

ASSESSMENT REPORT

DARGUES REEF GOLD PROJECT Section 75W Modification MP 10_0054 Mod 1 – Paste Fill

1 BACKGROUND

Big Island Mining Pty Ltd (BIM), a wholly owned subsidiary of Cortona Resources Limited, owns and operates the Dargues Reef Gold Project (the Project), which is located in Majors Creek approximately 13 kilometres south of Braidwood within the Southern Tablelands of NSW (see **Figure 1**).

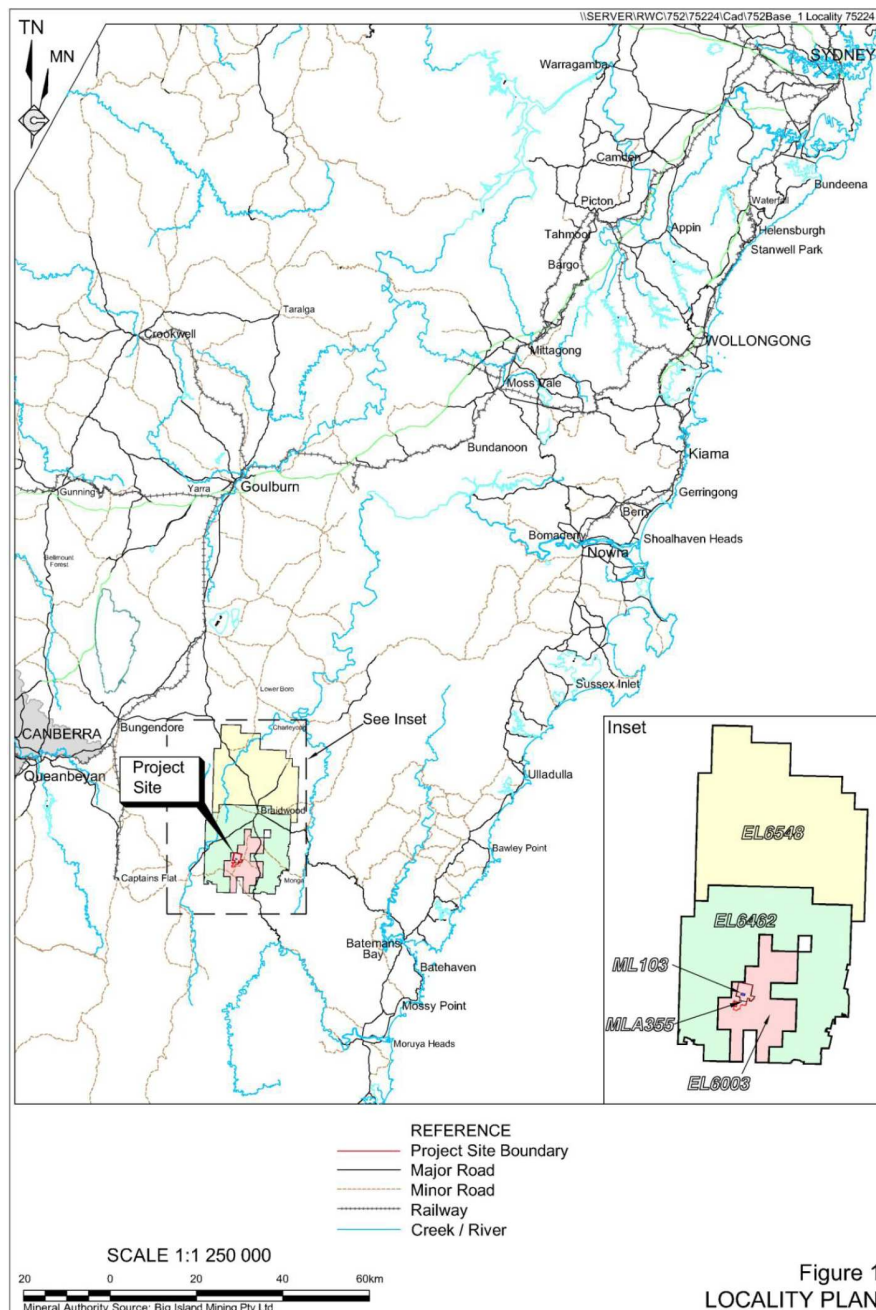


Figure 1: Regional Context

The Planning Assessment Commission (PAC) approved the Project on 2 September 2011. The merits of the PAC's decision were subsequently appealed in the Land and Environment Court (Court). The Court delivered final orders on the project on 8 February 2012. The orders granted approval of the project, and issued a revised project approval.

