April 2016

CORONATION NORTH PROJECT

Water Quality Mitigation - Fresh Water Dam Scenario

Submitted to:
Oceana Gold (New Zealand) Ltd

Report Number: 1545831-004-R-Rev1

REPORT

Table of Contents

TABLES

FIGURES

APPENDICES

ABBREVIATIONS

AWBM	Australian Water Balance Model
CS5	Coronation Pit Stage 5
Golder	Golder Associates (NZ) Limited
Ha	Hectare
m	Metres
m^3	Cubic metres
MAM	Mean Annual Minimum flow
MGP	Macraes Gold Project
ML	Million litres
mRL	Metres relative level; in this case metres above mean sea level.
OceanaGold	Oceana Gold (New Zealand) Ltd
WRS	Waste rock stack

1.0 INTRODUCTION

1.1 Background

Oceana Gold (New Zealand) Ltd (OceanaGold) operates the Macraes Gold Project (MGP) located in Otago, approximately 25 km west of Palmerston. The MGP consists of a series of open pits and an underground mine supported by ore processing facilities, waste storage areas and water management systems.

OceanaGold is currently seeking to obtain resource consents authorising the development of the Coronation North Project, within the Mare Burn tributary catchment of the Taieri River. The Coronation North Project involves the construction of the planned Coronation North pit and the Coronation North waste rock stack (WRS) together with an extension to the existing Coronation Pit to the Stage 5 pit shell layout (CS5). OceanaGold also plans to reduce the area of the already consented Coronation WRS (Figure 1).

Golder Associates (NZ) Limited (Golder) has been engaged by OceanaGold to undertake technical assessments for mine water management, to support the resource consent application. Surface water and contaminant transport modelling has been undertaken by Golder to assess the effects of the Coronation North Project on water quality in Mare Burn (Golder 2016). The modelling was focused on simulating water quality and flows at the existing MB01 and the proposed MB02 water quality compliance points (Figure 1). The results of this modelling indicated that OceanaGold would need to implement mitigation measures to enable ongoing compliance with the existing and proposed consent conditions.

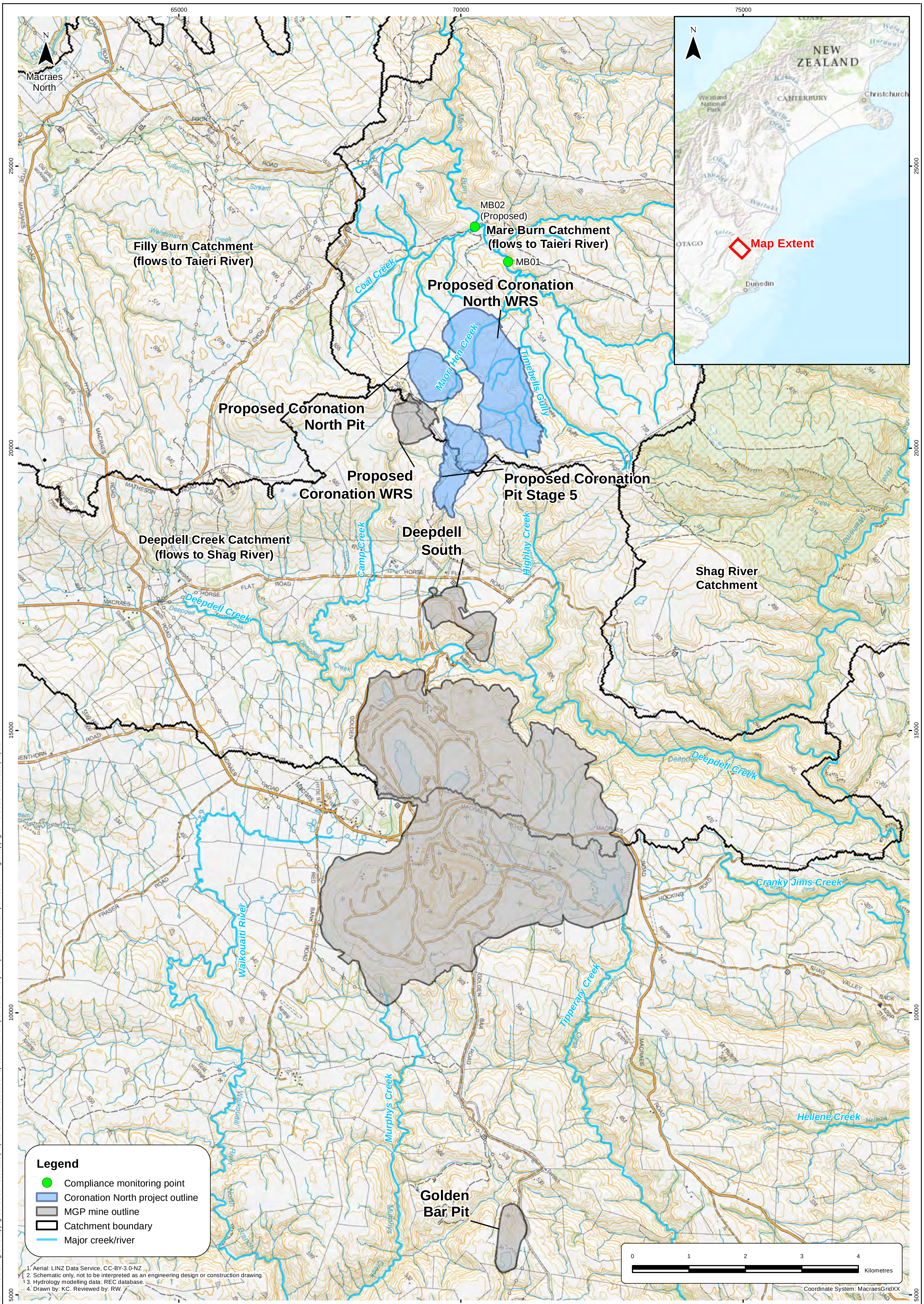
Modelling indicated that elevated concentrations of dissolved iron and arsenic may also require localised mitigation measures to be implemented. The model outcomes however indicated that the key contaminant requiring mitigation would be sulfate, which is also the case for most of the catchments affected by the MGP. The source of the sulfate is primarily WRS leachate, although the pit lake water is also expected to be characterised by elevated sulfate concentrations. Leachate is discharged from most WRS areas in the MGP as continuous and relatively stable flows carrying elevated sulfate concentrations (Golder 2016). Similar discharges are also expected to characterise the planned Coronation North WRS.

