)
1:10,000

- Project Area
- Study Area

**Model Features**
- Predicted Water Table Drawdown Contour (m)

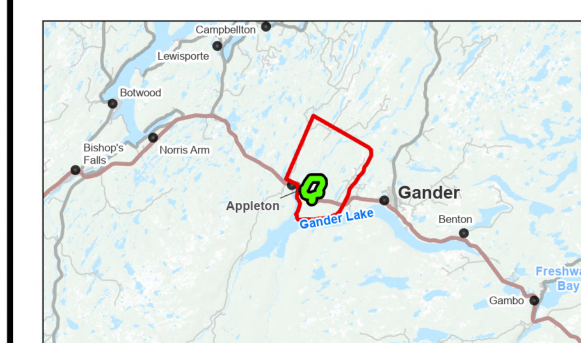
**Proposed Project Layout**
- Access Road
- Haul Road
- Proposed Site Features
- Open Pit

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary

**Waterways**
- Watercourse
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




***Notes***
**1.** Coordinate System: NAD 1983 CSRS UTM Zone 21N
**2.** Data Sources: New Found Gold Corp.; Stantec.
**3.** Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Esri, CGIAR, USGS

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Figure No.

**A.16**

Title

## Predicted Particle Traces from WRSF, OSF, and OS to the Receiving Environment - Closure Phase

Client/Project 121417976_409

New Found Gold Corp.
Queensway Gold Project
Groundwater Modelling

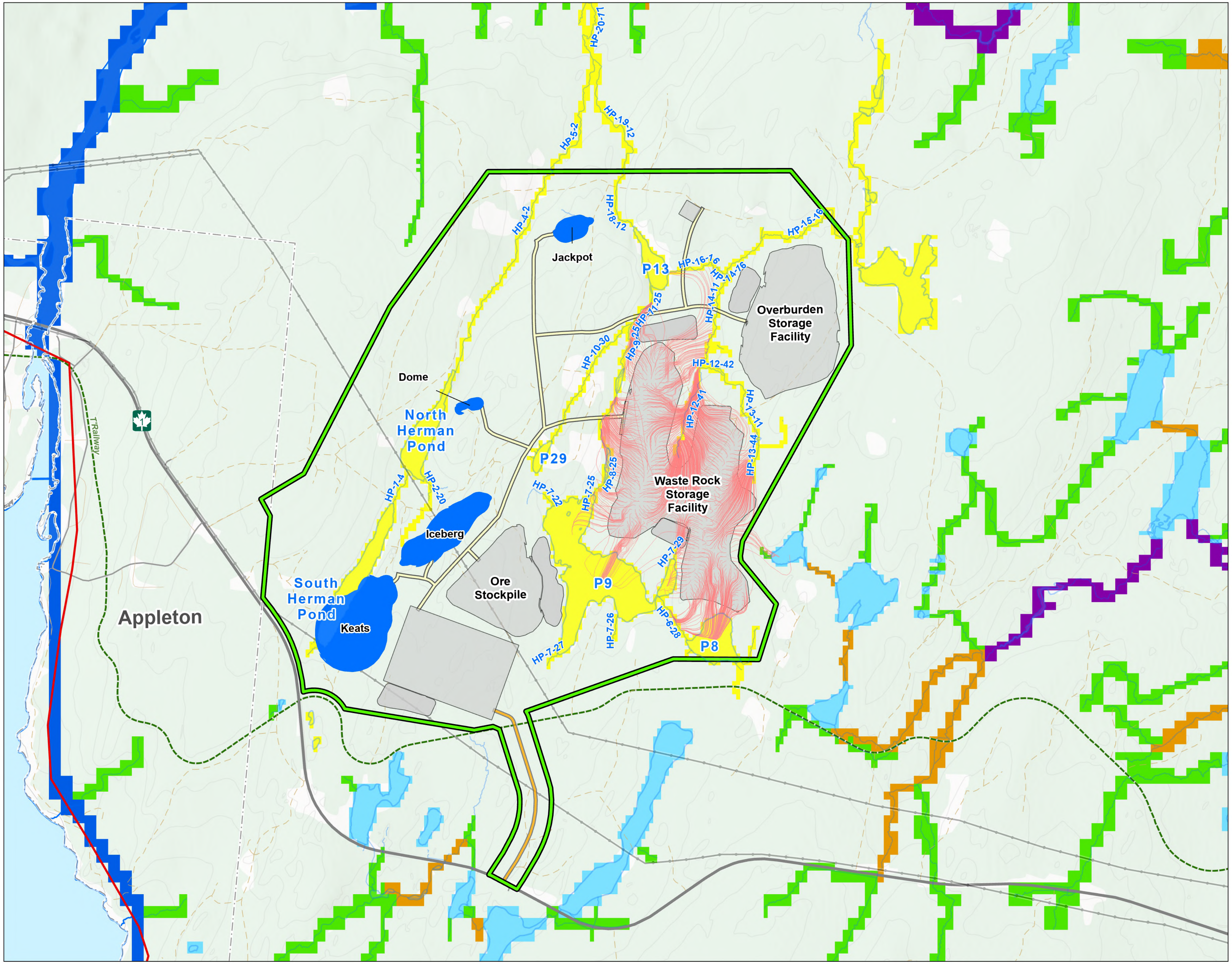
Project Location
North Gander Lake,
Newfoundland and Labrador