The approved project is shown in **Figure 2** and allows BIM to:

- construct and operate an underground gold mine, including ancillary infrastructure;
- extract and process up to 355,000 tonnes of gold ore per annum (tpa) for up to 7 years;
- transport the processed ore from the site via road; and
- progressively rehabilitate the site.

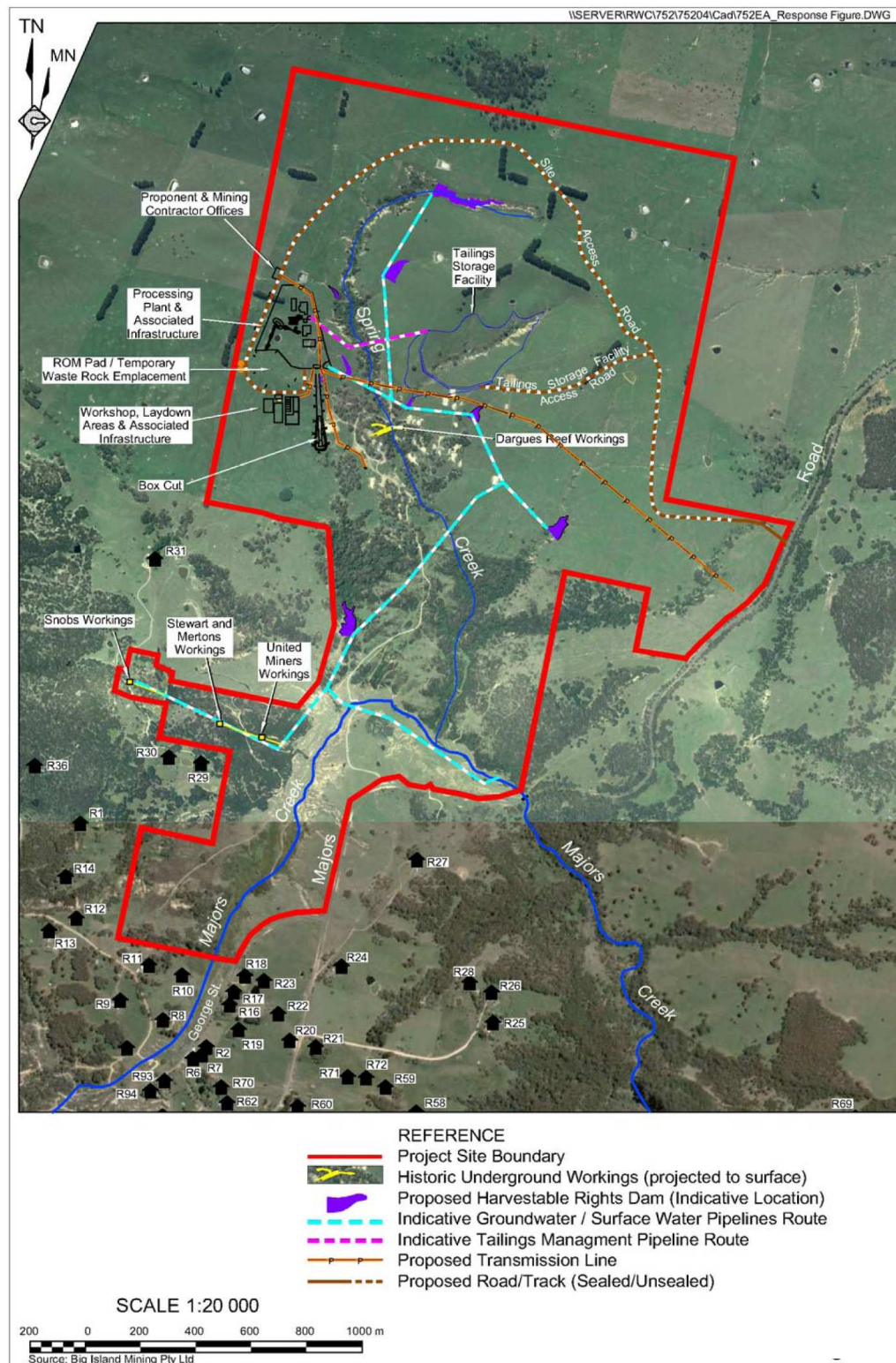


Figure 2: Approved Ulan Continued Operations Project - General Arrangement

2 PROPOSED MODIFICATION

On 10 May 2012, BIM requested a modification to the approval for the Project. The proposed modification is described in detail in the Environmental Assessment (EA) submitted in support of the application (see **Appendix A**). The modification involves the:

- construction and use of a paste plant to mix tailings and cement and produce paste fill;
- construction and use of a paste line to transfer paste fill from the paste plant to the underground workings; and
- use of paste fill as back fill in the underground mining operation.

The proposed paste fill hardens in a similar manner to concrete, and would allow extraction of ore from horizontal sills and vertical pillars that would otherwise have been required to be retained to ensure the geotechnical stability of the mine. The completed stopes proposed to be back filled with paste would be sealed to prevent leakage of paste during back filling operations. Approximately 84% of stopes (by volume) would be backfilled with paste, with a further 7% being backfilled with waste rock and the remaining 9% left as voids. The proposed paste fill schedule throughout the life of the project is shown in **Figure 3**.

The Proponent suggests the benefits of using the paste fill would include improved stability of the mine, increased recovery of the resource (i.e. additional extraction of 300,000 tonnes), a likely reduction in the final size of the tailings storage facility (TSF), and a shorter timeframe for groundwater recovery following the cessation of mining.

The Department notes that even though there is potentially up to an additional 300,000 tonnes of extracted material that could be recovered as a result of this modification, the Proponent is not seeking to modify the limits on processing or the maximum life of the project. Notwithstanding, the Department has observed that there are slight changes to the mining rate predicted as part of the modification. The Department has considered these changes to the mining rates and is satisfied the proposal would remain within acceptable limits already established in the existing approval. See further discussion in Section 4.

