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Ref No.: PM-0921023.0230

Oscar Flores, New Afton Mine General Manager
New Gold Inc.
Box 948 Station Main
Kamloops, B.C. V2C 5N4

Dear Mr. Flores,

Re: BGC Support in Response to Chief Inspector's Order of February 3, 2015

On February 3, 2015, the British Columbia Ministry of Energy and Mines (MEM) Chief Inspector of Mines issued a letter request (MEM February 3, 2015) for all mines with active tailings storage facilities (TSF) in B.C. to comment on the extent to which the conditions that the Mount Polley Expert Panel Report (Independent Expert Engineering Investigation and Review Panel 2015) concluded had contributed to the incident at the Mount Polley TSF may or may not exist at their mines. In particular, the MEM request requires mine managers "to *undertake an assessment to determine if the dam(s) associated with your tailings storage facility/facilities may be at risk due to:*

1. *undrained shear failure of silt and clay foundations;*
2. *water balance adequacy; and*
3. *filter adequacy."*

Fourteen specific questions were noted under these three topics; all are addressed in the following sections of this letter.

As the current Engineer of Record for the New Afton and Pothook TSFs at the New Afton Mine, BGC Engineering Inc. (BGC) has prepared this letter summarizing the relevant technical information and responses in support of New Gold's letter of assurance. It has been prepared at your request, and is submitted to you in support of New Afton's letter of assurance. It relies upon information supplied by mine staff, BGC reports, and in some cases draws upon information provided by third parties. It is noted that the Chief Inspector of Mines also requested a response from New Gold on the implementation of the Expert Panel recommendations; specifically, the Mining Association of Canada's *"Toward Sustainable Mining"* initiative, and convening an Independent Tailings Dam Review Board. BGC has not provided commentary on these two items.

BACKGROUND

The New Afton Mine is located in the Thompson-Nicola Region of B.C. about 10 km west of Kamloops. The historic Afton Mine was operated between 1977 and 1996, and featured two open pits, a waste rock dump and a TSF referred to as the "*Historic TSF*." The Historic TSF is not part of the New Afton Mine and an assessment of that facility is not included herein.

The New Afton Mine comprises an underground mine with active tailings storage facilities (the New Afton TSF and Pothook TSF) that were built in 2009. Vector Engineering Inc. (Vector) was the Engineering of Record for these TSFs, including their initial design, construction and operation until February, 2013 when BGC assumed the role of Engineer of Record. The current general arrangement of structures is shown in Figure 1-1.