Prepared by AC on 2025-12-18
QR by NW on 2026-04-01
TR by SS on 2026-03-23

N

0 0.5 1 km

(At original document size of 11x17)
1:25,000




**Legend**

- Project Area
- Study Area

**Model Features**

Particle Tracking (Closure)
- Waste Rock Storage Facility

River Order
- 1
- 2
- 3

Model Boundaries
- CHD (Gander River and Pits)
- GHB (Ponds and Lakes)
- DRN

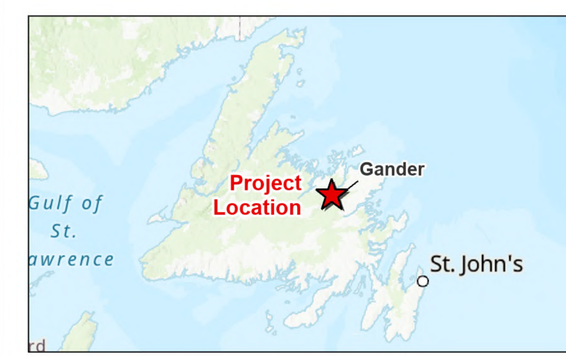
**Proposed Project Layout**
- Access Road
- Haul Road
- Proposed Site Features

**Existing Infrastructure**
- Transmission Line
- Highway
- Collector
- Local / Street
- Resource Road / Trail
- NL T'Railway Provincial Park

**Administrative Boundaries**
- Municipal Boundary

**Waterways**
- Watercourse
- Waterbody

**Land Cover**
- Forested Area
- Non-forested Area




***Notes***
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: New Found Gold Corp.; Stantec.
3. Background: Government of Newfoundland and Labrador, Department of Environment, Conservation, and Climate Change; Department of Forestry, Agriculture and Lands - Land Use Atlas Mapping Service; Department of Municipal and Community Affairs; Additional topographic basemapping from Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

Stantec

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# Appendix B Table

Table B.1 Water Level Calibration Residuals
Groundwater Modelling
New Found Gold (NFG) , NL
Stantec Project No. 121417976