The receiving water body for the WRS discharges is Mare Burn. Mare Burn is characterised as having intermittent flows during summer periods. At times during dry periods the Mare Burn provides no dilution to the expected WRS discharges. On that basis, the WRS discharges are expected to result in exceedances of the existing and proposed water quality compliance criteria unless mitigation measures are implemented.

1.2 Scope of Work

OceanaGold held a technical workshop on 2 March 2016 to identify water quality mitigation options appropriate for the Coronation North Project. A number of mitigation options were identified and in follow-up to this workshop Golder has been tasked with:

- Evaluating the potential for a freshwater dam constructed within the Mare Burn catchment to provide a downstream continuous base flow adequate to enable the Coronation North Project to meet the proposed consent criteria for sulfate on an ongoing basis.
- Identifying the primary seepage points from the planned Coronation North WRS and calculating the likely seepage discharge flows at these points that would require mitigation for water quality.
- Investigating the viability of storing/buffering WRS seepage at the toe of the WRS for release during higher flow periods in Mare Burn, when release of the stored seepage water would not result in exceedance of the compliance criteria.



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APRIL 2016

PROJECT 1545831-004

1

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This report presents:

- A summary of projected effects the proposed Coronation North Project has on water quality in Mare Burn, where these effects may require mitigation.
- A brief summary of the mitigation measures that were reviewed at the technical workshop.
- An assessment of a freshwater dam mitigation option on Coal Creek and the projected mitigated water quality at the proposed compliance location at MB02.
- Seepage rates from the proposed Coronation North WRS final landform that require mitigation.

2.0 PROJECTED WATER QUALITY IN MARE BURN

2.1 Model Stages

Water management modelling has been used to generate water quality projections at current (MB01) and proposed (MB02) surface water compliance points associated with the Coronation North Project (Golder 2016). The model produces projections of contaminant concentrations covering the operational period of mining and for the post-closure period. Compliance criteria developed for existing Resource Consents, were compared with projected surface water concentrations at the current (MB01) and proposed (MB02) compliance points on Mare Burn.

The catchment water modelling simulated three stages of mine development in the Mare Burn catchment (Golder 2016).

- Stage 1 – A model of the Mare Burn catchment incorporating currently consented operations including the Coronation Pit and Coronation WRS. In the model it is assumed that the Coronation Pit and WRS are fully developed and both are still in the operational phase.
- Stage 2 – A model of the Mare Burn catchment incorporating the structures and waste storage associated with both the fully developed CS5 and Coronation North Pits. It is assumed that only the Coronation North pit and WRS is operational. The Coronation WRS is not included in this model as new mine planning has excluded it from the Mare Burn catchment. The Coronation Pit lake is assumed to be developing.
- Stage 3 – A model of the Mare Burn catchment incorporating the structures and waste storage associated with both the fully developed CS5 and Coronation North Pits at post closure. It is assumed the Coronation North WRS has been rehabilitated.

Water quality projections for each of the modelled stages of operation have been based on conservative water quality assumptions (Golder 2016). Specifically:

1) All modelled contaminants have been simulated as being conservatively transported in surface water bodies.
2) Contaminants in the WRS seepage and in the pit lake discharges have been derived from water quality monitoring carried out at the MGP. The concentrations applied in the models are based on 95th percentile values for water quality derived from monitoring locations representing specific structures on site. As the pit lake water quality and WRS seepage associated with the Coronation North project is expected to be similar to that from comparable features in other areas of the MGP, this is considered to be a conservative assumption with respect to future water quality.

2.2 Model Results

Projections derived from modelling results for the Stage 1 phase of operations in the Mare Burn catchment indicated that:

- Dissolved arsenic concentrations at MB01 would exceed the compliance limit 6 % of the time. The primary source of arsenic would be water discharged from the Coronation Pit sump. Natural attenuation of dissolved arsenic through geochemical reactions is however likely to ensure that the concentrations detected at MB01 will remain within the compliance limit.
- Dissolved iron concentrations at MB01 would exceed the compliance limit 8 % of the time. The primary source of iron would be Coronation WRS seepage discharges. Natural attenuation of dissolved iron through oxidation and precipitation in the silt ponds to be constructed at the toe of the Coronation WRS is however likely to ensure that the concentrations detected at MB01 will remain within the compliance limit.
- Sulfate is unlikely to exceed the compliance limit at MB01. From observations in other areas of the MGP, the sulfate concentrations in the pit sump water and in WRS discharges are unlikely to exceed the compliance limits during the Stage 1 operational period

Projections derived from modelling results for the Stage 2 phase of operations in the Mare Burn catchment indicated that:

- Dissolved arsenic concentrations at MB02 would exceed the compliance limit 8 % of the time. The primary source of arsenic would be water discharged from the Coronation North Pit sump. Natural attenuation of dissolved arsenic through geochemical reactions is however likely to ensure that the concentrations detected at MB02 will remain within the compliance limit.
- Dissolved iron concentrations at MB02 would exceed the compliance limit 8 % of the time. The primary source of iron would be Coronation North WRS seepage discharges. Natural attenuation of dissolved iron through oxidation and precipitation in the silt ponds to be constructed at the toe of the Coronation North WRS is however likely to ensure that the concentrations detected at MB02 will remain within the compliance limit.
- Sulfate is unlikely to exceed the compliance limit at MB02. From observations in other areas of the MGP, the sulfate concentrations in the pit sump water and in WRS discharges are unlikely to exceed the compliance limits during the Stage 2 operational period

Projections derived from modelling results for the Stage 3 post-closure phase of operations in the Mare Burn catchment indicated that:

- Dissolved arsenic concentrations at MB02 would exceed the compliance limit 2 % of the time. The primary source of arsenic would be overflow water discharged from the Coronation and Coronation North pit lakes. Natural attenuation of dissolved arsenic through geochemical reactions is however likely to ensure that the concentrations detected at MB02 will remain within the compliance limit.
- Dissolved iron concentrations at MB02 would exceed the compliance limit 23 % of the time. The primary source of iron would be Coronation North WRS seepage discharges, although some iron would also be transported in the overflow water from the Coronation and Coronation North pit lakes. Natural attenuation of dissolved iron through oxidation and precipitation in the silt ponds to be constructed at the toe of the Coronation North WRS is however likely to ensure that the concentrations detected at MB02 will remain within the compliance limit.
- Sulfate concentrations at MB02 would exceed the compliance limit 27 % of the time. The primary source of sulfate would be seepage from the Coronation North WRS.

3.0 FRESHWATER DAM ASSESSMENT

3.1 Dam Location

The initial criteria for the location of a possible fresh water dam are listed below.

