Appendix 5.3.5A
Numerical Groundwater Monitoring Report

NEW GOLD INC.
BLACKWATER GOLD PROJECT

NUMERICAL GROUNDWATER MODELLING REPORT

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VA101-457/6-13
Rev 0
January 17, 2014

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NEW GOLD INC.
BLACKWATER GOLD PROJECT

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Rev	Description	Date	Approved
0	Issued in Final	January 16, 2014	KLB

EXECUTIVE SUMMARY

Knight Piésold Ltd. (KP) was retained by New Gold Inc. (New Gold) to provide a representation of baseline groundwater conditions and to evaluate potential effects of the Blackwater Gold Project (the Project) on hydrogeological conditions. To achieve this objective, a three-dimensional steady-state, regional-scale numerical groundwater model was developed using MODFLOW-SURFACT to simulate baseline hydrogeological conditions at the Project site. The baseline model was then modified to include proposed mine facilities in order to assess hydrogeological conditions during mine operations, mine closure, and the post-closure period.

The steady-state baseline model was calibrated to average annual hydrogeologic conditions. The modelled area encompasses the project site and surrounding drainages, including Davidson Creek, Turtle Creek, Creek 661, Creek 705 and a portion of Chedakuz Creek. The calibrated baseline model was then modified to create three numerical Mine Effects Models representing key phases of Project development:

- A transient Operations Model
- A transient Closure/Post-Closure model, and
- A steady state Post-Closure Model.

Baseline Model and Calibration

The baseline model was calibrated to average annual groundwater elevations at 18 on-site groundwater monitoring wells, 22 vibrating wire piezometers and to estimates of average annual baseflow at 14 locations within the study area. Baseflow estimates were obtained from the results of a baseline watershed model developed for the Project (KP 2013f). The baseline model was successfully calibrated by iteratively adjusting hydraulic conductivity and groundwater recharge values until a suitable match between observed and simulated conditions was achieved. Recharge applied to the calibrated baseline model was varied according to the distribution of surficial materials and elevation. The calibrated model achieved groundwater levels with a normalized root mean square error of 2%.

The simulated baseline water table generally mimics the surface topography with groundwater elevations ranging from 1,760 meters above sea level (masl) in the high elevation region west of the mine site to 920 masl at the downstream extent of the modelled Chedakuz Creek. Within the active model domain, groundwater recharge occurs along topographic highs and flows to groundwater discharge zones located within the valleys.

Mine Effects Models and Predicted Effects on Hydrogeological Conditions

Proposed major mine facilities were represented in the mine effects models, including the open pit, Tailings Storage Facility (TSF), east and west waste rock dumps, a Low-Grade Ore (LGO) stockpile, a freshwater reservoir and seepage collection measures consisting of an Environmental Control Dam (ECD), groundwater interception trenches and engineered drainage ditches. The TSF facility was represented using boundary conditions specified on the top layer of the model and included discrete representation of the supernatant ponds, tailings beach and TSF embankments.

From model results, reductions in groundwater flow contributing to the Blackwater River catchment were predicted to be negligible at the end of active dewatering. Average annual baseflow contribution to these Blackwater River tributary streams was estimated to be 20 m^3/d (0.4%) lower than baseline conditions at the end of active dewatering (Year 13) and to be the same as baseline conditions in Post-Closure.

Open Pit and Pit Lake Simulation Results

A transient Operations Model was constructed to assess hydrogeologic conditions associated with active mine dewatering and to simulate groundwater inflow rates to the open pit. Results of the Operations Model indicate that simulated groundwater inflow rates to the proposed open pit during operational dewatering are expected to increase from the start of operations through Year 13 as the open pit increases in size and depth. Annual average inflows to the open pit were estimated to be 50 L/s with a maximum annual inflow rate of approximately 60 L/s.

During closure and after pit filling, groundwater elevations directly surrounding the Pit Lake are expected to recover to the elevation of the Pit Lake water surface. Modelled groundwater inflow to the Pit Lake during Post-Closure when the Pit Lake is at its maximum elevation is predicted to be 4.5 L/s. Seepage from the Pit Lake is predicted to be 1.3 L/s. Model results indicate that seepage from the Pit Lake is expected to contribute to the Davidson Creek and Creek 661 watersheds and not to the Blackwater River catchment.

Pit Filling Simulation Results

A transient Closure/Post-Closure Model was developed to estimate the length of time for the Pit Lake to fill to the open pit spillway elevation, taking into account both the open pit volume and the loss of incoming water to the groundwater system. The Pit Lake was estimated to fill 21 years after the end of operational dewatering. This prediction assumes that water is pumped to the Pit Lake from TSF Site D a rate of 362 L/s to assist groundwater inflows in rapid pit filling.

Seepage Pathway Assessment

A seepage analysis was conducted to assess pathways of potential seepage originating from the proposed mine facilities including, the TSF, Pit Lake, east and west waste rock dumps and the plant site. MODPATH particle tracking was implemented to delineate flow directions and estimate seepage travel times to discharge locations from key mine infrastructure. Results are presented showing the estimated groundwater seepage pathways from each facility, the discharge location of seepage pathways, and seepage travel times. Seepage flux rates from facilities to downstream discharge locations were estimated by generating a water budget for each facility using the Hydrostratigraphic Unit (HSU) package in Groundwater Vistas combined with the results of the MODPATH particle tracking.

From model results, all seepage originating from the west waste rock dump and the plant site was predicted to be collected or discharge to drainages that flow to the TSF. Seepage was predicted to bypass seepage collection measures and discharge to downstream locations from these facilities:

- Approximately 0.4 L/s of seepage originating from TSF Site D was predicted to bypass seepage collection measures and discharge to Davidson Creek. Approximately 0.2 L/s seepage was predicted to discharge to Creek 661 and 0.1 L/s was predicted to discharge to the TSF spillway channel.
- Seepage of 0.5 L/s originating from the Pit Lake was predicted to travel along local groundwater flow paths through the upper bedrock and discharge to Creek 661 with travel times of tens of

years. A small portion of seepage (0.01 L/s) was predicted to discharge to Davidson Creek following travel paths though deep bedrock with travel times exceeding 400 years.

- A seepage amount of 1.7 L/s from the east waste rock dump was predicted to flow within the overburden and shallow bedrock under the engineered drainage ditches and discharge to Creek 661.

The results of baseline and mine operations numerical groundwater models were used to inform environmental effects assessment as part of the EIA submission.

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ABBREVIATIONS

Project .... Blackwater Gold Project
DEM .... digital elevation model
ECD .... Environmental Control Dam
GM .... Global Mapper
GWV .... Groundwater Vistas
HSU .... hydrostratigraphic unit
KP .... Knight Piésold
LGO .... Low Grade Ore
LPG .... low-permeability subgrade
MAE .... mean absolute error
masl .... meters above sea level
mbgs .... meters below ground surface
NAG .... non-potentially acid generating
NRMSE .... normalized root mean square error
NTS .... national topographic system
PAG .... potentially acid generating
RMSE .... root mean square error
TSF .... Tailings Storage Facility

1 – INTRODUCTION

1.1 PROJECT DESCRIPTION

The Blackwater Gold Project (Blackwater) is a large gold-silver deposit located approximately 112 km southwest of Vanderhoof in central British Columbia, as shown on Figure 1.1. The proposed project involves a conventional truck-shovel open pit mine and 60,000 tonnes per day (TPD) gold processing plant. Proposed mine facilities will be located primarily in the Davidson Creek watershed and the headwaters of the Creek 661 watershed.

Knight Piésold Ltd. (KP) was contracted by New Gold to assist with studies in support of an Environmental Impact Assessment (EIA) and a Feasibility Study. Part of this assessment includes a numerical groundwater modelling study to support baseline hydrogeologic characterization of the project area and to evaluate potential effects of proposed mine facilities on baseline hydrogeological conditions.

1.2 NUMERICAL MODELLING OBJECTIVES

The objectives of the numerical groundwater modelling were to:

1. Develop a conceptual understanding of the pre-project groundwater system based on the available hydrogeological and hydrologic data.
2. Develop and calibrate a baseline numerical groundwater model to simulate pre-development hydrogeological conditions including groundwater flow directions, distribution of hydraulic head, and discharge of groundwater to creeks within the study area.
3. Predict potential effects of the proposed mine development and operations on pre-development hydrogeological conditions in the project area.
4. Characterize potential groundwater flow pathways for seepage originating from major mine facilities, including estimates of groundwater travel times and seepage rates to downstream discharge locations.

To achieve these objectives, a steady-state baseline numerical model was developed and calibrated to simulate baseline hydrogeological conditions at the project site. Using the calibrated model as a basis, three numerical models were then developed to assess potential effects of proposed mine development on pre-development hydrogeological conditions. The three 'Mine Effects Models' represent mine development and infrastructure during the following key phases of the Project:

- Operations Model: A transient model representing the time period that the open pit will be actively dewatered (Year -2 through Year 13)
- Closure/Post-Closure Model: A transient model representing end of mine conditions through Closure (Year 20) and into Post-Closure, and
- Post-Closure Model: A steady state model representing Post-Closure conditions during which the open pit and TSF are discharging water via their respective spillways.

Results of the numerical models will be used to inform the EIA.

1.3 BASELINE DATA SOURCES

Baseline characterization of the Blackwater Project relies on hydrometeorological, geological, geomorphological, and hydrogeological data previously presented within the following reports:

- **Reconnaissance Terrain and Terrain Stability Mapping** – Reconnaissance Terrain and Terrain Stability Mapping (KP 2013a)
- **2012 Site Investigations** – 2012 Site Investigation Report (KP 2013b)
- **Open Pit Investigation** – Feasibility Open Pit Slope Design Report (KP 2013c)
- **Hydrology and Meteorology Data** – 2013 Hydrometeorology Report (KP 2013d)
- **2013 Site Investigations** – 2013 Site Investigation Report (KP 2013e)
- **Watershed Modelling** – Watershed Modelling Report (KP 2013f)
- **Geotechnical Characterization** – Geotechnical Characterization Report (KP 2013g), and
- **Open Pit Hydrogeology** – Open Pit Water Management Report (KP 2013h).

Average annual streamflows estimated using the watershed model developed for the Project (KP 2013f) were used as calibration targets in the baseline numerical model. Conceptual hydrogeologic models developed as part of the watershed modelling study (KP 2013f) and open pit inflow assessment (KP 2013h) were incorporated into the conceptual hydrogeologic model developed for the numerical groundwater model in this study.

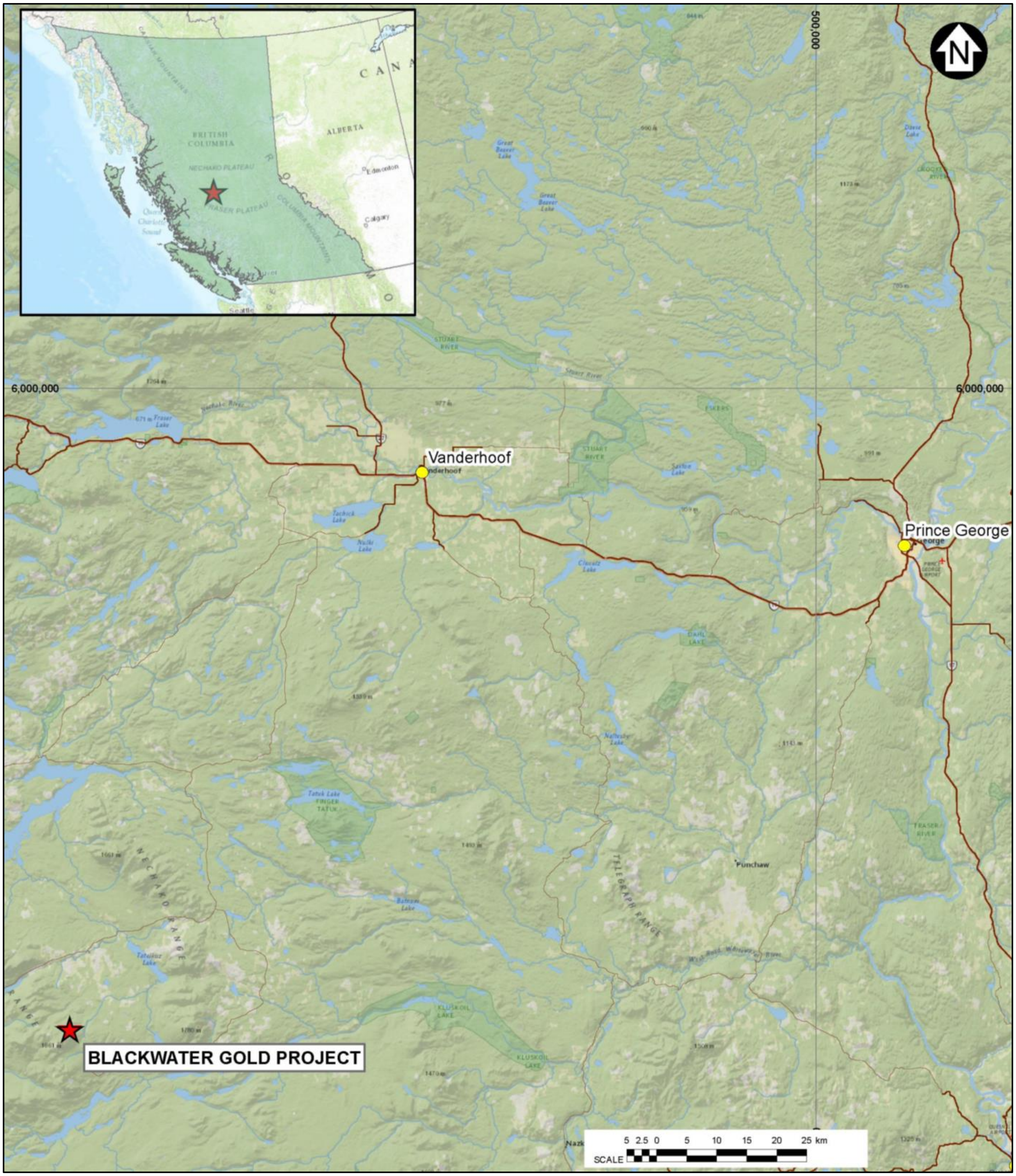


Figure 1.1 Project Location Map

2 – CONCEPTUAL HYDROGEOLOGIC MODEL

2.1 PHYSIOGRAPHY AND DRAINAGE

The Blackwater Project is situated on the Nechako Plateau and is characterized by gently undulating, northwest trending hills cut by small to medium sized drainages. Elevation across the Blackwater property ranges from just over 1,000 metres above sea level (masl) in low-lying areas northeast of the proposed mine site to 1,800 masl at the summit of Mt. Davidson on the southwest side of the property. The Blackwater deposit is located on the northern flanks of Mt. Davidson.

The Blackwater Project is situated primarily within the Davison Creek watershed and the headwaters of the Creek 661 watershed. Davidson Creek and Creek 661 flow northeast to Tatelkuz Lake which is drained by northwesterly flowing Chedakuz Creek. Mt. Davidson creates a drainage divide between northeast flowing Davidson Creek and Creek 661, southwest flowing Creek 705, and south flowing tributaries to Blackwater River (See Figure A.1 in Appendix A). Seeps and wetlands are common along the lower slopes of Mt. Davidson. Major drainage features are shown on Appendix Figure A.1.

The majority of the proposed TSF, waste dumps, and mine site infrastructure lies within the Davidson Creek watershed. The footprint of the proposed Tailings Storage Facility (TSF) lies within the upper reaches of the Davidson Creek catchment area. The terrain within this footprint is predominantly gently inclined, except along the incised portions of Davidson Creek.

Streamflow data within the project area are available from hydrometric stations established for the Project on Davidson Creek, Creek 661, Creek 705 and Turtle Creek (KP 2013d). Streamflows are typically highest in the spring associated with snowmelt with a second smaller peak frequently associated with fall rain events. Low flows occur in the winter months preceding freshet and are fed by groundwater. Groundwater contribution to streamflow (baseflow) within several sub-catchment along each major drainage course have been estimated using a watershed model constructed for the Project (KP 2013f).

2.2 CLIMATE

Climate at the Blackwater property is sub-continental and characterized by warm summers and cold winters. The climate is influenced by cold arctic air and moisture-laden weather systems moving west along the Kitimat Ranges. Meterological parameters estimated for the Project have been estimated using data collected at two climate stations in the immediate project area and correlated with data from regional climate stations, and estimates based on watershed modelling conducted for the Project (KP 2013f). Mean monthly temperatures range from -7.7°C in January to 12.5°C in July at the project elevation of 1,470 masl (KP 2013d). Watershed modelling results indicate the average annual precipitation calculated from 1998 through 2012 is 640 mm at the project site elevation (KP 2013f). An equal proportion of precipitation is estimated to fall as rain and as snow. Watershed model results also estimate the mean annual potential evapotranspiration (PET) at 470 mm and actual evapotranspiration (AET) at 280 mm.

Average groundwater recharge across the modelled areas was estimated as 11% of total precipitation (an equivalent area weighted average depth of 70 mm) based on the results of the watershed model (KP 2013f).

2.3 GEOLOGIC MODEL

The geological model for Blackwater is summarized below. Detailed descriptions of the study area geomorphology, surficial geology, and bedrock geology are provided in the Blackwater Geotechnical Characterization Report (KP 2013g), and the Open Pit Water Management report (KP 2013h).

2.3.1 Geomorphology

Surficial deposits and landforms in the project area are primarily associated with the Fraser Glaciation, the last period of continental ice sheet glaciation in British Columbia. Surficial landforms such as drumlins, eskers and other streamlined glacial landforms evidence that the localized ice flow direction in the project area at the peak of glaciation was toward the northeast (KP 2013a). Glacial ice appears to have stagnated in Davidson Creek valley during late deglaciation producing ice-stagnation landforms such as kettles and kames. Esker complexes are present on the north sides of Davidson Creek and the headwaters of Creek 661. Meltwater channels provide evidence for water flow beneath and from the margin of the receding ice sheet and major meltwater channels have a northeast trend. The valleys of both Davidson Creek and Creek 505659 (a headwater tributary to Creek 661) contain a succession of meltwater channels, expressed by a series of up to six terraces. The terraces provide evidence of sequential downcutting by meltwater streams. An estimated 80% of the surficial materials in the Davidson Creek valley is classified as lodgement glacial till (Plouffe et. al. 2004), with the other 20% made up of ablation till, glaciofluvial, glaciolacustrine, fluvial, and organic material. Ablation till is uncommon and predominantly found at higher elevations on the valley sides.

Bedrock exposure in the project area is rare and restricted to higher elevations. Soil cover is generally thick within the Davidson Creek watershed and has an average thickness greater than 60 m (KP 2013g). Bedrock is deepest along the Davidson Creek valley bottom and east of the deposit, where it was encountered at depths of over 100 m.

2.3.2 Surficial Geology

The surficial geology model for the project area was developed based on the findings from the 2012 and 2013 Geotechnical Site Investigations (KP 2013be) and a review of these findings by Dr. John Clague, P. Geo. of the Department of Earth Sciences at Simon Fraser University (Clague 2013). The stratigraphy of the surficial materials and bedrock from surface downward consists of the following:

- Holocene Deposits
- Fraser Glaciation Deposits
    - Glaciofluvial Deposits
    - Glacial Till
    - Glaciolacustrine Deposits
- Interglacial Fluvial Deposits
- Older Glacial Deposits (primarily glacial till from an earlier period of glaciation)
- Reworked Regolith
- In-situ Regolith, and
- Intact Bedrock.

The surficial materials are depicted in a conceptual cross-section of the Davidson Creek valley in Figure 2.1. The distribution of the surficial materials at the project site is shown on

Appendix Figure A.2. A summary of each unit comprising the surficial geology model in the Geotechnical Characterization Report (KP 2013g) and Clague (2013) is summarized below.

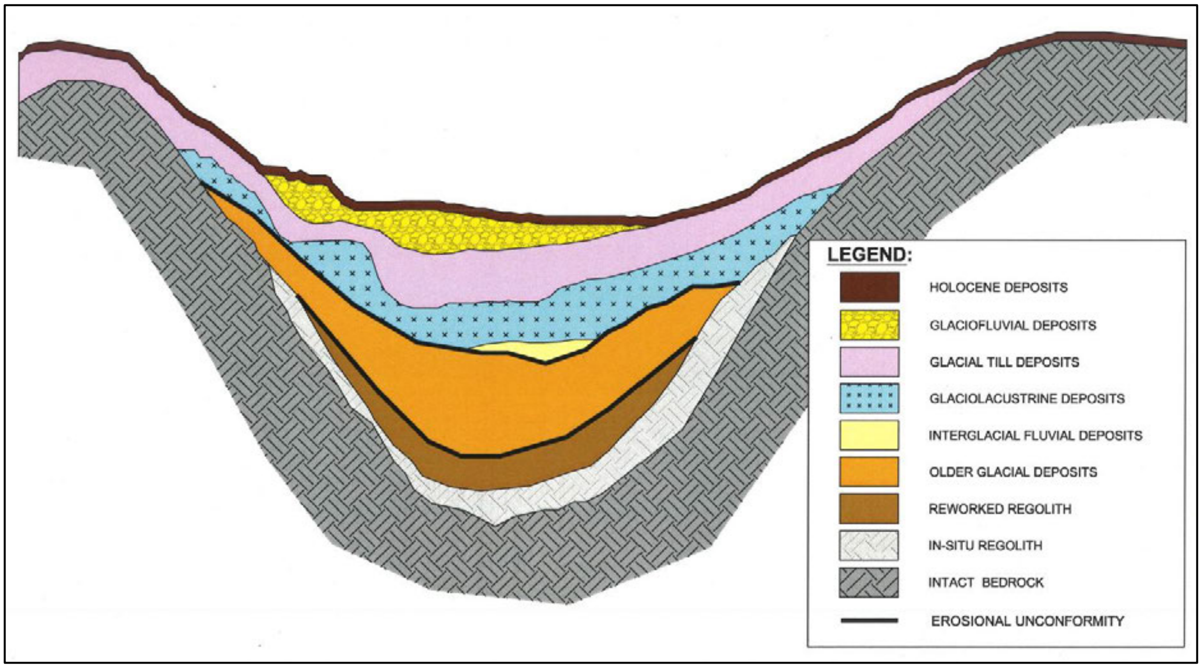


Figure 2.1 Conceptual Geologic Model of Davidson Creek Valley

2.3.2.1 Holocene Deposits

Recent surficial deposits consist of fluvial gravels, sands, and silts within the major drainage channels as well as organic material within floodplains and wetlands. The landscape in the valley bottoms is dominated by marshes and shallow lakes filled with organic sediments formed from decaying marsh vegetation. Accumulations of peat are present in areas where drainage was restricted during the post-glacial period.

2.3.2.2 Fraser Glaciation Deposits

The Fraser Glaciation sequence at the Blackwater Project includes glaciofluvial deposits, glacial till and glaciolacustrine deposits as outlined below.

- Glaciofluvial deposits - These deposits include kame, esker, and meltwater channel deposits:
  - Kame deposits were formed from non-channelized glaciofluvial deposits. Kame deposits have a significant proportion of silt and are inferred to have lower permeability than channel deposits. Kame deposits of various thicknesses occur around Davidson Creek in areas of shallow relief above the creek valley.
  - Glaciofluvial esker deposits extend north in the Chedakuz valley and on the western margin of the Top Lake valley as it cuts through the Fawnie Range. Glaciofluvial esker deposits are well-graded, coarse-grained sands and gravels with a low proportion of fines.
  - Meltwater deposits consist predominantly of coarse-grained sands and gravels with trace fines and cobbles. These deposits were formed by meltwater runoff from the advancing and retreating ice sheet and within subglacial cavities and channels.

- Glacial Till Deposits - Glacial till deposits are the most dominant surficial material in the region and consist of compact to very dense lodgement till with uncommon loose to compact ablation till. Glacial till thickness is variable, ranging from a few to tens of metres. The material is predominantly well graded, stiff to very dense, sandy silt to silty sand with some gravel and trace clay and cobbles. Lodgement till is dense or stiff and contains a significant percentage of fines (silt and clay) that greatly lowers the permeability. Ablation till is less dense and may contain less fines. Lodgement till was the dominate material encountered in the valley basin of the Davidson Creek watershed, and ablation till is found in a few locations on site at higher elevations on the valley sides.
- Glaciolacustrine Deposits - Glaciolacustrine sediments were deposited locally in an ephemeral lake that formed between the advancing Cordilleran ice sheet and higher ground to the west and south. Sediment-laden meltwater flowing along the margin of the ice sheet entered the lake, and silt-sized particles settled out of suspension onto the lake bed. The lake was overridden by the advancing Fraser ice sheet, which terminated glaciolacustrine deposition and compacted the deposits. Glaciolacustrine deposits up to 20 m thick were identified in most of the drill holes in the upper Davidson Creek valley (KP 2013g). The glaciolacustrine deposits are very dense, massive sandy silt, and did not exhibit any fine laminated layers or weaker clayey laminations. Glaciolacustrine deposits consist of massive silts with trace clay, sand, and poorly graded gravel. Where encountered, glaciolacustrine layers consistently lie below the Fraser glacial till deposits.

2.3.2.3 Interglacial Fluvial Deposits

During the interglacial period, deposition of fluvial sediments consisting of sands and gravels would be expected within major drainage valleys such as Davidson Creek valley (Clague 2013). The interglacial deposit would lie below the glaciolacustrine unit from the Fraser glacial sequence and above older glacial sediments. Interglacial fluvial deposits at the contact between deposits from the two glacial periods are described as absent or thin in drill core collected within Davidson Creek valley (KP 2013g). The absence of a continuous sand and gravel deposit cannot be explained by subsequent glacial erosion, as the overlying glaciolacustrine sediments would have also been eroded. Data collected as part of the 2012 and 2013 geotechnical investigations removes the potential for a widespread sand and gravel deposit (KP 2013g). Where encountered, glaciofluvial deposits of the interglacial unit were described as localized and as discontinuous lenses, which suggest that Davidson Creek was a minor stream with limited extent during the interglacial period.

2.3.2.4 Older Glacial Till Deposits

An older glacial sequence predominantly composed of glacial till and rare interbedded glaciofluvial and glaciolacustrine deposits lies below the Fraser glacial deposits or locally below interglacial deposits. These glacial deposits are similar in composition to the Fraser glacial till deposits and are indistinguishable by field description and laboratory particle size testing.

2.3.2.5 Reworked Regolith (Reworked Completely Weathered Bedrock) and In-situ Regolith (Completely Weathered Bedrock)

The older glacial sequence rests on reworked and in-situ regolith horizon (completely weathered bedrock). The reworked regolith comprises poorly graded sediments containing abundant weathered bedrock clasts. It is presumed that gravitational processes and recorded landscape instability controlled the deposition, potentially during the onset of cold climatic conditions during the early Pleistocene, ca. 2.6 Ma.

The original bedrock texture or fabric was evident in in-situ regolith in the majority of drill holes advanced within Davidson Creek valley. The boundary between the reworked and in-situ regolith is difficult to discern in all drill holes. The reworked and in-situ regolith was found to range in thickness from a few metres to over 30 m, with an average thickness of approximately 15 m. The regolith is thin or absent in topographically high areas and thicker within topographic lows, indicating that the Davidson Creek watershed may have been shielded from glacial erosion. A wide range of gradation is observed, indicative of the various states of decomposition of the weathered bedrock. The presence of this stratum is unusual in British Columbia, as it is typically scoured by the process of glaciation. A white to light brown zone of silt and clay sized sediments near the top of the layer is either a soil horizon or a weathered tuff (volcanic ash).

2.3.3 Bedrock

Geology in the project area consists of a lower unit of Upper Jurassic volcaniclastic, sedimentary, and mafic to felsic volcanic rocks of the Bowser Lake Group. The Bowser Lake group are intruded by Late Cretaceous granitic to granodioritic plutons. Widespread Eocene volcanic arc-related extensional felsic volcanic rocks and minor sedimentary rocks of the Ootsa Lake Group overlie the Bowser Lake Group and are themselves overlain on higher ridges by basalt and andesite of the Eocene Endako Group. Intact bedrock exposure is rare and restricted to higher elevations in the area.

Bedrock geology encountered during site investigations conducted in the Davidson Creek watershed consists of an andesite from the Cenozoic Ootsa Lake Formation and fragmentals volcanics from Cretaceous Volcaniclastics and Flows (KP 2013b,e). Bedrock in the west part of the TSF footprint also belongs to the Ootsa Lake Formation, but comprises rhyolites and felsic volcanic rocks. The bedrock in the southeast portion of the project area, including the deposit area, is rhyolites and felsic volcanic rocks of the Entiako Formation, which belongs to the Middle Jurassic Hazelton Group. Bedrock to the west is basement rock from the Bowser Lake Group (KP 2013b,c,e).

Bedrock geology in the project area is shown on Appendix Figure A.3. The bedrock geology encountered during site investigations conducted in the Davidson Creek watershed consists of andesite from the Eocene Ootsa Lake Formation and fragmentals volcanics from Cretaceous Volcaniclastics and Flows (KP 2013b,e). Bedrock in the west part of the TSF footprint also belongs to the Ootsa Lake Formation but is comprised of rhyolites and felsic volcanic rocks.

The bedrock in the deposit area consists of rhyolites and felsic volcanic rocks of the Entiako Formation, which belongs to the Middle Jurassic Hazelton Group (KP 2013c). Bedrock to the west of the deposit is basement sedimentary rock from the Bowser Lake Group.

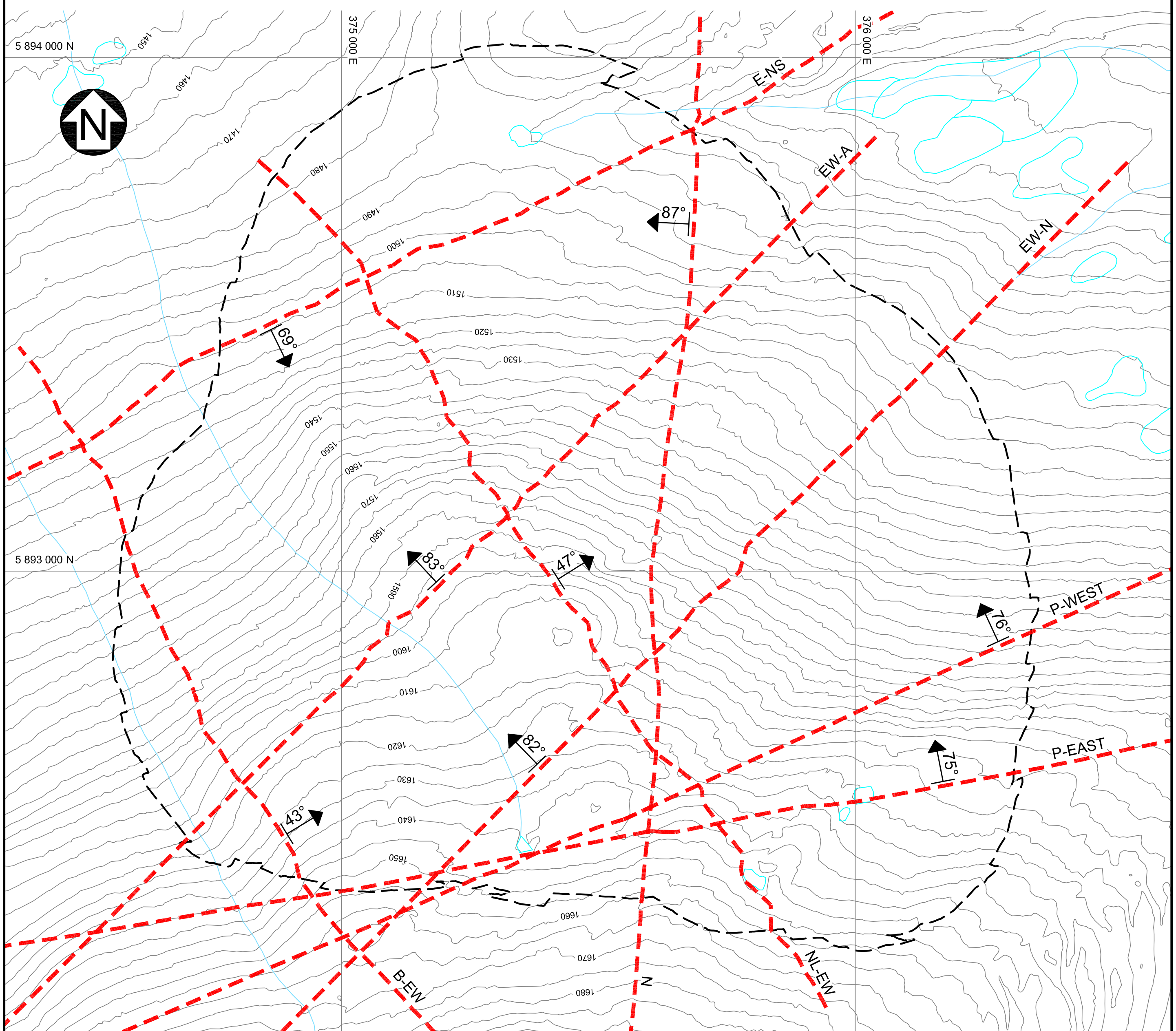
Bedrock beneath the regolith is characterized by a weathering profile that is distinguished based on rock characteristics such as discolouration, intactness, weakness and clay content. The weathered bedrock transition from highly to moderately to slightly weathered with increasing depth is accompanied by an increase in intactness and decrease in clay infill (KP 2013b,e).

A bedrock elevation contour map was generated using the 2012 and 2013 site investigation data (KP 2013g) and New Gold’s 2012 condemnation drilling data as shown on Appendix Figure A.3. Intact bedrock exposure in the area is restricted to higher elevations. Bedrock was encountered at depths greater than 100 m below ground surface (mbgs) in drill holes advanced on the eastern slope of Mt. Davidson.

2.3.4 Geologic Structure

An inferred fault (inactive) was interpreted on the south abutment of Site D Main Dam southern extent based on 2012 site investigation results (KP 2013b). Two drill holes (GT13-20 and GT13-21) targeted the inferred fault during the 2013 site investigations to collect information on hydraulic conductivity and evaluate the existence of a hydraulic pathway and determine the orientation of the fault. The fault zone was found to be near vertical. Results of in-situ hydraulic conductivity tests conducted within the fault zone ranged from $9x10^{-9}$ to $6x10^{-7}$ m/s.

New Gold geologists delineated a series of sub-vertical fault systems within the deposit area at the locations shown on Figure 2.2. Five of these features trend northeast-southwest through the deposit, two trend southeast-northwest through the central/east portion of the deposit, and one trends north-south through the central part of the deposit. Drill circulation losses while drilling within the deposit area as part of a geomechanical site investigation were attributed to drill hole locations within these faults or shear zones (KP 2013c).



SCALE A 200 100 0 200 400 600 m

LEGEND:

FAULTS

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10 U.
2. FAULT SURFACE PROVIDED BY NEW GOLD, FEBRUARY 2013.
3. CONTOUR INTERVAL IS 5 METRES.
4. OPEN PIT OUTLINE FROM NORWEST, FEBRUARY 2013.

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NEW GOLD INC.

BLACKWATER GOLD PROJECT

INFERRED FAULTS WITHIN THE DEPOSIT AREA

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/6	13

FIGURE 2.2 REV 0

2.4 HYDROGEOLOGY

Baseline hydrogeology data were obtained from drilling information, in-situ hydraulic conductivity testing (packer testing and response testing), and recorded groundwater levels at monitoring wells, standpipe piezometers, and vibrating wire piezometers (VWP). Two pumping tests were conducted in the open pit area: one test was conducted in an area of higher permeability bedrock within the deposit and the second test was conducted in lower permeability bedrock south of the proposed open pit footprint (KP 2013h). Two pumping wells and 12 observation wells with multipoint VWPs were installed to support the pumping test program.

2.4.1 Hydrostratigraphic Units

The geology in the area has been simplified into eight hydrostratigraphic units:

- Fluvial and glaciofluvial channel deposits
- Glaciofluvial kame deposits
- Glacial till deposits
- Glaciolacustrine and lacustrine deposits
- Completely weathered bedrock (in-situ and reworked regolith)
- Weathered bedrock
- Higher permeability bedrock in the deposit area, and
- Competent bedrock.

Hydraulic conductivities for each hydrostratigraphic unit based on in-situ hydraulic conductivity testing are provided in Table 2.1. Packer tests reported as no take have been presented as $1x10^{-9}$ m/s, and response tests with results below the measurable testing limit are presented as $1x10^{-8}$ m/s. Further detail on each hydrostratigraphic unit includes:

- **Fluvial and glaciofluvial channel deposits:** Channel deposits include esker deposits as well as glacial fluvial meltwater deposits and modern fluvial channel deposits. This material is characterized by sands and gravels with little fines. One response test was conducted in a monitoring well installed surficial material mapped as channel deposits. The hydraulic conductivity value estimated from the test of $9x10^{-5}$ m/s is within the lower range for loose granular deposits.
- **Glaciofluvial kame deposits:** Kame deposits are mapped at the surface over much of Davidson Creek valley and in the headwater tributaries feeding Creek 661. Kame deposits consist of silty and well-graded sand and gravel units. The geometric mean hydraulic conductivity of six response tests conducted in monitoring wells and piezometers screened in kame deposits is $4x10^{-5}$ m/s.
- **Glacial till deposits:** Lodgement till covers much of the surface in the project area and has been encountered during site investigations over 50 m thick. Ablation till is only mapped within a few isolated locations at higher elevations and adjacent to Davidson Creek valley. The geometric mean hydraulic conductivity of 13 response tests conducted in monitoring wells and piezometers screened in till material is $3x10^{-6}$ m/s, which is at the upper limit of the expected range of hydraulic conductivity values for till material of $1x10^{-12}$ m/s to $1x10^{-6}$ m/s (Freeze and Cherry 1979). Tests conducted in wells and piezometers screened in the till layer likely provide hydraulic conductivity values that are biasedly high since monitoring well and piezometer installations tend to target more permeable water bearing zones. Laboratory testing of 108 till samples collected from drill holes and test pits for particle size analysis typically reported 25 to 45% fine (5th to 95th percentile distribution) with distributions of 5 to 50% gravel, 20 to 70% sand, 10 to 50% silt, and 0 to 17% clay (KP 2013g).

Results of laboratory permeability testing of till samples reported permeability ranges of 10^{-11} to 10^{-7} m/s for 27 constant head tests and 10^{-8} to 10^{-6} m/s for 7 falling head tests. A hydraulic conductivity estimate using the mean grain size distribution of the tests and the Kozeny-Carman equation (Carman 1956) is $4x10^{-8}$ m/s, which falls within the range of laboratory tested values. A hydraulic conductivity value of $1x10^{-7}$ m/s has been adopted as a representative value for a till deposit based on laboratory testing of the till material and grain size distributions.

- **Glaciolacustrine and lacustrine deposits:** Glaciolacustrine sediments consist of thinly-bedded sandy silt, gravelly silt, and silt. Glaciolacustrine sediments are present beneath the upper till layer in Davidson Creek valley. Recent lacustrine deposits are present at the surface beneath a few isolated lakes, such as Tatelkuz Lake. One response test was conducted in sediments identified as lacustrine (MW12-06D), which resulted in a hydraulic conductivity estimate of $<1x10^{-8}$ m/s. Laboratory testing of 40 glaciolacustrine samples collected from drill holes and test pits for particle size analysis typically reported 60 to 95% fines (5th to 95th percentile distribution) within the samples.
- **Bedrock:** Bedrock within the model is assumed to be a homogeneous unit even though several types of bedrock are present at the study site. This approach is considered sufficient for the purpose of this hydrogeology assessment. Results of hydraulic conductivity tests conducted in bedrock are plotted with depth on Figures 2.3 and 2.4. Bedrock at the project site is divided into units according to weathering and intactness:
  - **Completely weathered bedrock**: Completely weathered bedrock (in-situ regolith and reworked regolith) consists of a silt and clay matrix with abundant weathered bedrock clasts. This unit is inferred to be present only in Davidson Creek valley. Laboratory testing of 32 in-situ and reworked regolith samples collected from drill holes for particle size analysis reported 20 to 85% fines (5th to 95th percentile distribution within the samples. No in-situ hydraulic conductivity tests were conducted exclusively within this unit; completion zones of monitoring wells screened in the completely weathered bedrock unit also spanned the contact with the overlying sand and gravel unit. The completely weathered bedrock unit is expected to be a low permeability unit with a representative hydraulic conductivity of approximately $1x10^{-8}$ m/s.
  - **Weathered bedrock**: The profile of weathering within the bedrock was distinguished based on characteristics of rock fracture spacing, intactness, and discolouration noted on drill core (KP 2013b,e). The weathering profile grades from highly weathered to moderately weathered to slightly weathered with depth. Hydraulic conductivity test results conducted in weathered bedrock within drill holes located outside the deposit area are provided in Table 2.1. Results only include tests conducted a distance from the deposit area so the hydraulic conductivity statistics are not influenced by tests conducted within higher permeability bedrock found in the deposit area (see discussion below). The maximum depth of tests conducted in weathered bedrock was generally less than 60 m below the top of the bedrock surface, although testing in one drill hole extended to a depth of 90 m below top of bedrock. The geometric mean hydraulic conductivity increases slightly as weathering in the bedrock decreases from $4x10^{-8}$ to $7x10^{-8}$ m/s. This increase in hydraulic conductivity is attributed to a decrease in clay infill within the weathered spaces (Deer and Patton 1971). Only response tests could be conducted in the highly weathered bedrock zone since difficulty seating the packer prohibited packer testing within the zone. The lower portion of the weathered bedrock is considered to be a permeable pathway and a hydraulic conductivity of $1x10^{-7}$ m/s is considered representative for this zone.
  - **Higher permeability bedrock zone in the deposit area:** Results of in-situ hydraulic conductivity testing and pumping tests indicate bedrock within the central portion of the deposit area has a

higher permeability than the surrounding bedrock. The extent of this area is estimated in the Open Pit Water Management Report (KP 2013h) and is closely, but not exactly, related to the 'broken zone' in the Feasibility Open Pit Slope Design Report (KP 2013c). A bulk hydraulic conductivity of $5x10^{-6}$ m/s was estimated for this higher permeability bedrock zone based on the results of a pumping test. (KP 2013h). The area of the higher permeability bedrock is inferred to be approximately 1 km wide and to extend to depths of 500 m below the bedrock surface. The higher permeability bedrock zone is mainly located within the limits of the proposed open pit and will be excavated during mining operations.