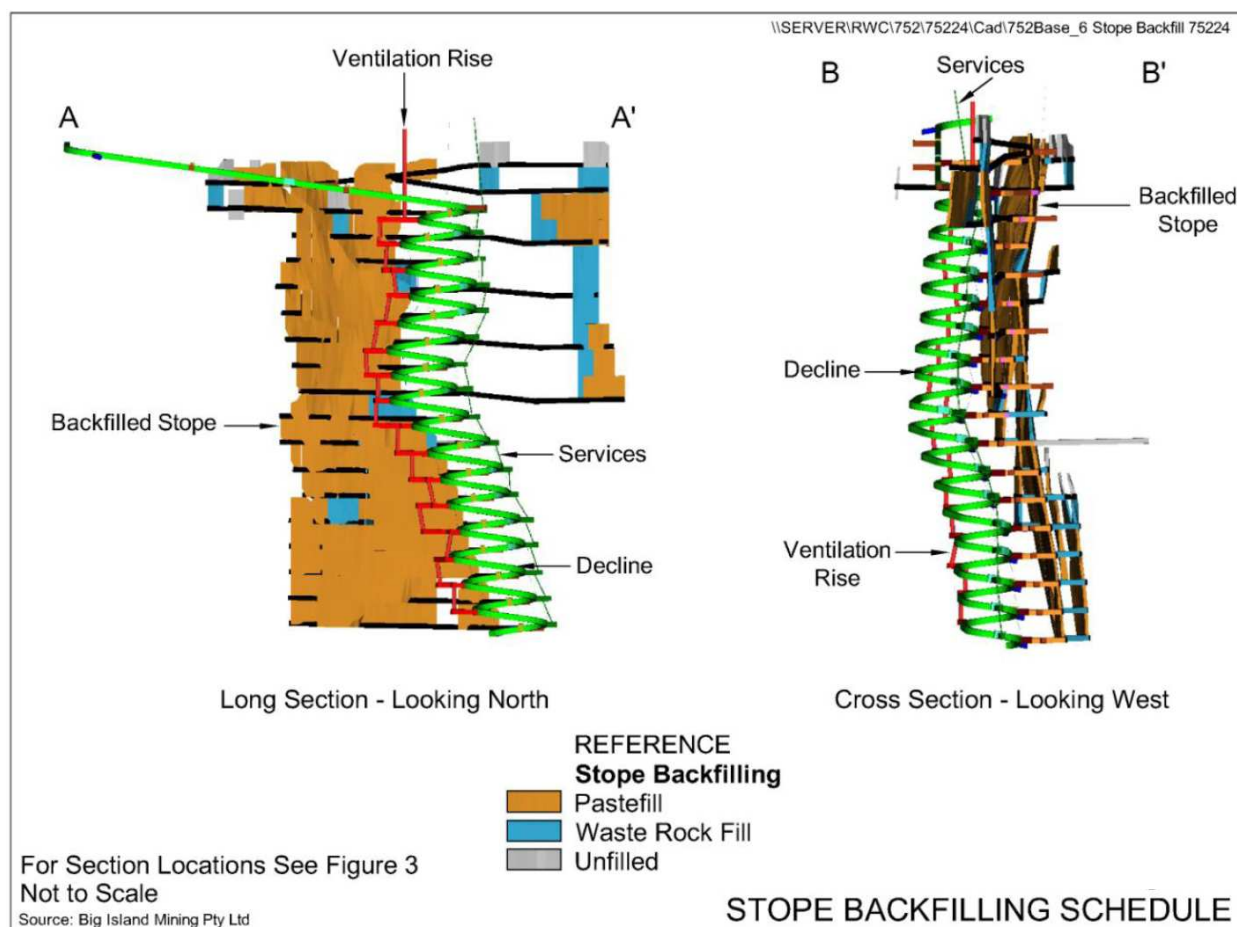


Figure 3: Proposed Stope Backfilling Schedule

3 STATUTORY CONTEXT

3.1 Approval Authority

Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011 and as modified by Schedule 6A to the Act, continues to apply to transitional Part 3A projects. Director-General's environmental assessment requirements were issued in respect of the Dargues Reef Gold Project (i.e. MP 10_0054) prior to 1 October 2011, and the project is therefore a transitional Part 3A project.

Consequently, this report has been prepared in accordance with the requirements of Part 3A and associated regulations, and the Minister may approve or disapprove of the carrying out of the modified project under Section 75W of the Act.

However, under the Minister's delegation of 14 September 2011, the Director Mining and Industry Projects may determine the modification application on behalf of the Minister as:

- there were less than 10 submissions in the nature of objections;
- BIM has made no reportable political donations; and
- Palerang Council has not objected to the proposed modification.

3.2 Modification

The Department is satisfied that BIM's requested modification should be characterised as a modification to the original approval rather than a new project in its own right, as:

- no additional ground disturbance is proposed;
- no additional employees are required;
- it does not change the approved maximum rates of ore extraction;
- it involves relatively minor changes to the approved surface infrastructure;
- no change in the approved noise, blasting, air quality, surface water, heritage, bushfire or visual amenity-related impacts are predicted; and
- the proposed activity is located on land listed in the scheduled lands (referred to in Appendix 1 of the project approval).

Consequently, the Department is satisfied that the modification may be determined under Section 75W.