- The site would need to be on a land parcel held by OceanaGold within the Mare Burn catchment.
  - Limits on landownership within the Mare Burn mean that Coal Creek is the only viable option to consider at this stage.
  - Future land purchases may however provide more options for viable dam locations.
- The dam location would need to be geometrically reasonable for the construction of a dam.
  - A site at the lower end of the Coal Creek catchment was identified as being potentially suitable for the construction of a dam exceeding 30 m in height.
- The upstream catchment would need to be sufficient to provide the volume of run-off required for storage.
  - An initial assessment of the Coal Creek catchment suggests the catchment yield would be sufficient for the intended purpose.
- The reservoir layout would need to provide for a high volume to depth ratio, which is one factor controlling the height of the necessary dam.
  - An initial assessment of the Coal Creek catchment suggests that the volume to depth ratio is acceptable for the water storage required.

A site at the lower end of the Coal Creek catchment was identified as meeting the above criteria.

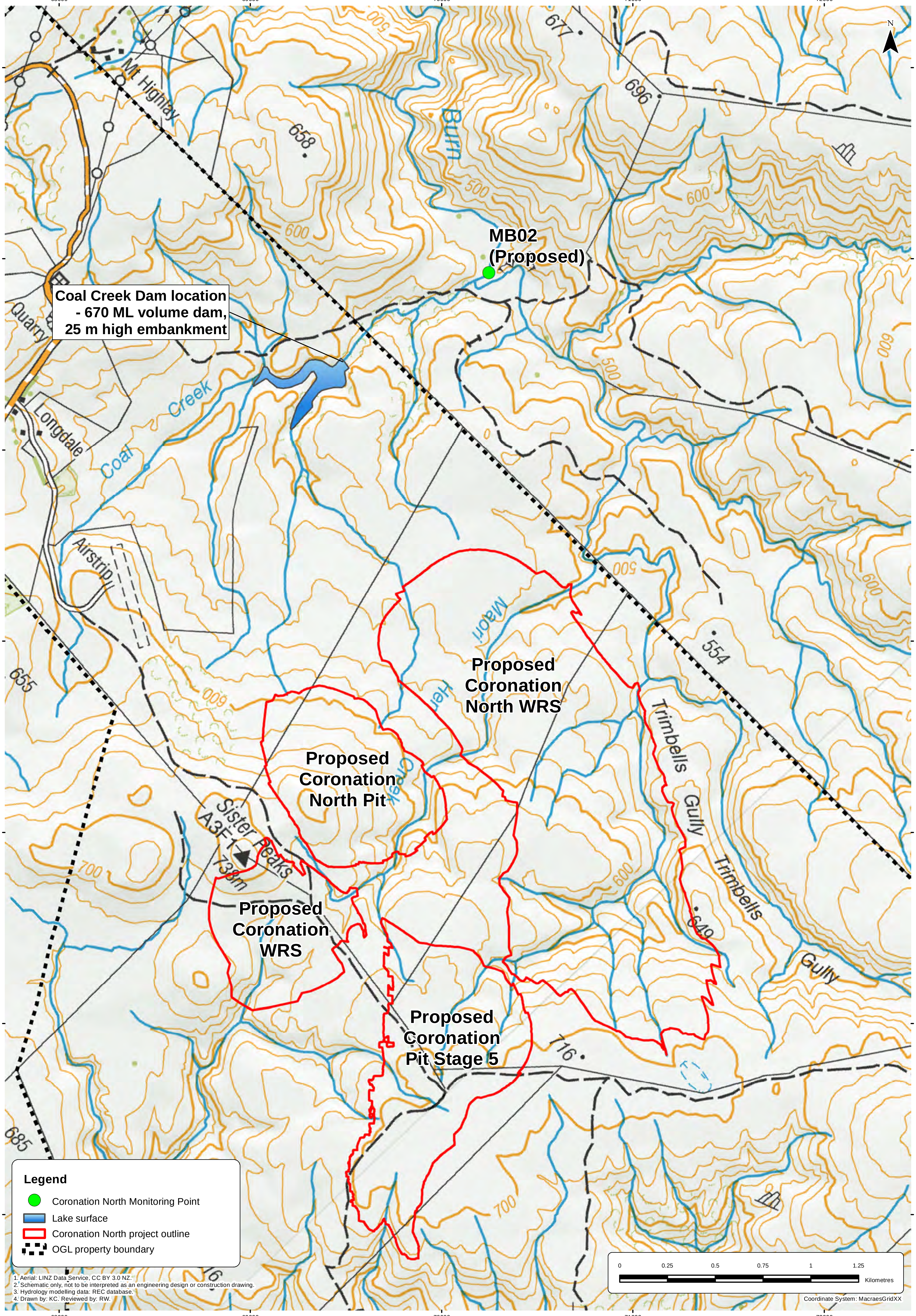
One alternative freshwater dam location was identified on Trimbells Gully, however, this is a relatively wider gully with no constriction points suitable for a dam embankment that would provide suitable storage. The reporting catchment is also relatively small. Therefore this location was not investigated further.

For the purposes of this study, the construction of a fresh water dam in the Coal Creek catchment is therefore a proposed option to help mitigate non-point source water quality issues by providing greater base flow reliability in Mare Burn. Run-off collected during periods of higher precipitation could be stored in the dam and released as a constant discharge throughout the year, thus supplementing base flows in the Mare Burn. By decreasing the frequency of low flows, the risk of non-compliance with consented water quality limits is reduced.

3.2 Required Modelling

Preliminary modelling has been undertaken to assess the position, size and potential base flows achievable for a dam constructed within Coal Creek, a left bank tributary of Mare Burn (Figure 2). The primary water management issues for the use of fresh water dams for mitigation purposes are:

- The time it takes to fill the dam - to ensure construction and filling of the dam can be completed before the mitigation is required.
- The maximum constant discharge rate that could be maintained by each of the dams – to ensure water quality compliance can be met through provision of a base flow in Mare Burn.



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3.3 Modelling Approach

A freshwater dam reservoir module was constructed within the Stage 3 (Closure) GoldSim model (refer Golder 2016). An allowance for a constant discharge rate was built into the module. Simulated overflows of the dam occur when the dam capacity is exceeded.

Fill times for the dam were calculated by undertaking a Monte Carlo simulation where a number of model runs (termed realisations) were undertaken. Each realisation start time was randomly selected from the climate record available. Fifty realisations were undertaken to provide a probabilistic result of dam filling time under different climate scenarios.