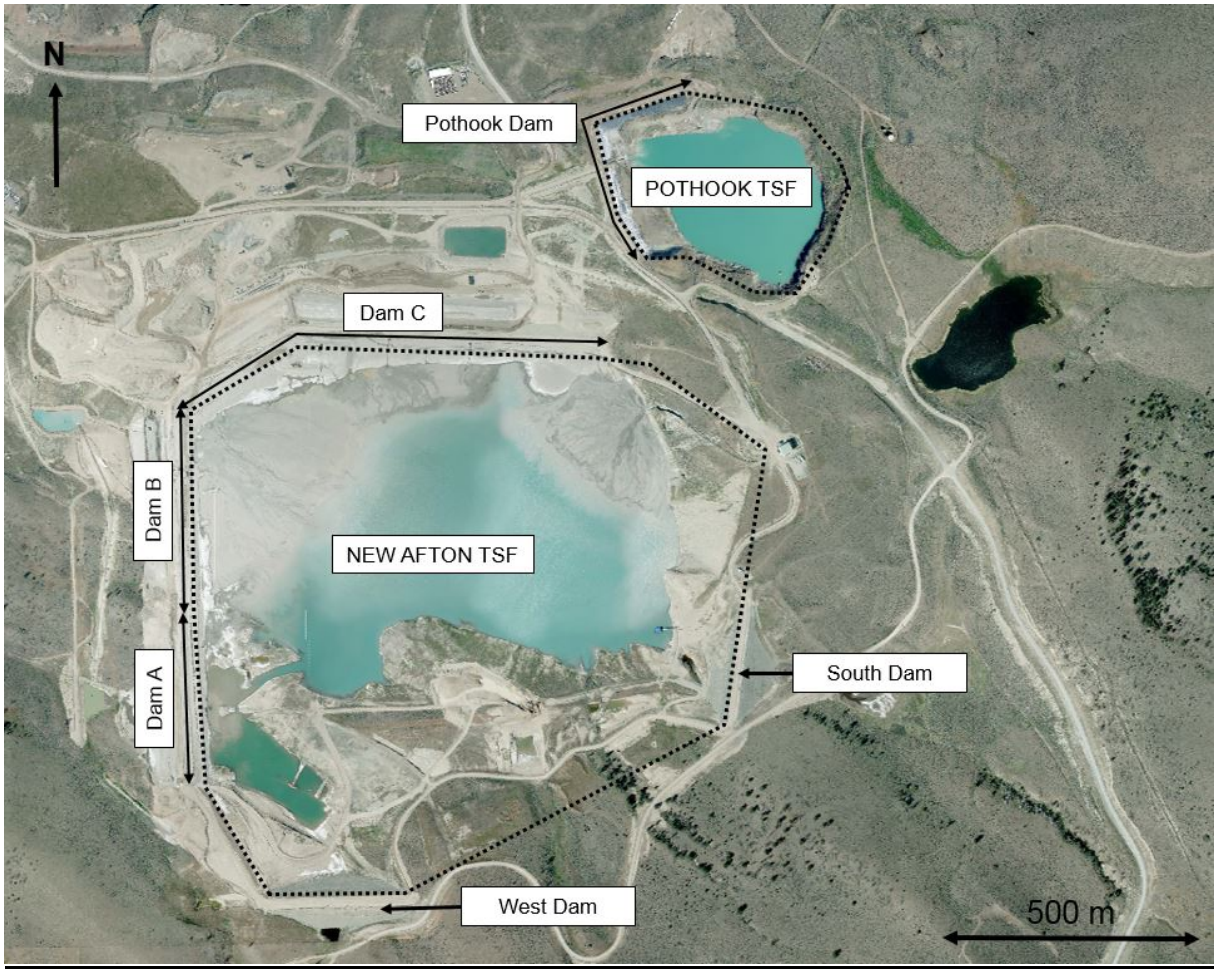

Figure 1-1. General arrangement of structures at the New Afton Mine (Image date July 2014). Approximate limits of the New Afton TSF and Pothook TSF are indicated along with the dams that comprise those facilities.

MEM INFORMATION REQUESTS

The following provides specific responses to the questions outlined in the MEM letter. As requested, the response uses the numbering sequence outlined in the MEM letter to facilitate tracking.

1. The potential for undrained shear failure of silt and clay foundations discussed here is supported by the site characterization report (BGC June 2015).

    a) The majority of TSF dam foundations at the New Afton Mine are founded on waste rock, glacial sediments, and bedrock. Soil foundations are predominantly very dense glacial till (basal till), comprising gravel, sand, silt, and clay together with cobbles and boulders. There is evidence of glaciolacustrine material, which was deposited at the margins of the last glaciers to occupy the Thompson River valley. These sediments accumulated in short-lived ice-marginal lakes. In comparison to the glaciolacustrine sediments present at the Mount Polley TSF, it is BGC's preliminary interpretation that the New Afton glacial lake was much smaller and, both temporally and spatially, much more constrained. Furthermore, the erosive action of the last glaciers to inundate the valley appear to have removed older glaciolacustrine sediments which are reported in published literature to be present in the vicinity of Kamloops but at lower elevations in the valley. BGC is continuing to assess the distribution and engineering properties of the glaciolacustrine sediments at the New Afton Mine site. The following is a brief summary of the current understanding and the focus of ongoing study.