- **Competent bedrock:** Competent bedrock is present everywhere beneath the weathered bedrock. Hydraulic conductivity tests were conducted within deeper bedrock in the deposit area as part of open pit site investigation (KP 2013c). The geometric mean hydraulic conductivity of 45 packer tests conducted in drill holes surrounding the open pit is $8x10^{-8}$ m/s. A bulk hydraulic conductivity of $1x10^{-7}$ m/s was estimated for the lower permeability bedrock zone surrounding the deposit based on the results of a pumping test (KP 2013h). Given the proximity of the packer and pumping test to the higher permeability bedrock associated with the deposit, these test results for deeper bedrock are expected to be higher than elsewhere across the project site. Drill holes for the geotechnical site investigations were advanced to depths until two consecutive packer tests yielded an estimated hydraulic conductivity value on the order of 10^{-7} m/s or less. As a result, tests from these site investigations are generally not considered to be part of the intact bedrock unit. Hydraulic conductivity in the competent bedrock is assumed to decrease with depth. A bulk hydraulic conductivity of $2x10^{-8}$ m/s is considered to be a representative value for the upper portion of the competent bedrock zone.

Table 2.1 Hydraulic Conductivity Test Results

	Unit	Response Tests (No.)	Packer Tests (No.)	Airlift Tests (No.)	Minimum (m/s)	Maximum (m/s)	Log Mean (m/s)	Pumping Test (m/s)
Overburden	Glaciofluvial -Channel	1	-	-	9E-05	9E-05	-	-
	Glaciofluvial - Kame	6	-	-	1E-08	1E-03	4E-05	-
	Till	13	-	-	5E-08	7E-04	3E-06	-
	Lacustrine	1	-	-	1E-08	1E-08	-	-
Bedrock	**Weathered Bedrock (Geotechnical Investigations)[1]**							
	Completely Weathered	0	-	-	-	-	-	-
	Highly Weathered	3	-	-	2E-08	8E-08	4E-08	-
	Moderately Weathered	7	10	-	1E-09	2E-05	7E-08	-
	Slightly Weathered	4	65	-	1E-09	4E-06	7E-08	-
	Higher Permeability Bedrock Zone in the Deposit Area							
	Geomechanical Investigations[2]	-	129	-	5E-09	6E-05	8E-07	5E-06
	Hydrogeological Investigation[3]	-	-	30	3E-08	2E-05	9E-07	
	Lower Permeability Bedrock Zone in the Deposit Area							
	Geomechanical Investigations[2]	-	45	-	1E-09	4E-06	8E-08	1E-07
	Hydrogeological Investigation[3]		-	31	4E-08	8E-06	3E-07	

NOTES:

1. SOURCE: BLACKWATER 2012 GEOTECHNICAL SITE INVESTIGATION REPORT (KP 2013c) AND 2013 GEOTECHNICAL SITE INVESTIGATION REPORT (KP 2013e).
2. SOURCE: FEASIBILITY OPEN PIT SLOPE DESIGN REPORT (2013c).
3. SOURCE: OPEN PIT WATER MANAGEMENT REPORT (KP 2013h).
4. HYDRAULIC CONDUCTIVITY TEST RESULTS REPORTED AS NO TAKE OR BELOW MEASURABLE TESTING LIMIT ARE INCLUDED IN THE TABLE AS $1x10^{-8}$ m/s FOR RESPONSE TESTS AND $1x10^{-9}$ m/s FOR PACKER TESTS.
5. MINIMUM, MAXIMUM, AND LOG MEAN VALUES ARE CALCULATED USING RESPONSE, PACKER, AND AIRLIFT TESTING RESULTS.

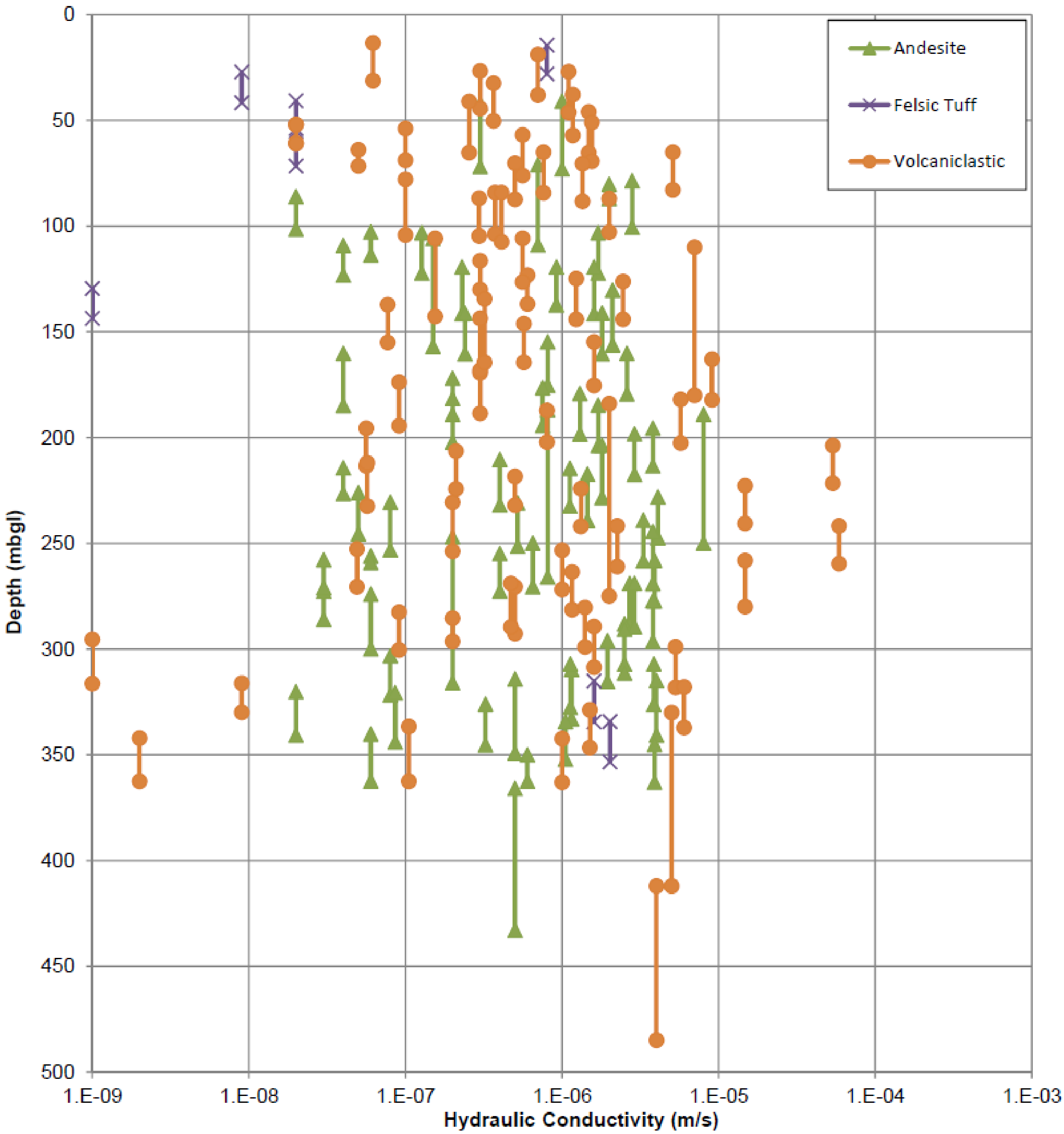


Figure 2.3 Hydraulic Conductivity with Depth in Bedrock (Inferred Higher Permeability Zone in the Deposit Area)

NOTES:

1. HYDRAULIC CONDUCTIVITY PACKER AND AIRLIFT TESTING RESULTS FROM KP 2013b,c,e,h.
2. DEPTHS ADJUSTED TO METERS BELOW GROUND LEVEL FOR INCLINED DRILL HOLES (KPL 2013c).
3. HYDRAULIC CONDUCTIVITY TEST RESULTS REPORTED AS NO TAKE ARE INCLUDED IN THE TABLE AS $1x10^{-9}$ m/s.

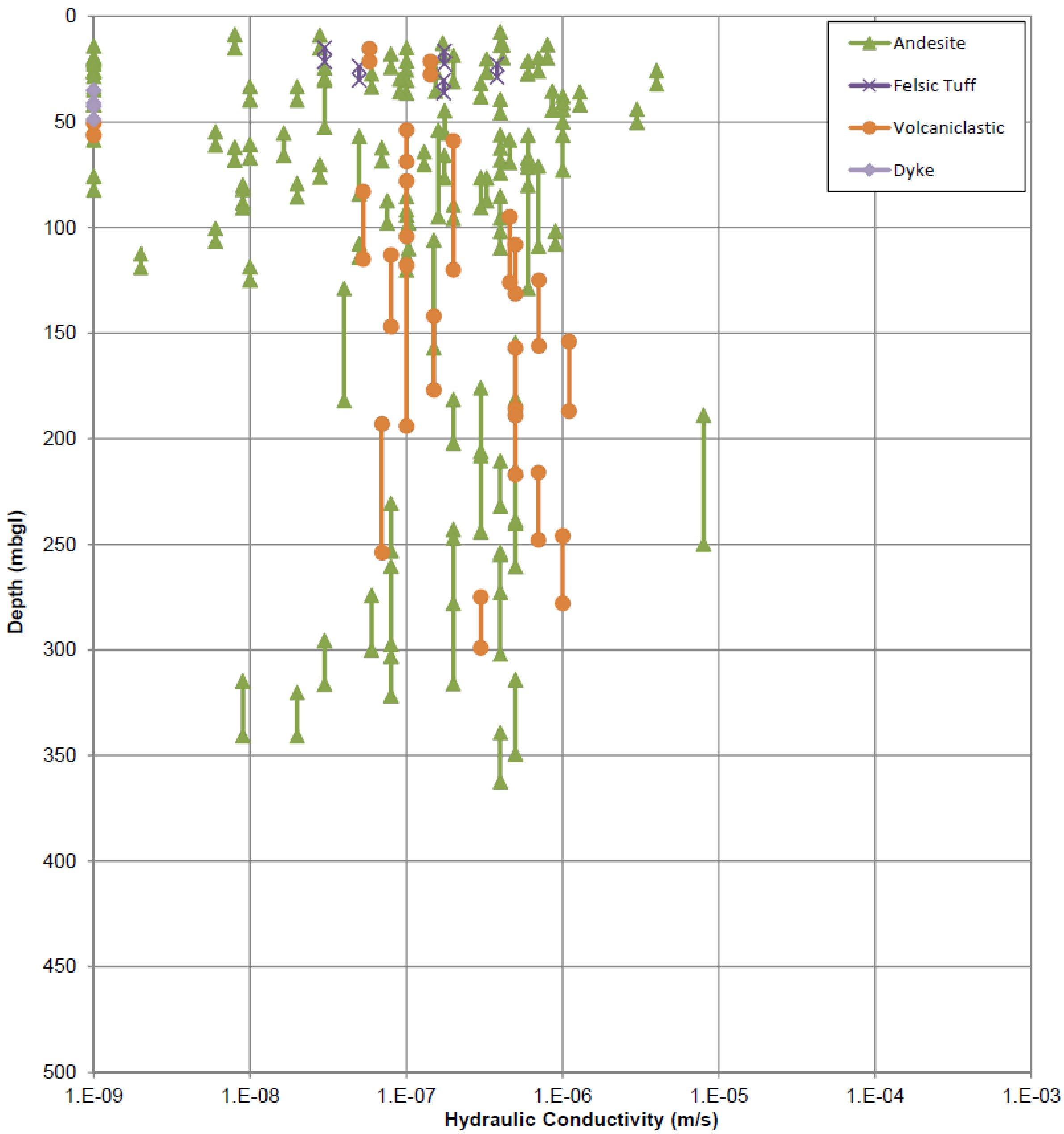


Figure 2.4 Hydraulic Conductivity with Depth in Bedrock (Inferred Lower Permeability Zone in the Deposit Area)

NOTES:
1. HYDRAULIC CONDUCTIVITY PACKER AND AIRLIFT TESTING RESULTS FROM KP 2013b,c,e,h.
2. DEPTHS ADJUSTED TO METERS BELOW GROUND LEVEL FOR INCLINED DRILL HOLES (KPL 2013c).
3. HYDRAULIC CONDUCTIVITY TEST RESULTS REPORTED AS NO TAKE ARE INCLUDED IN THE TABLE AS $1x10^{-9}$ m/s.

2.4.2 Flow Direction and Gradient

Groundwater at the site flows from recharge zones located in topographic highs, such as the vicinity of the proposed open pit, towards discharge zones located in the Davidson Creek, Turtle Creek, Creek 661 and Creek 705 valleys. Groundwater discharge to streams provides baseflow that sustains streamflow within major drainages during the winter and early spring months. A groundwater divide is present at Mt. Davidson that divides groundwater flow radially outward in all directions toward the Davidson Creek, Creek 661, Creek 705 and Blackwater River watersheds.

Hydraulic heads are measured at or near ground surface within Davidson Creek valley and similar conditions are assumed within the valleys of other major drainages. Hydraulic heads are near ground surface along the base of Mt. Davidson as evidenced by the presence of wetlands, shallow water tables in test pits and drill holes, and artesian conditions within exploration drill holes near the northern edge of the deposit. Groundwater level contours are flatter within the zone of higher permeability bedrock in the deposit (KP 2013h).

At the local scale, geologic structures (faults and fractures) are expected to influence groundwater flow pathways and hydraulic gradients. Faults and lineaments located within the deposit area may restrict groundwater movement along the margins of the deposit. VWPs installed within observation wells located southwest of the higher permeability bedrock zone in the deposit area exhibit strong hydraulic gradients in both vertical and horizontal directions, suggesting groundwater flow is compartmentalized in the deposit area. Hydraulic heads recorded at VWPs installed within observation well PH13-4-3 differed by 90 m.

The main groundwater flow pathway within the overburden is in the glaciofluvial and fluvial deposits. The main flow pathway within bedrock is the lower portion of the weathered bedrock, which is generally encountered across the site at 10 to 40 m below the top of bedrock. A completely weathered bedrock unit characterized by a high fraction of fines content and a low permeability overlies the weathered bedrock in Davidson Creek valley.

3 – BASELINE NUMERICAL MODEL

3.1 OVERVIEW

A steady-state, regional-scale numerical groundwater model was developed to simulate baseline hydrogeological conditions and to provide the basis required to assess potential effects of the Project on the local groundwater system. The model was developed using the MODFLOW-SURFACT computer code run in the Groundwater Vistas (version 6.20; ESI, 2011) graphical user interface. MODFLOW-SURFACT is a three-dimensional finite-difference flow model developed by the U.S. Geological Survey and HGL Software Systems that has become an industry standard for groundwater modelling applications (Hydrogeologic Inc., 1996).

The baseline model was calibrated to hydraulic head data collected from on-site groundwater monitoring wells and vibrating wire piezometers and to average annual baseflows (groundwater contribution to streamflow) estimated using a watershed model constructed for the Project (KP 2013f).

The baseline model simulates pre-development hydrogeological conditions including groundwater flow directions, distribution of hydraulic head and groundwater/surface water interaction on a project-site scale. Baseline model development, calibration and results are discussed in the sections that follow.

3.2 MODEL GEOMETRY AND GRID

The baseline model domain encompasses an area of 349 km^2 which includes the Blackwater Project site as shown on Figure 3.1. The model domain includes the Davidson Creek, Turtle Creek and Creek 661 to their confluence with Chedakuz Creek and Creek 705 to its confluence with Fawnie Creek. The model includes headwater tributaries of the Blackwater River catchment to the south. The northeast perimeter of the active model domain is defined by Tatelkuz Lake and Chedakuz Creek. Groundwater flow divides are inferred to be coincident with watershed boundaries where the model perimeter is defined by the watershed boundaries of Turtle Creek, Creek 661 and Creek 705. A small portion of the southeast model boundary cuts through the headwaters of the Blackwater River catchment.

The model has a rectangular grid of 228 rows by 300 columns covering an area of approximately 20 km by 35 km. The model was divided into 10 layers in the vertical dimension for a total of 684,000 cells, of which approximately 572,000 are active. Cell size is 500 m by 500 m at the edges of the model and is refined in the vicinity of the mine site to 25 m by 25 m. A maximum grid expansion factor of 1.5 was used to increase dimensions of adjacent cells.

The numerical grid was rotated 35 degrees counterclockwise from true north in order to align the grid axes with major hydrological features in the study area. This results in the grid being oriented such that drainages generally run parallel with model rows and the northeast boundary of the model at Tatelkuz Lake parallels model columns. The finite difference grid and layering is shown on Figure 3.2.

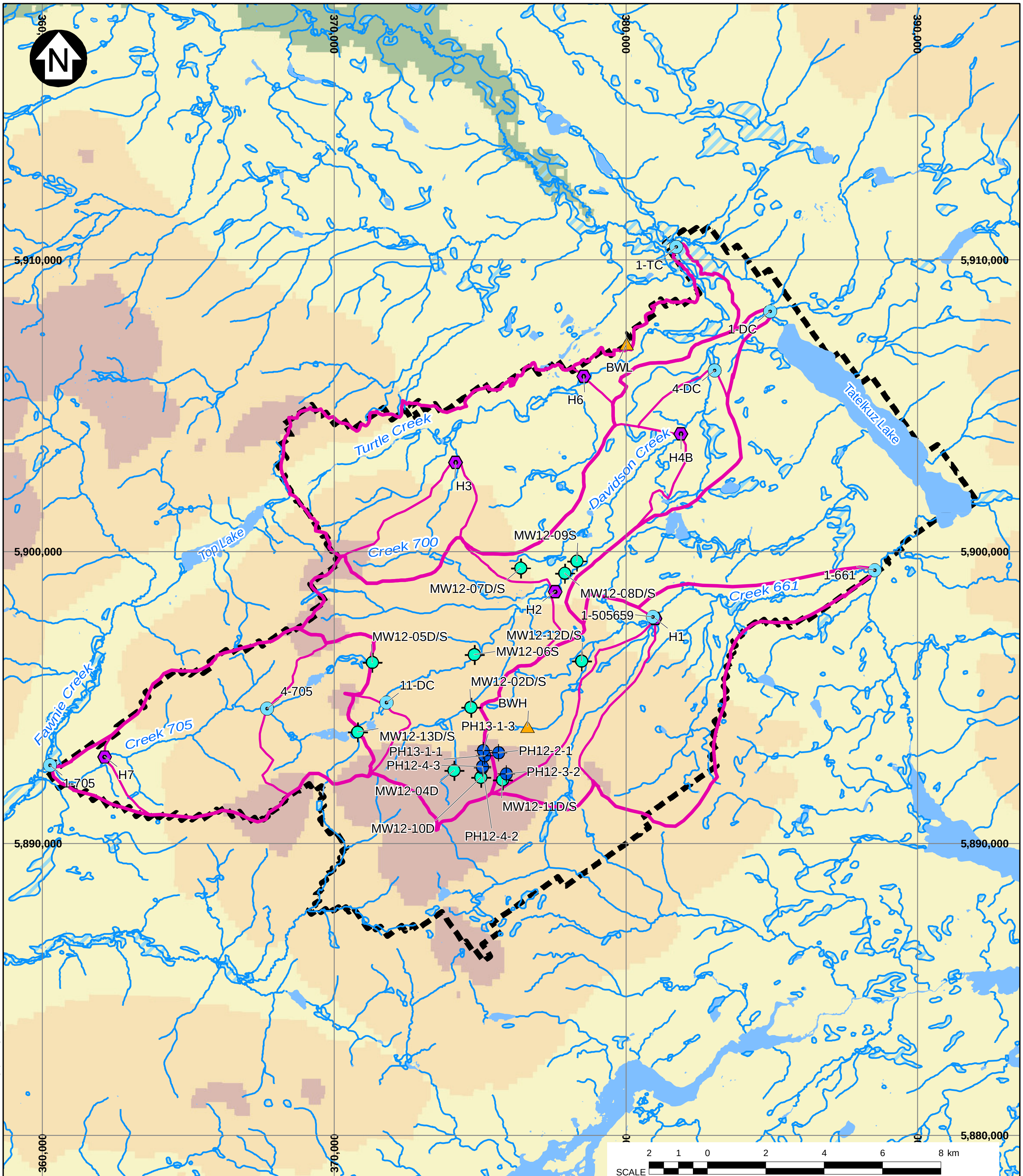
Elevation within the active model domain ranges from 930 masl at the outlet of Chedakuz Creek to 1,810 masl south of the proposed mine site at Mt. Davidson. The finite-difference grid was discretized into ten layers to represent major hydrostratigraphic units present in the study area. Layers 1 and 2 represent the surficial overburden units and Layers 3 through 10 represent bedrock units. Layers generally increase in thickness with depth:

- Layer 1 is an average of 30 m thick (top elevation defined by topography)
- Layer 2 is an average of 30 m thick (bottom elevation defined by bedrock surface)

- Layer 3 is an average of 25 m thick
- Layer 4 is an average of 30 m thick
- Layers 5 through 9 are 100 m thick, and
- Layer 10 is of variable thickness, extending to a constant base elevation of to 0 masl.

The model surface in Layer 1 was defined as ground surface elevation using a combination of two elevation datasets: LiDAR survey data (1 m resolution), which covers the proposed Project area and was processed into a digital elevation model (DEM) with 20 m resolution, and 100 m resolution National Topographic System (NTS) data. The two datasets were merged in Global Mapper (GM) and imported to Groundwater Vistas (GWV) as a single DEM covering the entire study area. Ground surface elevation contours for Layer 1 are provided on Figure 3.3.

Bedrock surface elevation contours determined as part of the Geotechnical Characterization for the Project (KP 2013g) were used to define the top of Layer 3 as the top of bedrock. A uniform depth to bedrock and the top of Layer 3 of 55 m was assigned to areas of the model where bedrock surface data was unavailable. Additional processing of layer elevation was required to remove discontinuities in the grid that resulted from layers that were thin relative to the change in elevation between adjacent cells. For this reason, layer thickness in the upper four layers is variable rather than constant. Elevation contours for the top of Layer 3 (top of bedrock) are provided on Figure B.3 in Appendix B.



LEGEND:

- CLIMATOLOGY STATION
- HYDROLOGY STATION/MODEL NODE
- WATERSHED MODEL NODE
- MONITORING WELL
- VIBRATING WIRE PIEZOMETER
- RIVER
- SUB-CATCHMENT BOUNDARY
- WATERSHED BOUNDARY
- MODEL STUDY AREA
- LAKE
- WETLAND

ELEVATION BAND (M)

- < 915
- 915-1220
- 1220-1525
- 1525-1830
- > 1830

NOTES:

1. BASE MAP: CANADA DEM GEOBASE.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:175,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

NEW GOLD INC.

BLACKWATER GOLD PROJECT

NUMERICAL GROUNDWATER MODEL STUDY AREA BOUNDARY

Knight Piésold CONSULTING

P/A NO. VA101-457/6 | REF NO. 13

FIGURE 3.1 REV 1

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
1	08JAN'14	ISSUED WITH REPORT	DMW	CC	CAS	KJB
0	20DEC'13	ISSUED WITH REPORT	DMW	AMD	CAS	KJB

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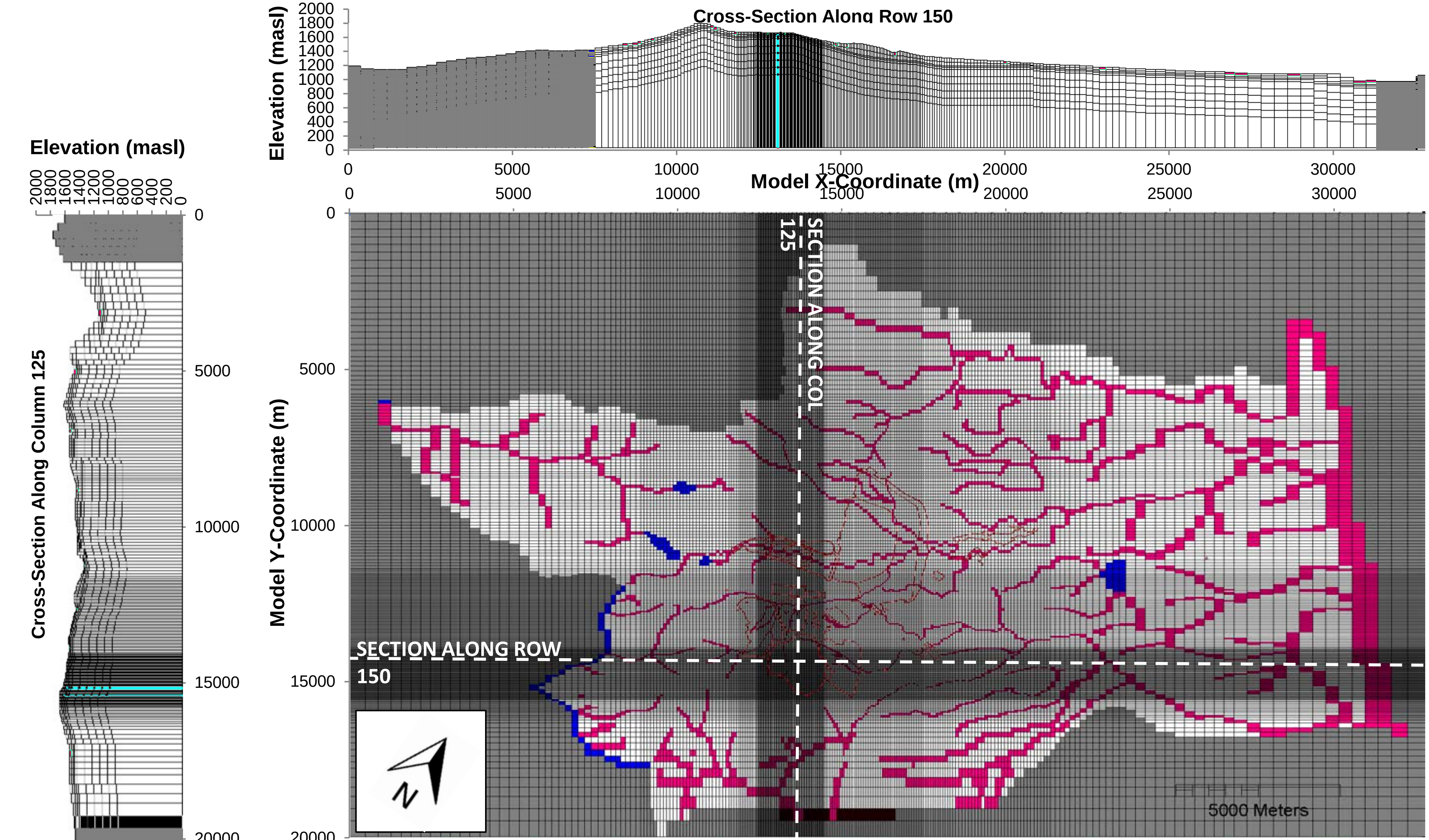


Boundary Conditions

- Constant Head
- Drain
- GHB
- Flow Barrier
- No Flow

NOTES:

1. AS INDICATED BY THE NORTH ARROW, THE MODEL GRID IS ROTATED FROM TRUE NORTH SUCH THAT COLUMNS AI.IGN WITH AN AZIMUTH OF 325 DEGREES.

2. PROPOSED MINE FACILITY OUTLINES ARE SHOWN IN RED FOR SPATIAL REFERENCE ONLY AND ARE NOT SIMULATED IN THE BASELINE MODEL.

0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
NUMERICAL GRID, LAYERS AND BOUNDARY CONDITIONS (LAYER 1)

Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 3.2

REV 0

3.3 HYDRAULIC CONDUCTIVITY

Hydraulic conductivity zones were assigned to the model to represent significant hydrostratigraphic units present in the study area as described in Section 2.4.1. Initial values of hydraulic conductivity were assigned to overburden and bedrock zones based on the results of in-situ hydraulic conductivity tests and laboratory characterization. These initial values were varied within the range of observed and expected values during calibration of the baseline model as discussed in Section 3.5. Calibrated hydraulic conductivity values assigned to each model layer were assumed to be isotropic ($K_x = K_y = K_z$), except for the glaciolacustrine deposit and the kame/till deposit. The hydraulic conductivity values for glaciolacustrine and kame/till deposits were assigned an anisotropy ratio (horizontal/vertical) of 5 and 45, respectively. Calibrated hydraulic conductivity values assigned to the model are summarized in Table 3.1.

Table 3.1 Baseline Model Hydraulic Conductivity Values

Hydrostratigraphic Unit	MODFLOW Layer	Hydraulic Conductivity $K_{x,y}$	Hydraulic Conductivity K_z	Specific Storage	Specific Yield	Effective Porosity
		(m/s)	(m/s)	(1/m)	(-)	(-)
Glaciofluvial: Channel	1	1E-04	1E-04	1E-04	0.3	0.15
Glaciofluvial: Kame	1	1E-05	1E-05	1E-04	0.3	0.15
Glacial Till	1,2	2E-07	2E-07	1E-04	5E-02	0.15
Glaciolacustrine	1,2	1E-07	2E-08	1E-04	5E-02	0.15
Kame/Till Deposit	1	9E-06	2E-07	1E-04	5E-02	0.15
Completely Weathered Bedrock	3	1E-08	1E-08	1E-06	1E-03	0.001
Weathered Bedrock	3 or 4	1E-07	1E-07	1E-06	1E-03	0.001
Competent Bedrock	4, 5	2E-08	2E-08	1E-06	1E-04	0.0001
Competent Bedrock	6,7,8	1E-08	1E-08	1E-06	1E-04	0.0001
Competent Bedrock	9,10	1E-09	1E-09	1E-06	1E-04	0.0001
Higher Permeability Bedrock Zone in Deposit	3 to 8	1E-06	1E-06	1E-05	5E-03	0.005
Bedrock Outcrops	1	1E-07	1E-07	1E-06	1E-03	0.001

Model Layer 1 was subdivided into six hydraulic conductivity zones based on the results of surficial landform mapping conducted within the immediate project area (KP 2013a) and using surficial geology maps by the Geologic Survey of Canada (Plouffe and Levson 2001, 2002) where the model extended beyond that area. The majority of Layer 1 represented a glacial till with a hydraulic conductivity of $2x10^{-7}$ m/s. Other units represented within Layer 1 include slightly weathered bedrock outcrops along topographic highs and glaciofluvial kame and channel deposits within major surface drainages. The glaciofluvial channel deposits were assumed to comprise approximately 30% of the width of permeable sediments in major surface drainage channels in the model where detailed surficial mapping was unavailable for the Project (KP 2013a). The kame/till deposit was specified in the model along the flanks of Mt. Davidson in areas where a kame deposit is mapped as part of the surficial landform mapping (KP 2013a) and where a thin kame unit (approximately 3 m thick) was encountered in test pits (KP 2013b,e). The kame/till hydraulic conductivity zone was assigned to the model during calibration to reduce flooding within grid cells at the base of Mt. Davidson, and to simulate a water table approximately 2 to 3 mbgs as observed during the field investigation.

Hydraulic conductivity zones for subsurface layers of the model (Layers 2 through 10) were assigned based on available drill hole lithology and corresponding with the conceptual hydrogeological model presented in Section 2.4. Layer 2 is predominantly glacial till everywhere except where a glaciolacustrine deposit is present within upper Davidson Creek Valley and beneath lakes, and where bedrock is present beneath outcrops. A plan view of hydraulic conductivity zones assigned to Layer 2 is presented on Figure B.2 in Appendix B.

Layers 3 through 10 represent bedrock units and generally consist of weathered bedrock in Layer 3 and competent bedrock in Layers 4 through 10. Exceptions to this include Davidson Creek valley where a completely weathered bedrock unit was assigned in Layer 3 and weathered bedrock was subsequently assigned in Layer 4. A higher permeability zone of bedrock is specified in the deposit area in Layers 3 through 8 with a hydraulic conductivity value of $1x10^{-6}$ m/s. Figures displaying the hydraulic conductivity zones for Layers 3 through 10 are provided in Appendix B.

3.4 BOUNDARY CONDITIONS

Boundary conditions used to define the active model domain are shown on Figure 3.2 and include:

- No-flow boundaries
- Constant head boundaries
- General head boundary
- Drain cells to represent creeks
- Faults, and
- Meteoric recharge.

3.4.1 No-Flow Boundary

Most of the perimeter of the active model domain is defined by no-flow boundary conditions that correspond to inferred groundwater divides along the model perimeter of the Turtle Creek, Creek 661, Creek 705 and Blackwater River watershed. No-flow cells are specified as inactive and are excluded from the groundwater flow calculations within the MODFLOW model. The locations of the no-flow cells are shown on Figure 3.2 for Layer 1 and are the same in all layers of the model.

3.4.2 Constant Head Boundaries

Lakes within the model domain are represented by constant head boundaries. The stage assigned to the constant head cells for a given water body was set equal to the approximate ground surface elevation at the lake shore. Constant head boundaries are used to represent Snake Lake and three small lakes near the divide between Davidson Creek and Creek 705 in model Layer 1.

Constant head boundaries were assigned at model perimeter locations where groundwater enters or exits the model domain. Constant head cells were assigned to the outlet of Chedakuz Creek and Creek 705 in Layer 1 to allow groundwater to discharge from the model coincident with surface water drainage. Constant head cells were also assigned to the tributaries of Fawnie Creek defined as the southern boundary of the model. The stage assigned to constant head cells was set at 2 m below the streambed elevation. The constant head cells are shown on Figure 3.2.

3.4.3 General Head Boundary

The general head boundary (GHB) is used to simulate head-dependant flow boundaries. Flow into or out of a GHB cell is proportional to the difference between head assigned to the boundary and the simulated head in the cell. General head boundary conditions were assigned to a segment of perimeter cells in Layer 1 to simulate flow across the model boundary toward the Blackwater River watershed (Figure 3.2). A hydraulic conductivity value equivalent to the subsurface till material ($2x10^{-7}$ m/s) was used to calculate flow across the GHB. Hydraulic heads assigned to the boundary were set at 2 m below ground surface.

3.4.4 Drain Boundaries

Drain boundaries were used to simulate streams and rivers within the study area and to represent Tatelkuz Lake. Drain cells act as a groundwater sink and allow groundwater to be removed from a model cell where the simulated piezometric head is higher than a predefined drain stage. Water is unable to discharge the drain cell if the simulated piezometric head is below the drain stage elevation. Drain stages for modelled creeks were set at 2 m below the ground surface elevation within a given model cell.

The ability of groundwater to flow though a drain is a function of the drain conductance. Drain conductances were estimated using the following formula:

$C = l * w * K / t$

Where:
C = conductance of streambed
l = length of stream in cell
w = width of streambed
K = hydraulic conductivity of streambed
t = thickness of streambed

Conductances were calculated using the calibrated hydraulic conductivity of the underlying materials and the drain cell dimensions.

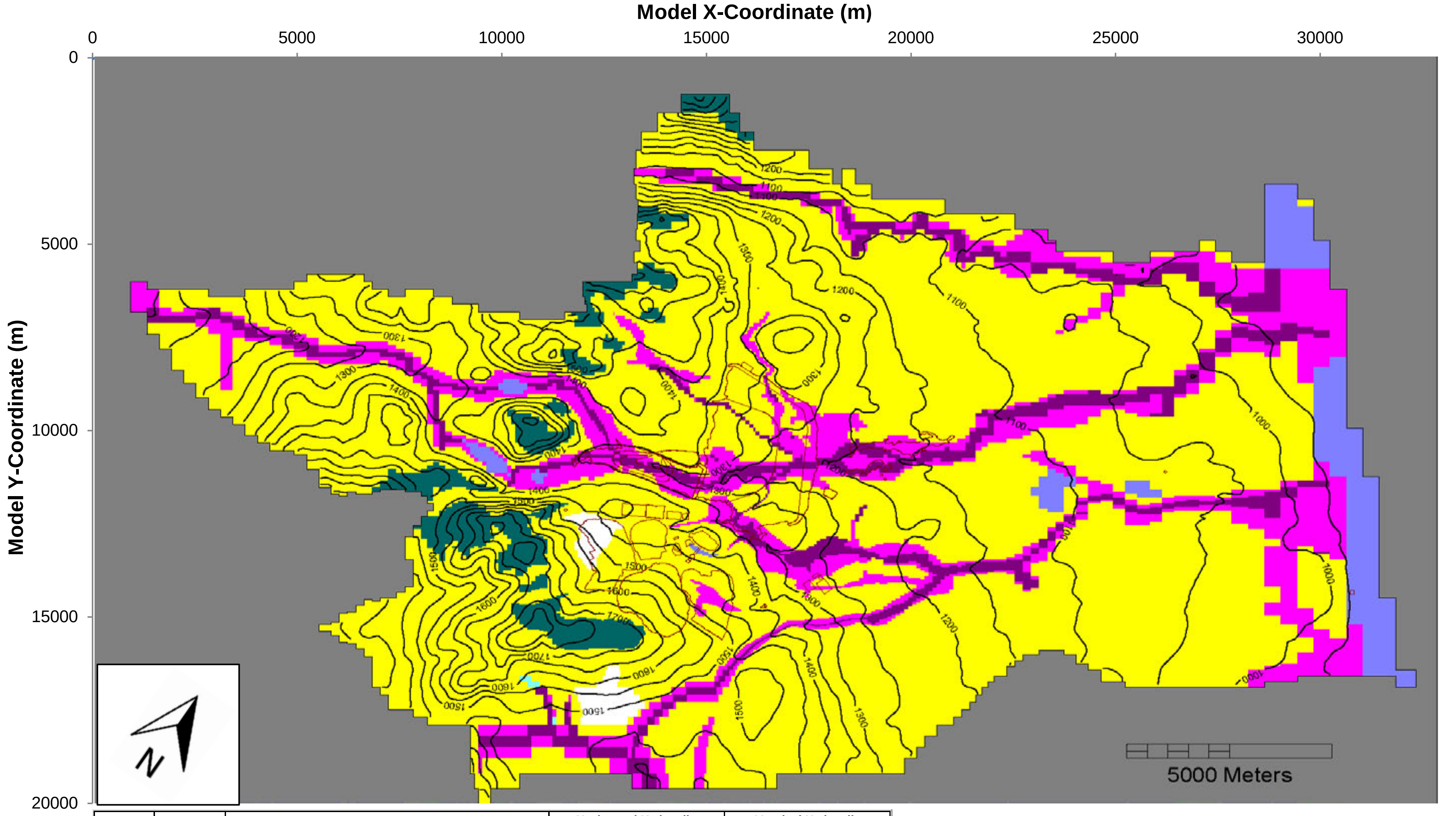
3.4.5 Faults

Faults acting as barriers to groundwater flow were represented in the model using the Wall boundary condition (Horizontal Flow Barrier Package). The wall boundary condition allows thin, low permeability vertical features to be represented in the model without refining the grid size. Faults were only specified within the deposit area where the inclusion of a mapped fault helped to improve model calibration. The best match to observed and simulated data was obtained using three faults located along the southern and western edges of the deposit. Including faults in the model allowed simulated hydraulic gradients to more closely represent the steep hydraulic gradients recorded at adjacent VWPs along the south edge of the pit. Wall boundaries representing faults were specified in model Layers 3 through 10 and were assigned a horizontal hydraulic conductivity of $1x10^{-9}$ m/s.

3.4.6 Meteoric Recharge

Seven recharge zones were assigned to Layer 1 based on the spatial distribution of surficial material types as shown on Figure 3.4. Recharge to glacial till materials was differentiated into three zones based on elevation (lower, middle and higher elevation) in order to represent the estimated influence of orographic effects on precipitation and recharge (KP 2013f). Recharge values within the till zone of the model were initially assigned proportional to the increase in net precipitation available for recharge and run off estimated by the results of watershed modelling (KP 2013f). Recharge to the lower till zone was subsequently assigned a lower value to reduce flooding within lower elevations of the model.

Initial groundwater recharge values were assigned based on surficial material type and watershed modelling (KP 2013f) which suggested that approximately 10% of annual precipitation (an areal weighted average of 70 mm) provides recharge to groundwater. These initial values were varied within an expected range during calibration of the baseline model. The calibrated groundwater recharge values assigned to each zone of the model are summarized in Table 3.2.