Constant discharge rates were calculated by iterating the managed outflow rate from the dam to meet the water quality compliance concentration for sulfate at MB02, which is proposed to be 1,000 g/m^3. The dam capacity was also reviewed to ensure the simulated dam could consistently provide the required baseflow. It is assumed that the dam would release water at a constant rate throughout the year and thereby supplement downstream flows during natural low flow periods. These supplementary flows would provide additional dilution to contaminated water discharges from the mine site.

Water quality compliance modelling focussed on 100 % compliance for sulfate within Mare Burn at MB02. This approach assumes that the iron and arsenic issues will be mitigated through natural attenuation within either the natural environment (refer Golder 2016) or through passive mitigation options such as wetlands.

3.4 Inputs and Assumptions

Key assumptions in the modelling of dam filling times and continuous discharge rates include:

- There are no seepage losses through the dam or, if there are losses, these occur at a constant rate that forms part of the managed discharge flow.
- Surface water run-off within Coal Creek that contributes to the dam storage was calculated with the AWBM runoff module. This runoff module is calibrated with runoff data for the Deepdell Creek monitoring site at Golden Point weir and documented in Golder 2011. It is reasonably assumed this calibration applies to the Coal Creek catchment.

For the purposes of this study, it has been assumed that the mine site discharge water quality has stabilised following closure, as was also assumed in the modelling undertaken to characterise site discharges in the modelling report (Golder 2016).

3.5 Model Results

3.5.1 Catchment Layout and Dam Size

Iterative modelling of the catchment and the discharge flows resulted in the catchment area and dam layout results summarised in Table 1. The reporting catchment area is based on the dam location initially identified, with no smaller catchments evaluated as part of this study. The reservoir volume is the storage capacity required to enable a constant discharge rate to be reliably achieved throughout the full post-closure period simulated. The reservoir height is the depth of stored water at the upstream dam face when an upstream reservoir of the required volume is full to overflow. The dam embankment height will require some freeboard above this level to allow for the design storm overflow and wave run-up.

Table 1: Catchment and dam layout results.

Parameter	Result
Reporting catchment area	650 ha
Reservoir volume	677 ML
Reservoir height	25 m

3.5.2 Baseflow augmentation and water quality results

Baseflow augmentation from the freshwater dam was modelled to determine the flow rate required to maintain compliance for sulfate in Mare Burn at MB02. The model indicated that a constant discharge from the Coal Creek dam of around 5 L/s would be required to maintain compliance for sulfate at MB02. Arsenic and iron concentrations have not been assessed as these contaminants are not conservatively transported and it has been assumed that natural attenuation and potentially other mitigation measures would enable OceanaGold to meet their respective compliance criteria at MB02.

Coal Creek at the chosen dam site carries intermittent flows, with modelled inflows to the reservoir varying between 0 L/s and approximately 2,500 L/s, at an average inflow of around 16 L/s. Taking into account a continuous release of 5 L/s, the modelled stored water volume varied between 400 ML and 677 ML, with a median volume of around 650 ML (Figure 3). This outcome indicates a reservoir of this volume could provide a reliable discharge at 5 L/s through dry summer periods. The simulated dam overflows periodically during periods of high flow.

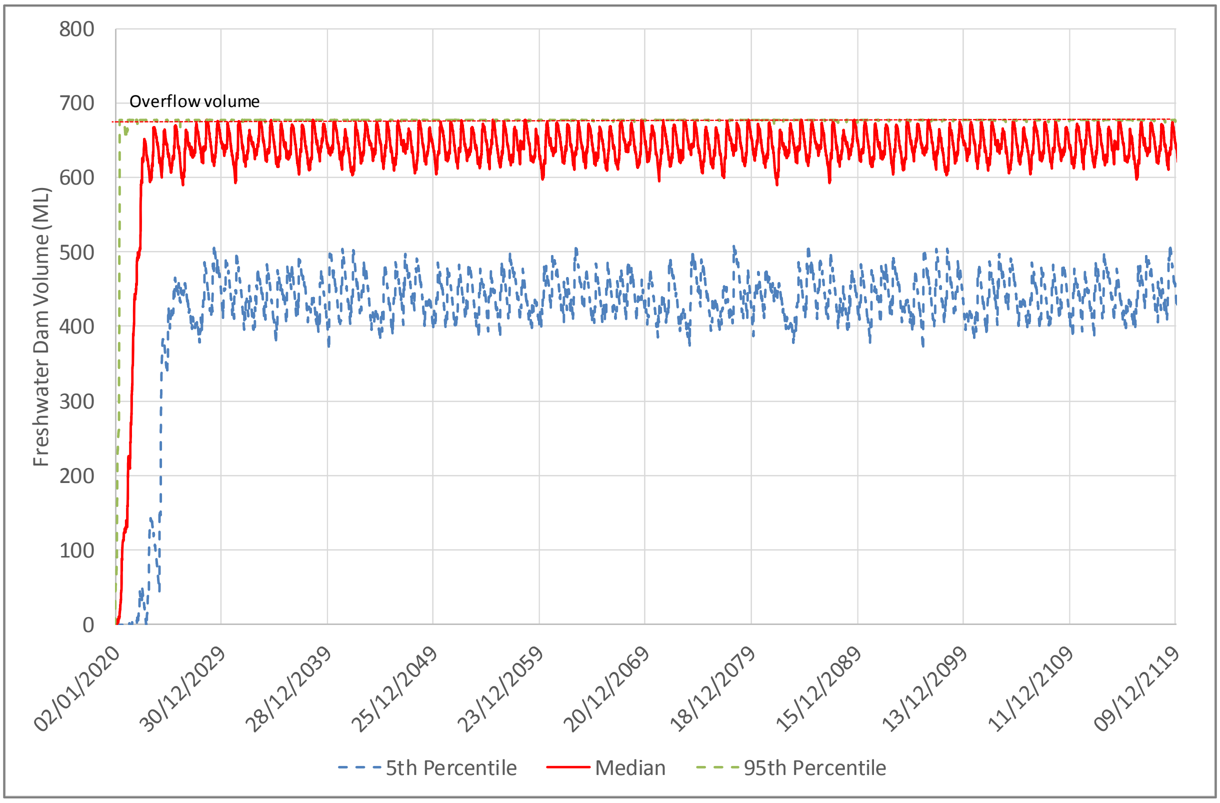


Figure 3: Coal Creek freshwater dam water level variation assuming 5 L/s outflow.