    BGC encountered glaciolacustrine sediments up to 6 m thick during site investigation activities at the left abutment of Dam A (Station 1+850 to 1+950 m) at a depth of 1 to 10 m below the ground surface. This material is characterized by beds or laminae of silt, clay, sand, and limited gravel that are variably oriented. The bedform structures are observed to range from sub-horizontally planar to highly convoluted. The glaciolacustrine material contains polished surfaces parallel to, and across bedform structures. Most polished surfaces developed in response to differential compaction, hence are parallel to bed forms. There is, however, localized evidence of glacial thrusting across the bed form structures. Slickensided surfaces are associated with the thrust features. Although shearing along slickensides is not necessarily undrained shearing, their presence is indicative of potentially weak behavior such that careful consideration is required.

    BGC has also identified glaciolacustrine material in a borehole drilled on the west side of Dam C at Station 0+950 m at a depth of 28 to 59 m below the ground surface. The overlying material comprises waste rock and till. Based on information collected to date, this material is characterized as varved silt and/or fine sand and clay laminae with polished clay surfaces.

    The surficial geology model of the area is based on observations and data from both construction and site investigation, as well as pre-development stereo air photographs.

Construction records and site investigation reports have been prepared by various consultants during the development of the New Afton Mine and findings published by the Geological Survey of Canada.

In summary, at the New Afton TSF, overconsolidated slickensided glaciolacustrine soil has been encountered over a 100 m length along the left abutment of Dam A, and in a single drill hole on the left end of Dam C. The majority of the New Afton and Pothook TSF dam footprints are founded on basal till, waste rock, or bedrock.

b) The geotechnical investigations to date have been based on the geological interpretation of the area in conjunction with the size and location of the TSF dams. The foundation characterization targeted the full soil profile and a depth of rock relevant to stability and seepage modelling.

When the MEM letter was received, the surficial geology model for the area of the New Afton TSF consisted primarily of till and/or waste rock overlying bedrock, and satisfactory factors of safety for stability were obtained using relatively conservative strength parameters. This model was considered to be satisfactory, but given the relatively local lateral extent of glaciolacustrine units defined by the Independent Expert Engineering Investigation and Review Panel in their report (British Columbia 2015), additional test holes were prescribed to confirm that smaller deposits of potentially weaker materials did not exist to the extent that stability models would be affected. A program of six boreholes (spaced 100 to 250 m apart) and 25 test pits (spaced 50 to 100 m apart), with corresponding laboratory testing on collected samples was added to the 2015 site investigation program. The test pit excavations were used to characterize soils to a depth of about 6 m, or bedrock if shallower than 6 m. Drill holes were located in areas where soil deposits were expected to be thick. Depending on the results of the stratigraphy encountered, e.g., if glaciolacustrine materials were encountered, additional investigation with a tighter spacing of less than 50 m was undertaken.

Given the stratigraphy encountered at the left abutment of Dam A, the program was amended to include an additional six drill holes and nine test pits to define the extent and engineering properties of the glaciolacustrine material. The characterization included examination of the glaciolacustrine material in a large exposure by a principal engineering geologist. At the time of preparing this letter, a preliminary outline of the glaciolacustrine material has been delineated at Dam A, and preliminary laboratory test results have been received.

The information for the Pothook TSF is based on observations by others recorded during foundation excavation works prior to fill placement. These observations indicate that the Pothook Dam is founded on either till over bedrock, directly on bedrock. The bedrock is exposed at multiple locations along the dam profile and the till is inferred to be relatively thin.

c) Dam design for the New Afton TSF is considered to be satisfactory where the foundations comprise till or waste rock. It should be noted that the slope of the downstream shell for all dams is 3 horizontal to 1 vertical. Local zones where glaciolacustrine materials are found in dam foundations, such in the vicinity of the left abutment of Dam A as mentioned in paragraph 1 a) above, may require amendments to the design for future dam raises. In regards to Dam A, that structure is currently considered to be stable where glaciolacustrine material was encountered in the foundation; however, designs for future construction as the dam is raised may need to be modified once stability analyses for the ultimate dam height are completed to take the findings of the recent site investigation into account. The design for the Pothook TSF is considered to be satisfactory given that the majority of this relatively small structure is founded on relatively thin till over bedrock, or directly on bedrock.