3.3 Consultation

After receiving BIM's request and the associated EA for the proposed modification, the Department:

- made the EA publicly available from 16th to 30th May 2012:
 - on the Department's website;
 - at the Department's Information Centre;
- referred the EA to the Environment Protection Authority, NSW Office of Water, Department of Trade & Investment, Regional Infrastructure & Services (Division of Resources and Energy), Palerang Council and Eurobodalla Shire Council for comment; and
- advertised the exhibition in the Braidwood Times newspaper.

The Department received a total of 10 submissions on the proposed modification, including:

- 4 from public authorities;
- 2 from special interest groups; and
- 3 from the general public.

The Department also received verbal confirmation from a representative of Palerang Council that Council does not have any concerns in relation to the proposed modification and would therefore not be providing a formal submission.

All submissions are included in full in **Appendix B**. A summary of the issues raised in submissions is provided below.

Government Agencies

All of the government authorities consulted either supported or else did not object to the proposed modification. A summary of the key issues raised by each authority is provided below.

The **Environment Protection Authority** (EPA) requested that the proponent be required to conduct trials to optimise the paste mix design prior to full scale placement, and carry out ongoing testing to confirm the waste classification of the paste fill. The EPA also requested additional information on the nature of the binder, any other additives to be used and the cumulative noise impacts generated by the proposed activities. The proponent submitted additional information in response to the EPA's requests as part of its submissions report, including an expert report regarding the paste mix design and integrity.

In addition, the Proponent has committed to undertaking further tests prior to paste fill operations, consistent with the EPA's request.

The **NSW Office of Water** (NOW) initially raised concern over the long-term stability of the paste fill and potential impacts to groundwater quality. The Proponent's response to submissions report included an expert report regarding the paste mix design and integrity. NOW is satisfied with the proposed conditions that require an updated Water Management Plan be developed in consultation with NOW, where detailed monitoring, trigger response and mitigation plans will be outlined.

The **Division of Resources and Energy** (DRE) indicated that it has no objection to the proposed modification, and noted that the Mining Operations Plan would need to be approved prior to the commencement of the modified activities.

Eurobadalla Shire Council (ESC) engaged a water quality specialist (i.e. Dr Beck from GHD) to review the EA, provide an opinion on the risk to the water quality in the ESC's drinking water catchment and highlight any issues or concerns in relation to the data quality and the conclusions reached. Dr Beck's report indicated that the overall risk to the water quality in the catchment would be relatively lower than the previously proposed waste rock backfill, however noted that information in relation to the mobilisation of some heavy metals was not included in the EA. As mentioned above, additional information on this matter was provided as part of the Proponent's submissions report.

Special Interest Groups

The Department received two submissions from special interest groups, including the Araluen Valley Producers and Protectors of the Ecosystem Coalition (AVPECC) and The Coastwatchers Association Inc. (Coastwatchers).

AVPECC questioned the use of the Community Consultative Committee to support the proposal and requested that the testing and monitoring safeguards for the tailings be the same as those approved by the Court. AVPECC also raised concerns about the lack of information in the EA on the risks associated with alkaline concrete leaching from the paste fill and testing parameters for xanthate.

Coastwatchers indicated its support for the use of paste fill, but raised concerns in relation to the longevity and stability of the paste fill and potential alkalinity of the leachate affecting groundwater. Coastwatchers requested that BIM be required to conduct continuous monitoring of the paste fill and leachate over time, and that these results be made publically available. Coastwatchers also requested that any future changes to the Dargues Reef project be advertised in the Eurobodalla press.

General Public

The Department received three public submissions. Two of these submissions referenced a study by Dr Hose of Macquarie University. The Department understands Dr Hose was commissioned by the Environmental Defenders Office to specifically review the proposal. His report states that the leaching tests and data interpretation in the EA seem appropriate and adequate, and that environmental harm from the metals in the paste fill is unlikely. However, Dr Hose raised concerns about potential alkalinity of the leachate and lack of information in the EA about the longevity and stability of the paste fill.

The public submitters also made a number of requests in relation to monitoring and reporting of the potential environmental impacts associated with the paste filling operations.