Modelling also indicates operation of a 25 m high dam with a reservoir capacity of 677 ML on Coal Creek could provide a continuous release of up to 7 L/s to supplement the low flows in Mare Burn. This exceeds the 5 L/s flow that would be required to enable ongoing compliance for sulfate concentrations at MB02. This excess capacity may also enable the release of water from the reservoir for periodic flushing flows, in addition to the periodic overflows.

A summary of the sulfate water quality results for MB02, taking into account the operation of the clean water dam, is presented in Table 2 and Figure 4.

Table 2: Summary of projected water quality at MB02 post-closure.

Parameter	Concentrations (g/m^3) (1)					Exceedances
	Minimum	Mean	95th Percentile	Maximum	Compliance limit	
Sulfate	5.7	443	876	928	1,000	NO

Note: 1) These concentrations relate to the period when seepage discharges from Coronation North WRS are producing the maximum projected sulfate mass load.

The 95th percentile and maximum concentrations for sulfate indicated in Table 2 are approaching the proposed compliance limit of 1,000 g/m^3, however the water quality inputs for the model are considered to be conservatively high for sulfate and the modelling does not take into account any other potential water quality mitigation measures that OceanaGold may seek to put in place.

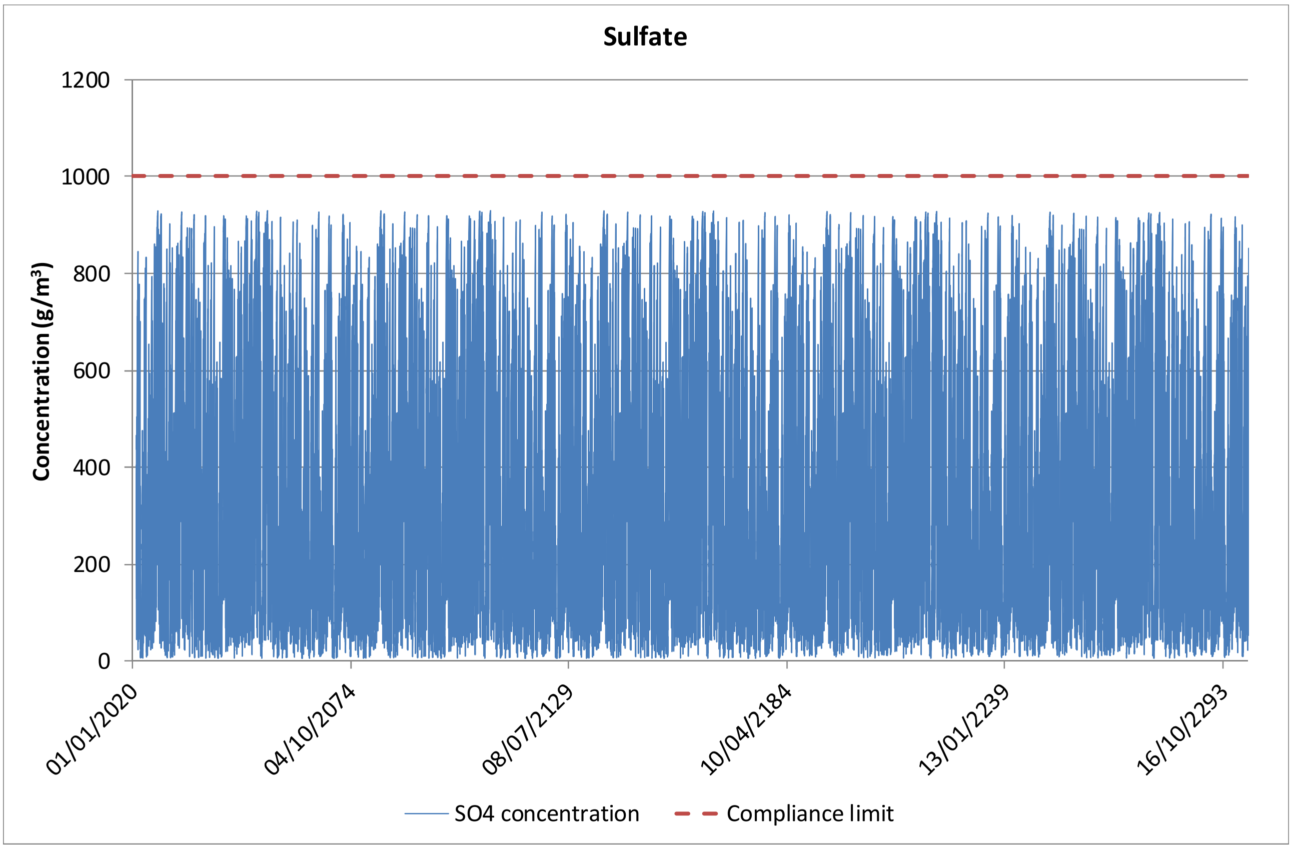


Figure 4: MB02 sulfate results - freshwater dam mitigation scenario.

3.5.3 Dam filling

A Monte Carlo modelling approach was used to evaluate the Coal Creek dam filling times. Two scenarios were run:

- Scenario 1 – dam filling with no managed release during the dam filling period
- Scenario 2 – a managed release of 5 L/s during the dam filling period.

Scenario 1 results

Based on the median filling times calculated in the model, the Coal Creek dam could be expected to take approximately 2 years for the reservoir to fill to capacity (677 ML). Based on a particularly wet scenario, represented by the 95th percentile filling rate, the dam could take approximately 6 months to fill. Based on a particularly dry scenario, represented by the 5th percentile filling rate, the dam could take in excess of 4 years to fill (Figure 5). This filling period was calculated on the basis that there are no planned releases of water from the dam during this period.

Scenario 2 results

Based on the median filling times calculated in the model, the Coal Creek dam could be expected to take up to 3 years for the reservoir to fill to capacity (677 ML). Based on a particularly wet scenario, represented by the 95th percentile filling rate, the dam could take approximately 6 months to fill. Based on a particularly dry scenario, represented by the 5th percentile dam volume, the dam may take around 5 years to reach an equilibrium volume of around 400 ML to 500 ML (Figure 6). This filling period was calculated on the basis that there is a managed release of 5 L/s from the dam.

3.6 Future Proofing Dam

Mining activity in the Mare Burn catchment commenced in 2012 with the initial development of the Coronation Pit. Construction of the Coronation North Pit and Coronation North WRS is proposed to start in 2016. Further mine development within the Mare Burn is possible with exploration activities ongoing in the area. Therefore the design of the fresh water dam should be futureproofed (enable higher discharge flow rates to provide for additional dilution) for further extensions of operations in the catchment. For this reason a number of larger dam scenarios on Coal Creek were modelled.