| ID | Weighting Factor | Targets | Easting | Northing | Observed Head (masl) | Simulated Head (masl) | Weighted Residual (m) |
|---|---|---|---|---|---|---|---|
| 23MW-01 | 1 | Monitoring Well | 662450 | 5429866 | 113.85 | 109.05 | 4.80 |
| 23MW-02D | 1 | Monitoring Well | 659521 | 5430643 | 37.26 | 35.31 | 1.95 |
| 23MW-02S | 1 | Monitoring Well | 659523 | 5430640 | 36.47 | 34.78 | 1.69 |
| 23MW-03 | 1 | Monitoring Well | 658036 | 5429520 | 88.44 | 86.30 | 2.14 |
| 23MW-04 | 1 | Monitoring Well | 659963 | 5428346 | 85.51 | 81.39 | 4.12 |
| 23MW-05 | 1 | Monitoring Well | 661106 | 5427939 | 100.85 | 96.08 | 4.77 |
| 23MW-06 | 1 | Monitoring Well | 659018 | 5428480 | 93.71 | 88.92 | 4.79 |
| 23MW-07 | 1 | Monitoring Well | 657917 | 5428089 | 98.71 | 93.87 | 4.83 |
| 23MW-08 | 1 | Monitoring Well | 658291 | 5427908 | 78.37 | 77.08 | 1.29 |
| 23MW-09 | 1 | Monitoring Well | 660133 | 5426907 | 83.05 | 83.46 | -0.41 |
| 23MW-10 | 1 | Monitoring Well | 658673 | 5427138 | 101.45 | 96.60 | 4.85 |
| 23MW-11 | 1 | Monitoring Well | 657506 | 5426956 | 84.05 | 82.81 | 1.24 |
| 23MW-12D | 1 | Monitoring Well | 656108 | 5427270 | 32.54 | 29.00 | 3.54 |
| 23MW-12S | 1 | Monitoring Well | 656107 | 5427265 | 32.81 | 29.00 | 3.81 |
| NFGC-20-36 | 0.1 | Exploration Borehole | 658180 | 5427504 | 86.97 | 83.69 | 0.33 |
| NFGC-20-39 | 0.1 | Exploration Borehole | 658955 | 5429115 | 79.94 | 78.32 | 0.16 |
| NFGC-20-45 | 0.1 | Exploration Borehole | 658169 | 5427550 | 85.92 | 82.65 | 0.33 |
| NFGC-20-46 | 0.1 | Exploration Borehole | 658194 | 5427535 | 86.32 | 83.49 | 0.28 |
| NFGC-20-64 | 0.1 | Exploration Borehole | 658146 | 5427478 | 87.75 | 83.25 | 0.45 |
| NFGC-20-66 | 0.1 | Exploration Borehole | 658665 | 5428708 | 88.35 | 76.92 | 1.14 |
| NFGC-20-68 | 0.1 | Exploration Borehole | 658640 | 5428722 | 88.30 | 75.94 | 1.24 |
| NFGC-21-77 | 0.1 | Exploration Borehole | 658110 | 5427527 | 88.72 | 81.95 | 0.68 |
| NFGC-21-78 | 0.1 | Exploration Borehole | 657871 | 5427606 | 87.66 | 81.16 | 0.65 |
| NFGC-21-84 | 0.1 | Exploration Borehole | 658096 | 5427581 | 86.41 | 80.11 | 0.63 |
| NFGC-21-85 | 0.1 | Exploration Borehole | 658080 | 5427428 | 88.28 | 82.10 | 0.62 |
| NFGC-21-110 | 0.1 | Exploration Borehole | 658920 | 5428992 | 89.00 | 81.17 | 0.78 |
| NFGC-21-129 | 0.1 | Exploration Borehole | 658128 | 5427516 | 87.00 | 82.16 | 0.48 |
| NFGC-21-130 | 0.1 | Exploration Borehole | 657139 | 5425773 | 52.29 | 57.41 | -0.51 |
| NFGC-21-137 | 0.1 | Exploration Borehole | 658119 | 5427492 | 87.37 | 82.28 | 0.51 |
| NFGC-21-142 | 0.1 | Exploration Borehole | 657138 | 5425826 | 51.48 | 58.75 | -0.73 |
| NFGC-21-147 | 0.1 | Exploration Borehole | 656972 | 5425642 | 49.77 | 48.17 | 0.16 |
| NFGC-21-156 | 0.1 | Exploration Borehole | 657950 | 5427474 | 85.50 | 79.83 | 0.57 |
| NFGC-21-157 | 0.1 | Exploration Borehole | 657713 | 5427494 | 90.22 | 84.26 | 0.60 |
| NFGC-21-162 | 0.1 | Exploration Borehole | 657682 | 5427513 | 90.49 | 85.45 | 0.50 |
| NFGC-21-164 | 0.1 | Exploration Borehole | 658079 | 5427288 | 90.67 | 84.63 | 0.60 |
| NFGC-21-166 | 0.1 | Exploration Borehole | 657737 | 5427539 | 89.13 | 84.49 | 0.46 |
| NFGC-21-167 | 0.1 | Exploration Borehole | 665175 | 5431040 | 59.16 | 56.02 | 0.31 |
| NFGC-21-170 | 0.1 | Exploration Borehole | 658040 | 5427422 | 88.15 | 80.95 | 0.72 |
| NFGC-21-174 | 0.1 | Exploration Borehole | 658046 | 5427307 | 90.56 | 83.50 | 0.71 |
| NFGC-21-179 | 0.1 | Exploration Borehole | 665254 | 5431052 | 58.84 | 56.43 | 0.24 |
| NFGC-21-180 | 0.1 | Exploration Borehole | 665098 | 5430911 | 57.38 | 55.60 | 0.18 |
| NFGC-21-186 | 0.1 | Exploration Borehole | 665017 | 5430899 | 56.07 | 55.17 | 0.09 |