3.4 Response to Submissions

BIM has provided a response to the issues raised in these submissions (see **Appendix C**). The Department has considered all issues in the submissions and BIM's response to these issues in its assessment below.

4 ASSESSMENT

The Department has assessed the application, submissions on the proposal, EA documentation (including the submissions report) along with the original EA and conditions of approval. The following provides a summary of the key issues.

4.1 Groundwater

The proposed modification has the potential to impact on local and regional groundwater resources.

BIM engaged Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) to undertake a groundwater assessment of the proposed modification (refer to Appendix 2 of the EA). The assessment included a revision of the original groundwater model for the Project in order to analyse the impacts of using paste fill on the groundwater regime, including groundwater levels, discharges and quality.

The Department notes that a sensitivity/uncertainty analysis of the original groundwater model was undertaken during the Court case and it was agreed that the model provided a reasonable assessment of anticipated groundwater impacts. The Department is therefore satisfied that the model is appropriate to use for assessing groundwater impacts associated with this modification.

In addition, in response to concerns raised regarding the stability and permeability of the paste fill and potential impacts to groundwater quality, BIM submitted an expert report regarding the paste mix design and integrity as part of its response to submissions. See the following discussion.

Long Term Stability

NOW, the special interest groups and public submitters raised concerns in relation to the long-term stability of paste fill and potential impacts to groundwater quality.

In its response, BIM indicated that extensive physical testing and confirmation of the suitability of the paste fill mixture has been undertaken by a specialist paste fill consultant, Mr Revell of Revell Resources. The results of this testing are included in the report at Appendix 1 of the response to submissions (refer to **Appendix C**). The testing included strength testing of the paste fill mixture over 7, 28, 56, 112 and 260 days which indicated that the strength of the paste fill continues to develop over that time, with a suitable strength for the majority of the proposed stopes being reached after 28 days. After this time it is considered highly unlikely that the paste fill will degrade or become less stable, as it would not be subject to weathering, attack by acidic chemicals or natural degradation of the cement binder. Furthermore, the paste fill itself is primarily composed of ground granodiorite that is more than 400 million years old and is unlikely to degrade.

In addition, BIM noted that in the unlikely event that the paste did degrade, the leach tests (which were conducted on unbound samples of tailings material and would be representative of a complete degradation of the paste fill structure) show that the leachate would not contain contaminants at levels that would adversely impact on groundwater quality.

The Department notes the paste fill would not be placed in a reactive environment, making the potential for degradation less likely. Further, the Department is satisfied that the extensive physical test work undertaken by BIM confirms the suitability of the paste fill material and indicates that it is unlikely to degrade and cause adverse groundwater quality impacts.

However, the Department notes that in response to this issue and a request from the EPA to conduct trials to optimise the mix design, BIM has committed to further testing following commissioning of the processing plant and prior to the commencement of paste filling operations. BIM has included this commitment in an updated statement of commitments. Part of these tests would involve pouring samples of the paste fill mix into cylinders and measuring (amongst other things), the structural integrity of the mix prior to actual emplacement.

Both the Department and DRE are satisfied with these measures and acknowledge that it is impractical and potentially unsafe to require inspection/monitoring of the paste fill after emplacement, as it is sealed off. Further, both the Department and DRE note BIM are obliged to operate a 'safe, stable and non-polluting' mine under the relevant mining legislation. Finally, BIM will also be required to include detailed information on this testing in an updated Groundwater Monitoring Program (see discussion below).

Groundwater Quality

Leachate from the paste fill has the potential to adversely impact groundwater quality in the vicinity of the mine.

The paste fill is comprised of ground tailings material and a cement binder (approximately 5% of volume), and has been classified as General Solid Waste under the *Waste Classification Guidelines* (DECCW, 2008). Although this waste classification does not require Toxicity Characteristics Leaching Procedure (TCLP) testing, BIM undertook this testing and engaged specialist aquatic ecotoxicologists from Hydrobiology to review and report on the test work results (refer to Appendix 3 of the EA).