Table 3 presents an indication of constant rate discharge flows that could be produced under a number of larger dam scenarios that were modelled. The results show that with every 5 m increase in dam height, an additional reliable discharge of around 2 L/s to 3 L/s becomes available. There is however only a small increase in the reliable constant discharge flow once the dam height exceeds 35 m, indicating diminishing returns for a dam exceeding this height.

Table 3: Reservoir size and baseflow available.

Reservoir Volume (ML)	Reservoir Height (m)	Baseflow (L/s)
321	20	4
677(1)	25	7
1,267	30	9
2,163	35	12
3,469	40	13

Note: 1) Current modelled scenario.

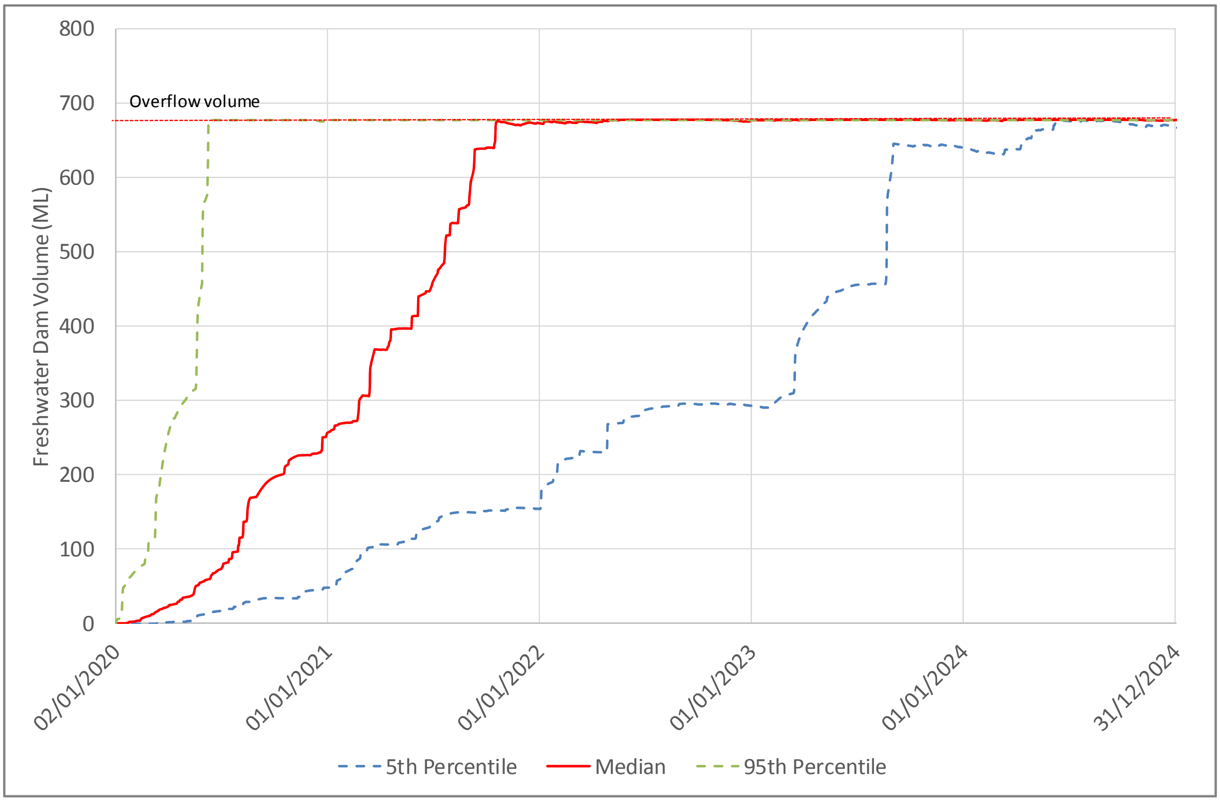


Figure 5: Coal Creek freshwater dam filling rates – no managed release of water

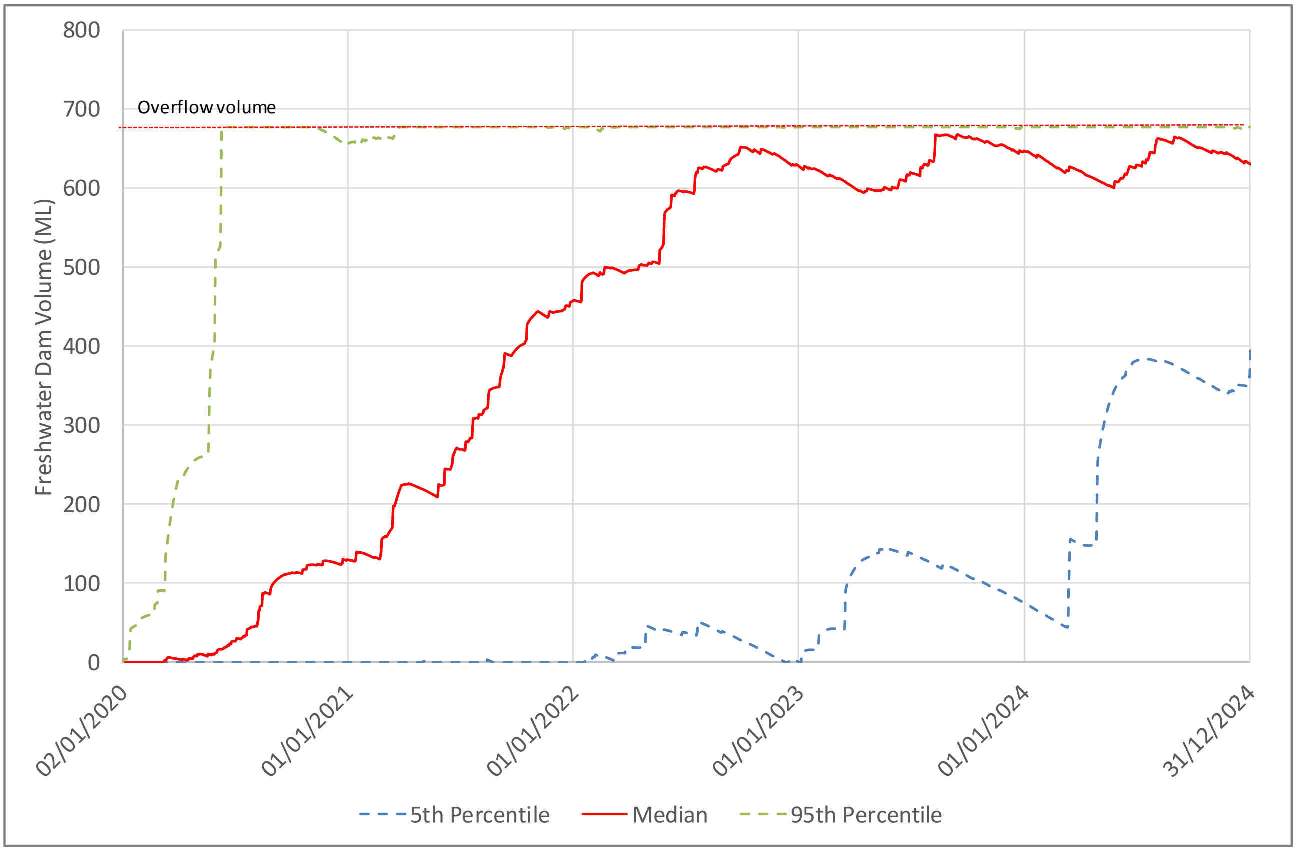


Figure 6: Coal Creek freshwater dam filling rates – 5 L/s managed release

3.7 Discussion

It is important to recognise that the size of the dam modelled has been based on the assumption that the concentration or mass load of sulfate in the water discharging from the WRS cannot be reduced through:

- Reducing annual rainfall infiltration to the WRS as a whole
- Reducing the area of the WRS that contains mineralised material, and thereby reducing sulfate concentrations in seepage water from most of the WRS
- Reducing sulfate concentrations in the seepage water through geochemically modifying the leaching behaviour of the WRS