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 6		Glaciofluvial: Channel	1.E-04	1.E-04
Zone 2		Glaciofluvial: Kame	1.E-05	1.E-05
Zone 1		Glacial Till	2.E-07	2.E-07
Zone 4		Glaciolacustrine	1.E-07	2.E-08
Zone 12		Kame/Till Deposit	9.E-06	2.E-07
Zone 11		Bedrock Outcrops	1.E-07	1.E-07

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE GROUND SURFACE ELEVATION (masl) AS DEFINED IN MODEL LAYER 1.
2. THE GLACIOLACUSTRINE AND GLACIOFLUVIAL KAME/TILL DEPOSITS HAVE ANISOTROPY RATIOS (Kh/Kv) OF 5 AND 45, RESPECTIVELY.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYER 1)

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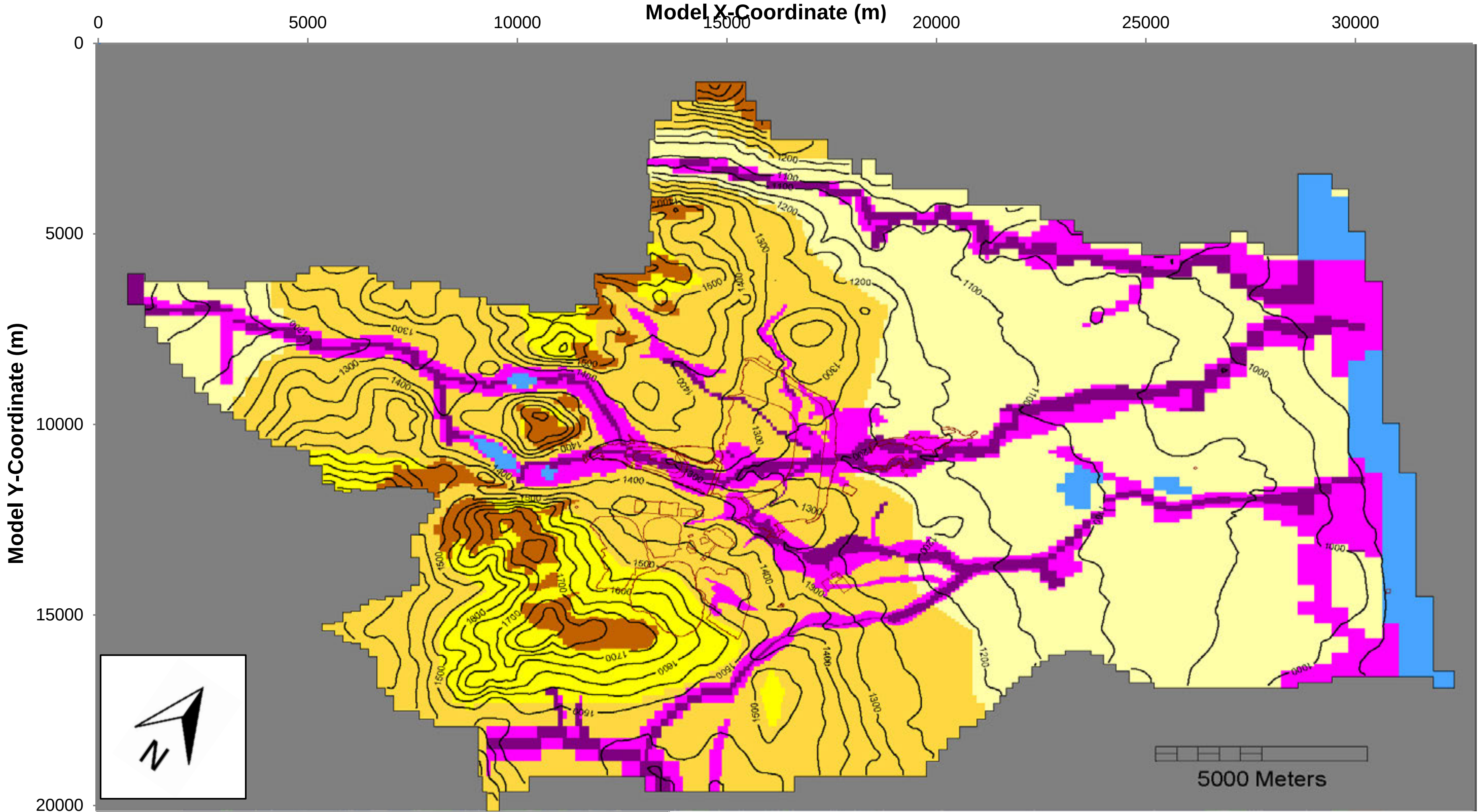
REF. NO. 13

FIGURE 3.3

REV 0



Zone	Color	Material Type	Groundwater Recharge (mm/year)
Zone 1		Till - Lower	22
Zone 2		Till - Mid	40
Zone 3		Till -Upper	80
Zone 4		Lacustrine	22
Zone 5		Bedrock Outcrop	80
Zone 6		Glaciofluvial - Channel	190
Zone 7		Glaciofluvial - Kame	190

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ARE OF GROUND SURFACE ELEVATION (masl) AS DEFINED IN MODEL LAYER 1.

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NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
GROUNDWATER RECHARGE ZONES (LAYER 1)

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P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 3.4

REV 0

Table 3.2 Calibrated Recharge Values by Zone

Recharge Zone	Unit	Area (km^2)	Recharge (mm/yr)
1	Till - Lower	117.2	22
2	Till - Mid	127.1	40
3	Till - Upper	21.4	80
4	Lacustrine	20.4	22
5	Bedrock Outcrop	12.9	80
6	Glaciofluvial - Channel	3.5	190
7	Glaciofluvial - Kame	44.1	190

3.5 BASELINE MODEL CALIBRATION

The baseline model was calibrated using an iterative trial-and-error method in order to refine the match between modelled and observed pre-development conditions at the site. Hydraulic conductivity and groundwater recharge rates were varied during the calibration process to achieve the best match to hydraulic head measurements in monitoring wells and vibrating wire piezometers as well as to estimates of average annual baseflows within the study area. Locations of the groundwater elevation and baseflow calibration targets are shown on Figure 3.1.

The PCG-5 solver was used to solve the groundwater flow equations in MODFLOW-SURFACT, with the following criteria:

- Number of outer iterations: 300
- Number of inner iterations: 600
- Maximum orthogonalizations: 10, and
- Head change criterion: 0.001 meters.

3.5.1 Hydraulic Head Targets

The baseline model was calibrated to hydraulic heads recorded by manual measurement or vibrating wire piezometers (VWPs) at 40 monitoring locations across the project area. Measured hydraulic heads at 18 monitoring wells were based on the average of three available manual groundwater level measurements (September 2012; April and July 2013). These measurements are considered to be generally representative of average annual conditions. The measured hydraulic heads at 22 VWPs represent recorded piezometric elevations in March 2013. Since these measurements represent baseflow conditions, measured hydraulic heads at VWPs may be slightly lower than the annual average. A summary of the measured and simulated hydraulic heads at the model calibration targets is provided in Table 3.3 and on Figure 3.5.

Simulated hydraulic heads differ from observed by less than 10 m at all locations within the model except within the deposit area. The greatest discrepancies in the deposit area are at observation well PH12-4-3. An inclined fault is mapped passing through observation well PH12-4-3. The fault was specified within the model to be vertical and not dipping. Simulated hydraulic heads within the lower portion of the observation well, at VWP1, VWP2 and VWP3, are within 5 m from the observed value. Monitoring well MW12-11D and observation well PH12-3-2 are located south of the deposit and report differences in hydraulic head of 12 to 15 m from recorded. The goal of model calibration was not to reproduce the hydraulic head variation at all observation points within the deposit area, but to obtain a general representation of hydrogeologic conditions. The match to hydraulic heads within the deposit area is considered suitable for the purpose of the model.

3.5.2 Baseflow Targets

The numerical model was calibrated to baseflow targets at 14 locations along Turtle Creek, Davidson Creek, Creek 661 and Creek 705 as shown on Figure 3.1. The baseflow values were derived from watershed modelling conducted for the Project (KP 2013f) and represent estimates of average annual baseflows.

Estimated baseflows at the outlets of Davidson Creek and Turtle Creek differ by less than 5 percent from baseflows estimated using the watershed model. Baseflows within Creek 705 vary by over 40 percent from the watershed model estimates. Limited data was available to calibrate Creek 705 streamflows in the watershed model and Creek 705 baseflows estimates are considered to be less certain.

Table 3.3 Observed and Simulated Hydraulic Heads

Well I.D.	Measured Groundwater Elevation (masl)	Simulated Groundwater Elevation (masl)	Residual Head (m)
MW12-02D	1,401	1,405	-4.1
MW12-02S	1,406	1,405	0.8
MW12-04D	1,556	1,565	-8.9
MW12-05D	1,374	1,378	-4.1
MW12-05S	1,373	1,377	-4.4
MW12-06S	1,258	1,261	-2.9
MW12-07D	1,203	1,208	-4.7
MW12-07S	1,204	1,208	-4.3
MW12-08D	1,160	1,156	4.3
MW12-08S	1,158	1,156	1.8
MW12-09S	1,144	1,142	1.8
MW12-10D	1,657	1,663	-5.6
MW12-11D	1,668	1,656	11.9
MW12-11S	1,668	1,659	9.3
MW12-12D	1,243	1,237	6.3
MW12-12S	1,243	1,237	6.4
MW12-13D	1,368	1,365	3.3
MW12-13S	1,359	1,365	-5.5
PH13-1-1_VWP1	1,524	1,514	9.8
PH13-1-1_VWP2	1,525	1,514	10.5
PH13-1-3_VWP1	1,517	1,513	3.6
PH13-1-3_VWP2	1,517	1,513	4.2
PH13-1-3_VWP3	1,518	1,513	4.7
PH12-2-1_VWP2	1,514	1,514	-0.3
PH12-2-1_VWP3	1,518	1,514	3.5
PH12-3-2_VWP1	1,624	1,622	1.8
PH12-3-2_VWP2	1,629	1,622	7.7
PH12-3-2_VWP3	1,633	1,621	12.3
PH12-3-2_VWP4	1,633	1,621	12.0
PH12-3-2_VWP5	1,634	1,619	15.4
PH12-4-2_VWP1	1,611	1,616	-5.4
PH12-4-2_VWP2	1,612	1,616	-4.1
PH12-4-2_VWP3	1,616	1,619	-2.5
PH12-4-2_VWP4	1,617	1,620	-2.7
PH12-4-2_VWP5	1,619	1,620	-1.4
PH12-4-3_VWP1	1,525	1,520	4.6
PH12-4-3_VWP2	1,524	1,520	3.8
PH12-4-3_VWP3	1,535	1,532	2.5
PH12-4-3_VWP4	1,597	1,559	38.4
PH12-4-3_VWP5	1,610	1,559	51.2
		RMSE (m)	**11.9**
		NRMSE	**2%**

NOTES:

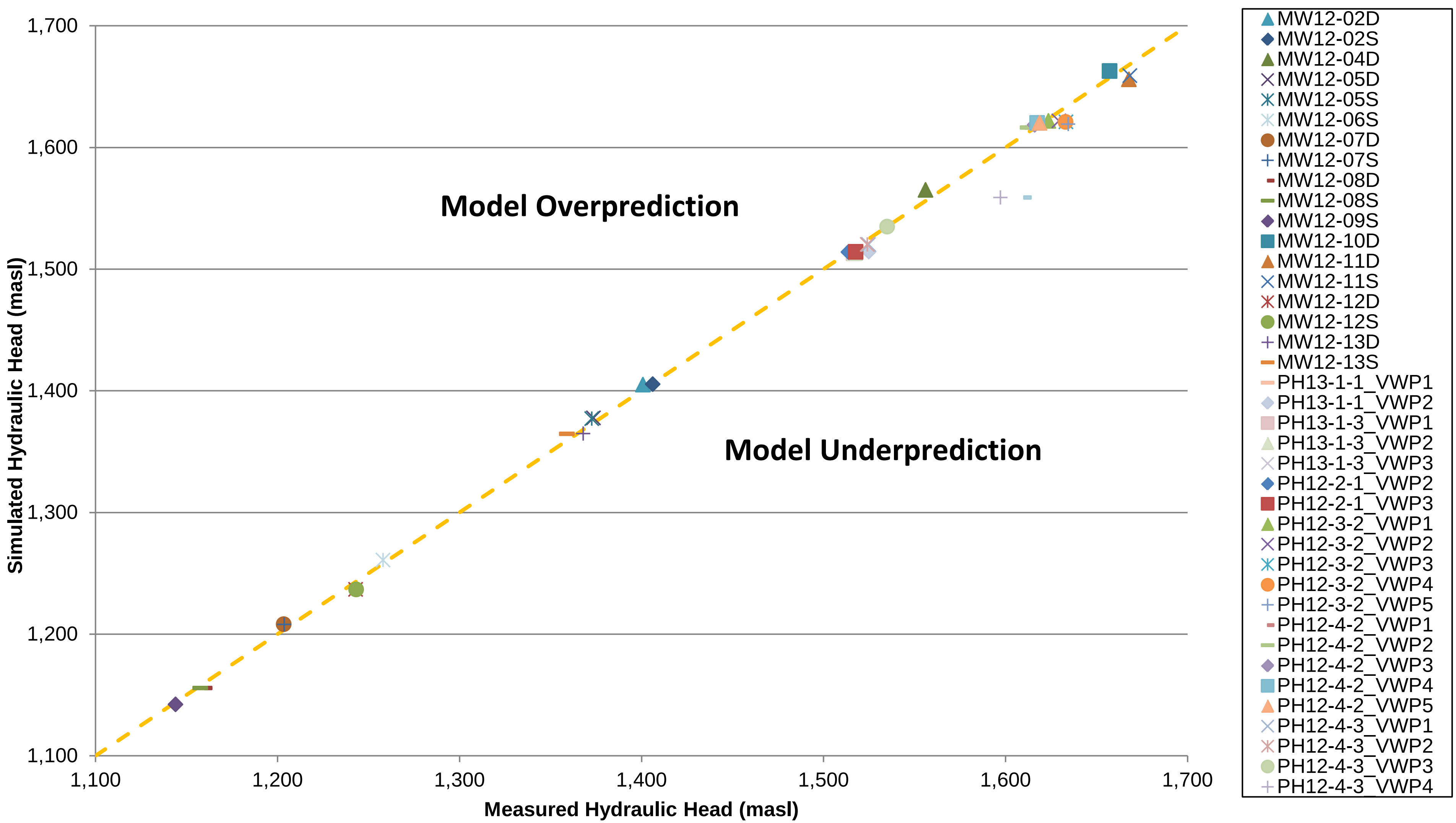
1. THE VALUES LISTED AS MEASURED GROUNDWATER ELEVATIONS AT MONITORING WELLS (MW) ARE AVERAGE ELEVATIONS OVER THE PERIOD OF AVAILABLE MEASURED DATA AND ARE MEASUREMENTS FROM MARCH 2013 AT VWPS INSTALLED IN OBSERVATION WELLS (‘PH’ SERIES).
2. RMSE = ROOT MEAN SQUARE ERROR; NRMSE = NORMALIZED ROOT MEAN SQUARE ERROR.

Table 3.4 Baseflow Calibration Results

Drainage	Hydrology Station	MODFLOW Model (Simulated)	Watershed Model (Target)	RPD
		(m^3/d)	(m^3/d)	(%)
Davidson Creek	11-DC	978	0	-
	H2	8,967	9,325	-4
	H4B	14,193	12,569	12
	4-DC	15,425	12,657	20
	1-DC	**15,611**	**15,008**	**4**
Creek 661	1-505659	3,134	1082	97
	H1	2,194	405	138
	1-661	**6,268**	**7,692**	**-20**
Turtle Creek	H3	796	593	29
	H6	7,204	8,940	-22
	1-TC	**10,929**	**11,386**	**-4**
Creek 705	4-705	939	428	75
	H7	5,279	2,603	68
	1-705	**6,356**	**3,969**	**46**

NOTES:

1. WATERSHED MODEL VALUES OBTAINED FROM WATERSHED MODELLING REPORT (KP 2013f).
2. BOLD INDICATES THE DOWNSTREAM MOST STATION ON EACH DRAINAGE COURSE.
3. RPD = RELATIVE PERCENT DIFFERENCE.



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NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
OBSERVED VS. SIMULATED HYDRAULIC HEAD

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P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 3.5

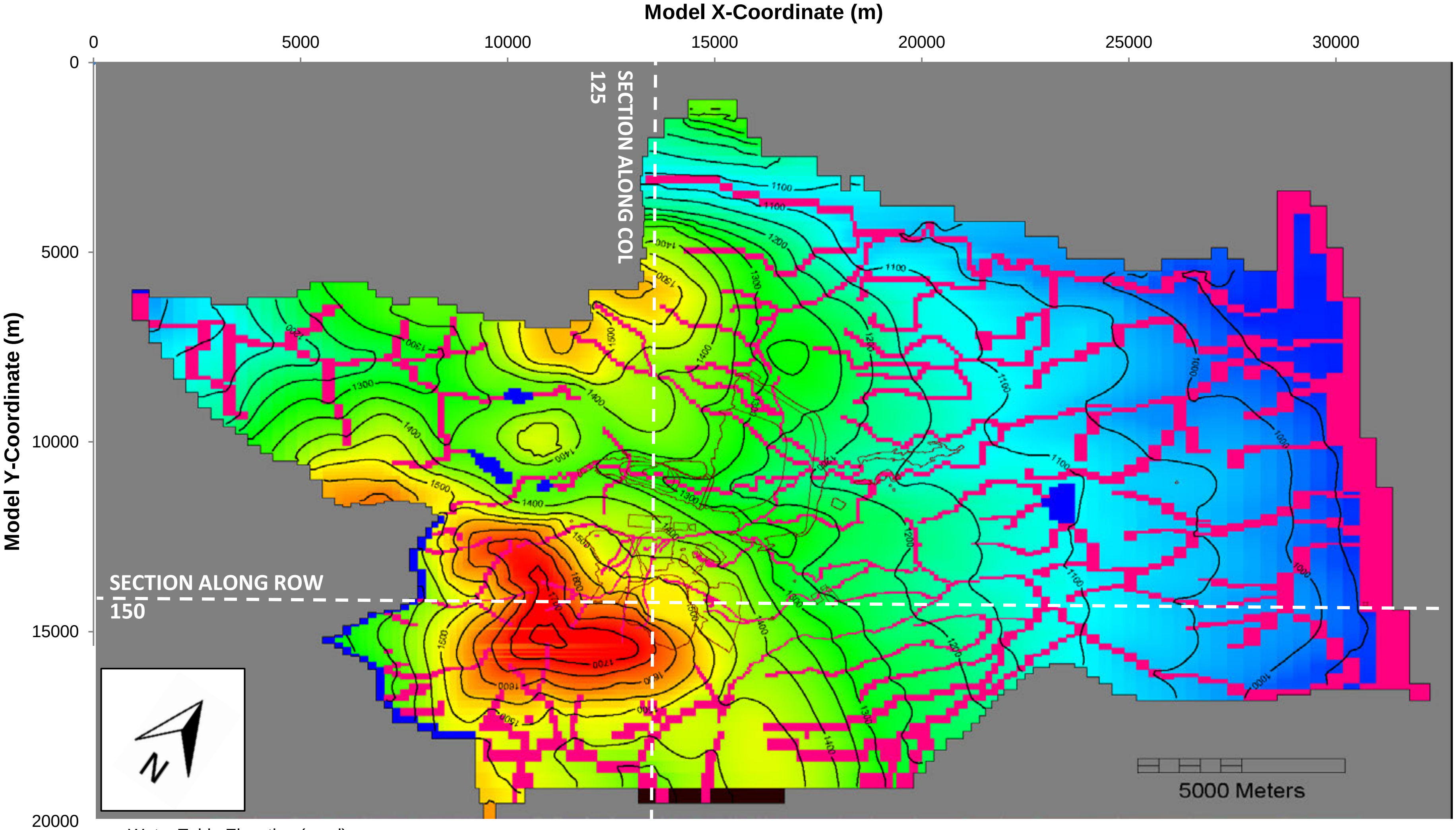
REV 0

3.6 BASELINE MODEL RESULTS

A simulated water table contour map for the calibrated baseline model is presented in Figure 3.6. The simulated water table generally mimics the surface topography with groundwater elevations ranging from 1,760 masl at Mt. Davidson to approximately 920 masl near the outlet of Chedakuz Creek. Cross-sections through the deposit area along model row 150 and column 125 are presented on Figure 3.7. The cross sections illustrate that groundwater recharge occurs within topographic highs and groundwater flows downslope to discharge areas located in creek valleys.

From the steady-state model, average annual groundwater discharge to tributaries of Blackwater River included in the model domain was 5,585 m^3/d (65 L/s). An additional 225 m^3/d (3 L/s) of groundwater was predicted to flow in the subsurface across the model boundary to the Blackwater River catchment.

Streams were simulated in the model using drain boundary conditions. Drains allow water to discharge from the model domain but do not allow surface water to infiltrate into the model domain. The potential for losing stream conditions exists within the headwaters of streams, along isolated stream segments where the width of glaciofluvial channel sediments increases, and at the downslope extent of the bench west of Tatelkuz Lake based on the results of the simulated vertical direction of flux in modelled stream cells. Where the potential for surface water infiltration exists due to an increase in the width of glaciofluvial channel sediments, the infiltrated water is expected to discharge back into the stream at a location downstream where the width channel deposit narrows. Representing streams with drains in this model is considered suitable for the scale of the regional study.



Water Table Elevation (masl)
1800
1700
1600
1500
1400
1300
1200
1100
1000
900

Boundary Conditions

- Constant Head
- Drain
- GHB
- Flow Barrier
- No Flow

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ARE OF MODEL SIMULATED WATER TABLE ELEVATION (masl).
2. PROPOSED MINE FACILITY OUTLINES ARE SHOWN FOR SPATIAL REFERENCE ONLY AND ARE NOT SIMULATED IN THE BASELINE MODEL.

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BLACKWATER GOLD PROJECT

BASELINE MODEL
SIMULATED WATER TABLE CONTOUR MAP

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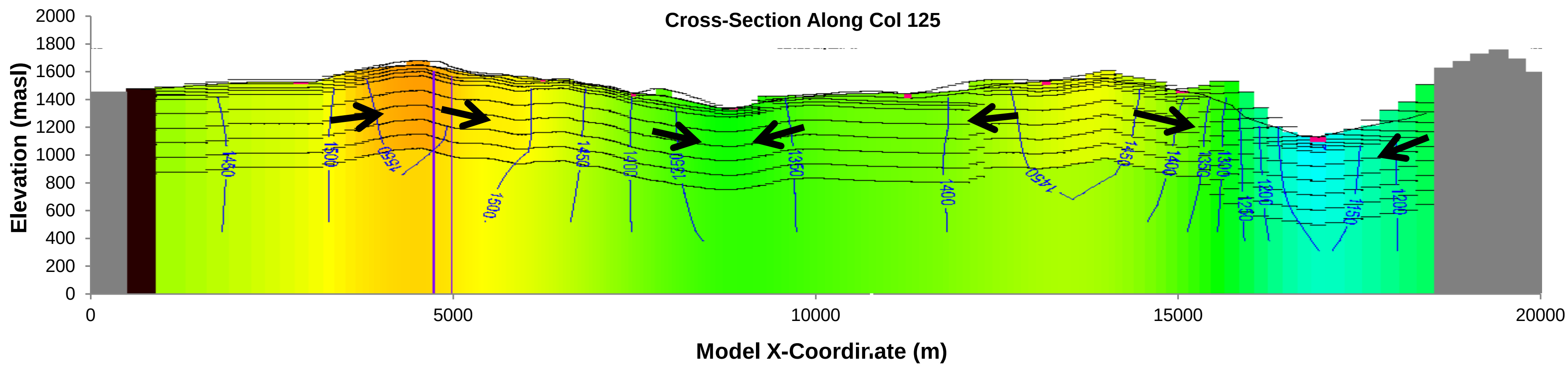
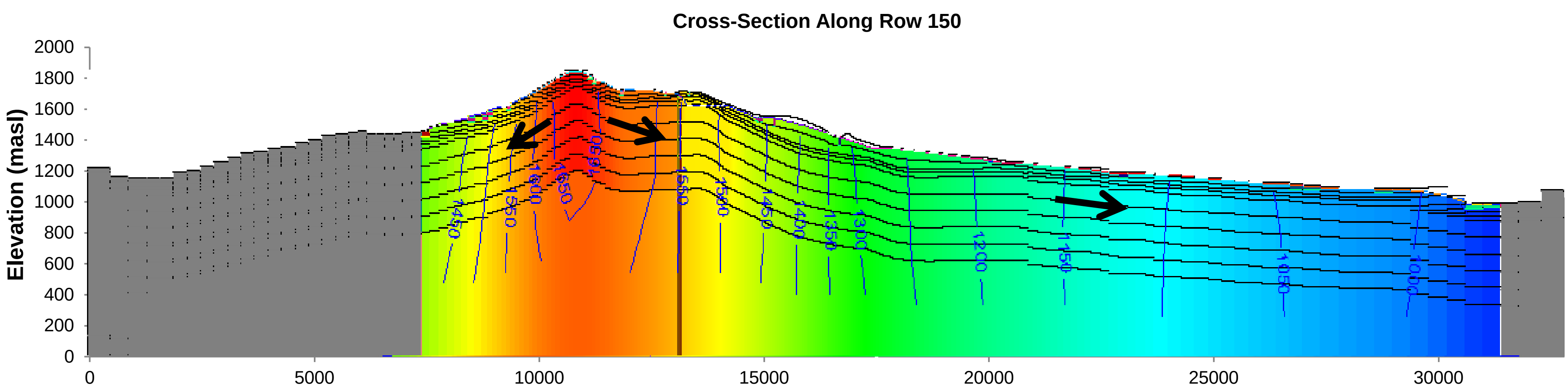
REF. NO. 13

FIGURE 3.6

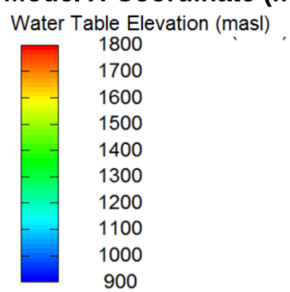
REV 0





NOTES:

1. CONTOURS REPRESENT HYDRAULIC HEAD EQUIPOTENTIALS.
2. ARROWS INDICATE GROUNDWATER FLOW DIRECTION BASED ON THE SLOPE OF THE EQUPOTENTIAL LINES.



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NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
SIMULATED HYDRAULIC HEAD DISTRIBUTION
(CROSS-SECTION)

Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 3.7

REV 0

4 – MINE OPERATIONS SIMULATION

4.1 OVERVIEW

A transient Operations Model was developed to assess potential effects of the Blackwater Project on pre-development hydrogeological conditions. The Operations Model was developed from the calibrated baseline groundwater model using MODFLOW-SURFACT and Groundwater Vistas.

The objectives of the operations groundwater modelling were to:

- Characterize potential effects of mine facilities on baseline hydrogeology during the operational period
- Estimate groundwater inflow rates to the open pit on a yearly basis, and
- Delineate the groundwater capture zone surrounding the open pit at its maximum extent.

The results of the transient operations modelling along with the methodology and assumptions used to develop the models are presented in the sections that follow.

4.2 PROJECT DESCRIPTION

The Project timeline includes two years of pre-production (Year -2) and 16.2 years of operations (Year 1 to 17.2) at a nominal milling rate of 60,000 dry metric tonnes per day. Closure is predicted to take an additional 18 years after milling is complete, defined as the time until the TSF discharges to Davidson Creek. The Pit Lake is estimated to fill to the spillway elevation 20 year after the end of operational dewatering. Key mine infrastructure considered during numerical model development includes the following components:

- Open Pit
- Tailings Storage Facility (TSF), which consists of the TSF Site C and TSF Site D facilities
- Non-Acid Generating (NAG) waste rock/overburden dumps
- Low Grade Ore (LGO) stockpile
- Environmental Control Dam (ECD) and groundwater interception trenches
- Seepage collection ditches
- Freshwater Reservoir and supply system, and
- Plant site.

Drawings showing the mine General Arrangement at the end of operations (Year 17), closure (Year 20), and post-closure are provided in Appendix C.

The TSF has been designed to permanently store tailings, potentially acid generating (PAG) waste rock, and non-acid generating waste rock (NAG) generated during the operation of the mine. TSF Site C will be constructed first to provide storage capacity for start-up of the process plant. The Site C facility has been designed to contain the first two years of tailings and PAG waste rock. TSF Site D will be constructed to manage tailings and mine waste for the remainder of the operational life of the project (Years 3 to 17). The TSF facility consists of three zoned water-retaining earth-rockfill dams referred to as the Site C Main Dam, Site C West Dam, and Site D Main Dam. Design of each TSF includes a tailings beach and supernatant water pond. A low-permeability core zone within each embankment will extend to low-permeability subgrade (LPS) materials at depth.

NAG waste rock and overburden will be combined and placed in two permanent engineered dumps adjacent to the east and west sides of the open pit (east dump and west dump). The LGO stockpile will be placed adjacent to the open pit during operations and will be reclaimed by the end of mine operations (Year 17).

An Environmental Control Dam (ECD) and groundwater interception trenches are planned approximately 1 km downstream of the Site D Main Dam to recover potential seepage from the TSF. One seepage interception trench will be constructed on each side of Davidson Creek, which will be excavated through the surficial sand and gravel terraces to LPS downstream of the Site D Main Dam. Seepage to the collection trenches will report to the ECD pond. Recovered water will be pumped to TSF Site D and the collection pond will be maintained in a dewatered condition to the maximum extent practical.

Engineered drainage ditches will be constructed downslope of the east and west waste rock dumps and LGO stockpile to collect surface runoff and shallow groundwater seepage from facilities. Drainage ditches will direct water to the TSF.

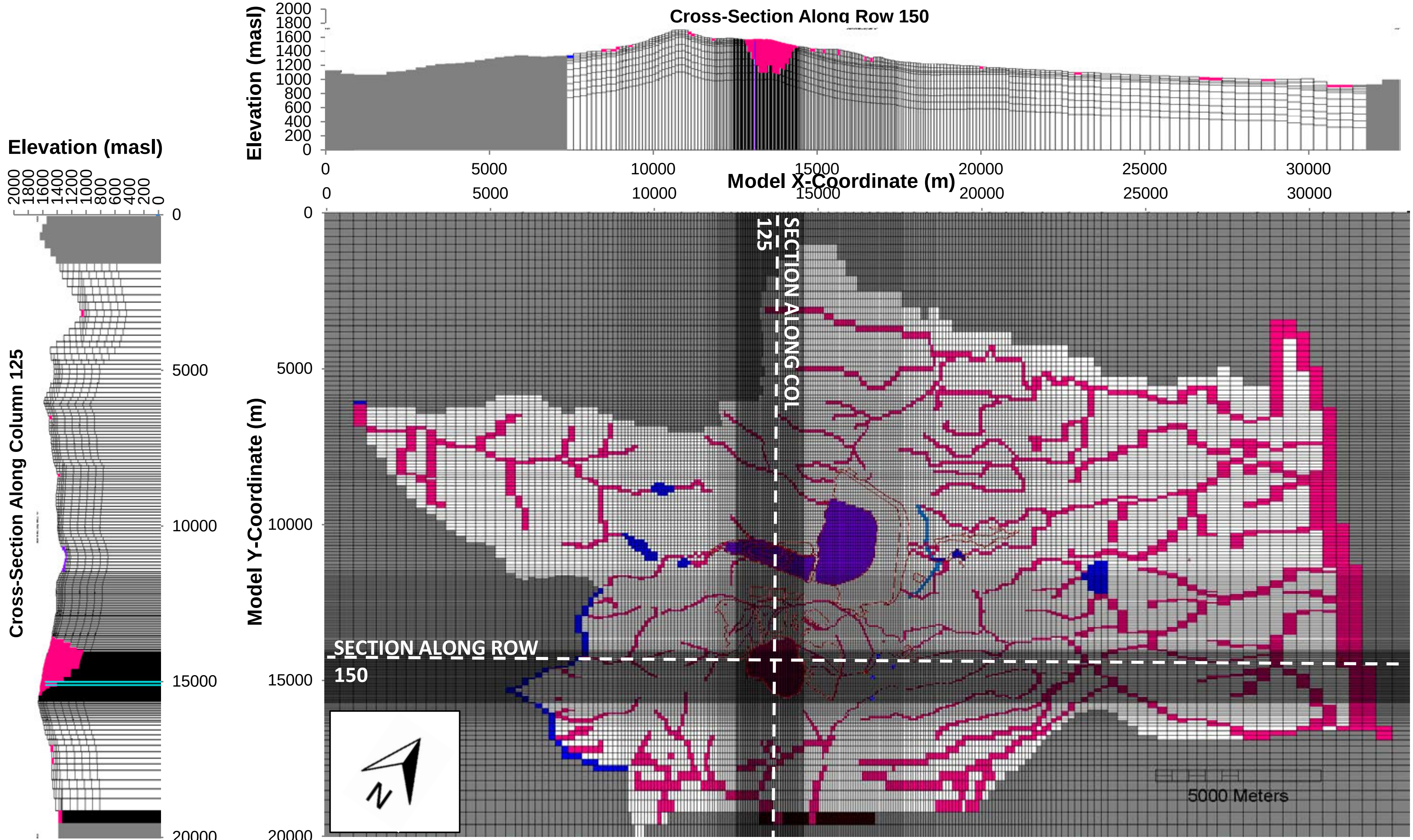
Fresh water for the project will be sourced from Tatelkuz Lake, which is located approximately 20 km northeast of the mine site. Freshwater for streamflow mitigation in Davidson Creek will be stored in a Freshwater Reservoir located approximately 800 m downstream of the ECD.

4.3 MODEL DISCRETIZATION

4.3.1 Model Grid, Initial Heads and Stress Periods

The model geometry, layering and numerical grid remained unchanged from the Baseline Model. The model grid and model layers for the Operations Model are shown on Figure 4.1. Hydraulic heads from the calibrated Baseline Model were set as the initial heads for the Operations Model.

The Operations Model was run for 15 years, corresponding to the period of time that the open pit will be actively de-watered (Year -2 to Year 13). The open pit will reach its maximum depth in Year 13. The model duration was subdivided into 15 stress periods, each of one year length. The open pit excavation was advanced and average annual groundwater inflows to the pit were estimated at the end of each (annual) stress period.



Boundary Conditions

- Constant Head
- River
- Drain
- GHB
- Flow Barrier
- No Flow

NOTES:

1. AS INDICATED BY THE NORTH ARROW, THE MODEL GRID IS ROTATED FROM TRUE NORTH SUCH THAT COLUMNS ALIGN WITH AN AZIMUTH OF 325 DEGREES.

2. THE ECD SYSTEM IS REPRESENTED WITH DRAIN BOUNDARY CONDITIONS AND IS HIGHLIGHTED IN LIGHT BLUE DOWNSTREAM FROM THE TSF MAIN EMBANKMENT.

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NEW GOLD INC.

BLACKWATER GOLD PROJECT

OPERATIONS MODEL
NUMERICAL GRID, LAYERS AND BOUNDARY CONDITIONS (LAYER 1)

Knight Piésold CONSULTING

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VA101-457/6-13	13

FIGURE 4.1 REV 0

4.3.2 Hydraulic Conductivity

Additional hydraulic conductivity zones were assigned to the Operations Model to define mine facilities in model Layer 1. A hydraulic conductivity value of $1x10^{-7}$ m/s was assigned to cells representing the seepage cut-off for the TSF embankments. Cells representing embankments of the Environmental Control Dam and the Freshwater Reservoir dam were assigned a hydraulic conductivity of $1x10^{-7}$ m/s. The seepage interception trenches of the ECD were represented by assigning a hydraulic conductivity of $1x10^{-5}$ m/s to grid cells in model Layer 1 within the planned footprint of the trenches.

Hydraulic conductivity values assigned to model Layers 2 through 10 remained unchanged from the Baseline Model.

4.3.3 Storage and Specific Yield

Specific storage values were assigned to the transient model based on the range of accepted values (Freeze and Cherry, 1979; Heath 1983) and the results of two pumping tests (KP 2013h). Storage parameters assigned to all units are provided in Table 3.1.

4.3.4 Boundary Conditions

Boundary conditions assigned to the Operations Model remained unchanged from the Baseline Model except where mine facilities are proposed. Details on the boundary conditions assigned to each proposed facility are provided below. Boundary conditions assigned to Layer 1 of the Operations Model are shown on Figure 4.1.

4.3.4.1 Tailings Storage Facility (TSF)

TSF Ponds C and D were represented using river boundary (RIV) cells defined in model Layer 1 within each pond footprint. River boundaries allow inflow to or outflow from the model domain based on the difference between simulated hydraulic head and a user defined stage elevation. Stage elevations of 1,343 masl and 1,334 masl were assigned to the RIV cells of TSF Ponds C and D, respectively, as defined by supernatant pond elevation. TSF Pond C RIV cells are activated at the start of stress period 2 (Year -1) and Pond D RIV cells become active at the start of stress period 3 (Year 1). Both ponds remain active through the end of stress period 15 (Year 13).

4.3.4.2 Open Pit

Drain cells were specified in the open pit area of the model to simulate operational dewatering during active mining. Operational pit shells for Years -2 through 13 were used to assign drain cells within model Layers 1 through 8 in each stress period. For each stress period, drain stage elevations were set equal to the elevation of the pit shell at a given cell location. Drain conductance was assigned a value high enough to allow water to drain freely into the open pit while still minimizing mass balance error and preventing convergence issues (5 m^2/day).

4.3.4.3 Environmental Control Dam and Seepage Interception Trenches

The ECD was specified within the model using a constant head boundary condition equivalent to the planned water elevation. The seepage interception trenches were represented using drain cells specified within model Layer 1. Drain cells were assigned a drain elevation equivalent to the bottom of the grid cell elevation. Conductance of the drain cells was calculated using the hydraulic conductivity value assigned to the interception trenches (1x10^{-5} m/s).

4.3.4.4 Camp Groundwater Wells

Groundwater extraction wells that will supply potable water to the mine construction and operations camp were represented in the Operations Model using the analytical Fracture Wells (FWL4) Package. Two extraction wells were included in the model. The well locations and screened intervals were obtained from well drillers' reports (Western Water Associates Ltd 2013). Pumping rates were assigned to the wells to meet the estimated 382 m^3/d (70 gpm) water requirement to supply the camp during the construction phase of the project. The water demand during construction exceeds the estimated requirements during operations (127 m^3/d). Well data and the pumping rates used in the model are summarized in Table 4.1.

Table 4.1 Groundwater Extraction Well Details

Well	Pumping Rate		Elevation	Screen Depth	Bottom of Well	Layers Screened
	(gpm)	(m^3/d)	(masl)	(m)	(masl)	(-)
TW13-01	40	218	1,402	27	1,375	1
TW13-02	30	164	1,333	58	1,275	1

4.3.4.5 Groundwater Recharge

The spatial distribution and rate of groundwater recharge for areas undisturbed by proposed mine facilities remained unchanged from the baseline model. Changes to the specified groundwater recharge boundary condition in the model were made for the following mine components:

- East and west dumps
- Low-Grade Ore Stockpile
- Tailings beach and embankments, and
- Tailings Ponds C and D.

A recharge rate of 130 mm/year was applied to the tailings beach and embankment in the Mine Operations model. A recharge rate of 60 mm/yr was assigned to the Low-Grade Ore Stockpile and the east and west dumps. No recharge was assigned to the TSF pond footprints as recharge to the pond area is controlled by the RIV cells of the supernatant ponds.