Table B.1 Water Level Calibration Residuals
Groundwater Modelling
New Found Gold (NFG) , NL
Stantec Project No. 121417976

| ID | Weighting Factor | Targets | Easting | Northing | Observed Head (masl) | Simulated Head (masl) | Weighted Residual (m) |
|---|---|---|---|---|---|---|---|
| NFGC-21-209 | 0.1 | Exploration Borehole | 658637 | 5428722 | 86.26 | 74.88 | 1.14 |
| NFGC-21-217 | 0.1 | Exploration Borehole | 657969 | 5427242 | 89.78 | 82.74 | 0.70 |
| NFGC-21-218 | 0.1 | Exploration Borehole | 663328 | 5428971 | 61.91 | 62.77 | -0.09 |
| NFGC-21-223 | 0.1 | Exploration Borehole | 658192 | 5427578 | 84.66 | 82.74 | 0.19 |
| NFGC-21-231 | 0.1 | Exploration Borehole | 658050 | 5427489 | 85.73 | 80.29 | 0.54 |
| NFGC-21-233 | 0.1 | Exploration Borehole | 658873 | 5429015 | 89.15 | 77.99 | 1.12 |
| NFGC-21-235A | 0.1 | Exploration Borehole | 663495 | 5428834 | 60.12 | 59.86 | 0.03 |
| NFGC-21-248 | 0.1 | Exploration Borehole | 657967 | 5427252 | 81.41 | 81.09 | 0.03 |
| NFGC-21-248A | 0.1 | Exploration Borehole | 658096 | 5427187 | 81.36 | 85.41 | -0.41 |
| NFGC-21-249 | 0.1 | Exploration Borehole | 658394 | 5428414 | 75.46 | 73.78 | 0.17 |
| NFGC-21-284A | 0.1 | Exploration Borehole | 657953 | 5427296 | 88.57 | 82.03 | 0.65 |
| NFGC-21-255 | 0.1 | Exploration Borehole | 658383 | 5428448 | 73.12 | 74.00 | -0.09 |
| NFGC-21-257 | 0.1 | Exploration Borehole | 658104 | 5427229 | 81.67 | 85.24 | -0.36 |
| NFGC-21-261 | 0.1 | Exploration Borehole | 663493 | 5428777 | 60.00 | 59.63 | 0.04 |
| NFGC-21-263 | 0.1 | Exploration Borehole | 658099 | 5427231 | 82.05 | 85.14 | -0.31 |
| NFGC-21-265A | 0.1 | Exploration Borehole | 658081 | 5427194 | 81.41 | 81.09 | 0.03 |
| NFGC-21-268 | 0.1 | Exploration Borehole | 658465 | 5428343 | 74.25 | 72.97 | 0.13 |
| NFGC-21-270 | 0.1 | Exploration Borehole | 657934 | 5427227 | 80.24 | 82.38 | -0.21 |
| NFGC-21-280 | 0.1 | Exploration Borehole | 657589 | 5427530 | 85.94 | 88.67 | -0.27 |