- Treating the discharge water at the toe of the WRS before it enters the Mare Burn drainage system.

Any reductions in sulfate mass loads from the WRS through applying mitigation measures other than the construction of the fresh water dam are likely to result in a reduction in the base flow required for dilution purposes.

In addition, should WRS discharges prove to be significantly lower during summer than during winter, this may change the discharge flow requirements from the fresh water dam.

4.0 WASTE ROCK STACK SEEPAGE

4.1 Introduction

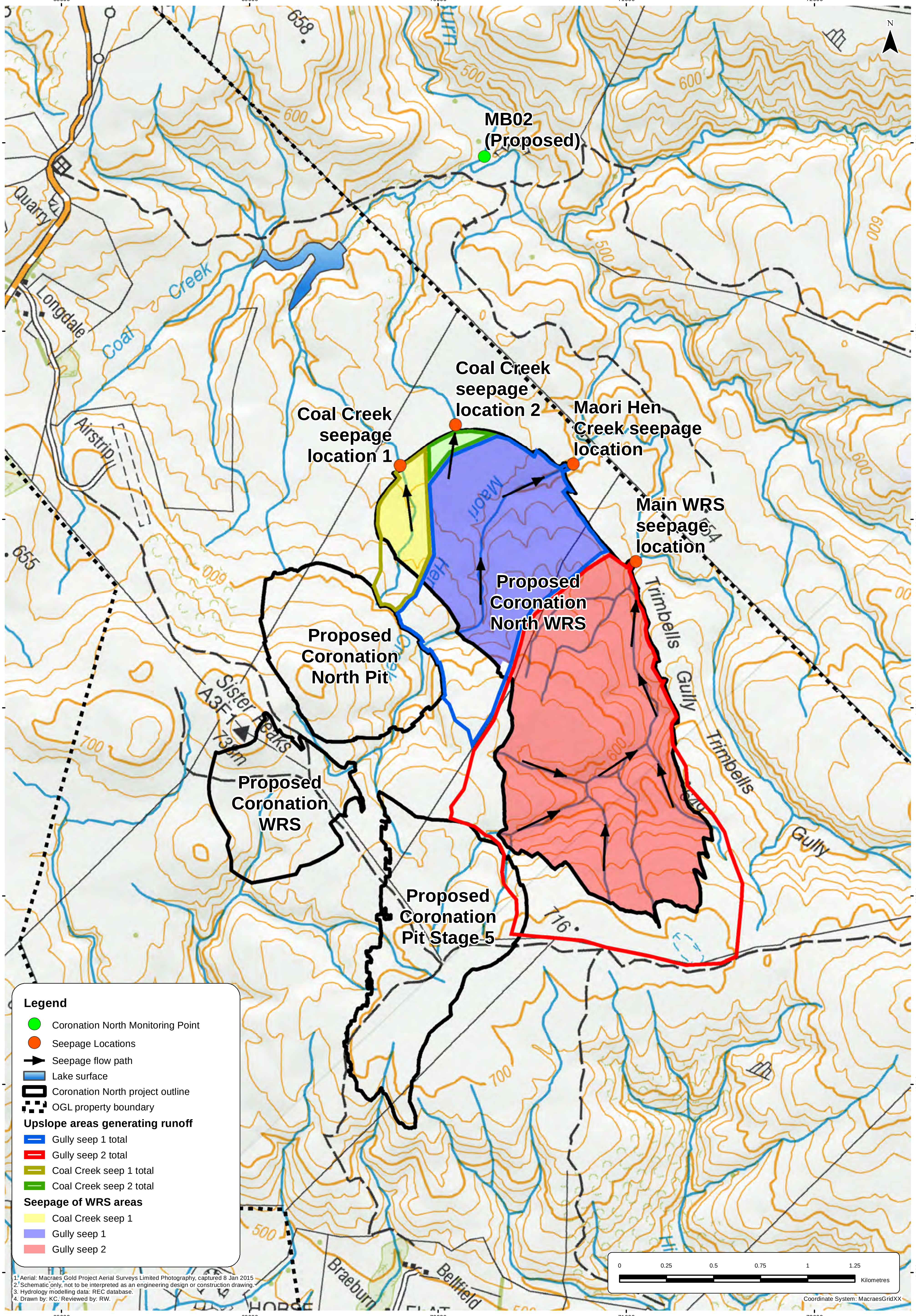
Flow rates at the main WRS seepage discharge points have been calculated to provide flow rates for the assessment of possible treatment options, diversion or storage or a combination of water quality mitigation measures. Anecdotal evidence of seepage flow from WRS's indicates that WRS's function by absorbing rainfall and storing and releasing seepage water throughout the year. WRS's such as Clydesdale, Northern Gully, Frasers East, Frasers West and Coronation all have seepages discharging from the toe of the WRS at various rates.

A WRS acts as an artificial aquifer. Seepage tends to follow the natural topography at the base of the WRS. Discharge of seepage water therefore mostly occurs from WRS underdrains or in natural gullies at the toe of the WRS. This section summarises the Coronation North WRS layout and likely seepage locations and seepage rates.