The EPA and ESC (i.e. Dr Beck) raised several issues in relation to the TCLP testing, including questioning why:

- the testing was completed on a sample of the tailings rather than a tailings/paste mixture; and
- only one ore sample was tested.

In its response to the first question, BIM indicated that the use of unbound tailings to determine the leaching characteristics of the material is appropriate, as it would produce a worst-case scenario for leachate. The Proponent notes that:

- the paste, once cured, is a solid mass with permeability of 1×10^{-8} m/s (which is the same permeability required of the TSF) and this would effectively inhibit the ability of the leaching solution to leach contaminants as only the surface and any cracks of the cured paste would be subject to leaching;
- while cured paste could have been crushed and ground for use during the leach test work, the tailings particles with the potential to leach metals would be covered with a cement/carbonate matrix, restricting the ability of those particles to liberate their metals; and
- while the leach test could have been undertaken using an uncured tailings and binder mix, this would have resulted in the curing reaction occurring concurrently with the leaching reactions and would have produced leach test results that were unrelated to the likely leaching characteristics of the paste.

The Department agrees that undertaking the leach test on tailings would produce a worst-case result and is therefore appropriate. Further, it is noted that the study undertaken by Dr Hose, and included in the general public submissions, also considers the leaching tests to be appropriate.

In its response to the second question, BIM indicated that, as identified in the expert reports of Aaron Green and David Morgan prepared for the Court (and accepted by the Appellants), alteration and mineralisation within the Dargues Reef deposit is unusually uniform and homogenous. As a result, the ore material used to produce the tailings sample tested is representative of the ore body as a whole. Further, Mr Morgan noted that it is typical to test one sample of tailings per ore type to determine the physical and geochemical properties of the tailings. The Proponent therefore concludes that the number of samples tested adequately represents the tailings that would be produced during the life of the mine.

The Department accepts that there is only one ore type within the Dargues Reef ore body and that the testing of one ore sample is adequate.

AVPPEC and the three public submitters expressed concerns that amyl xanthate was not analysed during the TCLP testing. In its response, BIM noted that this issue was comprehensively addressed during the Court case where it was agreed that xanthate binds strongly to sulphide minerals, the vast majority of which would be removed with the sulphide concentrate. Further, BIM indicates that the negligible amount that would be bound to the solidified paste fill would not be mobilised in groundwater, due to the impermeable nature of the paste fill. Irrespective, BIM notes that testing for xanthates is not a requirement of the *Waste Classification Guidelines* (EPA, 2009) and that no approved method for the testing of xanthates exists in NSW.

The Department accepts the outcome of the Court case and does not believe that xanthate testing of the leachate is warranted.

The results of the TCLP testing undertaken by Hydrobiology are presented in **Table 1**.

Table 1: Leachate Monitoring Results

Element	Mean concentration in extract (mg/L)	ANZECC Guideline ¹ (mg/L)	Drinking water guideline ² (mg/L)	Median groundwater concentrations ³ (mg/L)
Aluminium	0.165	0.055 (pH>6.5)		2.25
Antimony	0.00195		0.003	
Arsenic	<0.001	0.013	0.007	0.0015
Barium	0.019		0.7	
Cadmium	0.0001	0.0002	0.002	0.000055
Chromium	<0.0005			0.008
Chromium(VI)	<0.005	0.001	0.05	
Copper	<0.0001	0.0014	2.0	0.005
Lead	<0.0001	0.034	0.01	0.00385
Manganese	<0.001	1.9	0.5	0.24
Mercury	0.0004	0.0006	0.001	0.0003
Molybdenum	0.002		0.05	
Nickel	<0.001	0.011	0.02	0.003
Selenium	<0.001	0.011	0.01	
Silver	<0.0001	0.00005	0.1	
Uranium	0.0002 ⁴	0.006		
Zinc	<0.001	0.008		0.038

Note 1: From Table 3.4.1, Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ 2000).
Note 2: From Table 10.10 Australian Drinking Water Guidelines 6 (NHMRC 2004).
Note 3: From Groundwater analysis - Appendix 1 of Hydrobiology (2012).
Note 4: From Hogan et al (2003).
Source: Hydrobiology (2012). – after Table 3

Hydrobiology indicated that the anticipated chemical composition of the leachate that would be leached from the paste fill would comply with the ANZECC and ARMCANZ (2000) trigger values for the protection of 95% of aquatic species, the Australian Drinking Water Guidelines (NHMRC 2004) and the existing groundwater quality for all relevant elements except aluminium, mercury and silver.