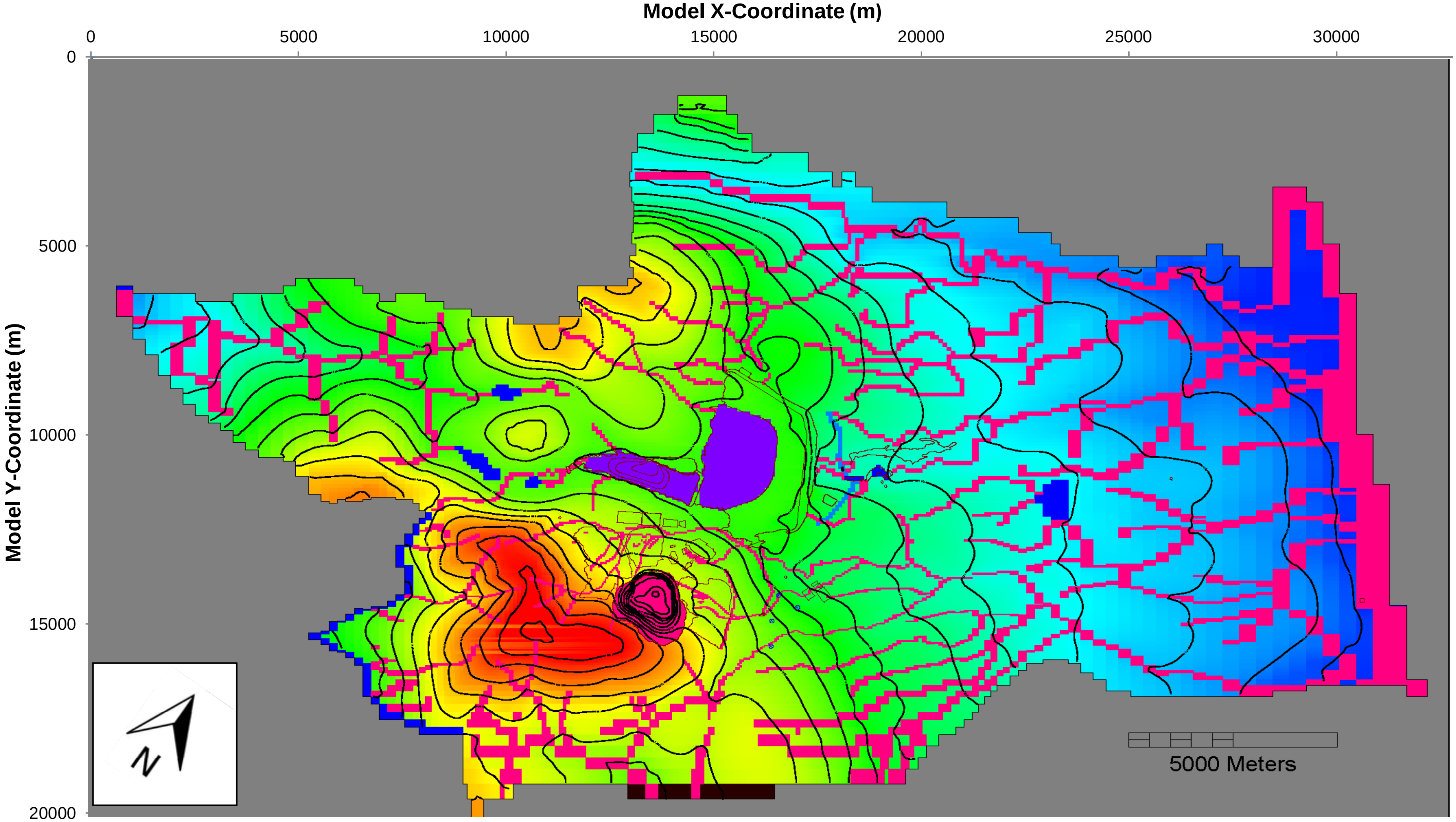
4.4 SIMULATION RESULTS

The Operations Model simulated water table contours are provided on Figure 4.2, which represents the predicted water table corresponding to the end of active mine dewatering (end of Year 13). Groundwater contours are depressed around the open pit. The predicted groundwater zone of influence defining the water table drawdown around the open pit is shown on Figure 4.3. Water table elevations within the open pit footprint are expected to be drawn down during Year 13 by a maximum of 350 m from pre-development conditions. The 1 m drawdown contour extends towards the Blackwater River a distance of about 600 m from the southeast edge of the pit rim. The drawdown zone of influence is irregularly shaped and is elongated toward the topographic highs of Mt. Davidson.

Groundwater drawdown was predicted around the camp water supply wells associated with groundwater extraction through the operational period. A maximum drawdown of approximately 5 m was expected immediately adjacent to the TW13-01 and TW13-02 well locations, as shown on Figure 4.2. Groundwater drawdown associated with the camp wells was predicted to intersect with the 1 m drawdown zone of influence of the open pit.

From model results, reductions in groundwater flow contributing to the Blackwater River catchment were predicted to be negligible at the end of active dewatering. Groundwater contribution (baseflow) to tributaries of Blackwater River included in the model were 5,585 m^3/d in baseline conditions. Reductions in average annual baseflow contribution to these Blackwater River tributary streams were estimated to be 20 m^3/d (0.25 L/s), which is equivalent to a 0.2% decrease in average annual baseflows to Blackwater River tributaries in the model. Groundwater flows leaving the model domain toward Blackwater River via the General Head Boundary remained unchanged from baseline conditions.

Simulated groundwater inflows to the open pit during each year of operations are provided on Figure 4.4. Groundwater inflow rates are plotted for the results of the Operations Model along with estimates based on an analytical calculation presented in the Pit Water Management Report (KP 2013h). The maximum groundwater inflow rate is almost 60 L/s with an average inflow for Year 3 through Year 13 of approximately 50 L/s. The analytical calculation was used to design the dewatering system and includes groundwater pumping rates required to achieve slope depressurization during the first few years of pit dewatering. Predicted groundwater inflows to the open pit using the numerical groundwater model do not consider requirements for slope depressurization.



Water Table Elevation (masl)

1800
1700
1600
1500
1400
1300
1200
1100
1000
900

Boundary Conditions

- Constant Head
- River
- Drain
- GHB

NOTES:

1. CONTOUR INDICATE MODEL SIMULATED WATER TABLE ELEVATION (masl).

2. THE ECD SYSTEM (DRAIN BOUNDARY CONDITIONS) ARE HIGHLIGHTED IN LIGHT BLUE DOWNSTREAM FROM THE MAIN TSF EMBANKMENT.

3. EMBANKMENT DRAINS ARE NOT ASSIGNED WITHIN THE FOOTPRINTS OF THE TSF EMBANKMENTS.

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NEW GOLD INC.

BLACKWATER GOLD PROJECT

OPERATIONS MODEL
GROUNDWATER ELEVATION MAP
(YEAR 13)

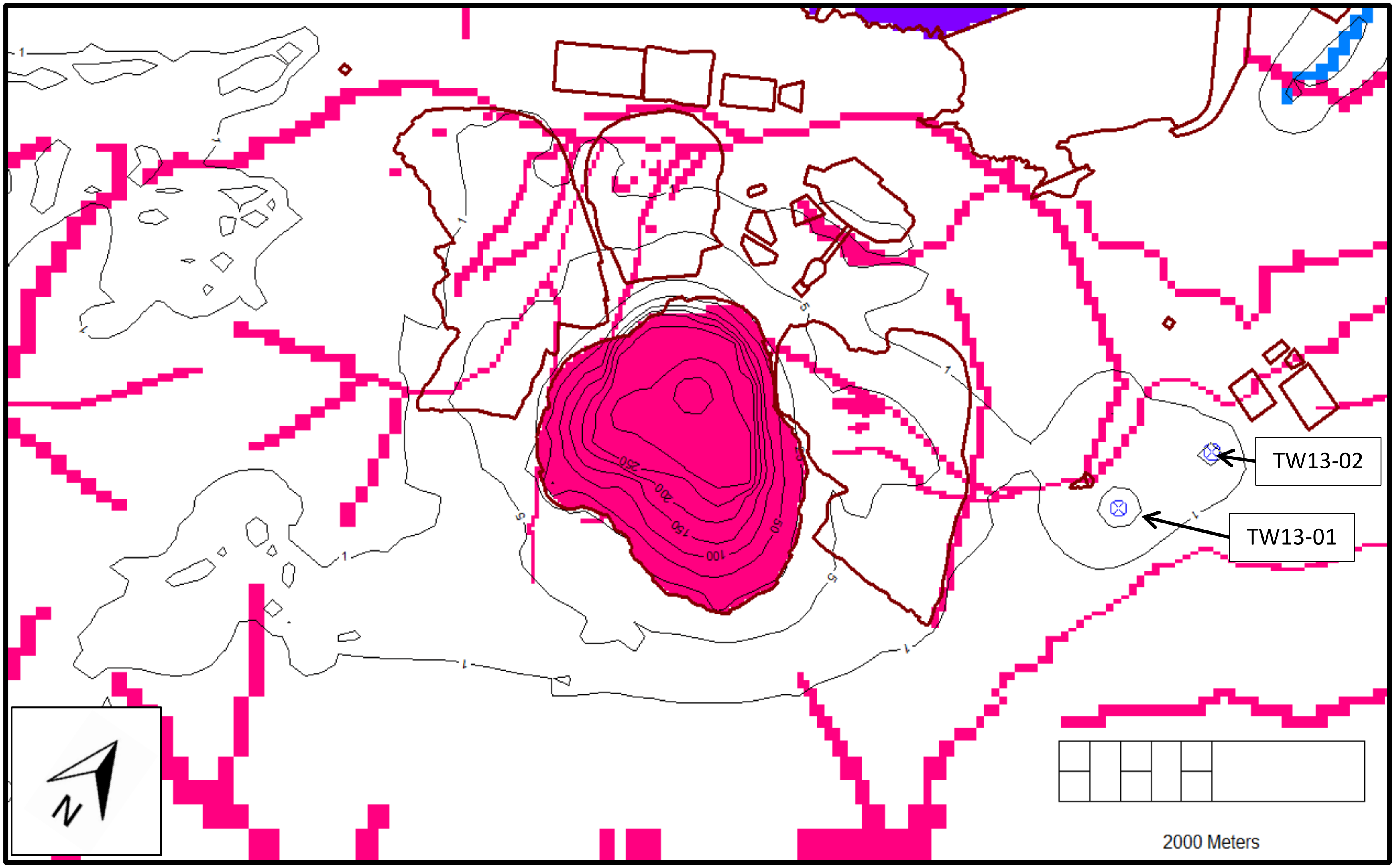
Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 4.2

REV 0



Boundary Conditions

- Constant Head
- River
- Drain
- GHB
- Flow Barrier
- No Flow

Groundwater Extraction Well

NOTES:

1. CONTOURS INDICATE PREDICTED WATER TABLE DRAWDOWN (meters) FROM PRE-DEVELOPMENT CONDITIONS.

NEW GOLD INC.

BLACKWATER GOLD PROJECT

OPERATIONS MODEL
PREDICTED OPEN PIT DRAWDOWN
(YEAR 13)

Knight Piésold CONSULTING

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VA101-457/6-13	13

FIGURE 4.3 REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
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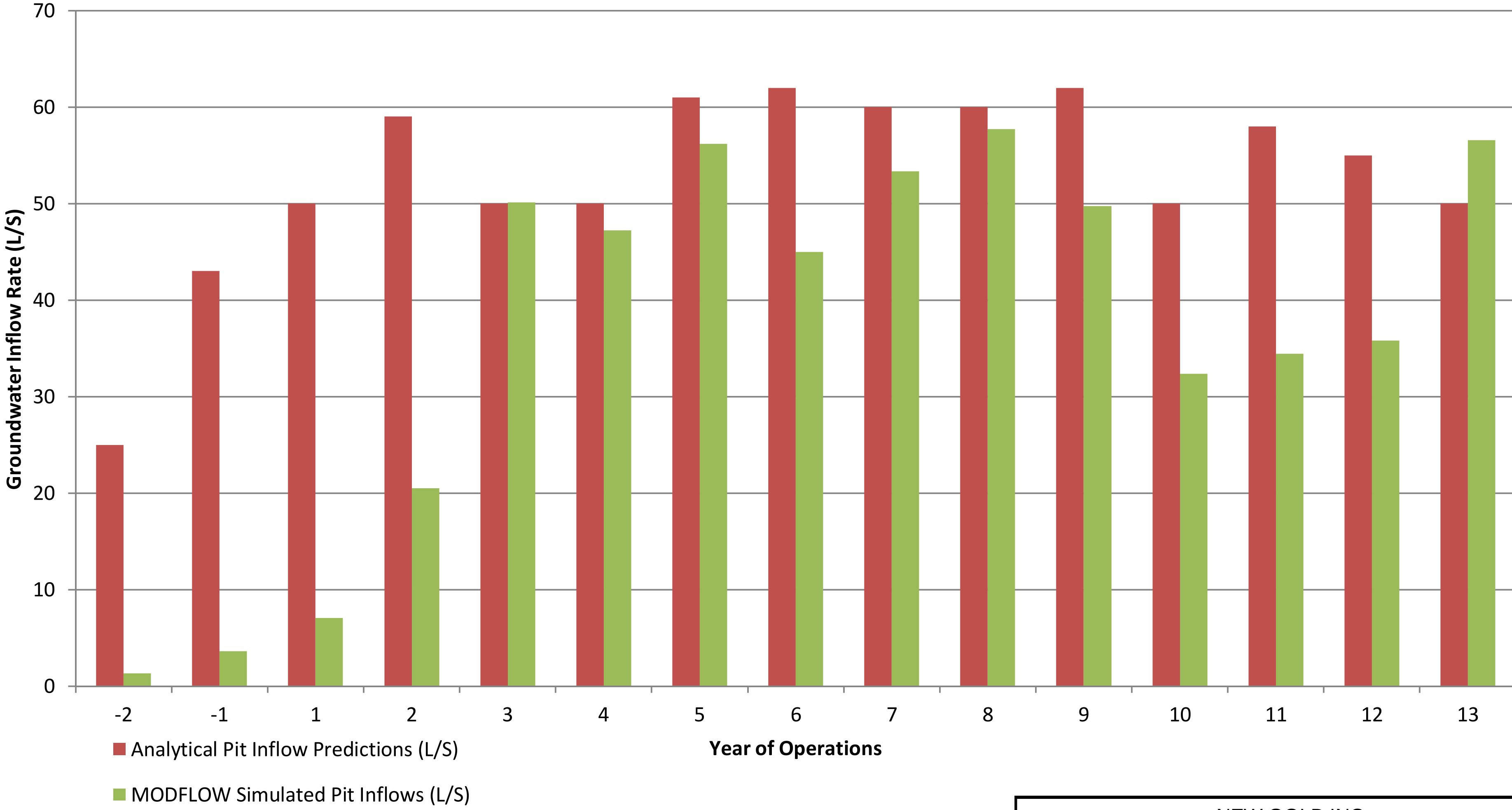

NOTES:

1. PIT INFLOW RATES PREDICTED FOR YEARS -2 THROUGH 2 USING THE ANALYTICAL METHOD ARE HIGHER THAN THOSE PREDICTED USING THE NUMERICAL MODEL. THE ANALYTICAL METHOD CONSIDERS THE GROUNDWATER PUMPING REQUIREMENTS FOR PIT DEWATERING AND PIT WALL DEPRESSURIZATION. THE NUMERICAL MODEL SIMULATIONS DO NOT INCLUDE PUMPING REQUIREMENTS TO ACHIEVE DEPRESSURIZATION.

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NEW GOLD INC.

BLACKWATER GOLD PROJECT

OPERATIONS MODEL
PREDICTED PIT INFLOW RATES: NUMERICAL MODEL AND ANALYTICAL CALCULATION

Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 4.4

REV 0

5 – CLOSURE/POST-CLOSURE SIMULATION

5.1 OVERVIEW

A transient Closure/Post-Closure Model was developed for the Project in order to simulate filling of the open pit during the closure phase of mining. The pit void will fill with water contributed by groundwater inflows and water pumped from the TSF D Pond.

The Closure/Post-Closure Model was developed using MODFLOW-SURFACT and Groundwater Vistas. The model was created by modifying the transient Operations Model to represent the pit as a void capable of filling with water. The results of the transient closure/post-closure modelling along with the methodology and assumptions used to develop the models are presented in the sections that follow.

5.2 MODEL DEFINITION

5.2.1 Model Geometry and Grid

The numerical model geometry, layering and grid remained unchanged from the Operations Model.

5.2.2 Stress Periods

The Closure/Post-Closure Model was run for a 40 year duration. The simulation period starts at the end of active mine dewatering (Year 13). The model duration was subdivided into eight stress periods of variable length as summarized in Table 5.1.

Table 5.1 Closure/Post-Closure Model Stress Periods

Period	Stress Period	Stress Period Length (days)	Stress Period Length (years)	Cumulative Time (days)
CLOSURE / POST-CLOSURE	1	1	0	1
	2	1455	4.0	1,456
	3	2372	6.5	3,828
	4	2372	6.5	6,200
	5	2555	7.0	8,755
	6	2200	6.0	10,955
	7	2200	6.0	13,155
	8	2250	6.2	15,405
Total Simulation Time (Years):			42	

5.2.3 Initial Head Distribution

The final head distribution from the end of the Operations Model (Year 13) was assigned as the initial head distribution in the Closure/Post-Closure Model. Using these heads to define the initial condition allows the transient model to begin its simulation period with hydrogeologic conditions representing the end of active dewatering.

5.2.4 Hydraulic Conductivity and Storage

The hydraulic conductivity values assigned to the Closure/Post-Closure Model remained unchanged from the Operations Model except within the open pit. The open pit was represented as a void within the model using a hydraulic conductivity zone assigned a value of $2x10^{-4}$ m/s. This value was high enough to allow water to drain freely into the pit excavation from the surrounding surficial and bedrock material. The void zone was assigned to Layers 1 through 7 in the footprint of the open pit. The hydraulic conductivity value was varied during model construction to minimize convergence and mass balance issues. Storage and specific yield were set to 1.0 within the void area to represent the Pit Lake as open water.

5.2.5 Boundary Conditions

Additional boundary conditions were incorporated into the model to represent proposed mine facilities to simulate potential effects on hydrogeological conditions. A discussion detailing how each proposed facility is represented in the model is provided in the following subsections.

5.2.5.1 Tailings Storage Facility (TSF)

As in the Operations Model, TSF Ponds C and D were simulated using the river cells defined in model Layer 1 within the footprint area of both TSF ponds. The river cells in TSF Pond C and D were active during all stress periods of the Closure/Post-Closure Model. The stage elevations and conductances assigned to the RIV cells in Pond C and D remained unchanged from the Operations Model. A tailings beach was modelled along the TSF Embankment using a recharge boundary condition. A recharge rate of 100 mm/yr was assigned to the tailings beach.

5.2.5.2 Pit Lake

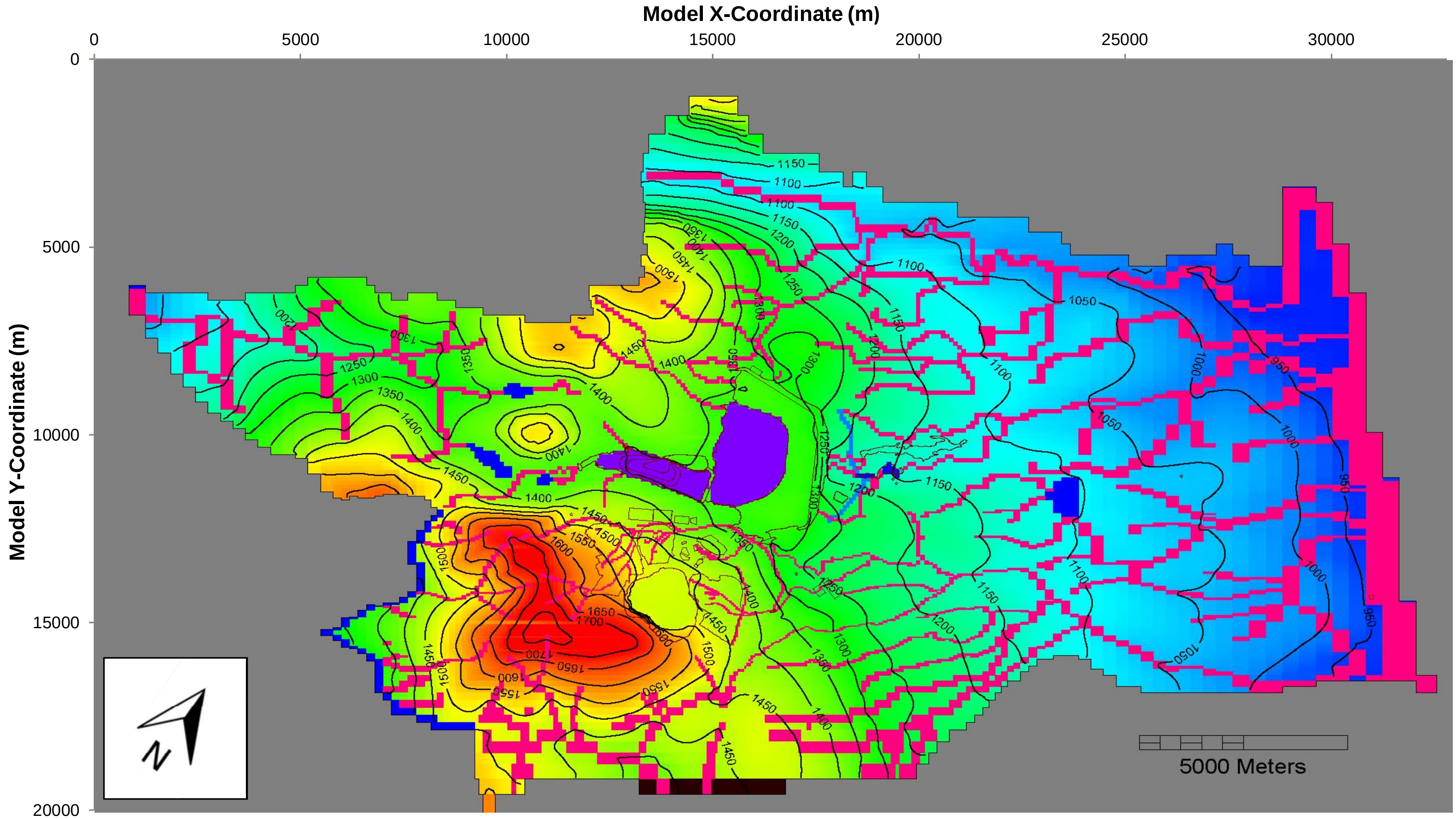
Water will be pumped from TSF Pond D to the open pit to assist in rapid pit filling of the Pit Lake. Total water contributing to the pit void in the model was specified as a combination of groundwater inflows and water pumped from TSF Pond D. Well boundary cells were specified within the void zone in Layers 6, 7 and 8 to simulate pumping from TSF Pond D to the pit void. The well boundaries were active during stress periods 3 through 5 (a pumping duration of 20 years) and supplied water to the open pit at a constant rate of 362 L/s to fill the pit void.

The Pit Lake Spillway was represented in the model using drain cells assigned to Layer 1 at the outlet of the Pit Lake. The drain stage elevation was set at 1,475 masl in order to control the Pit Lake elevation (corresponding to a Pit Lake volume of 236.2 million cubic meters). Water discharges freely from the pit to the spillway drain when hydraulic heads within the Pit Lake exceed the drain elevation.

5.3 SIMULATION RESULTS

The Closure/Post-Closure Model simulated water table contours are provided on Figure 5.1. The simulated water table contours represent the predicted water table corresponding to Post-Closure (end of Year 40) once the pit lake has reached its maximum spillway controlled volume.

Model results indicate the open pit is predicted to reach its maximum storage volume of 236.2 million cubic meters 21 years after the end of operational dewatering (in Year 33). This corresponds with a spillway controlled water surface elevation of 1,475 masl. During this period, the pit lake is allowed to fill naturally with groundwater for four years after the end of operational dewatering at which point pumping from TSF Pond D at a rate of 362 L/s commences. Water in excess of the Pit Lake volume is discharged from the simulated pit via spillway drains. The estimated duration of pit filling corresponds well with an estimate of 20 years previously completed using GoldSim (KP 2013i).



Water Table Elevation (masl)

1800
1700
1600
1500
1400
1300
1200
1100
1000
900

Boundary Conditions

- Constant Head
- River
- Drain
- GHB
- Flow Barrier
- No Flow

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ARE OF MODEL SIMULATED WATER TABLE ELEVATION (masl).

2.THE ECD SYSTEM (DRAIN BOUNDARY CONDITIONS) ARE HIGHLIGHTED IN LIGHT BLUE DOWNSTREAM FROM THE MAIN TSF EMBANKMENT.

3. THE ULTIMATE PIT LAKE ELEVATION ASSIGNED TO THE MODEL WAS 1475 masl.

3. EMBANKMENT DRAINS ARE NOT ASSIGNED WITHIN THE FOOTPRINTS OF THE TSF EMBANKMENTS.

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NEW GOLD INC.

BLACKWATER GOLD PROJECT

CLOSURE/POST-CLOSURE MODEL GROUNDWATER ELEVATION MAP (YEAR 55)

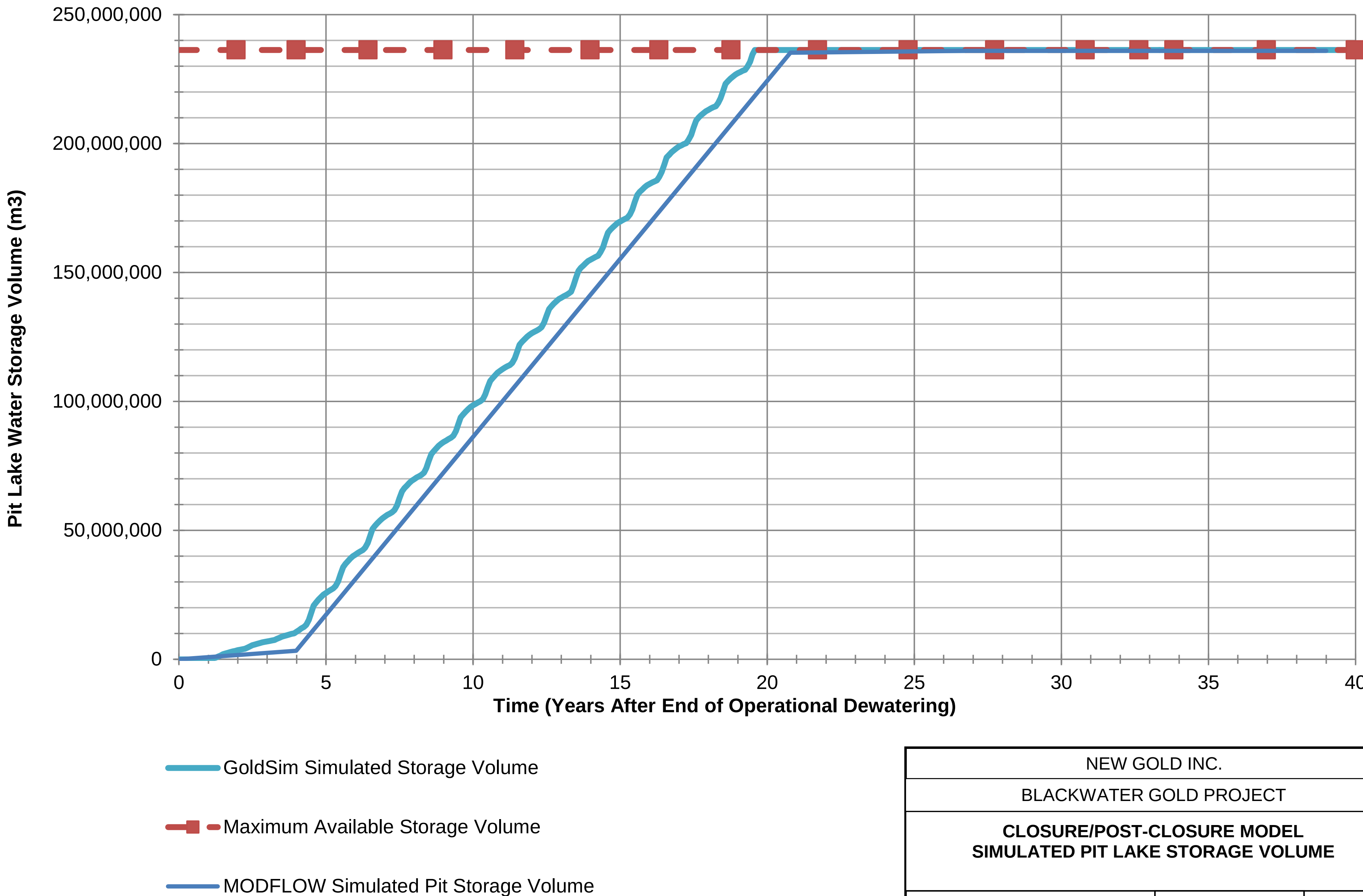
Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 5.1

REV 0



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NEW GOLD INC.

BLACKWATER GOLD PROJECT

CLOSURE/POST-CLOSURE MODEL
SIMULATED PIT LAKE STORAGE VOLUME

Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 5.2

REV 0

6 – POST-CLOSURE SIMULATION

6.1 OVERVIEW

A steady-state Post-Closure Model was developed to characterize potential seepage pathways from key mine infrastructure during the post-closure period. The Post-Closure Model was developed by modifying the Closure/Post-Closure Model to represent the elevation of the Pit Lake using a constant head boundary condition.

The main objectives of the steady-state post-closure modelling were to:

- Estimate total seepage rates from the Pit Lake during post-closure
- Delineate potential seepage pathways from key mine facilities, including the Pit Lake, TSF, east and west waste rock dumps, and the plant site using MODPATH, and
- Estimate seepage travel times to downstream discharge locations using MODPATH and Endpoint analysis.

The results of the steady-state post-closure modelling along with the methodology and assumptions used to develop the model are presented in the sections that follow.

6.2 MODEL DEFINITION

6.2.1 Model Geometry and Grid

The numerical model geometry, layering and grid remained unchanged from previous models.

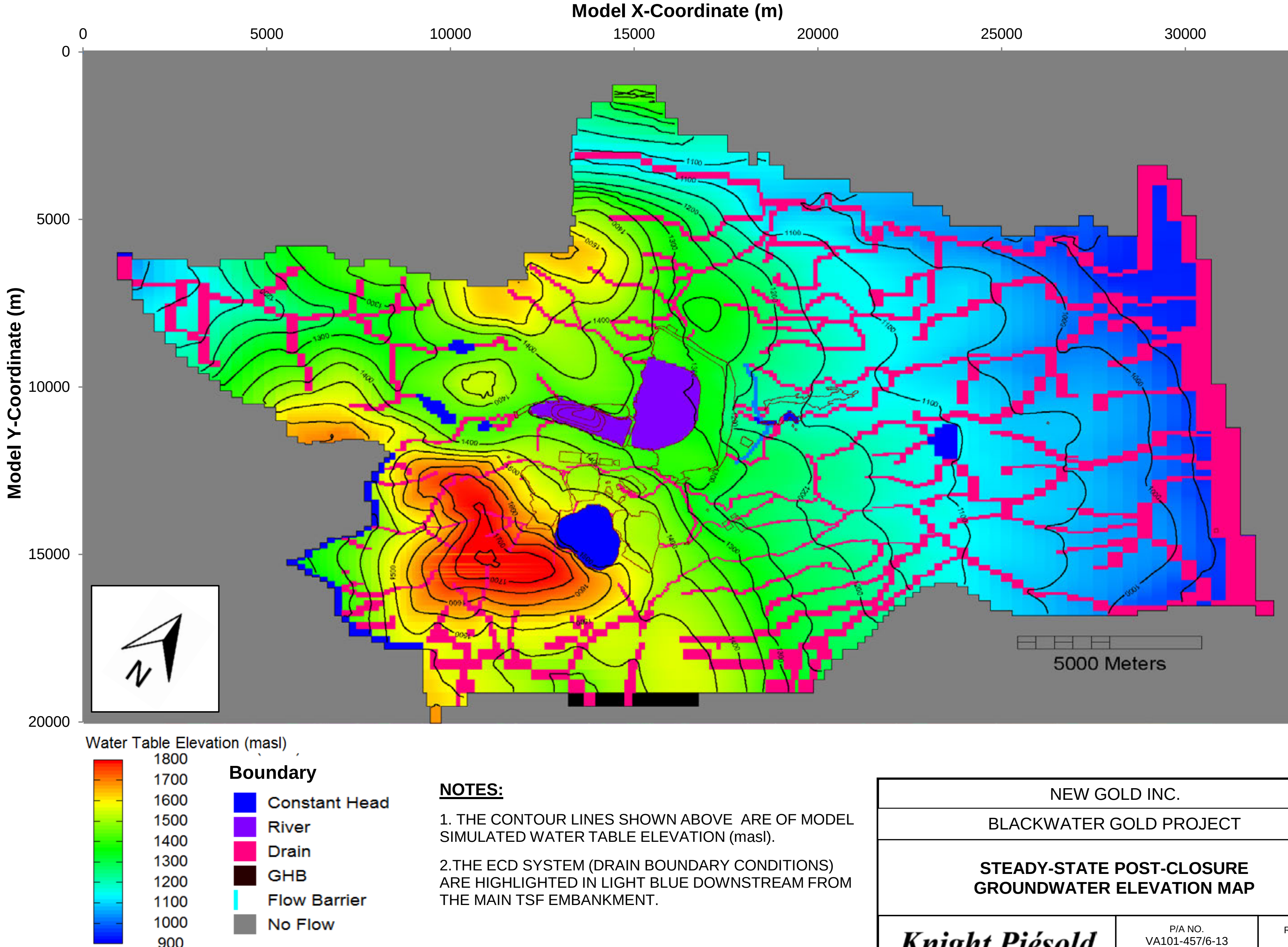
6.2.2 Boundary Conditions and Hydraulic Conductivity

Boundary conditions and hydraulic conductivity values assigned to the steady-state Post-Closure model were changed from previous model versions within the TSF and Pit Lake. A hydraulic conductivity value of $1x10^{-7}$ m/s was assigned to cells representing the seepage cut-off for the TSF embankments. Similar to previous simulations, the rockfilled core of the embankment was assigned a hydraulic conductivity of $1x10^{-5}$ m/s. Drain cells were assigned to Layer 1 within the footprint areas of the TSF embankments and the south abutment. Drain stage was set to the elevation of the top of Layer 1. Constant head cells were used to represent the Pit Lake and were assigned in Layers 1 through 8 of the pit void. A constant head of 1,475 masl was assigned to the Pit Lake cells.

6.3 SIMULATION RESULTS

The steady-state Post-Closure Model simulated water table contours are provided on Figure 6.1. Hydraulic head contours indicate that groundwater flow from the Pit Lake is expected to be towards the Davidson Creek and Creek 661 catchments. Based on a water balance assessment of the Pit Lake using the Post-Closure model, groundwater inflows to the Pit Lake are estimated to be 4.5 L/s and seepage from the Pit Lake is expected to be approximately 1.3 L/s. The difference in flow into and out of the Pit Lake leaves the Pit Lake via the pit spillway together with net precipitation reporting to the Pit Lake. Additional details on seepage pathways from the Pit Lake are discussed below in the Seepage Pathway Analysis.

No change to average annual baseflows or groundwater flows to Blackwater River catchment was predicted above the limits of modelling error using the steady-state Post-Closure model.



NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ARE OF MODEL SIMULATED WATER TABLE ELEVATION (masl).
2. THE ECD SYSTEM (DRAIN BOUNDARY CONDITIONS) ARE HIGHLIGHTED IN LIGHT BLUE DOWNSTREAM FROM THE MAIN TSF EMBANKMENT.

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STEADY-STATE POST-CLOSURE GROUNDWATER ELEVATION MAP

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P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE 6.1

REV 0

6.4 SEEPAGE PATHWAY ANALYSIS

6.4.1 Seepage Flow Directions and Travel Times (MODPATH Particle Tracking)

MODPATH particle tracking was implemented to delineate flow directions and estimate seepage travel times to discharge locations from key mine infrastructure. The following facilities were included in the MODPATH analysis:

- TSF facility, including Site C and Site D
- Pit Lake
- East and west dumps, and
- Plant site.

For the Pit Lake MODPATH analysis, particles were inserted along the downstream rim of the pit shell in Layers 1 through 8 and within the footprint of the Pit Lake constant head cells in Layer 8. For MODPATH analyses at all other facilities, particles were inserted at the top of Layer 1 within the facility footprint. Particles were forward tracked through the groundwater flow system to downstream discharge locations. Downstream discharge locations are shown on Figure 6.2.

MODPATH combined with Endpoint Analysis was used to determine the discharge location of potential seepage from each facility. Endpoint analysis allows the user to identify steady-state flow lines that terminate (discharge) at a cell along the model boundary. The MODPATH simulation can be used to calculate approximate groundwater travel times along the seepage pathways by taking into consideration an assumed effective porosity. Effective porosities assigned to the model for the MODPATH velocity calculations are shown on Table 3.1 and include 0.1% (0.001) for weathered bedrock, 0.01% (0.0001) for competent bedrock and 15% (0.15) for overburden material. Travel times are representative of advective transport and do not include effects from dispersion or diffusion.

MODPATH results are sensitive to specification of the "sink strength" input parameter, which defines the termination criterion for particle traces flowing through boundary cells. All MODPATH scenarios presented herein adopt a "stop at 50 percent strength" weak sink option to discontinue particle traces in boundary cells. Conceptually this means that the model terminates a particle trace in a cell if more than 50% of the water in the cell is removed.

6.4.2 Seepage Flux Rates (HSU Mass Balance)

Seepage Flux Rates for the mine facilities were estimated using the Hydrostratigraphic Unit (HSU) package in Groundwater Vistas to generate a water budget for each facility. The HSU package allows the user to group model cells into "hydrostratigraphic units," or zones, in order to track inflow and outflow from these defined regions of the model. The footprint area under each facility contributing seepage to each discharge location was delineated and assigned to a distinct HSU zone using the MODPATH particle tracking results. The plant site footprint for example, was divided into two HSUs corresponding to areas contributing seepage to its two downstream discharge locations: the lower east dump drainage ditch and the natural channel reporting to the TSF. Seepage fluxes to each discharge location downstream of a facility were quantified following this methodology.

6.4.3 Seepage Analysis Results

The results of the MODPATH and seepage flux rate simulations are summarized in Table 6.1 and include seepage discharge locations, approximate advective groundwater travel times and seepage flux rates.

The simulated MODPATH particle traces resulting from each simulation are provided in Appendix D along with figures showing the HSU zones defining the simulated discharge zone used to assess the seepage rates for each mine facility. Histograms showing the distribution of particle travel times from each facility to downstream locations are provided in Appendix E.

Results of the seepage analysis for each facility are described in the sections that follow.

6.4.3.1 TSF Site D

Seepage from TSF Site D is predicted to be captured primarily by the TSF main embankment drains (15 L/s) and the ECD collection system (5 L/s). Travel time for seepage to arrive at TSF embankment drains is fast, and the minimum travel time estimated within the seepage analysis (0.3 years in Table 6.1) likely an over-prediction of travel time limited by the resolution of the model. Lesser amounts of seepage are predicted to reach Creek 661 (0.2 L/s), Davidson Creek (0.4 L/s), the south abutment drains (0.4 L/s) and the TSF spillway (0.1 L/s). The model estimates that several particles discharge to Davidson Creek, the ECD system and the TSF main embankment with very long travel times in excess of 1,500 years. These particles originate within the TSF near the boundary of the TSF Site D Pond discharge zone (shown in purple on Appendix Figure D.3). The low hydraulic gradient near this flow boundary results in very long travel times for particles to move forward from the originating grid cell (Appendix Figure E.1).

The total foundation seepage rate leaving TSF Site D is estimated to be approximately 21 L/s based on the results of the HSU zone mass balance. This seepage estimate only includes seepage through the foundation and does not include seepage through the TSF embankment. Embankment seepage cannot be simulated using the current model construction due to the representation of the TSF using river boundaries and modified recharge rates to represent the pond and beach, respectively.

6.4.3.2 TSF Site C

Particle traces indicate that all seepage from TSF Site C is predicted to discharge to the Site D facility. Seepage travel times were not assessed for these seepage paths.

6.4.3.3 Pit Lake

The total seepage from the Pit Lake is estimated to be 1.3 L/s based on the HSU zone mass balance. A large portion of the seepage originating from the Pit Lake is predicted to discharge to drainages that ultimately report to the TSF, including natural channels upstream of the east dump drainage ditches (0.4 L/s) and drainages reporting to the TSF Site D (0.3 L/s). Model results indicate seepage to the east dump drainage ditches is expected to follow shallow flow paths primarily through the overburden in model Layers 1 and 2 (Appendix Figure D.6). Seepage to Creek 661 (0.5 L/s) is expected to travel though the upper layers of bedrock. A lesser amount of seepage (0.01 L/s) is predicted to discharge to Davidson Creek.

Results of the seepage analysis indicate that seepage flow paths originating from TSF Site D and the Pit Lake converge toward the TSF spillway and Creek 661 via local groundwater flow paths. Seepage flow paths originating from the Pit Lake travel to Davidson Creek via deeper (regional) groundwater flow paths within the competent bedrock.