| NFGC-21-290A | 0.1 | Exploration Borehole | 659002 | 5429205 | 82.51 | 76.08 | 0.64 |
| NFGC-21-298 | 0.1 | Exploration Borehole | 658006 | 5427411 | 87.38 | 80.22 | 0.72 |
| NFGC-21-307 | 0.1 | Exploration Borehole | 658542 | 5428385 | 83.57 | 76.35 | 0.72 |
| NFGC-21-307A | 0.1 | Exploration Borehole | 658580 | 5428365 | 83.87 | 78.95 | 0.49 |
| NFGC-21-307B | 0.1 | Exploration Borehole | 658383 | 5428470 | 83.59 | 76.49 | 0.71 |
| NFGC-24-2235 | 0.1 | Artesian Well | 662538 | 5436656 | 56.50 | 49.01 | 0.75 |
| NFGC-24-2235 | 0.5 | Artesian Well | 662538 | 5436656 | 56.50 | 49.01 | 3.75 |
| NFGC-24-2204A | 0.5 | Artesian Well | 661977 | 5435268 | 21.50 | 27.91 | -3.20 |
| K-23-285 | 0.5 | Artesian Well | 661897 | 5436041 | 52.50 | 53.44 | -0.47 |
| K-23-286 | 0.5 | Artesian Well | 660571 | 5434582 | 69.50 | 66.69 | 1.41 |
| NFGC-23-1575 | 0.5 | Artesian Well | 658341 | 5430880 | 29.27 | 37.89 | -4.31 |
| NFGC-23-1270 | 0.5 | Artesian Well | 659171 | 5430264 | 46.51 | 47.47 | -0.48 |
| NFGC-22-661 | 0.5 | Artesian Well | 659079 | 5429391 | 74.16 | 69.67 | 2.25 |
| NFGC-24-2023 | 0.5 | Artesian Well | 659028 | 5428384 | 86.48 | 84.50 | 0.99 |
| NFGC-21-430A | 0.5 | Artesian Well | 658281 | 5428294 | 73.01 | 73.21 | -0.10 |
| NFGC-23-1131 | 0.5 | Artesian Well | 657829 | 5428097 | 100.78 | 97.18 | 1.80 |
| NFGC-21-455 | 0.5 | Artesian Well | 657747 | 5427447 | 81.30 | 83.05 | -0.88 |
| NFGC-23-1856 | 0.5 | Artesian Well | 658075 | 5426895 | 85.47 | 86.89 | -0.71 |
| NFGC-23-1127 | 0.5 | Artesian Well | 657312 | 5426932 | 85.60 | 83.15 | 1.22 |
| NFGC-22-824 | 0.5 | Artesian Well | 657295 | 5426205 | 66.63 | 70.38 | -1.88 |
| NFGC-22-1026 | 0.5 | Artesian Well | 656838 | 5425243 | 42.48 | 43.25 | -0.39 |
| Dummy_1 | 0.5 | Dummy | 659974 | 5441045 | 82.06 | 89.75 | -3.84 |
| Dummy_2 | 0.5 | Dummy | 662660 | 5439540 | 64.16 | 63.64 | 0.26 |