d) Drilling has been completed at Dam A, and laboratory testing should be completed in July. Review of the recently-encountered glaciolacustrine material at Dam C is in-progress. A site investigation report that includes dam foundation data collected in 2015 will be ready about two months after the final laboratory testing data are received. Stability assessments are currently underway and are expected to be completed by late July. Preliminary stability modelling of the existing TSF indicates that where glaciolacustrine materials have been encountered at Dam A and Dam C, the current design satisfies the required stability criteria. However, changes to the design of future raises at the left abutment of Dam A may be required. This will likely include locking the downstream toe of this portion of the dam into existing topography by extending the downstream shell.

2) Water balance adequacy comments below are supported by the water balance that BGC has developed for New Gold. The model provides a five-year prediction of monthly TSF pond volumes. The model considers average years and sequences of wet or dry years based on historic precipitation records. Thus, periods of above and below average precipitation are considered. The model is used to support planning for changes to processing rates and for extreme runoff conditions. The water balance has predictive elements that are validated as new data are collected; it is therefore a living model that requires periodic updates – typically annually.

a) The water balance for the New Afton mine is characterized as a "negative" water balance, i.e. mine operations are only maintained by make-up water imported from Kamloops Lake. It should be noted that the "negative" water balance also occurs even in wet years. Consequently, the New Afton TSF does not have a "surplus" of water.

The target total inventory of mine water to be stored in the facility is 1.5 to 2.0 Mm^3 to provide sufficient draft to operate the New Afton TSF reclaim barge and to provide sufficient settling time for discharged solids. This volume of water is the combination of precipitation, ground water pumped from the underground workings and the historic

Afton Open Pit, and free water from the deposition of solids from hydraulically deposited tailings.

b) No surplus water has been added to the facility over the past five years as the mine operates with an overall water deficit that is offset by make-up water pumped from Kamloops Lake. Currently the mine is licensed to draw an annual volume of 290 m^3/h from Kamloops Lake for make-up water supply to the processing plant. In December 2014, 150,000 m^3 of water was added to the New Afton TSF from the Historic TSF. Drawing of water from the Historic TSF was undertaken by New Afton at the request of KGHM, the owner of the Historic TSF. This water was included in the water balance model.

c) Generating surplus water is not a normal operating condition and there is no surplus mine water to release. Handling of surplus water from wet years, or extreme storm events is discussed in section 2 f) below.

d) Although BGC generally recommends developing beaches across all dams where practical, minimum beach widths are not required to satisfy factor of safety targets in stability models. To support the upstream side of the core or liner in the New Afton TSF dams, 30 m wide, hydraulically-placed and equipment densified, cyclone sand cells are required. The dam is designed for the pond to be in direct contact with the upstream side of the sand cells during operations.

e) The design considers deformation given two conditions: consolidation or deformation under normal loading, and deformation due to earthquakes. Deformation from normal loading caused by dam construction and tailings deposition is being monitored by a network of instruments as outlined in the construction records report. Deformation due to normal loading is not considered a significant design consideration given that the annual construction to raise the dams will offset any settlement that occurs. Deformation due to the earthquake loading has been evaluated and is not a governing design criterion.

f) If surplus water is generated due to wet conditions, abstraction from Kamloops Lake can be reduced or temporarily stopped until pond levels return to the target range noted in 2 a) above. The design of the facility allows for storage without discharge of an extreme storm event plus freeboard per the Canadian Dam Association's Dam Safety Guidelines (CDA 2013). For the New Afton and Pothook TSFs this volume is 0.3 Mm^3 and less than 0.1 Mm^3, respectively (Vector April, 2009). In general, the water balance is relatively insensitive to precipitation due to the small contributing catchment areas.