6.4.3.4 East Waste Rock Dump

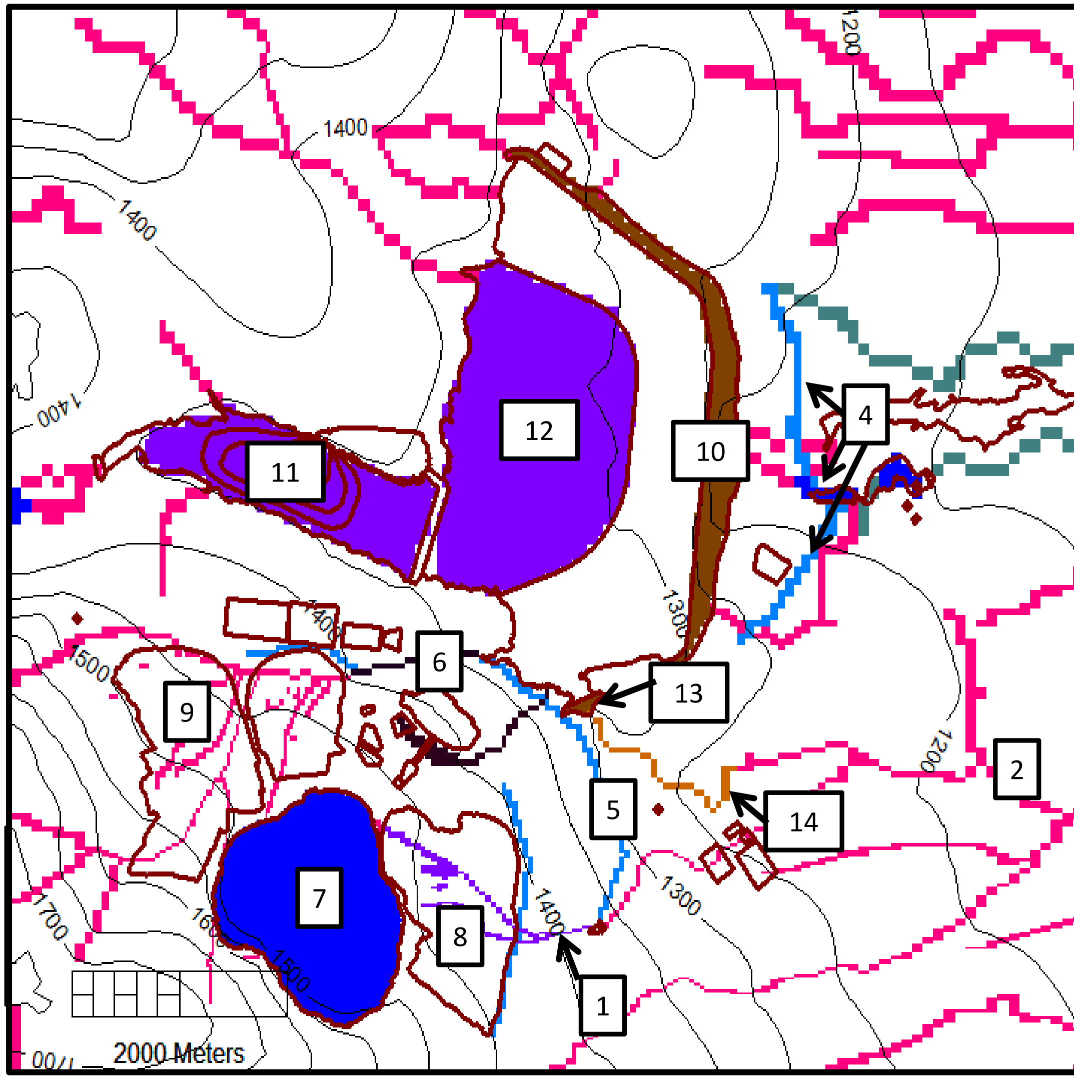
Seepage originating from the east dump is predicted to be approximately 3 L/s based on the HSU zone mass balance. Seepage from the east dump is predicted to discharge primarily to Creek 661 at a rate of approximately 1.7 L/s. MODPATH particle traces indicate that seepage is predicted to travel to Creek 661 along local groundwater flow paths in the overburden and shallow bedrock. Approximately 1.3 L/s of the seepage is predicted to discharge to springs within the east dump footprint, engineered drainage ditches and natural channels that will be routed to TSF Site D. A trace proportion of seepage (<1%) is predicted to discharge to the TSF spillway.

6.4.3.5 West Waste Rock Dump

All seepage originating from the west dump is predicted to discharge to downstream mine facilities or drainages leading to mine facilities. The total seepage rate of 3.3 L/s is predicted to discharge primarily to springs within the footprint of the waste rock dump and to the drainage ditch north of the west dump. This seepage will be collected in drainages that flow TSF Site D. A small portion of seepage is predicted to be captured by the Pit Lake (0.1 L/s) and a trace amount of seepage is predicted to discharge to TSF Site C.

6.4.3.6 Plant Site

All seepage from the footprint of the plant site is predicted to discharge to engineered drainage ditches and natural channels that flow to TSF Site D. Seepage originating from the footprint of the plant site is predicted to be approximately 2.4 L/s based on the HSU zone mass balance.



Number	Discharge Locations
1	Channel to East Dump Drainage Ditches
2	Creek 661
3	Davidson Creek
4	ECD System
5	Lower East Dump Drainage Ditch
6	Natural Channel Reporting to TSF
7	Pit Lake
8	Springs within East Dump Footprint
9	Springs within West Dump Footprint
10	TSF Main Embankment Drains
11	TSF Site C Pond
12	TSF Site D Pond
13	TSF South Abutment Drains
14	TSF Spillway

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ARE OF MODEL SIMULATED WATER TABLE ELEVATION (masl).

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BLACKWATER GOLD PROJECT

STEADY-STATE POST-CLOSURE PARTICLE DISCHARGE LOCATIONS

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REF. NO. 13

FIGURE 6.2

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Table 6.1 Results of MODPATH Particle Tracking and Advective Travel Times

Facility	MODPATH/Seepage Discharge Location	Simulated Seepage Flux Rates		Travel Time to Discharge Location (Years)[1]			
		Discharge (L/Sec)	Discharge (% of Total)	Average	Median	Minimum	Maximum
Pit Lake							
	Davidson Creek	0.01	1%	809	781	424	1,334
	Creek 661	0.5	42%	290	218	28	1,037
	TSF Main Embankment Drains	0.01	1%	226	120	78	711
	TSF Spillway	0.01	1%	24	25	21	26
	ECD System	0.03	2%	364	279	122	1,313
	Natural Channel Reporting to TSF	0.3	22%	202	150	51	2,113
	Channel to East Dump Drainage Ditches	0.4	31%	103	102	12	227
	Total Seepage From Pit Lake	**1.3**	**100%**	-	-	-	-
TSF C							
	TSF Site D Pond	-	100%	-	-	-	-
TSF D							
	Davidson Creek	0.4	2%	1,807	585	127	6,979 [4]
	Creek 661	0.2	1%	365	254	97	1,037
	TSF Main Embankment Drains	15	72%	90	40	0.3	2,824 [4]
	TSF South Abutment Drains	0.4	2%	21	15	1	84
	TSF Spillway	0.1	<1%	82	70	22	217
	ECD System	5.0	24%	224	129	13	2,492 [4]
	Natural Channel Reporting to TSF	0.1	<1%	15	10	0.5	93
	Total Seepage From TSF D	**21.3**	**100%**	-	-	-	-
East Waste Rock Dump							
	Creek 661	1.7	56%	424	405	47	1,288
	Springs within East Dump Footprint	0.4	13%	32	23	0.5	123
	Channel to East Dump Drainage Ditches	0.7	22%	109	88	2	297
	Natural Channel Reporting to TSF	0.05	2%	27	27	21	33
	Lower East Dump Drainage Ditch	0.2	6%	448	482	328	544
	TSF Spillway	0.04	1%	38	36	23	63
	Total Seepage From East Waste Rock Dump	**3.0**	**100%**	-	-	-	-
West Waste Rock Dump							
	Springs within West Dump Footprint	0.7	22%	55	17	0.1	336
	Natural Channel Reporting to TSF	2.4	74%	198	160	0.5	558
	TSF Site C Pond	<0.1	<1%	-	-	159	-
	Pit Lake	0.1	4%	18	13	0.2	59
	Total Seepage From West Waste Rock Dump	**3.3**	**100%**	-	-	-	-
Plant Site							
	Natural Channel Reporting to TSF	0.5	22%	72	77	26	102
	Lower East Dump Drainage Ditch	1.9	78%	38	36	11	92
	Total Seepage From Plant Site	**2.4**	**100%**	-	-	-	-

NOTES:

1. APPROXIMATE SEEPAGE TRAVEL TIMES FROM THE STOCKPILES TO THE DISCHARGE LOCATIONS WERE CALCULATED USING AN ASSUMED EFFECTIVE POROSITY OF 0.1% (0.001) FOR WEATHERED BEDROCK, 0.01% (0.0001) FOR UNWEATHERED BEDROCK AND 15% (0.15) FOR ALLUVIAL MATERIALS.
2. TRAVEL TIMES ARE PROVIDED FOR THE STEADY-STATE POST-CLOSURE MODEL
3. RAVEL TIMES ARE BASED ON ADVECTIVE TRAVEL ONLY AND DISREGARD THE EFFECTS OF DISPERSION AND DIFFUSION.
4. PARTICLES WITH LONG TRAVEL TIMES ORIGINATE NEAR THE BOUNDARY OF THE TSF SITE D POND DISCHARGE ZONE (SHOWN ON FIGURE 3). THE PROXIMITY TO THIS BOUNDARY MAY INFLUENCE THE MODELLED TRAVEL TIMES.

7 – CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

Based on the data analysis, model calibration and model simulations, the following conclusions can be drawn from the results of the numerical groundwater flow models:

- Groundwater in the southwestern portion of the deposit area behaves in a compartmentalized manner. The best fit to modelled data was achieved by specifying barriers to groundwater flow (faults) along the edges of the deposit and a higher permeability bedrock zone in the central portion of the deposit. Identification of this compartmentalization was the result of and supported by increased data density in this area. Groundwater compartmentalization is likely present at most locations on the site and was included in the model calibration process.
- Mine dewatering was simulated using a transient Operations Model simulating 15 years of mine operations (Year -2 through Year 13). Drain cells were specified within the pit shell. The maximum groundwater inflow rates predicted using the numerical groundwater model were approximately 60 L/s with an average inflow rate of 50 L/s. Numerical model results compare well with estimates using an analytical calculation.
- At the end of active dewatering (Year 13), water table drawdown of 1 m was predicted to extend an average distance of approximately 1,200 m from the pit edge. The predicted drawdown zone of influence is irregularly shaped and is elongated beneath the topographic high at Mt. Davidson. The 1 m drawdown contour extends approximately 600 m from the pit edge in a southeast direction toward Blackwater River.
- The groundwater drawdown zone of influence for the open pit at the end of active dewatering as defined by 1 m drawdown contours was predicted to merge with the drawdown zone of influence from the camp wells. The assessment was conducted using a camp water demand predicted for the construction phase which is approximately three times greater than the predicted water demand during operations and is therefore considered conservative.
- From model results, reductions in groundwater flow contributing to the Blackwater River catchment were predicted to be negligible at the end of active dewatering. Average annual baseflow contribution to these Blackwater River tributary streams was estimated to be 20 m^3/d (0.4%) lower than baseline conditions at the end of active dewatering (Year 13) and to be the same as baseline conditions in Post-Closure.
- The Pit Lake was estimated to take 21 years to fill to its maximum volume at the spillway elevation following the cessation of dewatering. This analysis assumed that water is pumped to the Pit Lake from TSF Site D at a rate of 362 L/s to assist in rapid pit filling.
- Results of the steady-state Post-Closure seepage assessment using MODPATH particle tracking and a mass balance analysis of facility footprint area contributing seepage to downstream discharge locations indicated that:
    - Total seepage into the foundation materials below TSF Site D was predicted to be 21 L/s. The majority of seepage originating from TSF Site D was predicted to discharge to the TSF embankment drains (15 L/s) and to the seepage collection system at the Environmental Control Dam (5 L/s). Approximately 0.4 L/s of seepage originating from TSF Site D was predicted to bypass seepage collection measures and discharge to Davidson Creek. Approximately 0.2 L/s seepage was predicted to discharge to Creek 661 and 0.1 L/s was predicted to discharge to the TSF spillway.

  - Total seepage from the Pit Lake was estimated to be approximately 1.3 L/s and was predicted to flow in the directions of the Davidson Creek and Creek 661 catchments. Seepage from the Pit Lake was not predicted to flow toward the Blackwater River catchment. A large portion of the Pit Lake seepage was predicted to discharge to drainages that flow to TSF Site D (0.7/s). Seepage of approximately 0.5 L/s was estimated to travel along local groundwater flow paths through the upper bedrock and discharge to Creek 661. A trace amount of seepage (0.01 L/s) was predicted to discharge to Davidson Creek following travel paths though deep bedrock.
  - Approximately 1.3 L/s of seepage from the east dump was predicted to discharge to springs and natural channels directed to engineered drainage ditches that convey runoff and toe discharge to the TSF. A seepage amount of 1.7 L/s from the east waste rock dump was predicted to flow within the overburden and shallow bedrock under the engineered drainage ditches and discharge to Creek 661.
  - Seepage originating from the west waste rock dump was predicted to discharge primarily to drainage channels routed to the TSF. Seepage from this facility was not predicted to reach the downstream environment.
  - Seepage originating from the plant site was predicted to flow to natural and engineered drainages that are routed to the TSF. Seepage from this facility was not predicted to reach the downstream environment.
- Results of the seepage analysis indicated that seepage flow paths originating from TSF Site D, the Pit Lake and the east waste rock dump converge beneath the TSF spillway and Creek 661. These local groundwater flow paths would discharge to the overlying drainages. Seepage flow paths originating from the Pit Lake were modelled to travel via deeper (regional) groundwater flow paths within the competent bedrock to Davidson Creek.

7.2 RECOMMENDATIONS

The following monitoring is recommended to be collected to verify model results provided in this report, address uncertainty in predicted effects based on these results and provide guidance for monitoring and contingency planning:

- Monitoring of groundwater levels in the deposit area to evaluate the effects of pit dewatering.
- Monitoring of groundwater levels and collection of groundwater quality samples at locations downgradient of facilities to assess potential seepage and flow reductions. Model results indicate that shallow seepage pathways within the overburden and shallow bedrock are topographically controlled. The monitoring network should be designed so groundwater monitoring locations are installed along these pathways, particularly downgradient of the proposed location of the TSF south abutment. The monitoring network should also be designed to assess the efficiency of the seepage interception works.
- Streamflow measurements and water quality sampling downgradient of the facilities at Creek 661 and Davidson Creek.

7.0 REFERENCES

Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G., 2000. MODFLOW-2000, the U.S. Geological Survey modular ground-water model -- User guide to modularization concepts and the Ground-Water Flow Process: U.S. Geological Survey Open-File Report 00-92, 121 pp.

Deere, D. U. and Patton, F. D., 1971: Slope stability in residual soils, Fourth Panam. Conf. SMFE, San Juan, Puerto Rico, 1, pages 87–170.

Freeze, R.A. and Cherry, J.A., 1979. Groundwater, Prentice-Hall.

Heath, R.C., 1989. Basic Ground-Water Hydrology, U.S. Geological Survey Water-Supply Paper 2220.

Hydrogeologic Inc. (HGL), 1996. MODHMS/MODFLOW-SURFACT: A Comprehensive MODFLOW-Based Hydrologic Modeling System. Reston, VA.

Knight Piésold Ltd. 2013a., Reconnaissance Terrain and Terrain Stability Mapping. KP Ref No. VA101-457/4-4, Rev 0. February 2012. .

Knight Piésold Ltd., 2013b. 2012 Site Investigation Report. KP Ref No. VA101-457/6-1, Rev 0. September 2013.

Knight Piésold Ltd., 2013c. Feasibility Open Pit Slope Design. KP Ref No. VA101-457/6-2, Rev 0, November 2013.

Knight Piésold Ltd., 2013d. 2013 Hydrometerology Report. KP Ref No. VA101-457/6-12, Rev 0, November 2013.

Knight Piésold Ltd., 2013e. 2013 Site Investigation Report. KP Ref No. VA101-457/6-4, Rev 0, November 2013.

Knight Piésold Ltd., 2013f. Watershed Modelling Report. KP Ref No. VA101-457/6-6, Rev 0, November 2013.

Knight Piésold Ltd., 2013g. Geotechnical Characterization Report. KP Ref No. VA101-457/6-8, Rev 0, November 2013.

Knight Piésold Ltd., 2013h. Open Pit Water Management Plan. KP Ref No. VA101-457/6-8, Rev 0, November 2013.

Knight Piésold Ltd., 2013i. Updated FS Water Balance Model Memo. KP Ref No. VA13-02400, Rev 0, December 2013.

Plouffe, A. and Levson V.M., 2001. Surficial geology, Tatelkuz Lake, British Columbia; Geological Survey of Canada, Open File 4001, scale 1:100,000.

Plouffe, A. and Levson V.M., 2002. Surficial geology, Entiako Lake, British Columbia; Geological Survey of Canada, Open File 4157, scale 1:100,000.

Plouffe, A., Levson, V.M., and Mate, D.J., 2004. Surficial Geology, Nechako River, British Columbia. Geological Survey of Canada, Map 2067A, scale 1:250,000.

Pollock, D.W., 1994. User's Guide for MODPATH/MODPATH-PLOT, Version 3: A particle tracking post-processing package for MODFLOW, the U.S. Geological Survey finite-difference ground-water flow model: U.S. Geological Survey Open-File Report 94-464, 6 ch.

Western Water Associates, Ltd., 2013. Memorandum regarding New Gold, Blackwater Construction Camp, Water Supply Feasibility. August 2013.

8.0 CERTIFICATION

This report was prepared, reviewed and approved by the undersigned.

Prepared:

Kevin Davenport, EIT
Staff Engineer

Reviewed:

Cindy Starzyk, Ph.D.
Geological Engineering

Reviewed:

PROFESSIONAL PROVINCE OF H. RODNEY SMITH BRITISH COLUMBIA ENGINEER

Rod Smith, P.Eng.
Specialist Engineer

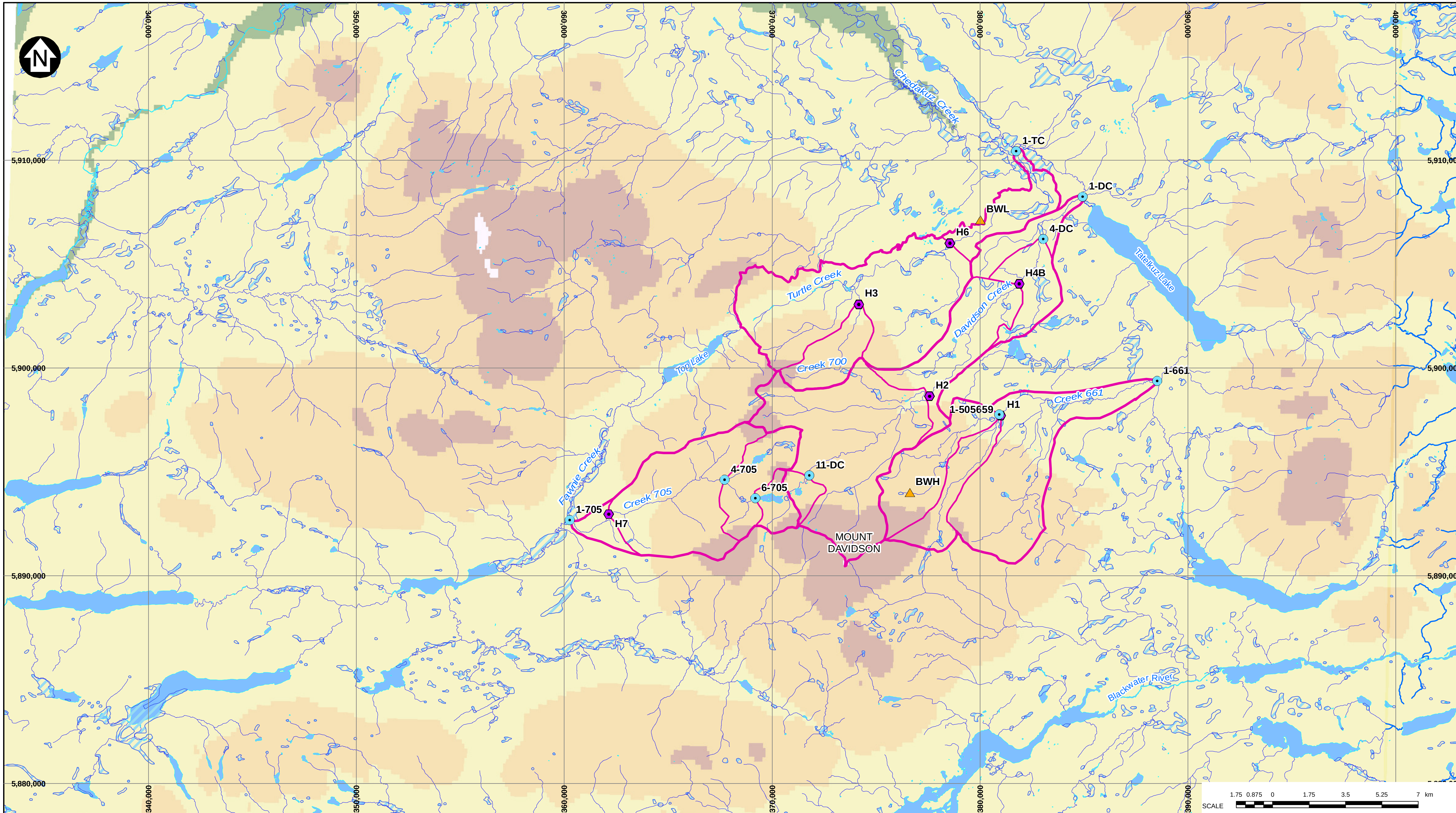
Approved:

Ken Brouwer, P.Eng.
President

APPENDIX A

APPENDIX FIGURES

(Pages A-1 to A-3)



LEGEND:

- CLIMATOLOGY STATION
- HYDROLOGY STATION/WATERSHED MODEL NODE
- WATERSHED MODEL NODE
- RIVER
- SUB-CATCHMENT BOUNDARY
- WATERSHED BOUNDARY
- LAKE
- WETLAND

ELEVATION BAND (M)

- < 915
- 915-1220
- 1220-1525
- 1525-1830
- > 1830

NOTES:

1. BASE MAP: CANADA DEM GEOBASE.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:175,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	20DEC'13	ISSUED WITH REPORT	DMW	AMD	CAS	KJB

NEW GOLD INC.

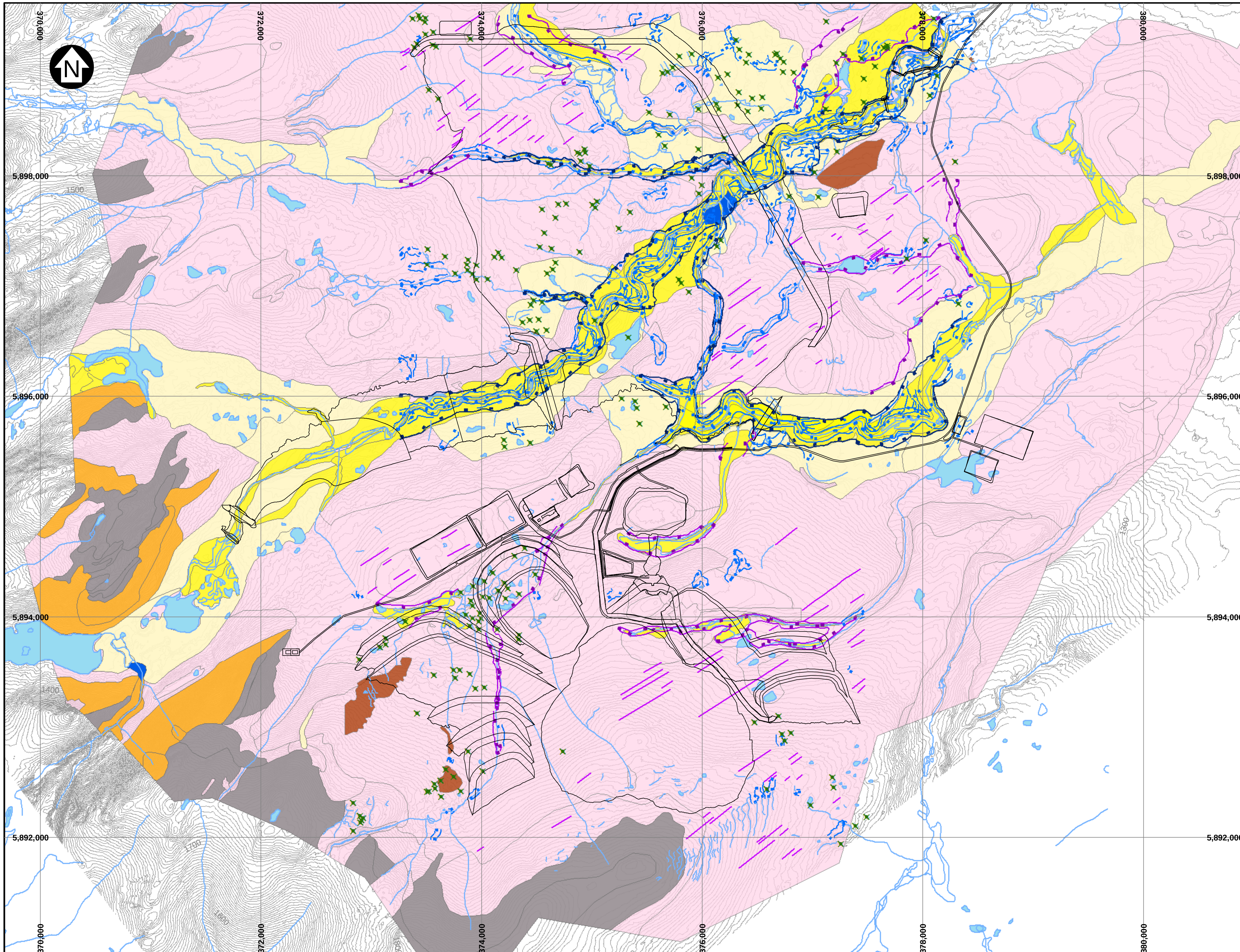
BLACKWATER GOLD PROJECT

STREAM COURSES AND PROJECT HYDROLOGY STATIONS

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/6	13

FIGURE A.1 REV 0



LEGEND:

- KAME
- RIVER/CREEK
- CONTOUR (5m)
- FLUTING
- INCISED MELTWATER CHANNEL
- MAJOR MELTWATER CHANNEL
- MELTWATER CHANNEL
- PRO-GLACIAL MELTWATER CORRIDOR
- SUB-GLACIAL MELTWATER CORRIDOR
- GLACIOFLUVIAL DEPOSITS (CHANNELIZED)
- GLACIOFLUVIAL DEPOSITS (NON-CHANNELIZED)
- LODGEMENT TILL
- ABLATION TILL
- GLACIOLACUSTRINE
- COLLUVIUM DEPOSITS
- BEDROCK
- LAKE
- PROPOSED MINE FACILITY

NOTES:

1. COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.

2. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:35,000 FOR 11x17 (TABLOID) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

3. THE CONTOUR INTERVAL IS 5 METRES; SOURCE: EAGLE MAPPING.

4. FACILITIES BASED ON 24MAY'13 VERSION OF THE GENERAL ARRANGEMENT.

5. CROSSMARKS POINT TOWARDS CENTRE LINE.

SCALE 350 175 0 350 700 1,050 1,400 1,750 m

NEW GOLD INC.

BLACKWATER GOLD PROJECT

SURFICIAL GEOLOGY AND LANDFORMS MAP

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/6	13

FIGURE A.2	REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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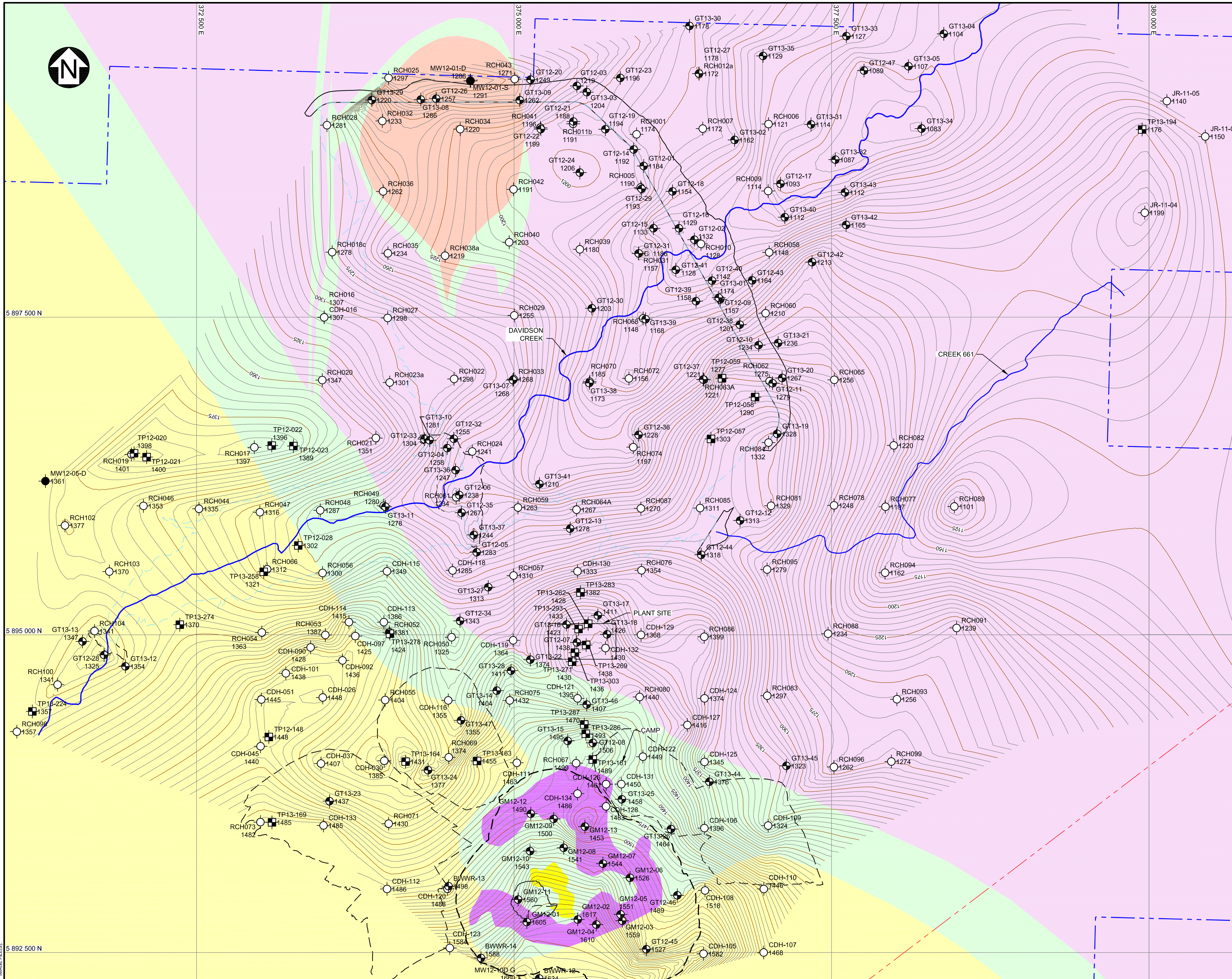

LEGEND:

- FELSIC INTRUSIVE
- VOLCANICLASTIC
- FELSIC VOLCANICLASTIC
- ANDESITE
- COHESIVE ANDESITE
- SEDIMENTS BOWSER LAKE GROUP
- LAMINATED FELSIC VOLCANICS
- RCH089 1253 — CONDEMNATION DRILLHOLES
- GT12-12 1335 — GEOTECHNICAL / GEOMECHANICAL / WASTE DRILL HOLE
- MW12-05 1564 — MONITORING WELLS
- TP12-058 1293 — TESTPIT
- PROPOSED WORKS
- NEW GOLD PROPERTY BOUNDARY
- DAVIDSON CREEK
- BEDROCK ELEVATION CONTOURS

NOTES:

1. BEDROCK CONTOUR INTERVAL IS 5 METRES.
2. ALL MINE SITE FACILITIES ARE CONCEPTUAL ONLY AND ARE ONLY INTENDED TO SUPPORT SITE INVESTIGATIONS.
3. BEDROCK GOLOGY PROVIDED BY NEW GOLD INC. FROM CONDEMNATION DRILLING PROGRAM.

300 150 0 500 1000 1500 m
SCALE A

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BEDROCK ELEVATION AND GEOLOGY

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/6	457/6-13

FIGURE A.3 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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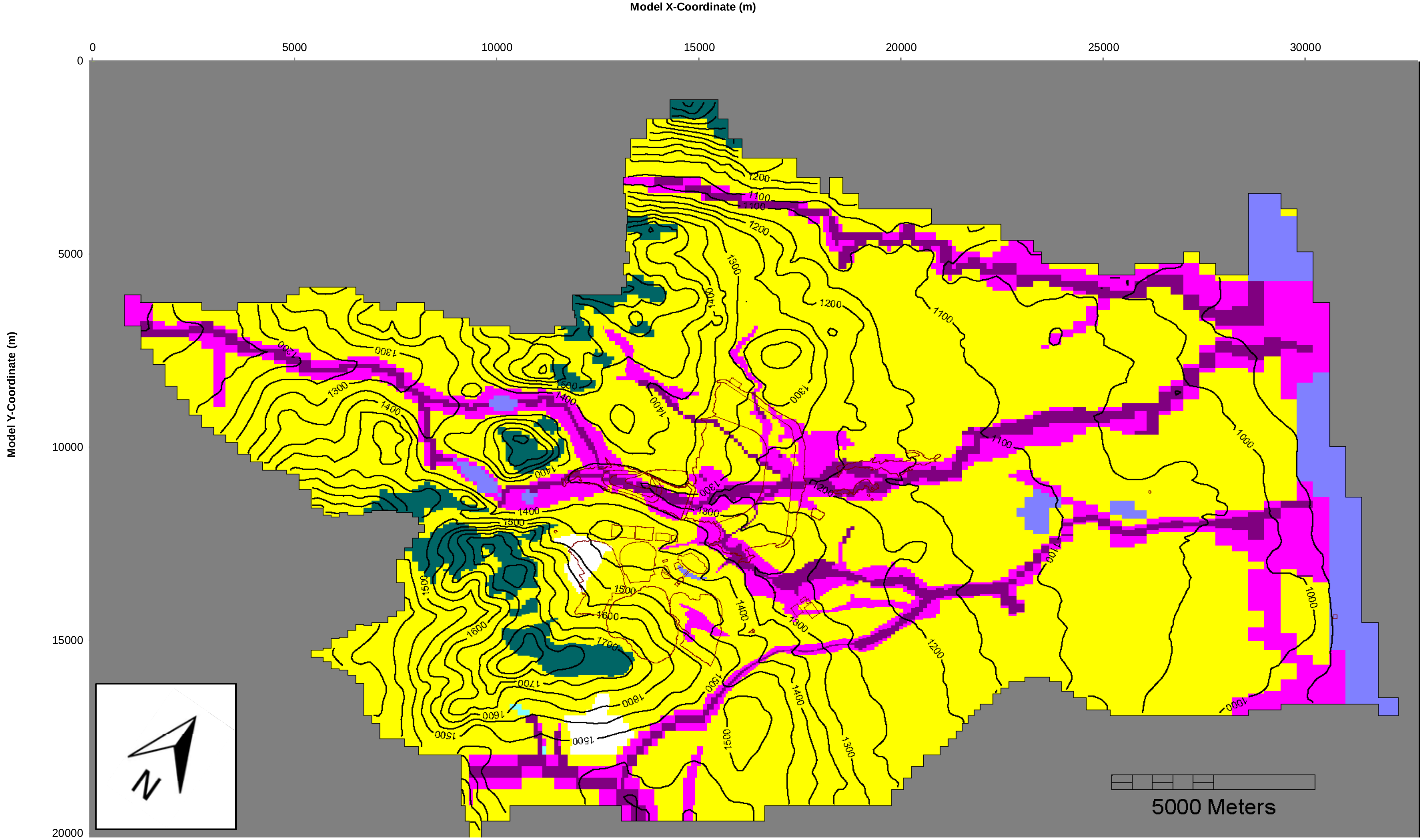
APPENDIX B

NUMERICAL MODEL HYDRAULIC CONDUCTIVITY ZONES

(Pages B-1 to B-7)



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 6		Glaciofluvial: Channel	1.E-04	1.E-04
Zone 2		Glaciofluvial: Kame	1.E-05	1.E-05
Zone 1		Glacial Till	2.E-07	2.E-07
Zone 4		Glaciolacustrine	1.E-07	2.E-08
Zone 12		Kame/Till Deposit	9.E-06	2.E-07
Zone 11		Bedrock Outcrops	1.E-07	1.E-07

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE GROUND SURFACE ELEVATION (masl) .

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYER 1)

Knight Piésold CONSULTING

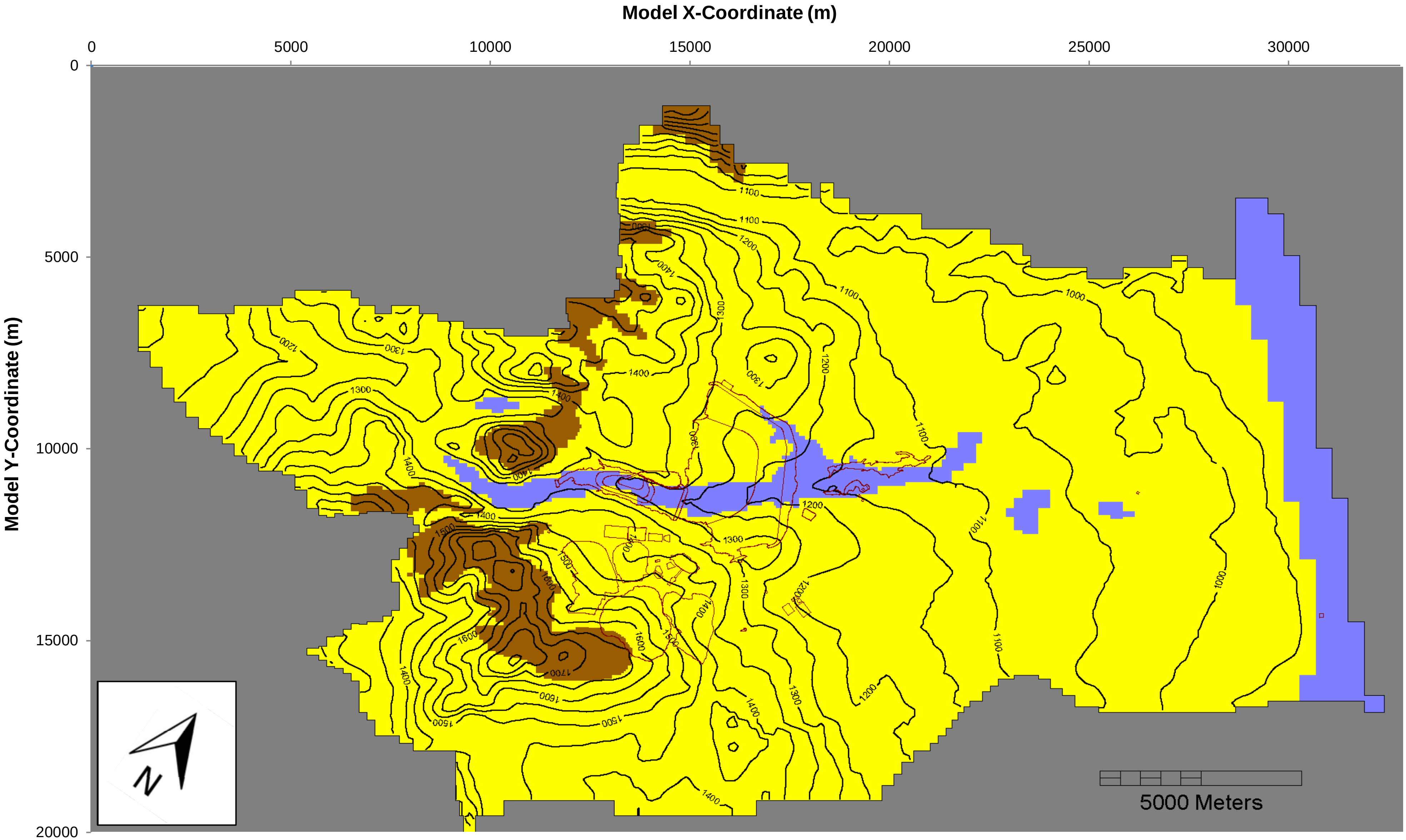
P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE B.1

REV 0

0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 1	Yellow	Glacial Till	2.E-07	2.E-07
Zone 4	Blue	Glaciolacustrine	1.E-07	2.E-08
Zone 5	Brown	Competent Bedrock	1.E-08	1.E-08

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE THE TOP ELEVATION OF LAYER 2 (masl).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYER 2)

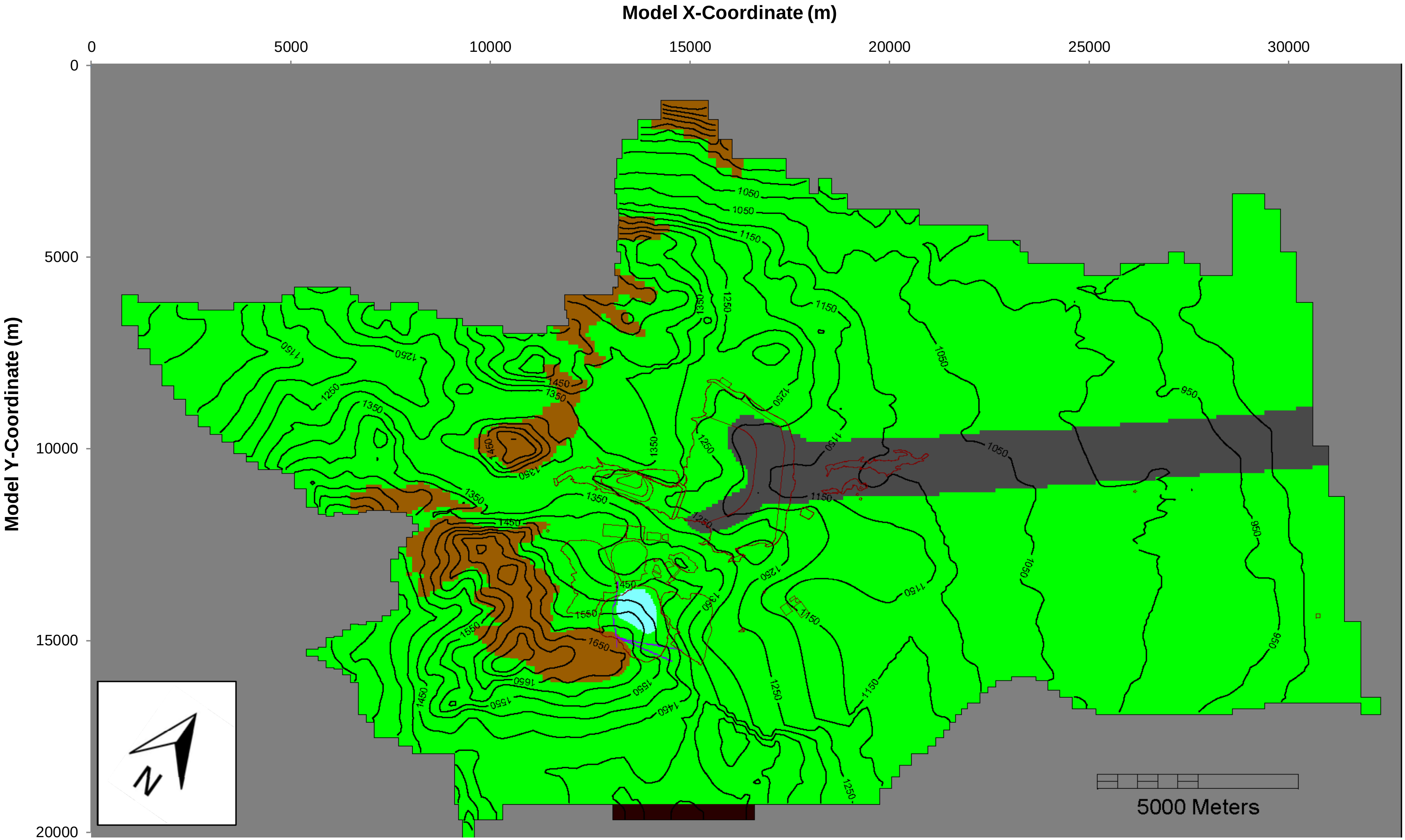
Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE B.2

REV 0



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 3		Completely Weathered Bedrock	1.E-08	1.E-08
Zone 9		Weathered Bedrock	1.E-07	1.E-07
Zone 5		Competent Bedrock	1.E-08	1.E-08
Zone 7		Higher Permeability Bedrock Zone in Deposit	1.E-06	1.E-06

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE THE TOP OF BEDROCK AS DEFINED IN MODEL LAYER 3.