Table B.1 Water Level Calibration Residuals
Groundwater Modelling
New Found Gold (NFG) , NL
Stantec Project No. 121417976

| ID | Weighting Factor | Targets | Easting | Northing | Observed Head (masl) | Simulated Head (masl) | Weighted Residual (m) |
|---|---|---|---|---|---|---|---|
| Dummy_3 | 0.5 | Dummy | 660660 | 5437292 | 69.13 | 78.49 | -4.68 |
| Dummy_4 | 0.5 | Dummy | 661479 | 5435768 | 56.20 | 61.95 | -2.87 |
| Dummy_5 | 0.5 | Dummy | 658698 | 5436683 | 107.92 | 120.07 | -6.07 |
| Dummy_6 | 0.5 | Dummy | 656850 | 5433292 | 90.02 | 99.97 | -4.98 |
| Dummy_7 | 0.5 | Dummy | 655803 | 5430911 | 47.25 | 47.34 | -0.04 |
| Dummy_8 | 0.5 | Dummy | 666298 | 5435445 | 99.53 | 95.63 | 1.95 |
| Dummy_9 | 0.5 | Dummy | 667517 | 5434245 | 38.30 | 52.09 | -6.90 |
| Dummy_10 | 0.5 | Dummy | 666470 | 5433711 | 57.49 | 70.18 | -6.34 |
| Dummy_11 | 0.5 | Dummy | 669879 | 5435845 | 32.33 | 40.60 | -4.13 |
| Dummy_12 | 0.5 | Dummy | 663898 | 5431178 | 61.22 | 66.91 | -2.85 |
| Dummy_13 | 0.5 | Dummy | 666248 | 5431803 | 48.93 | 54.31 | -2.69 |
| Dummy_14 | 0.5 | Dummy | 663200 | 5430025 | 68.52 | 72.41 | -1.95 |
| Dummy_15 | 0.5 | Dummy | 664337 | 5424493 | 59.11 | 66.90 | -3.89 |
| Dummy_16 | 0.5 | Dummy | 663051 | 5425345 | 71.85 | 78.38 | -3.27 |
| Dummy_17 | 0.5 | Dummy | 662399 | 5423958 | 102.26 | 105.17 | -1.46 |
| Dummy_18 | 0.5 | Dummy | 660211 | 5423457 | 90.74 | 99.03 | -4.14 |
| Dummy_19 | 0.5 | Dummy | 660662 | 5424777 | 107.47 | 114.36 | -3.44 |
| Dummy_20 | 0.5 | Dummy | 658674 | 5423725 | 78.03 | 82.79 | -2.38 |
| Dummy_21 | 0.5 | Dummy | 663301 | 5424476 | 80.40 | 85.28 | -2.44 |
| Dummy_22 | 0.5 | Dummy | 656353 | 5431993 | 63.16 | 71.96 | -4.40 |
| Dummy_23 | 0.5 | Dummy | 660295 | 5436520 | 86.04 | 93.98 | -3.97 |
| Dummy_24 | 0.5 | Dummy | 659944 | 5432310 | 19.40 | 22.22 | -1.41 |
| Dummy_25 | 0.5 | Dummy | 667500 | 5436066 | 48.24 | 43.55 | 2.35 |
| Dummy_26 | 0.5 | Dummy | 667633 | 5437335 | 20.39 | 26.97 | -3.29 |
| Dummy_27 | 0.5 | Dummy | 657096 | 5425951 | 50.52 | 60.36 | -4.92 |
| Dummy_28 | 0.5 | Dummy | 656377 | 5428889 | 32.33 | 40.60 | -4.13 |
| Dummy_29 | 0.5 | Dummy | 665211 | 5434342 | 94.99 | 95.23 | -0.12 |
| Dummy_30 | 0.5 | Dummy | 660112 | 5428315 | 77.76 | 79.44 | -0.84 |
| Dummy_31 | 0.5 | Dummy | 660446 | 5429508 | 63.82 | 66.50 | -1.34 |
| Dummy_32 | 0.5 | Dummy | 661126 | 5431022 | 77.09 | 80.49 | -1.70 |
| Dummy_33 | 0.5 | Dummy | 666694 | 5430453 | 51.00 | 55.32 | -2.16 |
| Dummy_34 | 0.5 | Dummy | 663929 | 5428985 | 53.11 | 55.40 | -1.15 |