4.2 Coronation North WRS Seepage Locations

The proposed Coronation North WRS is located on the true left side of Trimbells Gully and extends across two major natural drainage lines and gullies: an un-named tributary of Trimbells Gully and Maori Hen Creek. The western flank of the WRS extends into the Coal Creek sub-catchment of Mare Burn and extends across two separate drainage lines in this sub-catchment.

Figure 7 presents the Coronation North WRS outline, WRS areas generating seepage to each sub-catchment and likely seepage discharge locations based on topography. Additional catchment areas are located up-slope from the WRS. It is assumed engineered underdrains will convey runoff from these areas through the WRS to the toe of the WRS in the same locations as the WRS seepage.



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PRIMARY SEEPAGE DISCHARGE LOCATIONS

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PROJECT 1545831-004

7

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4.3 Seepage Rates

Seepage rates from the sub-catchments that the Coronation North WRS will cover have been calculated based on a 32 mm annual recharge rate across the MGP site, as documented in previous assessments (Golder 2011, 2016). Runoff from the upslope areas is assumed to infiltrate into the WRS and be captured by engineered underdrains. It is assumed that this water is soaked up by the WRS relatively quickly with little evaporative losses. Therefore inflow rates from upslope catchments, and the associated discharge rates at the WRS toe, have been calculated based on the expected natural catchment yield. This yield is 12% rainfall reporting as runoff, 78 mm/year (Golder 2011, 2016).

Although it is likely there is some seasonality to seepage discharge, there is insufficient monitoring data to confirm this expectation. It is therefore assumed that seepage rates from the WRS will not vary and therefore the yields will be evenly distributed throughout the year. Table 4 presents the WRS and upslope catchment area, the WRS seepage and upslope area catchment yields and the total seepage rates estimated at the toe of the WRS.

Table 4: Coronation North WRS seepage areas and rates.

Location	WRS area (ha)	Upslope area (ha)	Total area (ha)	WRS seepage rate (m^3/day)	Catchment runoff upslope area (m^3/day)	Toe seepage rate total (m^3/day)
Main WRS seepage location	142.4	62.6	205.0	124.8	133.8	258.6
Maori Hen Gully	73.7	21.7	95.4	64.6	46.4	111.0
Coal Creek 1	3.7	0.0	3.7	3.2	0.0	3.2
Coal Creek 2	13.7	5.7	19.4	12.0	12.2	24.2
Total	233.5	90.0	323.5	204.7	192.3	397.0

4.4 Storage and Release of WRS Seepage

The viability of the storage of WRS seepage water within the Mare Burn catchment and release of this water during high flows in Mare Burn has been considered as a possible mitigation measure. The concept involves the storage of seepage water within engineered containment dam's downslope of the Coronation North WRS. When flows in Mare Burn are at a high enough rate to provide adequate dilution to maintain the sulfate concentrations at MB02 below the compliance limit, the contained water would be released at a managed rate into the stream.

Although the concept appears viable, a number of issues arise:

1) Most silt pond embankments downslope from existing WRS locations do not retain all seepage water discharged from the WRS due to the permeable nature of the embankment. Appropriately designed and constructed embankments may however reduce or eliminate this issue.

2) Automated/mechanical water release mechanisms suitable for purpose require long term management (>100 years) of the system and ongoing operational costs.

3) A portion of subsurface seepage from the WRS will bypass any surface containment structure. The groundwater assessment indicates that sulfate sourced from the WRS will also be transported via shallow and deeper groundwater movement to the Mare Burn. Therefore, the containment structure will not retain all of the contaminant load sourced from the WRS.

4) The space required for such containment dams is limited due to the proximity of the WRS toe to Trimbells Creek.

Given the issues outlined above, detailed modelling of such as concept was not undertaken and has been assessed as non-viable.

5.0 CONCLUSIONS

The proposed consent concentration for sulfate in Mare Burn at the proposed MB02 compliance monitoring point is 1,000 g/m^3. Projected seepage flows from Coronation North WRS are expected to carry elevated concentrations of sulfate. Mare Burn has intermittent flows at MB02 and the discharges from Coronation North WRS are expected to be continuous. On this basis, mitigation measures will be required to enable OceanaGold to comply with the sulfate limit at MB02 following the close of operations at Coronation North.

One mitigation option would be to construct a freshwater dam in the Coal Creek sub-catchment of Mare Burn to provide a constant discharge into the catchment. This discharge would form a reliable base flow in Mare Burn and thereby provide reliable dilution for the seepage discharges from Coronation North WRS.

Modelling indicates that a 680 ML freshwater reservoir in the Coal Creek sub-catchment would be sufficient to provide a reliable constant discharge of up to 7 L/s. Ongoing compliance with the proposed sulfate limit at MB02 could be achieved if a constant discharge rate of 5 L/s from the fresh water dam is achieved.

Seepage discharge rates to the four natural gullies intersecting Coronation North WRS have been calculated, based on the areas of the buried sub-catchments together with contributions from any upslope catchment areas. The seepage discharge locations identified and evaluated are in the Trimbells Gully and Coal Creek sub-catchments of Mare Burn.

6.0 LIMITATIONS

Your attention is drawn to the document, “Report Limitations”, as attached in Appendix A. The statements presented in that document are intended to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimise the risks to which this report relates which are associated with this project. The document is not intended to exclude or otherwise limit the obligations necessarily imposed by law on Golder Associates (NZ) Limited, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

7.0 REFERENCES

Golder 2011. Macraes Phase III Project, site wide surface water model. Report prepared for Oceana Gold (NZ) Limited by Golder Associates (NZ) Limited. Golder report 0978110562-008. April 2011.

Golder 2016. Coronation North Project, surface water modelling. Report prepared for Oceana Gold (NZ) Limited by Golder Associates (NZ) Limited. Golder report 1545831-003. March 2016

APPENDIX A

Report Limitations

Report Limitations

This Report/Document has been provided by Golder Associates (NZ) Limited (“Golder”) subject to the following limitations:

i) This Report/Document has been prepared for the particular purpose outlined in Golder’s proposal and no responsibility is accepted for the use of this Report/Document, in whole or in part, in other contexts or for any other purpose.

ii) The scope and the period of Golder’s Services are as described in Golder’s proposal, and are subject to restrictions and limitations. Golder did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Report/Document. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Golder in regards to it.

iii) Conditions may exist which were undetectable given the limited nature of the enquiry Golder was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Report/Document. Accordingly, if information in addition to that contained in this report is sought, additional studies and actions may be required.

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