0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYER 3)

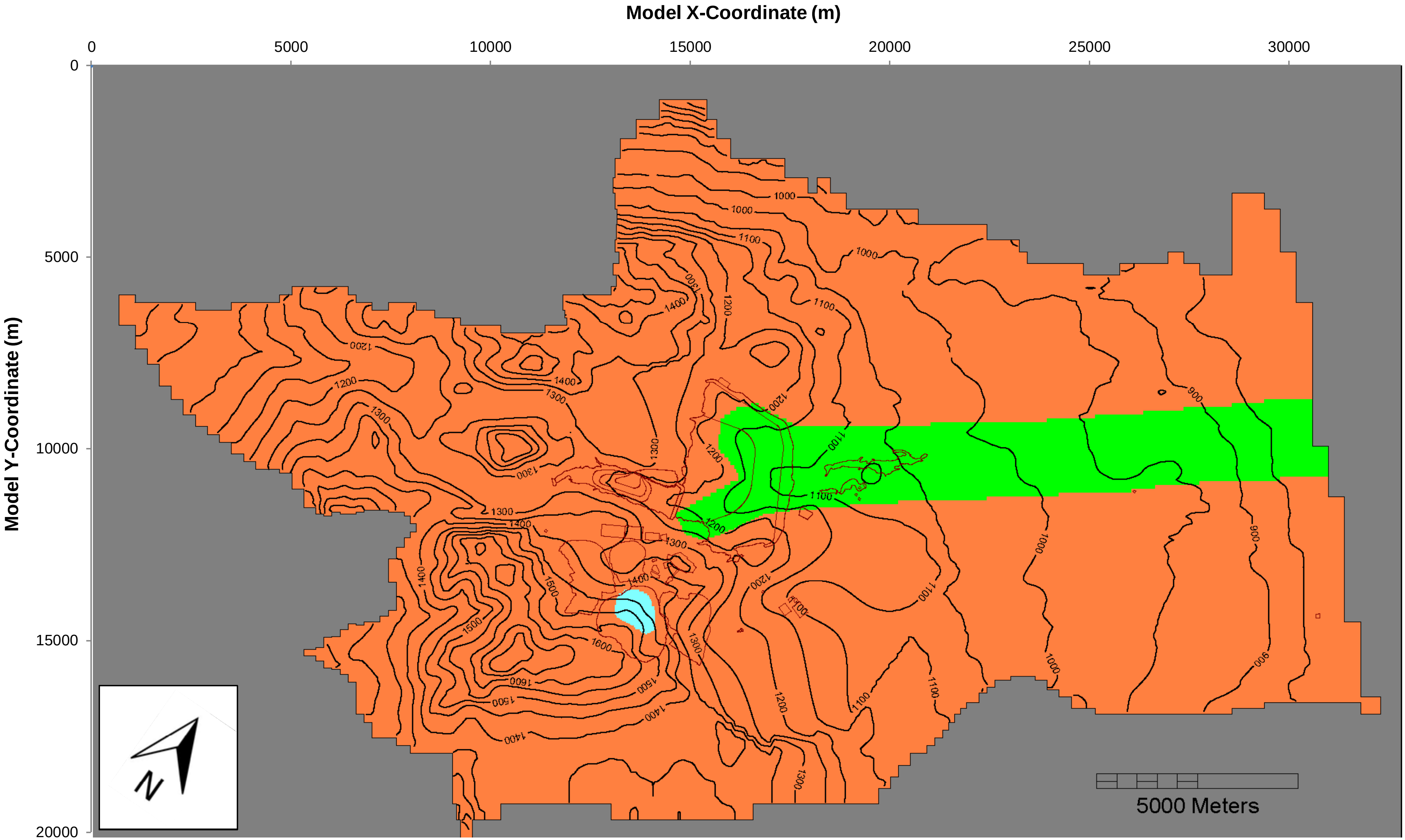
Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE B.3

REV 0



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 9	(green)	Weathered Bedrock	1.E-07	1.E-07
Zone 10	(orange)	Competent Bedrock	2.E-08	2.E-08
Zone 7	(light blue)	Higher Permeability Bedrock Zone in Deposit	1.E-06	1.E-06

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE THE TOP ELEVATION OF LAYER 4 (masl).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYER 4)

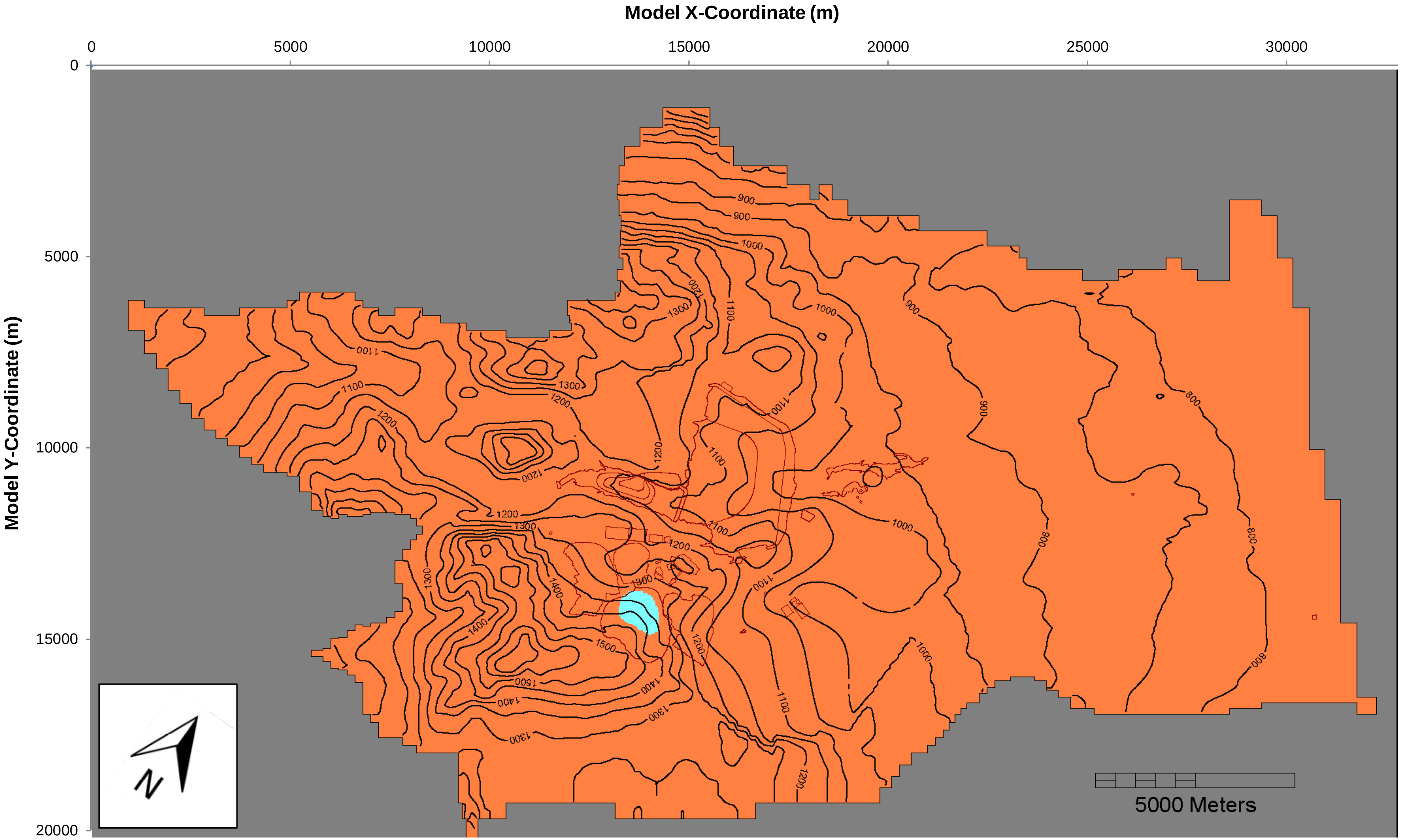
Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE B.4

REV 0



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 10		Competent Bedrock	2.E-08	2.E-08
Zone 7		Higher Permeability Bedrock Zone in Deposit	1.E-06	1.E-06

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE THE TOP ELEVATION OF LAYER 5 (masl).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYER 5)

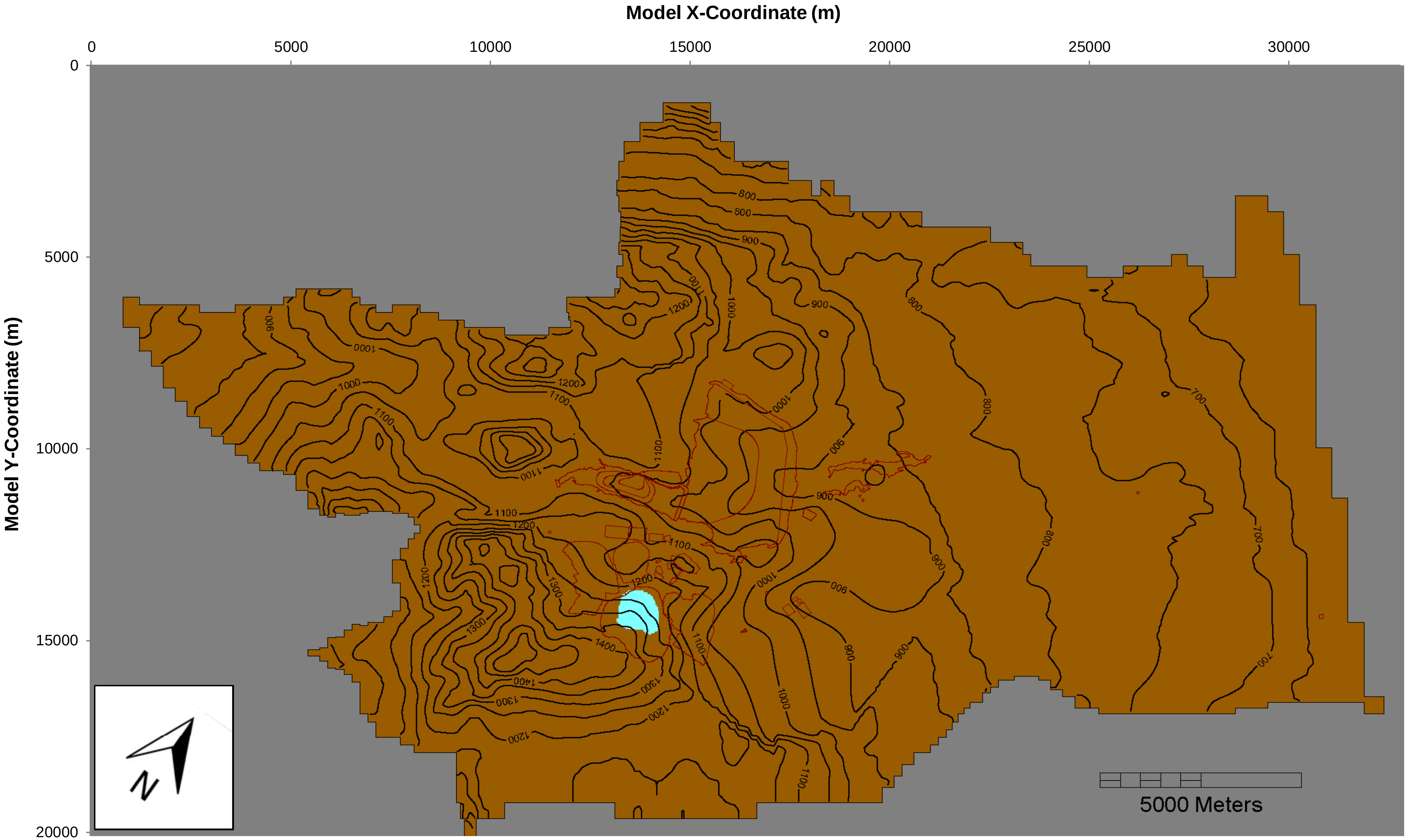
Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE B.5

REV 0



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 5		Competent Bedrock	1.E-08	1.E-08
Zone 7		Higher Permeability Bedrock Zone in Deposit	1.E-06	1.E-06

NOTES:
1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE THE TOP ELEVATION OF LAYER 6 (masl).

0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYERS 6, 7 AND 8)

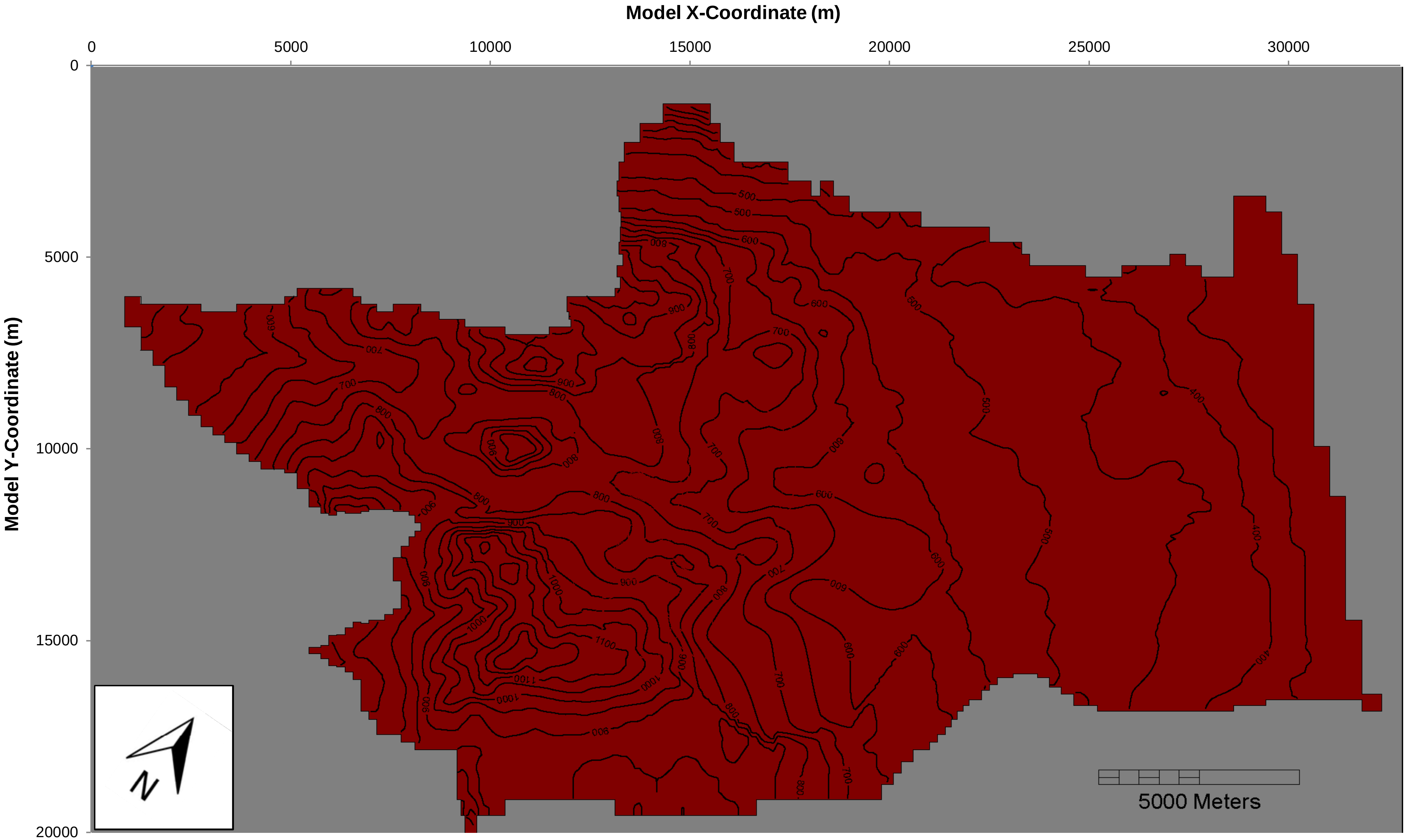
Knight Piésold CONSULTING

P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE B.6

REV 0



Zone	Color	Material Type	Horizontal Hydraulic Conductivity K_h (m/sec)	Vertical Hydraulic Conductivity K_v (m/sec)
Zone 8		Competent Bedrock	1.E-09	1.E-09

NOTES:

1. THE CONTOUR LINES SHOWN ABOVE ILLUSTRATE THE TOP ELEVATION OF LAYER 9 (masl).

0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

BASELINE MODEL
HYDRAULIC CONDUCTIVITY ZONES (LAYERS 9 AND 10)

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P/A NO. VA101-457/6-13

REF. NO. 13

FIGURE B.7

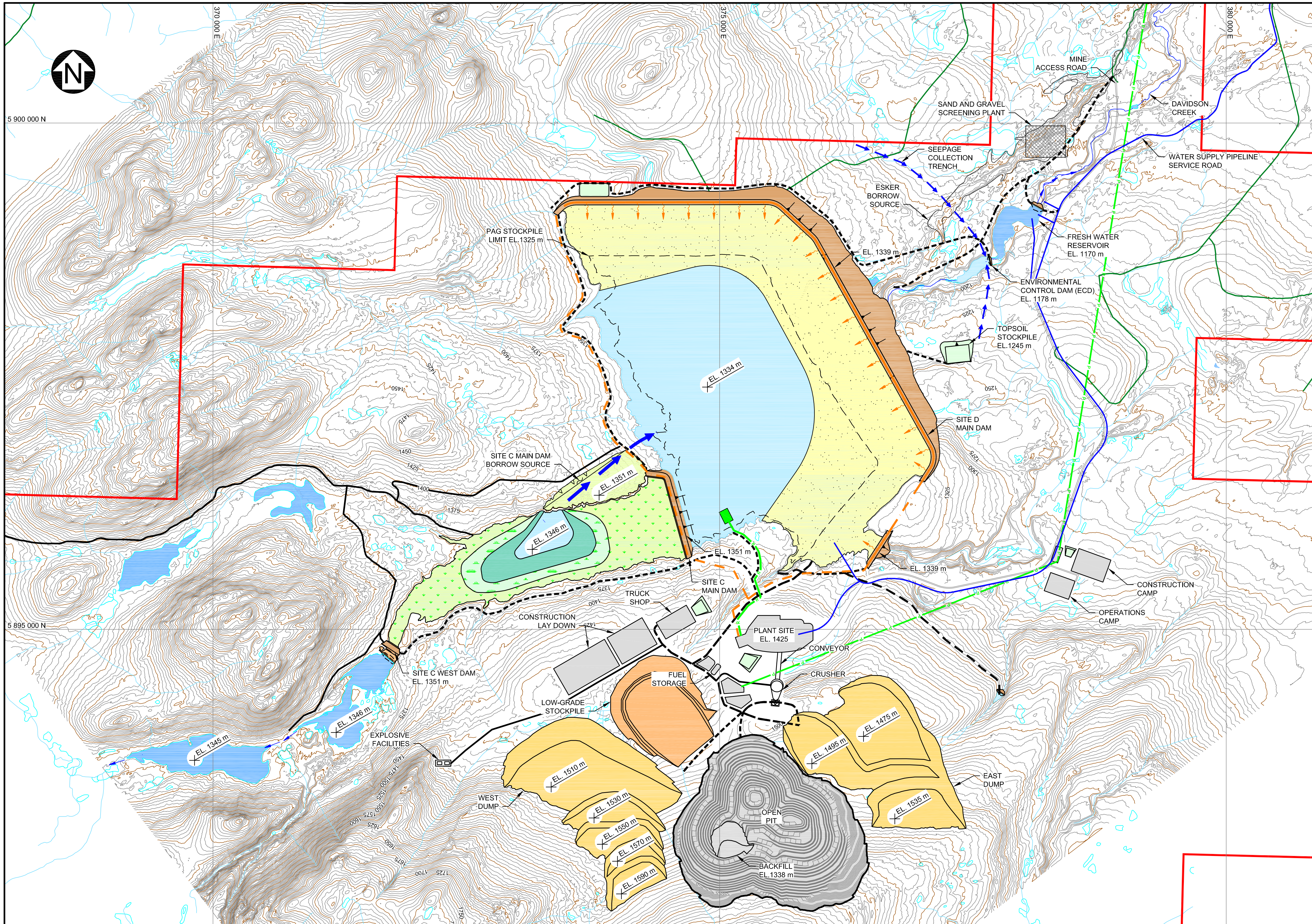
REV 0

Knight Piésold CONSULTING

APPENDIX C

GENERAL ARRANGEMENTS

(Pages C-1 to C-3)



LEGEND:

- UPLAND BEACH
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- UPLAND SLOPE
- TAILINGS BEACH
- POND
- EMBANKMENT FILL
- PAG WASTE ROCK
- NAG WASTE ROCK / OVERBURDEN
- LOW-GRADE ORE
- TOPSOIL
- RECLAIM SYSTEM
- WATER SUPPLY PUMPSTATION
- CONSTRUCTION HAUL ROAD
- MINE HAUL ROAD
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- FRESH WATER FLOW DIRECTION
- WATER RECLAIM PIPELINE
- NEW GOLD PROPERTY BOUNDARY
- TRANSMISSION LINE
- SPILLWAY
- SEEPAGE COLLECTION TRENCH
- TAILINGS PIPELINE
- TAILINGS DEPOSITION

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT END OF MINE (YEAR 17) PLAN

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA101-457/6	13

FIGURE C.1 REV A

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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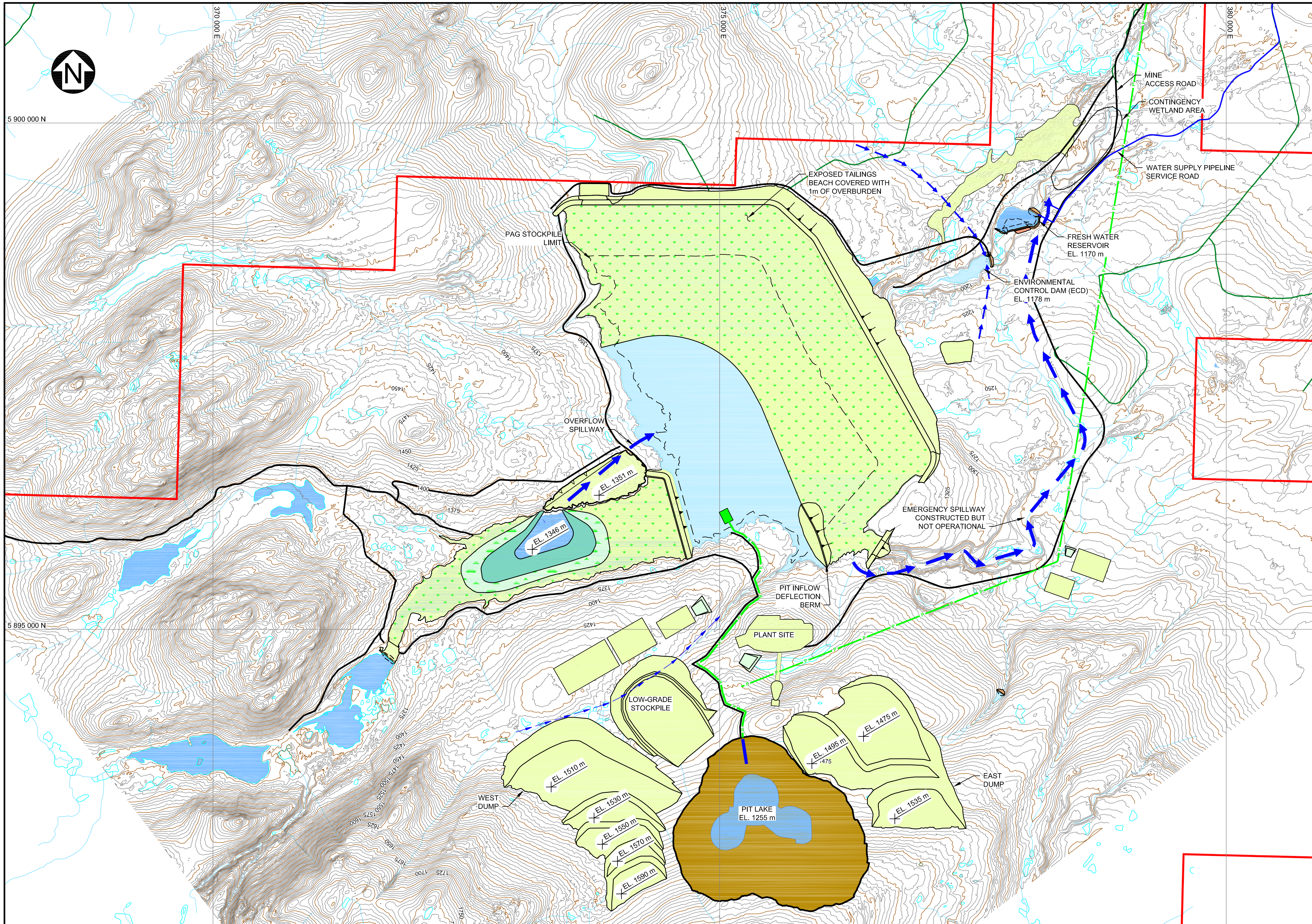

LEGEND:

- UPLAND BEACH
- UPLAND SLOPE
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- POND
- ROCK SLOPES
- RECLAIM SYSTEM
- MINE ACCESS ROAD
- PIPELINE SERVICE ROAD
- WATER RECLAIM PIPELINE
- TRANSMISSION LINE
- DIVERSION CHANNEL
- SEEPAGE COLLECTION TRENCH
- SPILLWAY

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT CLOSURE (END OF YEAR 20) PLAN

Knight Piésold CONSULTING

P/A NO. VA101-457/6 | REF NO. 13

FIGURE C.2 REV A

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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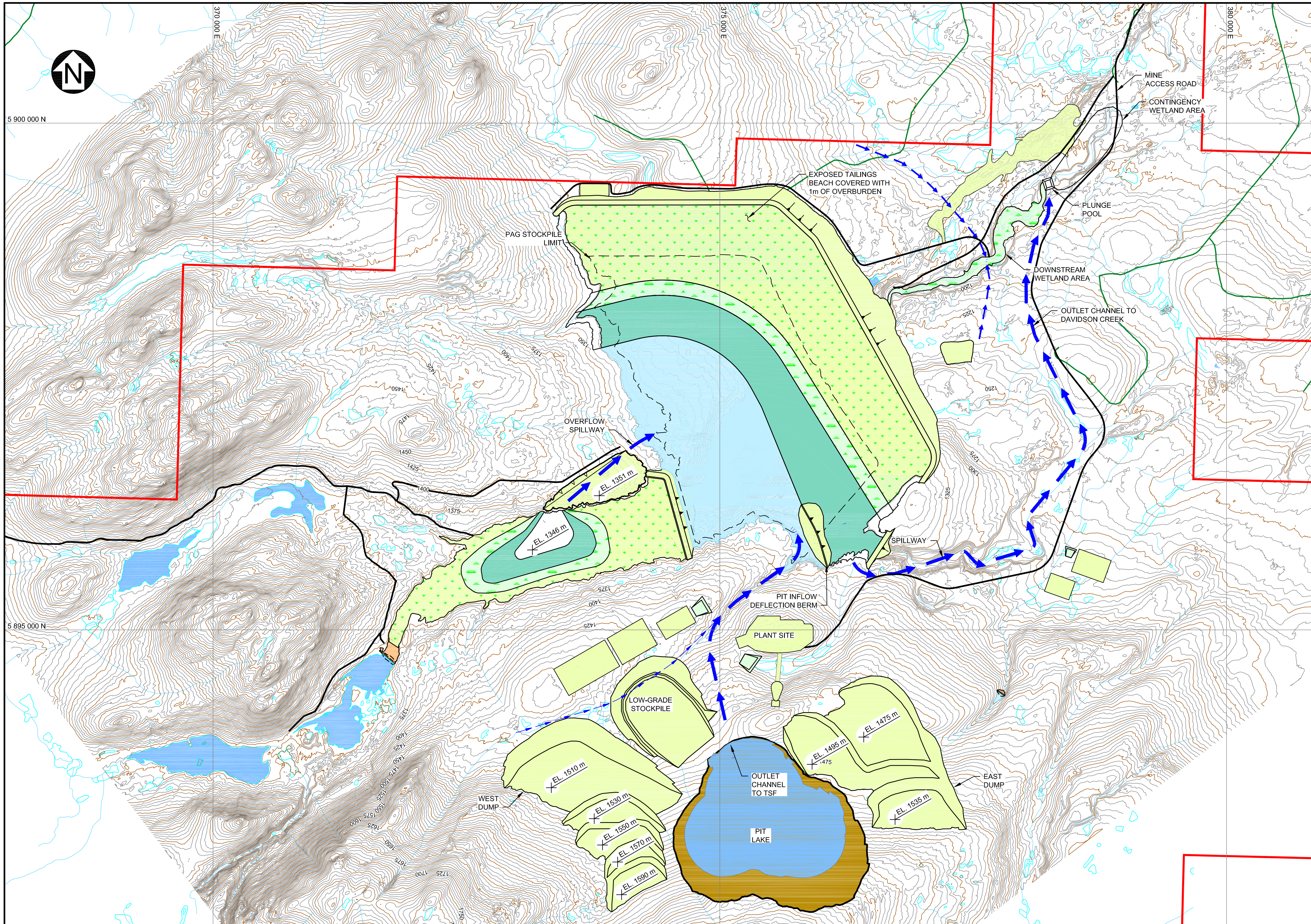

LEGEND:

- UPLAND BEACH
- UPLAND SLOPE
- BOG / WETLAND AREA
- EMERGENT VEGETATION WETLAND
- POND
- ROCK SLOPES
- MINE ACCESS ROAD
- DIVERSION CHANNEL
- SEEPAGE COLLECTION TRENCH
- SPILLWAY

NOTES:

1. CONTOUR INTERVAL IS 5 METRES.
2. DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 400 200 0 400 800 1200 1600 2000 m

NEW GOLD INC

BLACKWATER GOLD PROJECT

GENERAL ARRANGEMENT
POST CLOSURE
PLAN

Knight Piésold
CONSULTING

P/A NO.	REF NO.
VA101-457/6	13

FIGURE C.3 REV A

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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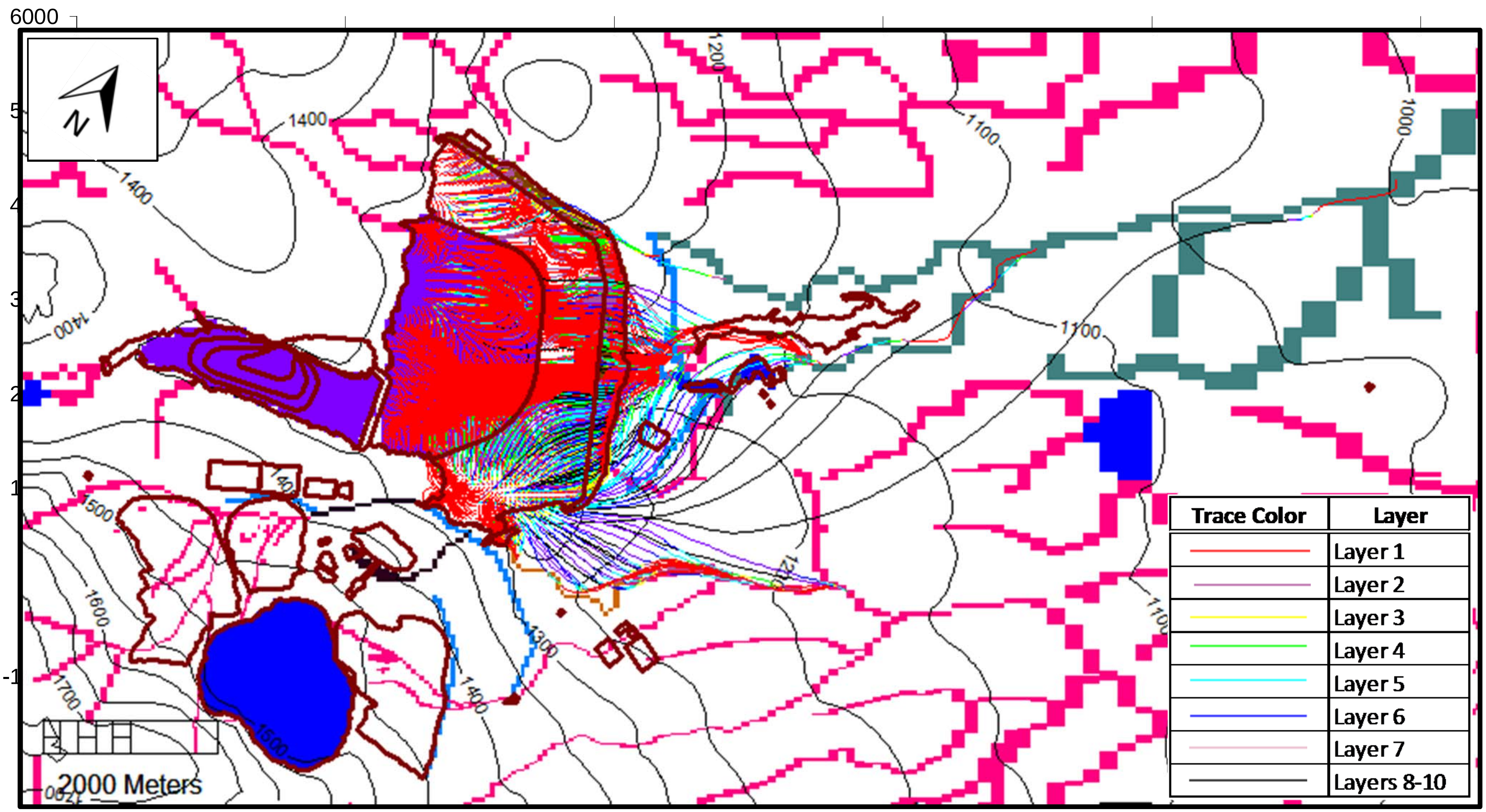
APPENDIX D

MODPATH PARTICLE SIMULATION RESULTS

(Pages D-1 to D-16)



NOTES:
1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE MODEL LAYER IT IS TRAVELLING IN.
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

TSF D MODPATH PARTICLE ANALYSIS
PARTICLES BY MODEL LAYER

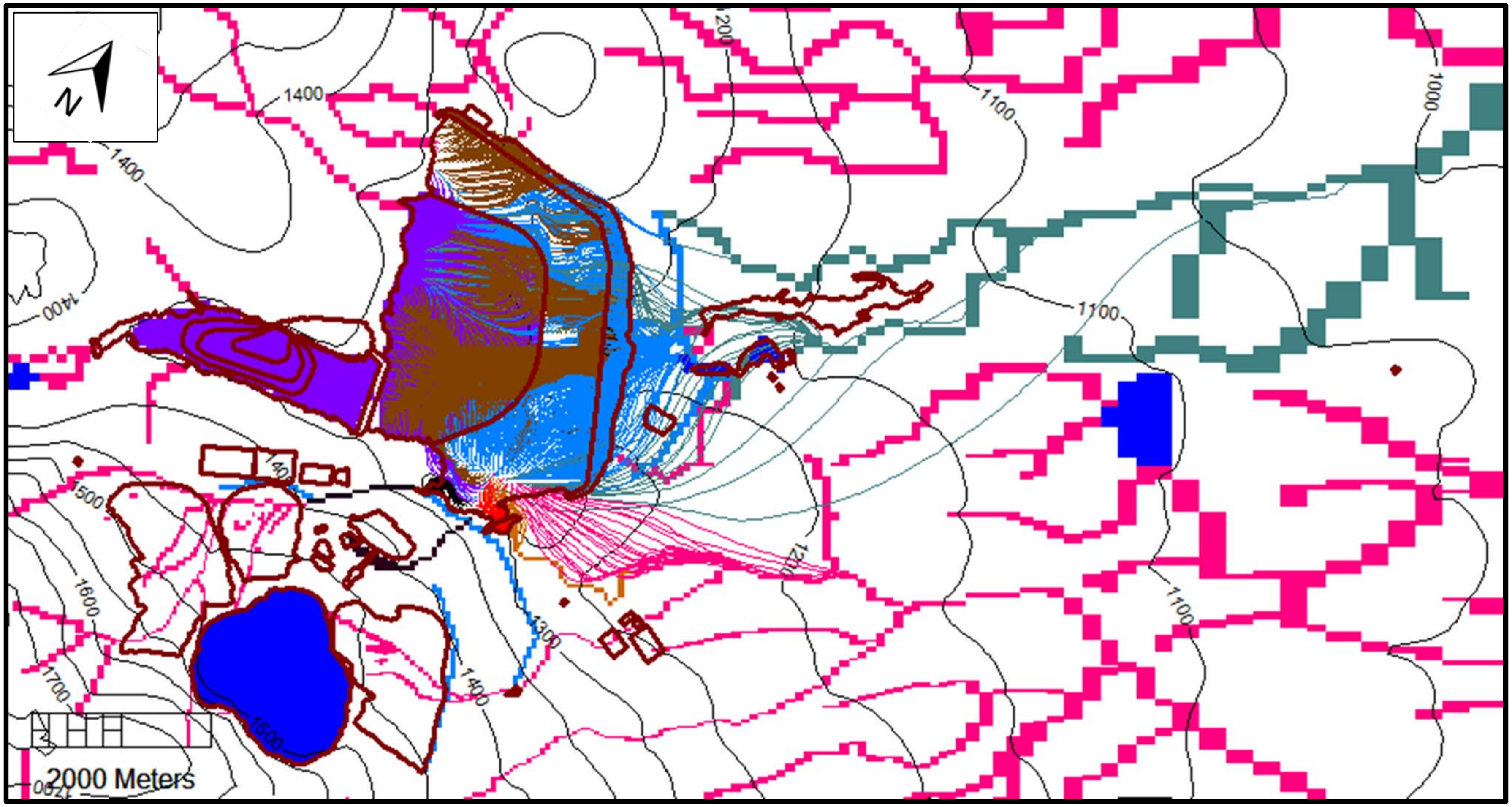
Knight Piésold CONSULTING

P/A NO. VA101-457/6

REF. NO. 13

FIGURE D.1

REV 0



NOTES:

1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES FROM THE MODEL DOMAIN:

    PINK = CREEK 661
    TEAL = DAVIDSON CREEK
    BROWN = TSF MAIN EMBANKMENT DRAINS
    RED = TSF SOUTH ABUTMENT DRAINS
    ORANGE = TSF SPILLWAY
    PURPLE = TSF SITE D POND
    BLUE = ECD SYSTEM
    BLACK = NATURAL CHANNEL REPORTING TO TSF

2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

NEW GOLD INC.