The Pothook TSF has a total remaining storage capacity of about 0.9 Mm^3. This is in addition to the volume of tailings that are already stored in the facility. This storage capacity in the Pothook TSF can be used at the mine's discretion should excess water from the New Afton TSF need to be transferred to the Pothook TSF to maintain normal operating conditions in the New Afton TSF following an extreme storm event.

g) No gaps in the water balance have been identified. The water balance is scheduled to be updated in the third quarter of 2015.

3) The design of the New Afton TSF includes fine and coarse filters to prevent piping and provide drainage to control the phreatic surface within the dams. Filter adequacy is supported by design documents, construction drawings and specifications (Vector 2008, BGC March 30, 2015 and April 13, 2015), and records of construction (AMEC 2009; Vector 2009 and April 2009; and, BGC January 31, 2014 and March 27, 2015).

a) The filter design for the TSF dams is based on criteria to restrict particle migration (including due to internal instability), provide drainage, and prevent segregation and crack formation as described in guidelines by ICOLD (1994) and FEMA (2011).

The filter design and specifications issued by both BGC (Dam A, Dam B, and Dam C at the New Afton TSF) and Vector (South Dam and the West Dam at the New Afton TSF and the Pothook Dam at the Pothook TSF) include a two-stage filter system (i.e. a fine filter and a coarse filter) to limit the breadth of filter gradation within each zone to maintain internal stability. BGC's specification for the fine filter requires a maximum particle size of 3/8", with less than 5% passing the No. 200 sieve. For the coarse filter, the specified maximum particle size is ¾", with less than 5% passing the No. 200 sieve. Slightly higher fines contents may be considered if non-cohesive behavior is demonstrated with the sand castle test (Vaughan and Soares, 1982). Vector's specification for the fine filter requires a maximum particle size of 3/4", with less than 5% passing the No. 200 sieve. For the coarse filter, the specified maximum particle size is ¾", with less than 5% passing the No. 200 sieve. Both filters are specified to be "non-plastic," which is assumed to be defined per ASTM (2010). Although BGC and Vector have specified slightly different gradations for the base soils and filters, the criteria that guard against piping have been satisfied.

b) Satisfactory filter installation for TSF dams is supported by the construction record reporting. Given that much of the New Afton TSF dams and the Pothook dams are lined with a 60 mil LLDPE geomembrane, the traditional piping criteria are not applicable to these portions of the impoundment. However, the design considers that bedding material should not erode should it be subject to high seepage velocities caused by possible liner damage. BGC does not consider the record of construction for the South Dam and West Dam to be satisfactory and this issue is addressed in section 3 c) below.

c) To mitigate potential issues with the South Dam and West Dam, BGC has proposed that the upstream face of the dams be lined with a 60 mil LLDPE geomembrane with bedding materials satisfying filter criteria. The retrofit is only possible because neither dam yet impounds any water or tailings. The construction of the retrofit is planned for early 2016 prior to the South and West Dams providing any containment of tailings or process affected water.

SUMMARY

Glaciolacustrine soils have been identified in discrete locations under Dam A and Dam C at the New Afton TSF that are potentially susceptible to undrained shear. The dams have downstream shells with slopes of 3H:1V and are currently considered to be stable. The stability of future raises for these dams is presently being assessed. If required for future dam raises, the dam slopes can be flattened to meet stability criteria using cyclone sand.

The water balance is operating in a deficit supplemented by an abstraction of 290 m^3/h from Kamloops Lake to maintain operations; as such, there is no surplus water generated or stored in the TSF. Any surplus water resulting from extreme events would be readily consumed through reducing the makeup water abstraction rate.

The dam filters have been designed to the standard of practice, which is based on both Canadian and international standards. Construction of the filters consistent with design is supported through appropriate construction records reporting, with the exception of the South and West Dams. Since South Dam and West Dam construction is not supported by satisfactory construction records reporting, these dams will be retrofit to mitigate potential construction defects before they are used to contain tailings.

CLOSURE

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Yours sincerely,

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