BLACKWATER GOLD PROJECT

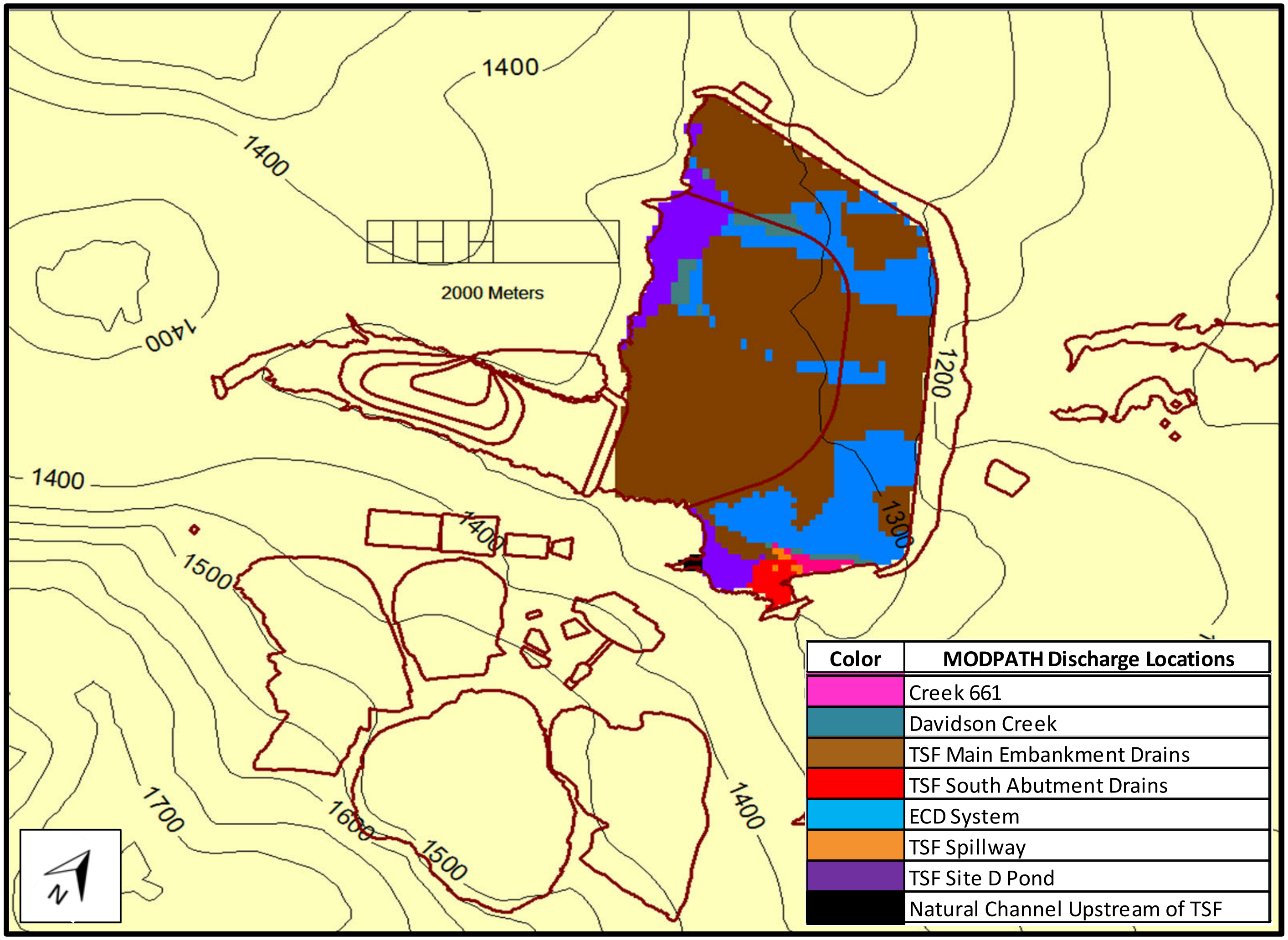
TSF D MODPATH PARTICLE ANALYSIS
PARTICLES BY DISCHARGE LOCATIONS

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

Knight Piésold CONSULTING

P/A NO.	REF. NO.
VA101-457/6	13

FIGURE D.2 REV 0



Color	MODPATH Discharge Locations
(magenta)	Creek 661
(teal)	Davidson Creek
(brown)	TSF Main Embankment Drains
(red)	TSF South Abutment Drains
(light blue)	ECD System
(orange)	TSF Spillway
(purple)	TSF Site D Pond
(black)	Natural Channel Upstream of TSF

NOTES:

1. THE EAST DUMP FOOTPRINT IS COLOURED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES.
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

NEW GOLD INC.

BLACKWATER GOLD PROJECT

TSF D MODPATH PARTICLE ANALYSIS
FOOTPRINT BY PARTICLE DISCHARGE LOCATION

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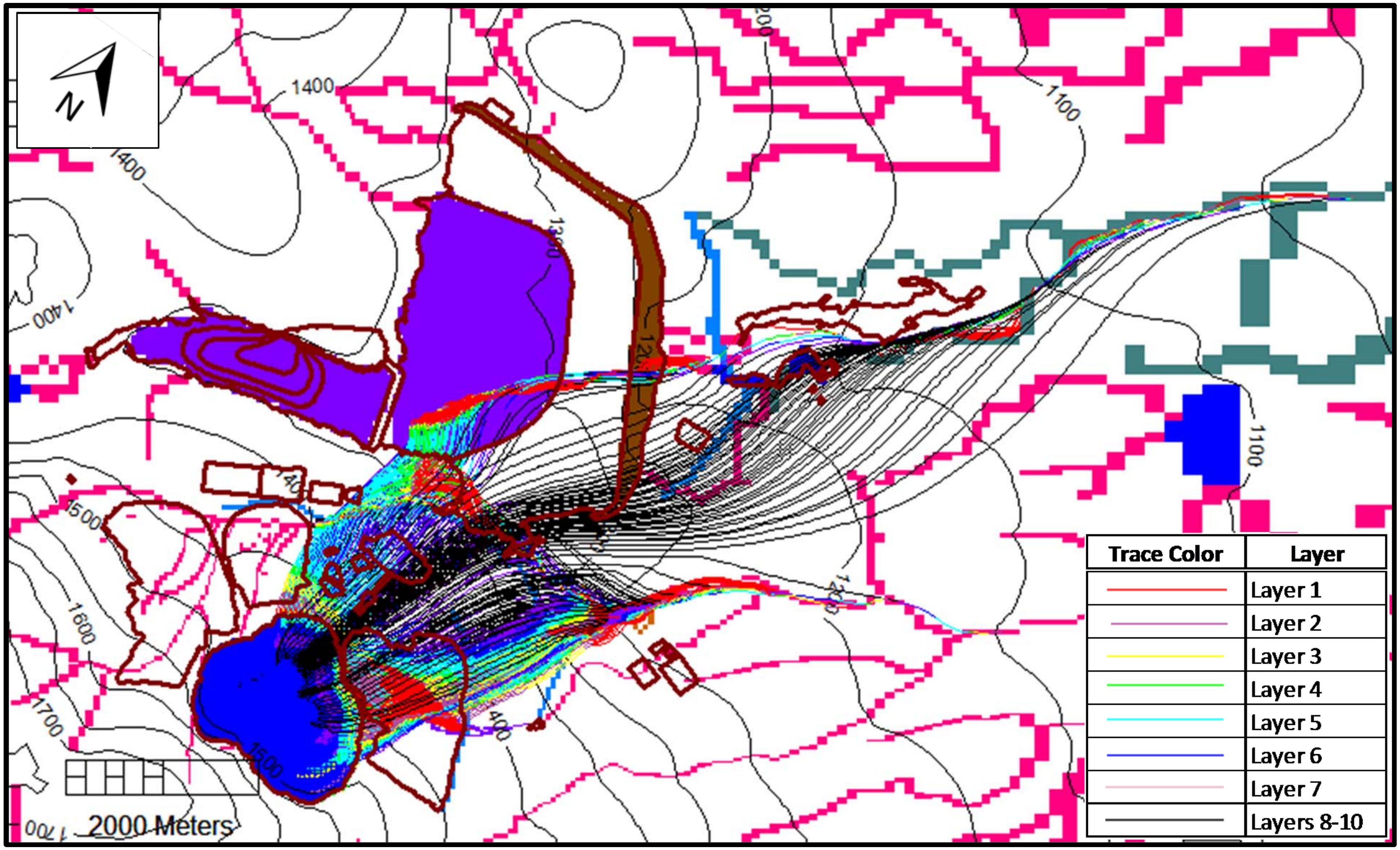
P/A NO.	REF. NO.
VA101-457/6	13

FIGURE D.3 REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB



NOTES:
1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE MODEL LAYER IT IS TRAVELLING IN.
3. PARTICLES WERE INSERTED INTO LAYERS 1 THROUGH 8.
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

NEW GOLD INC.

BLACKWATER GOLD PROJECT

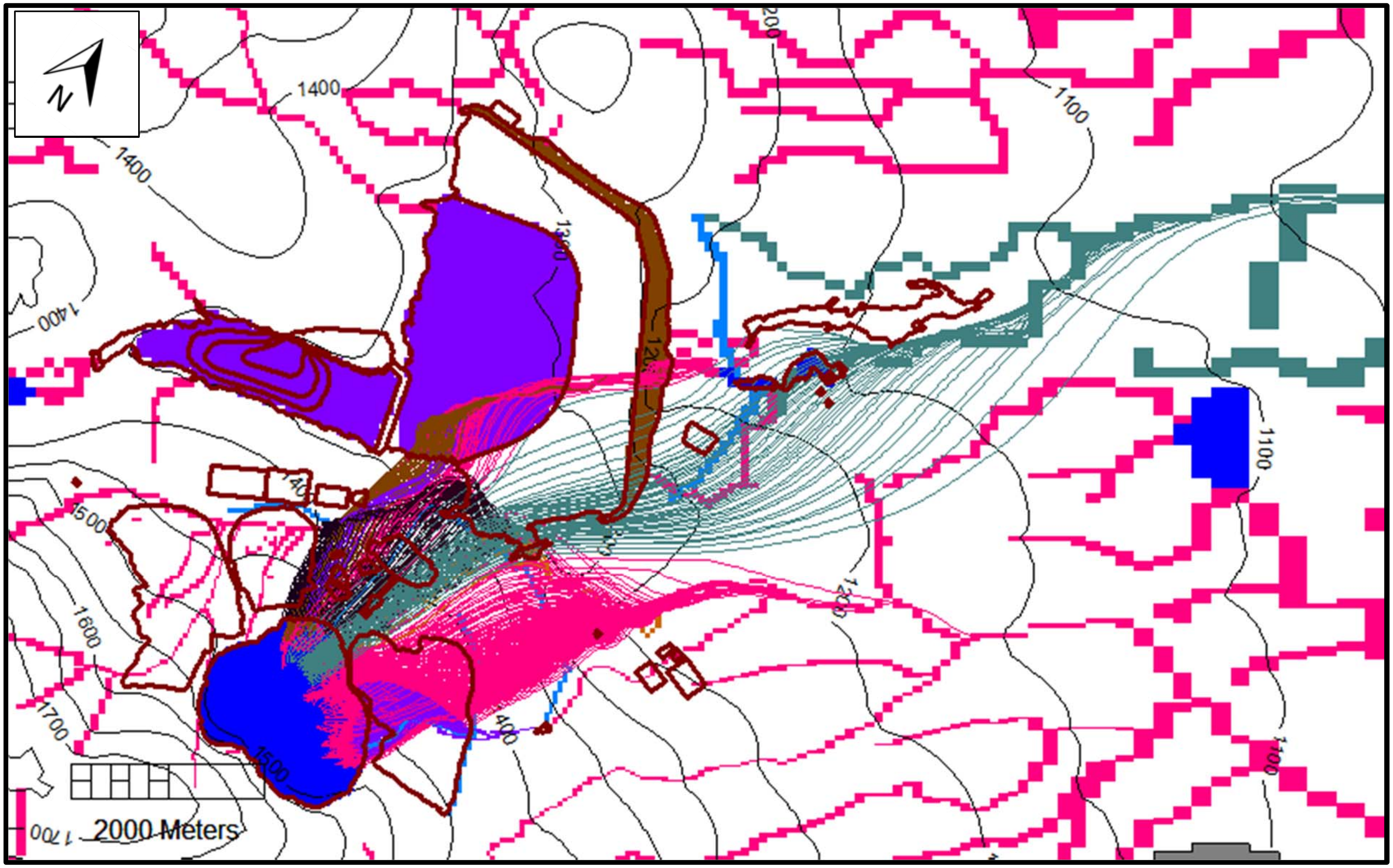
PIT LAKE MODPATH PARTICLE ANALYSIS
PARTICLES BY MODEL LAYER

Knight Piésold CONSULTING

P/A NO. VA101-457/6 | REF. NO. 13

FIGURE D.4 REV 0

0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



NOTES:

1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES FROM THE MODEL DOMAIN:
   - PURPLE = CHANNEL TO EAST DUMP DRAINAGE DITCHES
   - PINK = CREEK 661
   - TEAL = DAVIDSON CREEK
   - BLUE = LOWER EAST DUMP DRAINAGE DITCH
   - BLACK = NATURAL CHANNEL UPSTREAM OF TSF
   - BROWN = TSF D EMBANKMENT DRAINS
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

PIT LAKE MODPATH PARTICLE ANALYSIS
PARTICLES BY DISCHARGE LOCATIONS

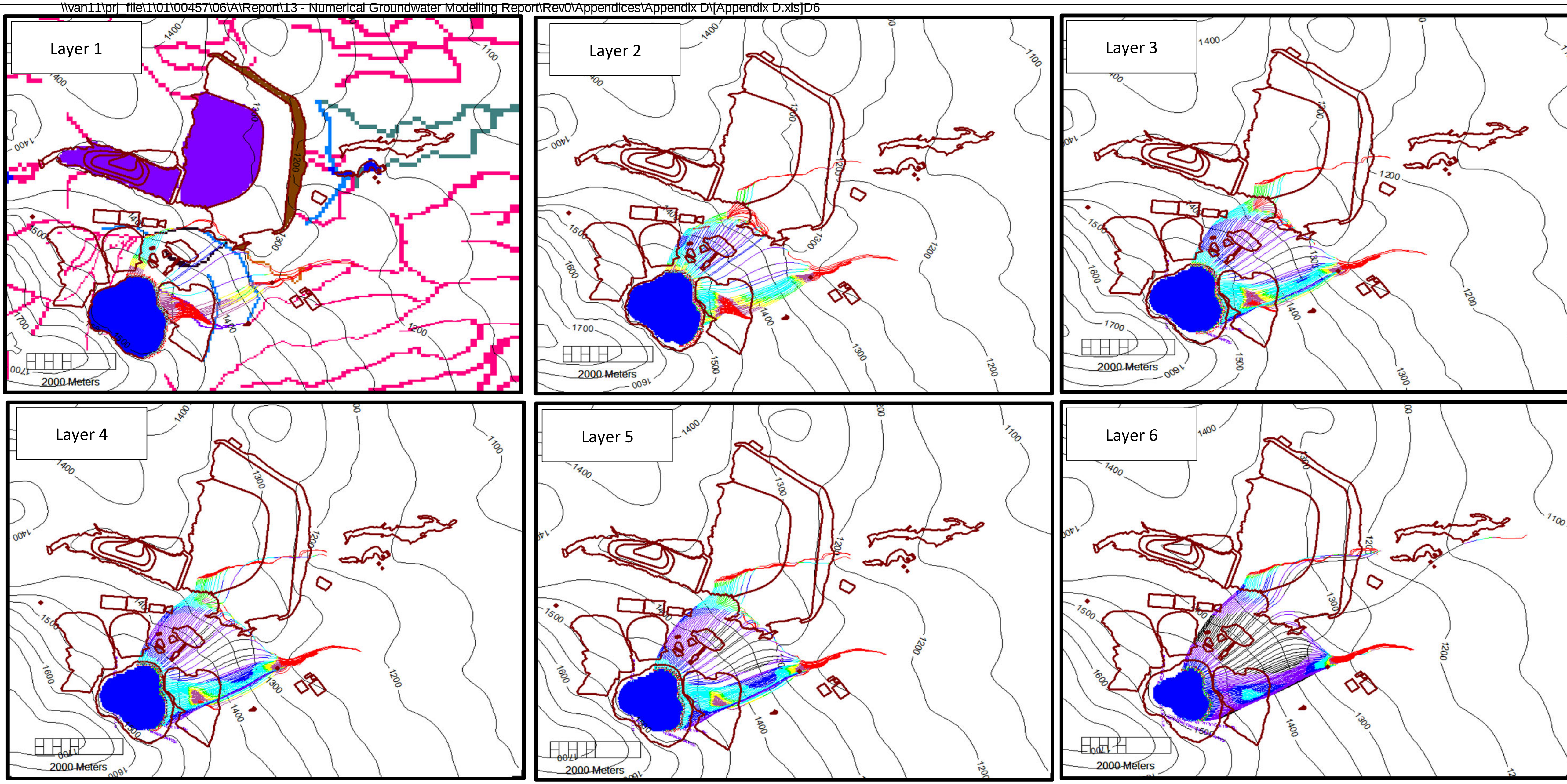
Knight Piésold CONSULTING

P/A NO. VA101-457/6

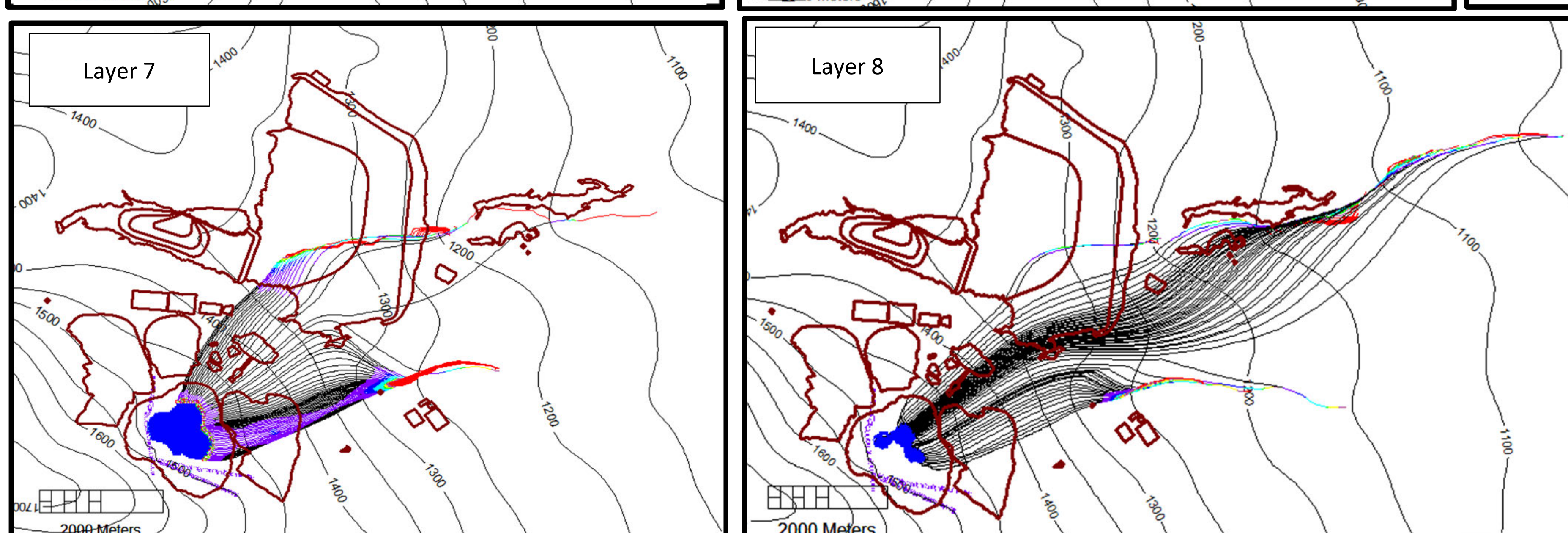
REF. NO. 13

FIGURE D.5

0



Trace Color	Layer
red	Layer 1
purple	Layer 2
yellow	Layer 3
green	Layer 4
cyan	Layer 5
blue	Layer 6
pink	Layer 7
black	Layers 8-10



NOTES:

1. THE IMAGES OF MODEL 1 LAYERS THROUGH 8 ABOVE PRESENT MODPATH PARTICLE TRACES BY THE LAYER IN WHICH THEY ORIGINATE.

2. PARTICLE TRACES ARE COLOURED ACCORDING TO THE MODEL LAYER IT IS TRAVELLING IN.

3. CONTOURS INDICATE WATER TABLE ELEVATION (masl)

0	16JAN'14	ISSUED FOR REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

PIT LAKE MODPATH PARTICLE ANALYSIS
PARTICLES BY STARTING LAYER

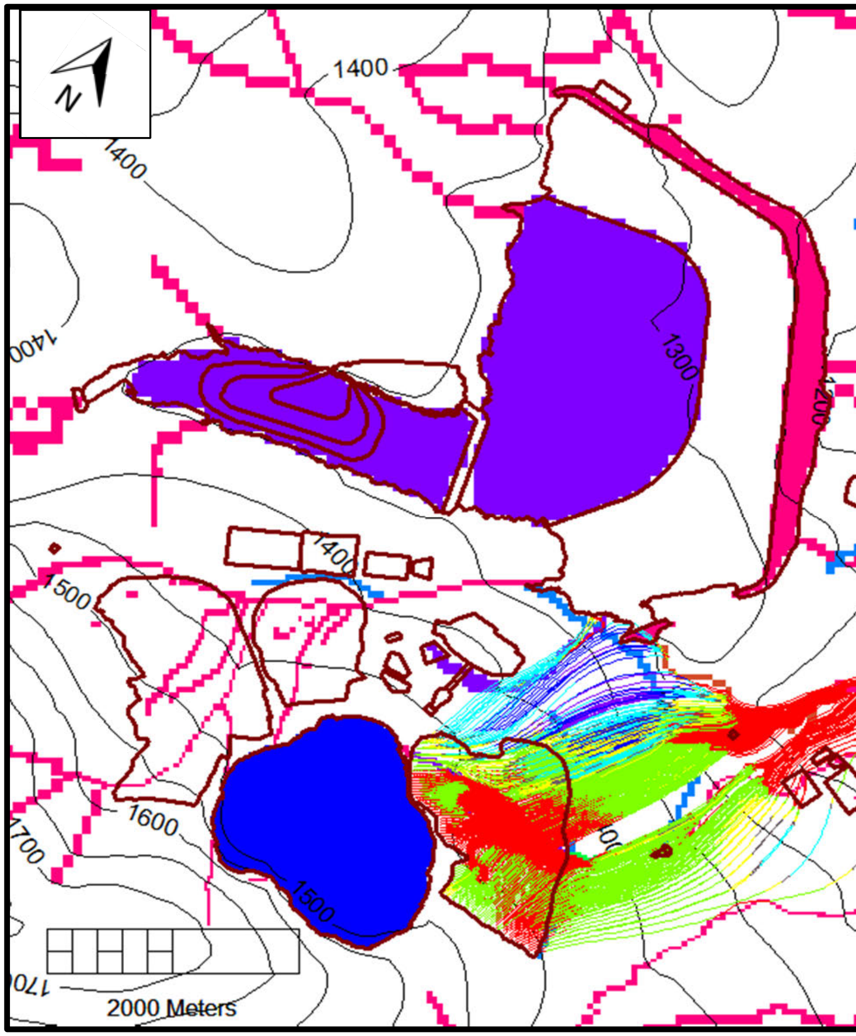
Knight Piésold CONSULTING

P/A NO. VA101-457/6

REF. NO. 13

FIGURE D.6

REV 0



Trace Color	Layer
red line	Layer 1
purple line	Layer 2
yellow line	Layer 3
green line	Layer 4
cyan line	Layer 5
blue line	Layer 6
pink line	Layer 7
black line	Layers 8-10

NOTES:
1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE MODEL LAYER IT IS TRAVELLING IN.
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

NEW GOLD INC.

BLACKWATER GOLD PROJECT

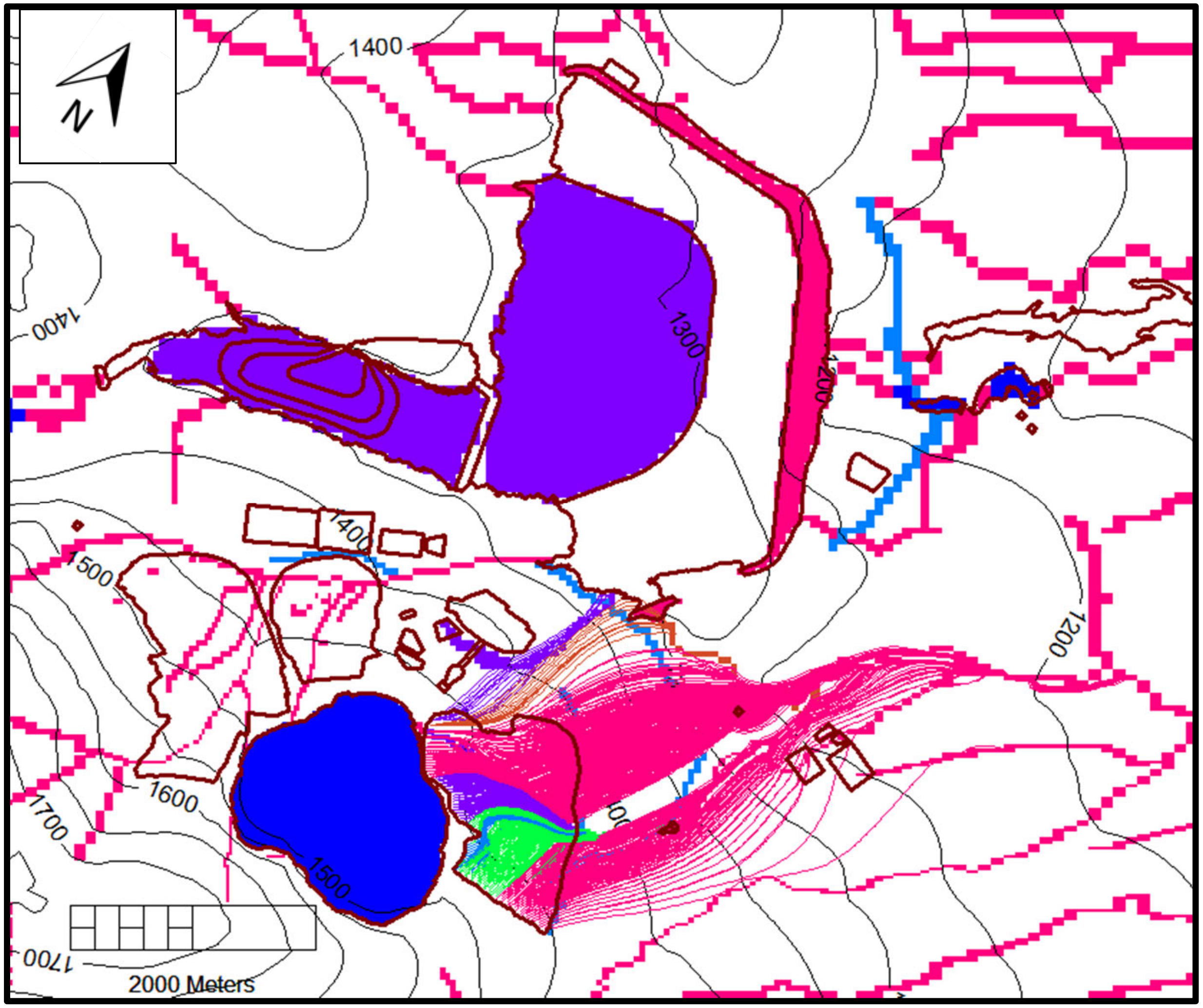
EAST DUMP MODPATH PARTICLE ANALYSIS
PARTICLES BY MODEL LAYER

Knight Piésold CONSULTING

P/A NO. VA101-457/6 | REF. NO. 13

FIGURE D.7 | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB



NOTES:

1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES FROM THE MODEL DOMAIN:
   - DARK PURPLE = NATURAL CHANNEL REPORTING TO TSF
   - BLUE = LOWER EAST DUMP DRAINAGE DITCH
   - GREEN = CHANNEL TO EAST DUMP DRAINAGE DITCHES
   - PURPLE = SPRINGS WITHIN EAST DUMP FOOTPRINT
   - BROWN = TSF SPILLWAY
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

NEW GOLD INC.

BLACKWATER GOLD PROJECT

EAST DUMP MODPATH PARTICLE ANALYSIS
PARTICLES BY DISCHARGE LOCATION

Knight Piésold CONSULTING

P/A NO.	REF. NO.
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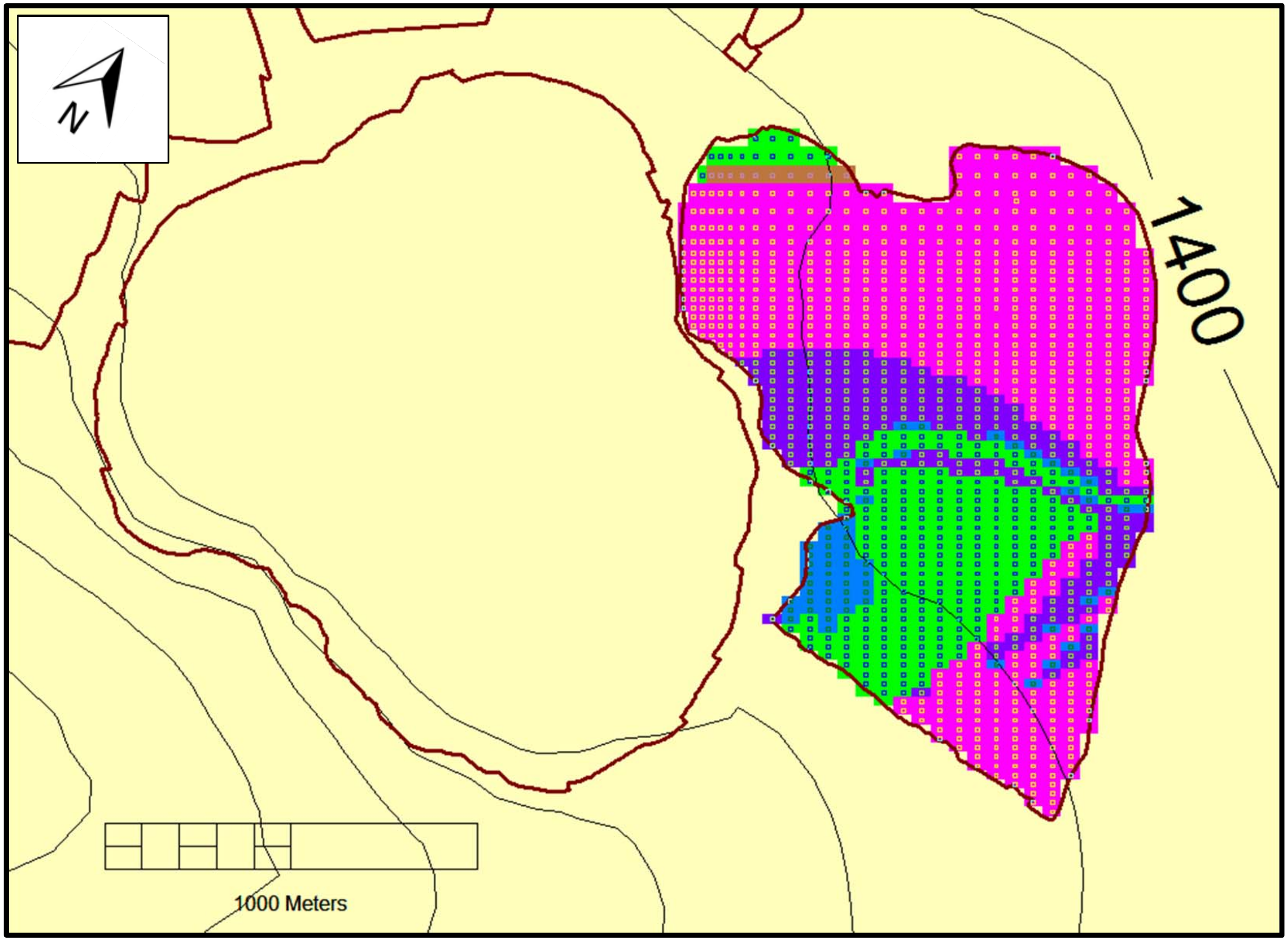
FIGURE D.8 REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB



NOTES:

1. THE EAST DUMP FOOTPRINT IS COLORED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES:
   - BLUE = LOWER EAST DUMP DRAINAGE DITCH
   - DARK PURPLE = NATURAL CHANNEL REPORTING TO TSF
   - GREEN = CHANNEL TO EAST DUMP DRAINAGE DITCHES
   - PURPLE = SPRINGS WITHIN EAST DUMP FOOTPRINT
   - ORANGE = TSF SPILLWAY
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

EAST DUMP MODPATH PARTICLE ANALYSIS
FOOTPRINT BY PARTICLE DISCHARGE LOCATION

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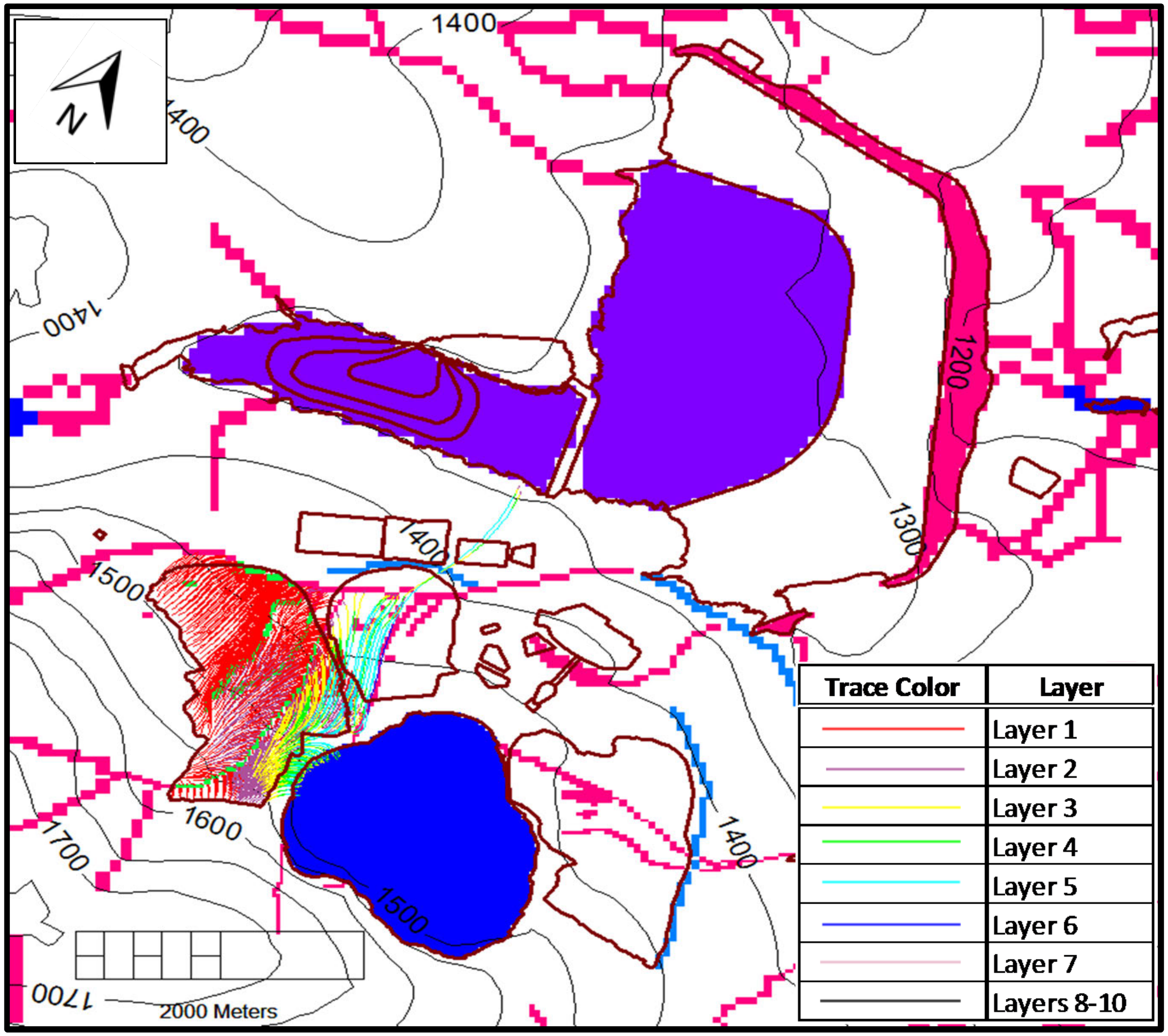
P/A NO. VA101-457/6

REF. NO. 13

FIGURE D.9

REV 0



NOTES:
1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE MODEL LAYER IT IS TRAVELLING IN.
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

NEW GOLD INC.

BLACKWATER GOLD PROJECT

WEST DUMP MODPATH PARTICLE ANALYSIS PARTICLES BY MODEL LAYER

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P/A NO.	REF. NO.
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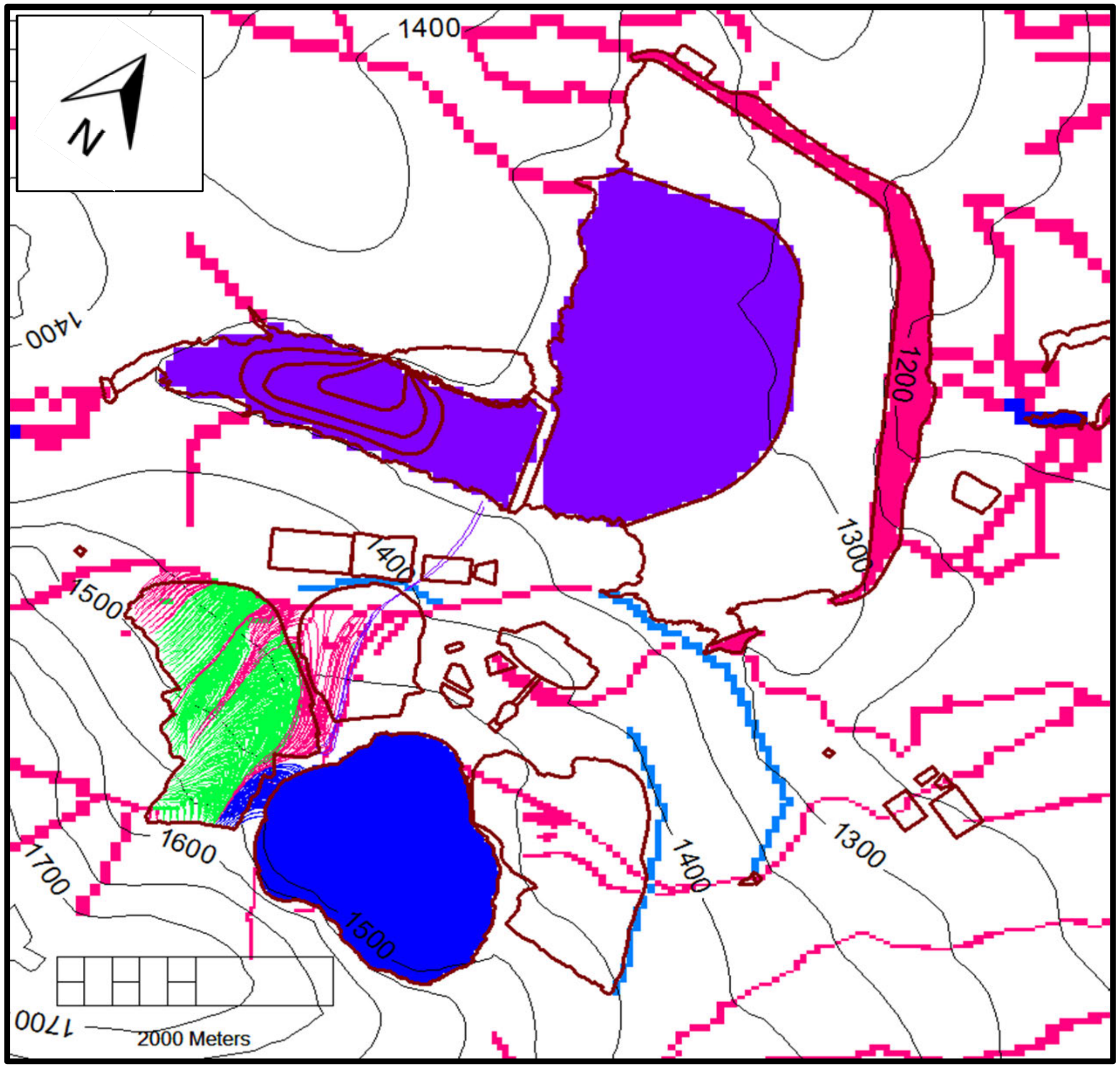
FIGURE D.10 REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB



NOTES:

1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES FROM THE MODEL DOMAIN:
   - GREEN = SPRINGS WITHIN WEST DUMP FOOTPRINT
   - PINK = NATURAL DRAINAGE REPORTING TO TSF
   - PURPLE = TSF SITE C POND
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

WEST DUMP MODPATH PARTICLE ANALYSIS
PARTICLES BY DISCHARGE LOCATION

Knight Piésold CONSULTING

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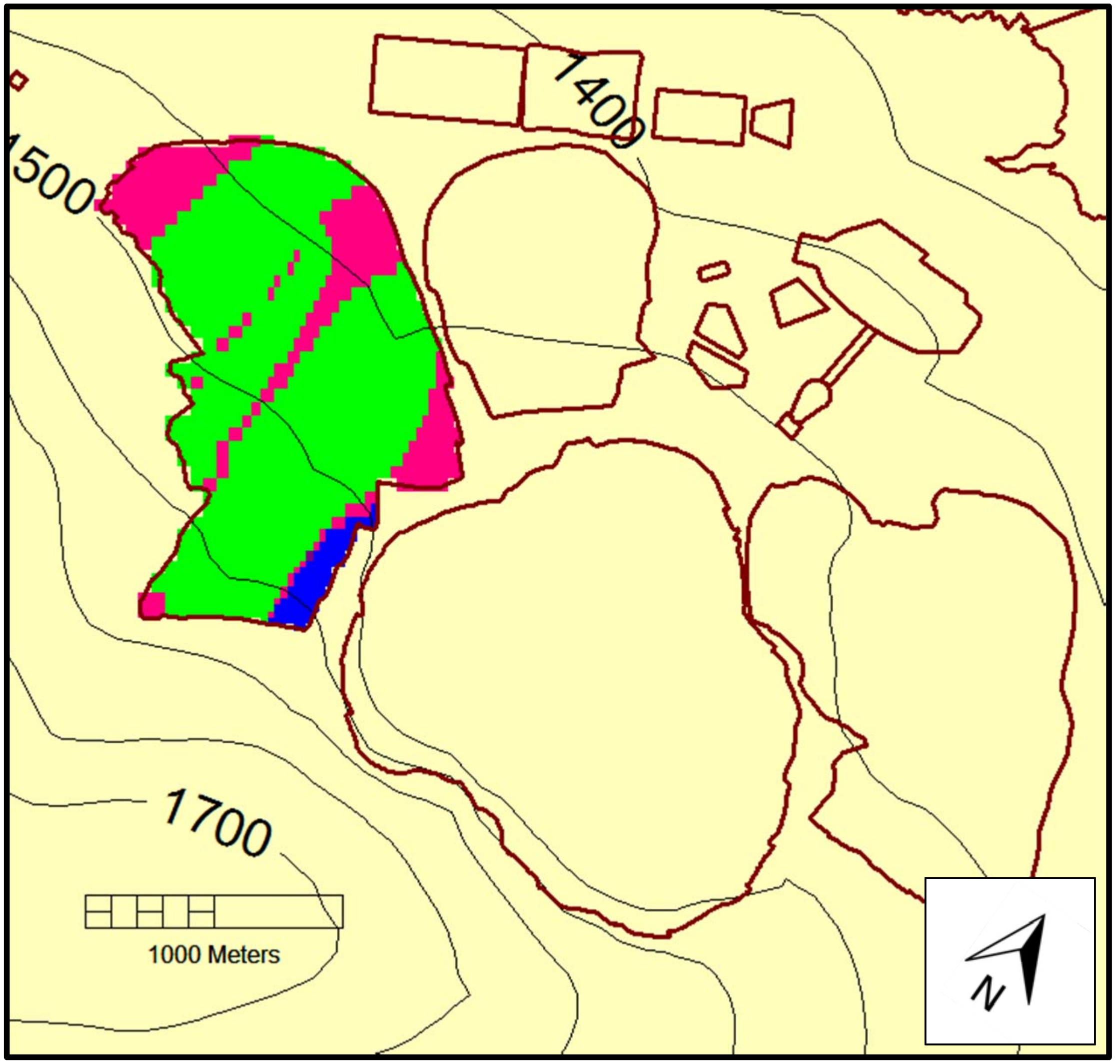
FIGURE D.11

REV 0



NOTES:

1. THE EAST DUMP FOOTPRINT IS COLORED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES:
   PINK = NATURAL CHANNEL REPORTING TO TSF
   GREEN = SPRINGS WITHIN WEST DUMP FOOTPRINT
   PURPLE = TSF SITE C POND
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

WEST DUMP MODPATH PARTICLE ANALYSIS
FOOTPRINT BY PARTICLE DISCHARGE LOCATION

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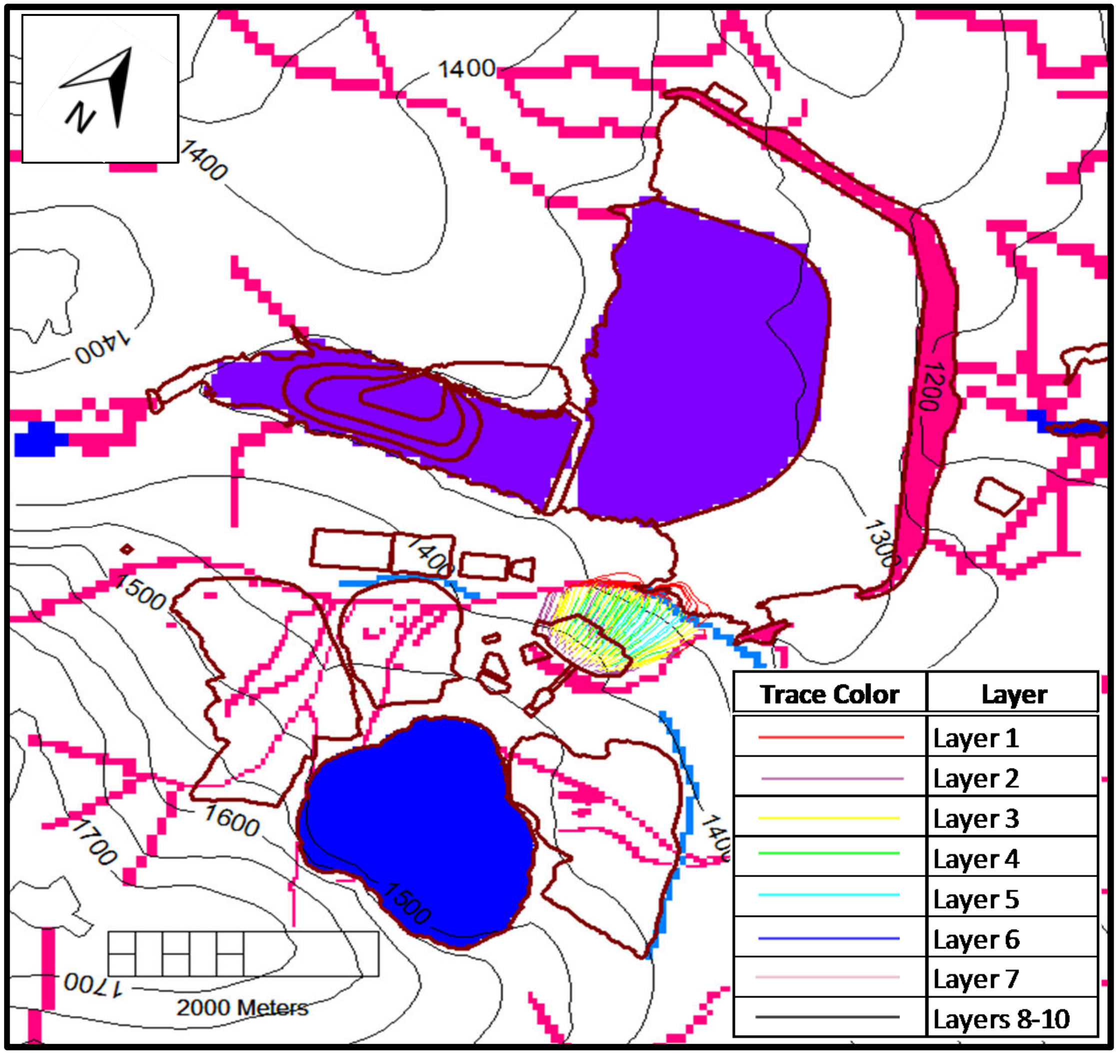
FIGURE D.12

REV 0



Trace Color	Layer
	Layer 1
	Layer 2
	Layer 3
	Layer 4
	Layer 5
	Layer 6
	Layer 7
	Layers 8-10

NOTES:

1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE MODEL LAYER IT IS TRAVELLING IN.

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BLACKWATER GOLD PROJECT

PLANT SITE MODPATH PARTICLE ANALYSIS
PARTICLES BY MODEL LAYER

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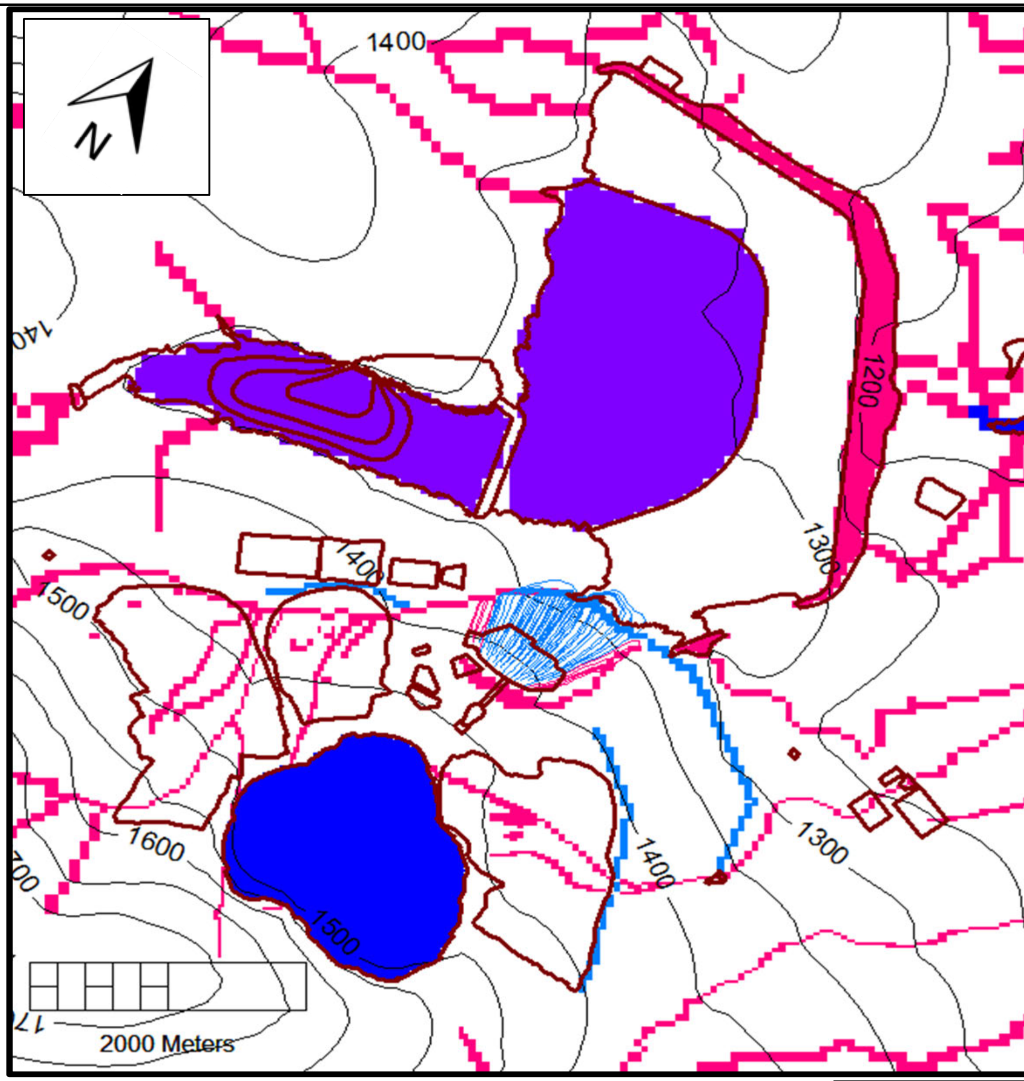
REF. NO. 13

FIGURE D.13

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN`14	ISSUED WITH REPORT	KTD	CAS	KJB



NOTES:

1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES FROM THE MODEL DOMAIN:
   BLUE = LOWER EAST DUMP DRAINAGE DITCH
   PINK = NATURAL CHANNEL REPORTING TO TSF
2. THE CONTOURS SHOWN ABOVE ARE OF WATER TABLE ELEVATION (masl).

0	16JAN`14	ISSUED WITH REPORT	KTD	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

PLANT SITE MODPATH PARTICLE ANALYSIS
PARTICLES BY DISCHARGE LOCATION

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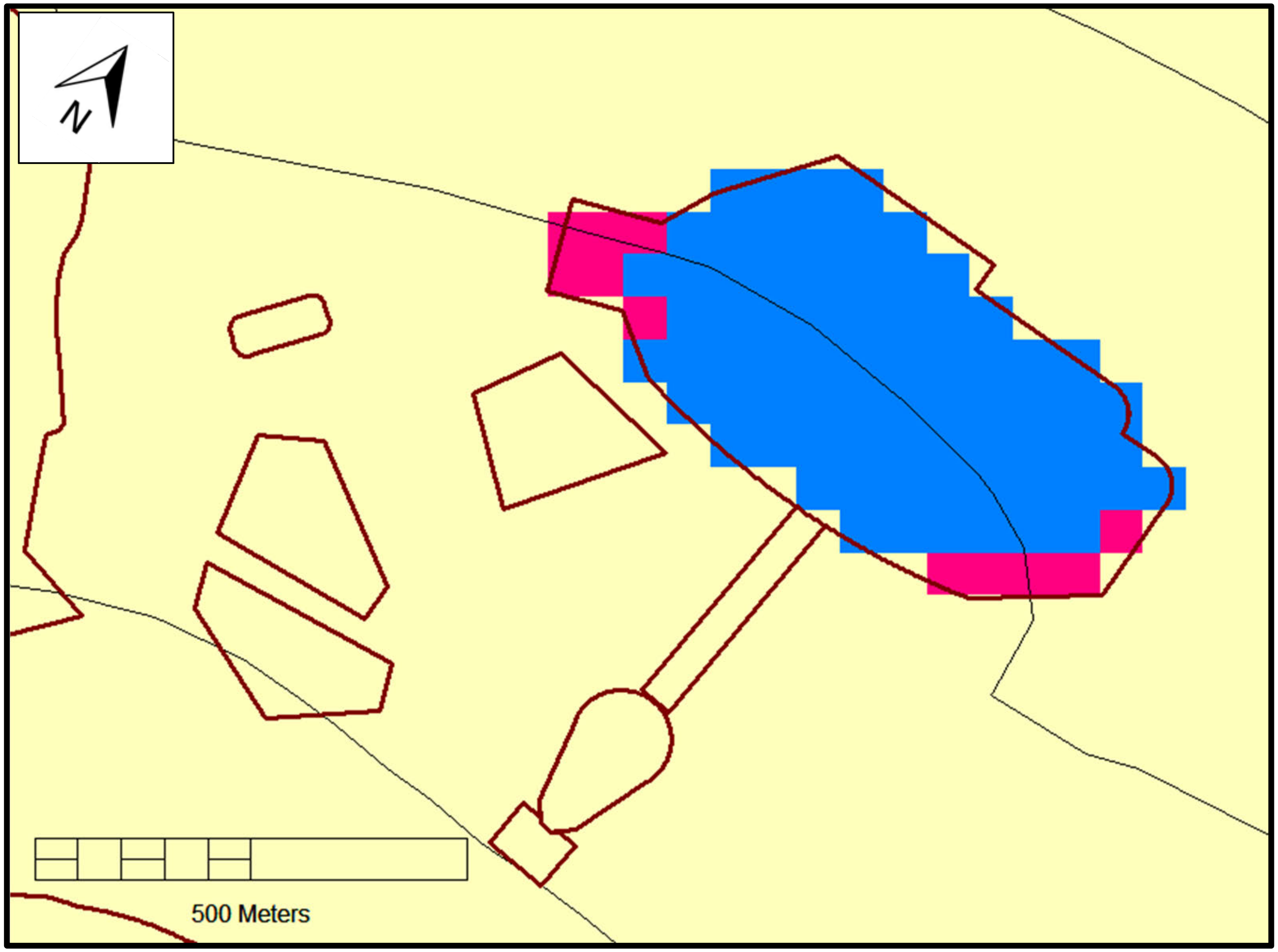
FIGURE D.14

REV 0



NOTES:

1. THE EAST DUMP FOOTPRINT IS COLORED ACCORDING TO THE LOCATION WHERE THE MODPATH PARTICLE DISCHARGES:

PINK = NATURAL CHANNEL REPORTIG TO TSF
BLUE = LOWER EAST DUMP DRAINAGE DITCH

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN`14	ISSUED WITH REPORT	KTD	CAS	KJB

NEW GOLD INC.

BLACKWATER GOLD PROJECT

PLANT SITE MODPATH PARTICLE ANALYSIS
FOOTPRINT BY PARTICLE DISCHARGE LOCATION

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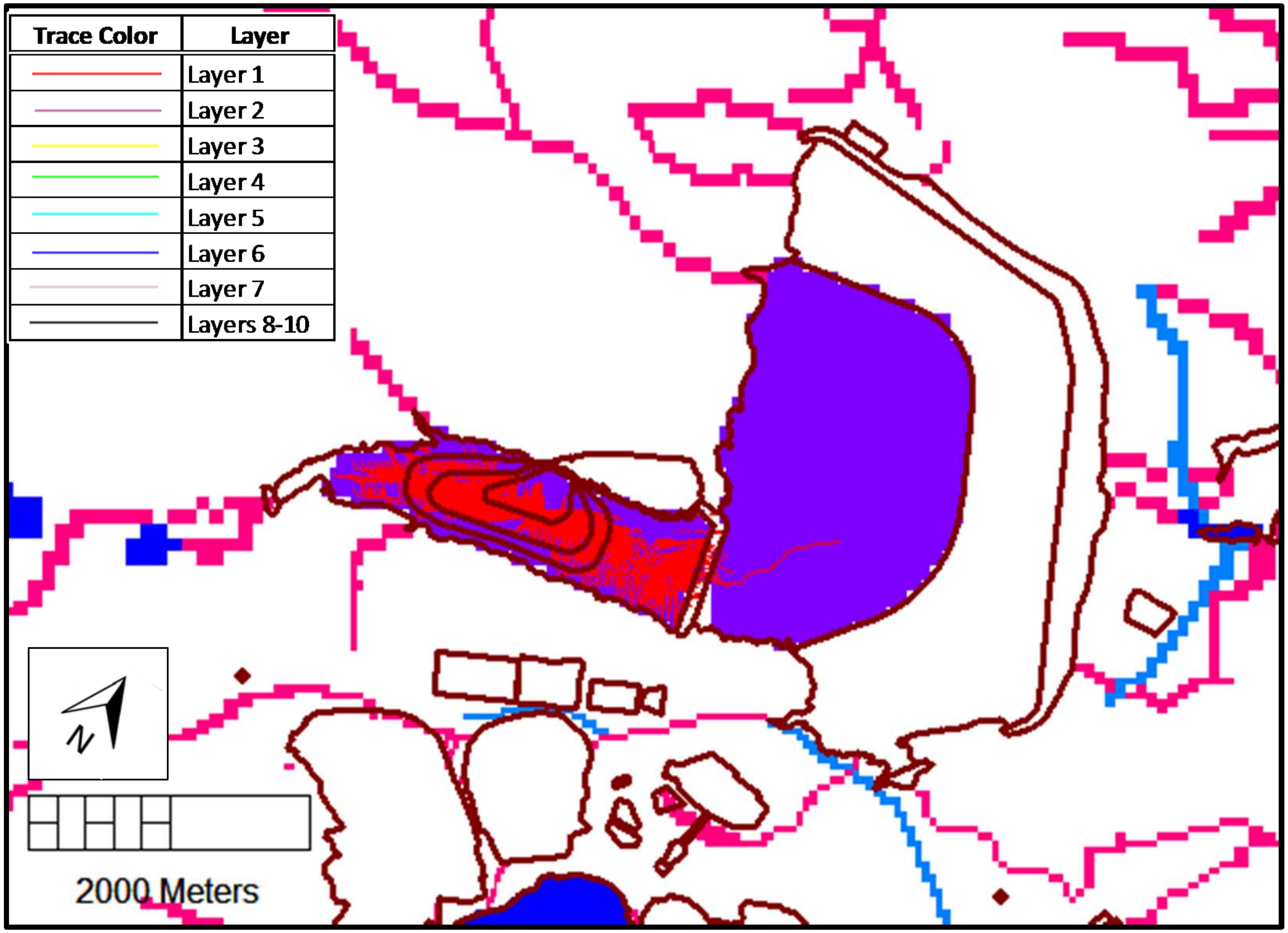
FIGURE D.15

REV 0



NOTES:

1. PARTICLE TRACES ARE COLOURED ACCORDING TO THE MODEL LAYER IT IS TRAVELLING IN.
2. ALL PARTICLES SHOWN ABOVE DISCHARGE INTO TSF PONDS C OR D. AS SUCH, NO FIGURE ILLUSTRATING TSF C MODPATH DISCHARGE LOCATIONS OR HSU BALANCE WAS COMPLETED.

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BLACKWATER GOLD PROJECT

TSF C MODPATH PARTICLE ANALYSIS
PARTICLES BY MODEL LAYER

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FIGURE D.16

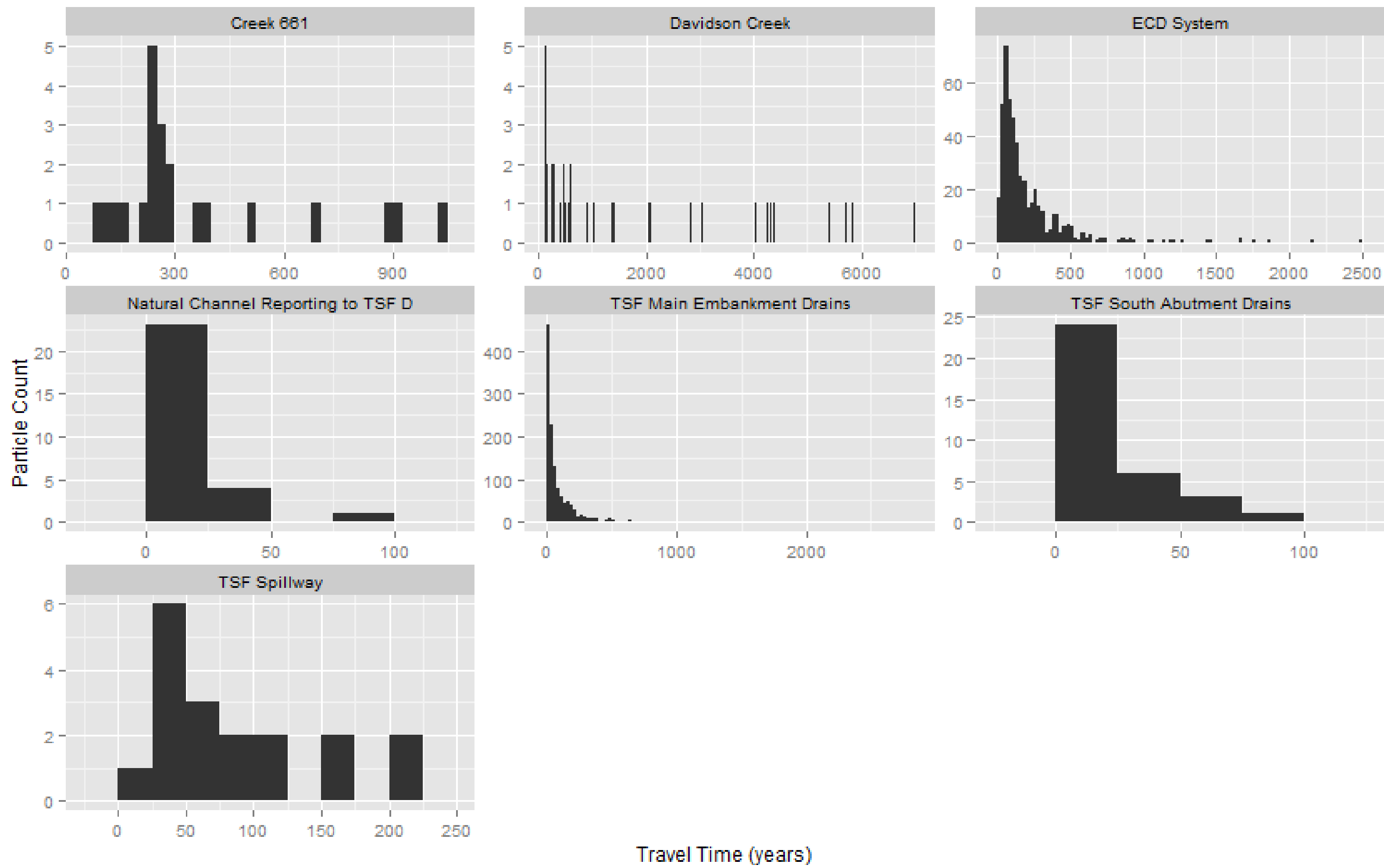
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN`14	ISSUED WITH REPORT	KTD	CAS	KJB

APPENDIX E

HISTOGRAMS OF MODPATH PARTICLE TRAVEL TIMES

(Pages E-1 to E-5)



NOTES:
1. HISTOGRAM BIN SIZE IS 50 YEARS.

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BLACKWATER GOLD PROJECT

HISTOGRAMS OF PARTICLE TRAVEL TIMES TSF SITE D

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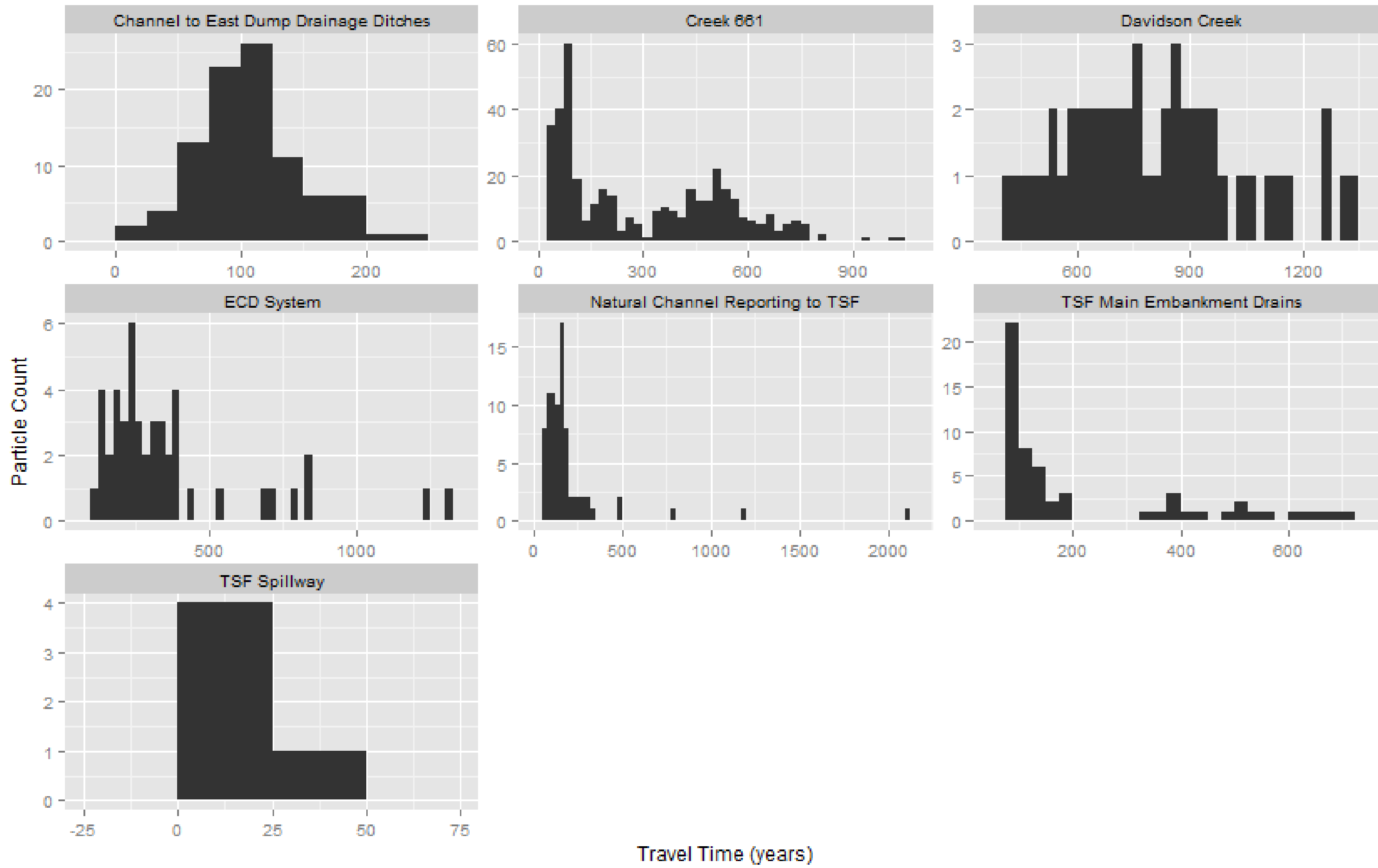
FIGURE E.1 REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	MAF	CAS	KJB



NOTES:

1. HISTOGRAM BIN SIZE IS 25 YEARS.

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BLACKWATER GOLD PROJECT

HISTOGRAMS OF PARTICLE TRAVEL TIMES
PIT LAKE

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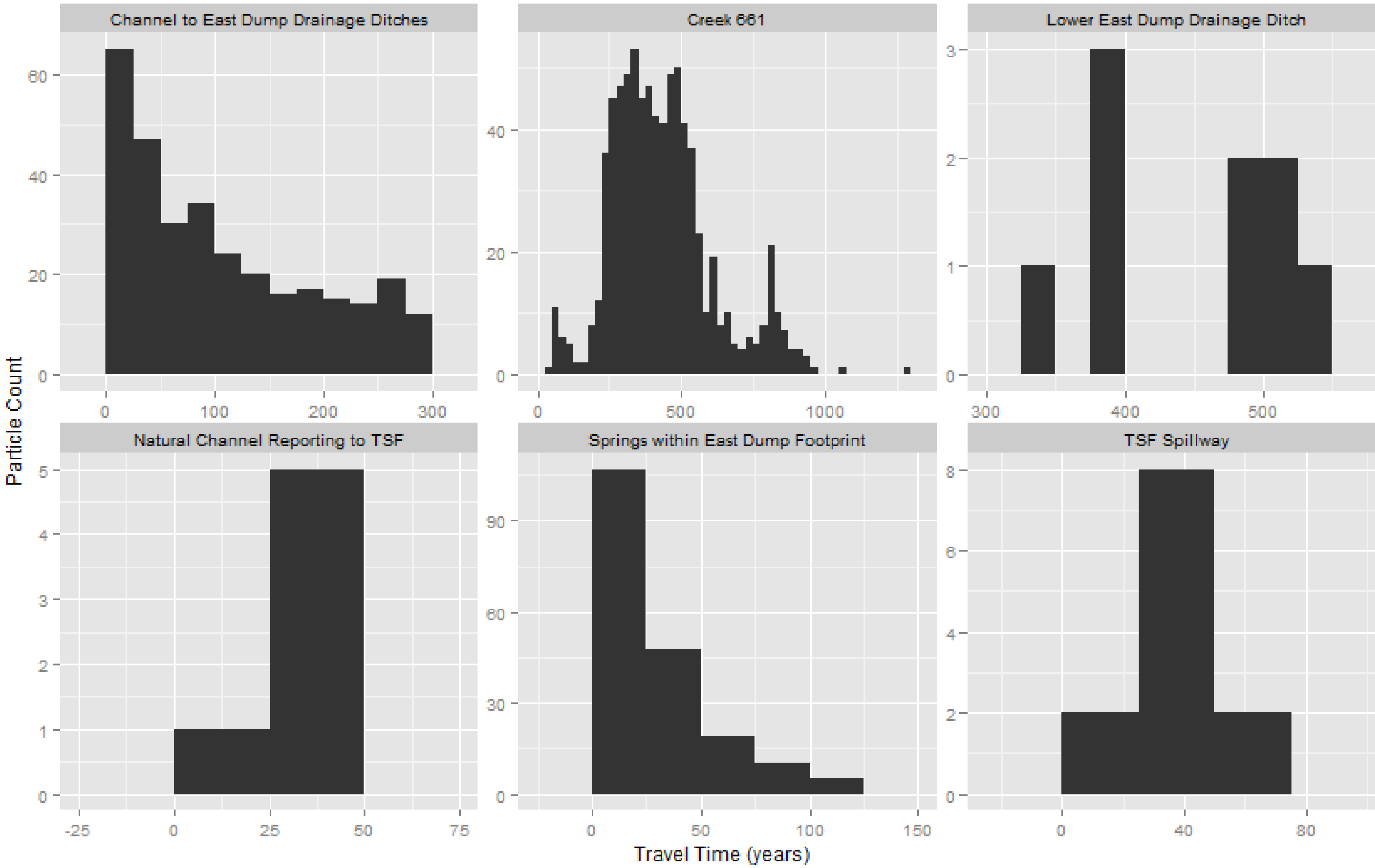
FIGURE E.2 REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	MAF	CAS	KJB



NOTES:

1. HISTOGRAM BIN SIZE IS 25 YEARS.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	16JAN'14	ISSUED WITH REPORT	MAF	CAS	KJB

NEW GOLD INC.

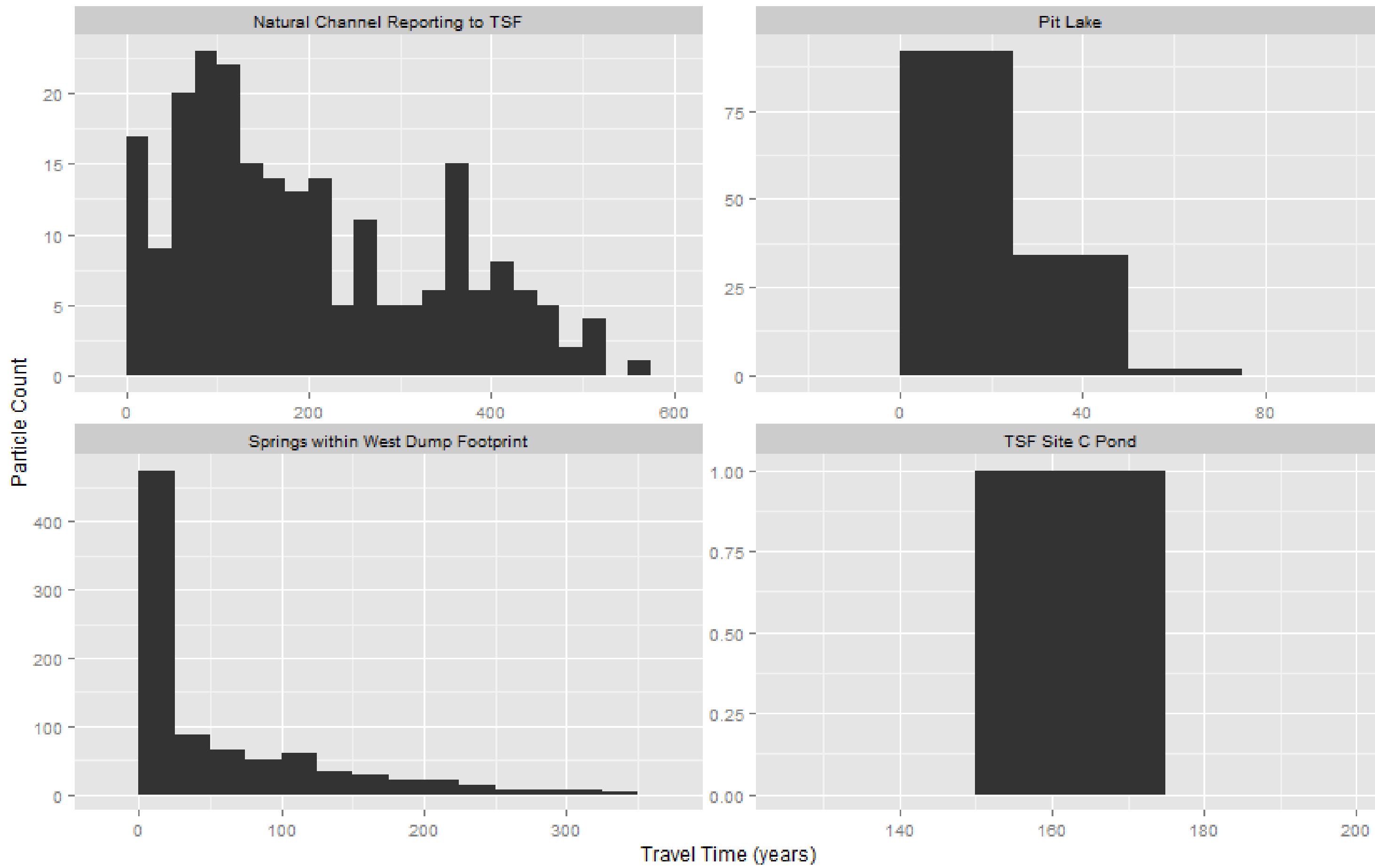
BLACKWATER GOLD PROJECT

HISTOGRAMS OF PARTICLE TRAVEL TIMES
EAST WASTE ROCK DUMP

Knight Piésold CONSULTING

P/A NO.	REF. NO.
VA101-457/6	13

FIGURE E.3 REV 0



NOTES:
1. HISTOGRAM BIN SIZE IS 25 YEARS.

0	16JAN'14	ISSUED WITH REPORT	MAF	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

HISTOGRAMS OF PARTICLE TRAVEL TIMES
WEST WASTE ROCK DUMP

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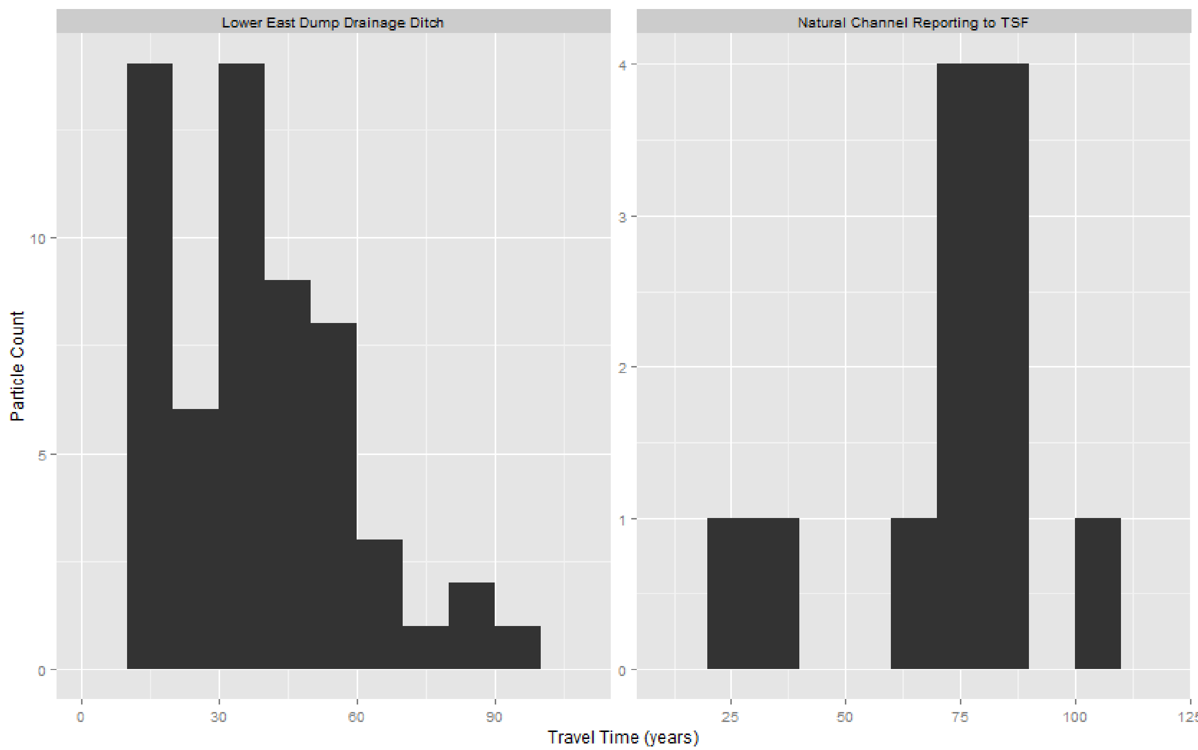
P/A NO. VA101-457/6

REF. NO. 13

FIGURE E.4

REV 0



NOTES:
1. HISTOGRAM BIN SIZE IS 10 YEARS.

0	16JAN'14	ISSUED WITH REPORT	MAF	CAS	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

NEW GOLD INC.

BLACKWATER GOLD PROJECT

HISTOGRAMS OF PARTICLE TRAVEL TIMES
PLANT SITE

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FIGURE E.5

REV 0