Hydrobiology indicates that the levels of these three elements are predicted to be sufficiently low that the leachate would not result in significant adverse groundwater quality-related impacts. Whilst the Department notes the aluminium level exceeds the ANZECC and ARMCANZ (2000) trigger values, it is less than the concentration of aluminium in the existing groundwater. The Department is confident that natural processes would quickly result in precipitation and absorption of soluble mercury and silver onto clays and other minerals.

Hydrobiology therefore concludes that there would be no adverse impacts associated with leaching of these elements from the paste fill. The Department agrees with this conclusion.

ESC (i.e. Dr Beck) and one public submitter raised concerns in relation to the potential of mobility of soluble metals in the leachate and resultant impacts on groundwater quality. In its response, BIM reiterated the expert opinions from Hydrobiology and the fact that the measured contaminate concentrations represent the worst-case scenario for leachate quality. Furthermore, BIM point out that:

- infiltration rates and pathways through the paste fill would be very slow (i.e. years) when compared to the laboratory tests, which were undertaken on unconsolidated tailings where the surface area available to be leached was much greater; and
- groundwater flow rates below and around the paste fill will dilute any leachate.

AVPPEC and the two public submitters also raised concerns about the potential for alkaline concrete leaching from the paste fill and resulting in long-term changes in the naturally acidic water table. However, as indicated by BIM in the EA and reiterated in the response to submissions, once the cement binder is within the paste mix and cured, it is essentially consumed, and is no longer mobile but rather part of the solid mass of paste fill. Therefore, the potential for alkaline concrete to leach from the paste fill is very low, and is therefore unlikely to result in any adverse alkalinity issues in the surrounding groundwater.

Overall, the Department accepts that the very low permeability of the paste fill, the extremely low rate at which water could seep out of the cured mass of paste fill and the subsequent dilution effects would mean that any mobilisation of soluble metals or alkalinity of leachate would be minimal and highly unlikely to result in adverse impacts on groundwater quality.

Notwithstanding, both NOW and the Department recommend an updated groundwater monitoring program be prepared.

BIM noted that groundwater is already being monitoring down to a depth of 216 metres and that there is no reason to expect that the aquifer properties or groundwater below this would be different from that above. This is due to the fact the that the aquifer that hosts the Dargues Reef deposit is a fractured rock granodiorite aquifer associated with the Braidwood Granodiorite, a massive intrusion with an aerial extent of 1000 km² and a depth of at least several kilometres.

Nevertheless, BIM committed to monitoring the quality of groundwater inflow from the deepest section of the underground workings during the life of the project and following the completion of mining operations until all relevant agencies are satisfied that the paste fill operations do not pose a threat to groundwater quality.

Notwithstanding, the Department has recommended the Groundwater monitoring program be updated, and as a result, detailed information in relation to groundwater monitoring would need to be defined in consultation with NOW and the EPA as part of the revised Groundwater Water Monitoring Program.

Groundwater Levels and Discharges

AGE assessed the potential impacts of the proposed modification on groundwater levels and discharges to local creeks (i.e. baseflow) both during and after mining operations.

AGE indicates that during mining operations, the proposed modification would be unlikely to change the anticipated rate of inflow of groundwater into the approved mine, the extent of groundwater drawdown or the rate of discharge of groundwater to Spring or Majors Creek. This is because the lowest level of the approved mine would be below the level at which paste fill is being emplaced. As a result, the paste fill would effectively be placed within the unsaturated zone above the dewatering point.

By contrast, following the cessation of mining operations the lower permeability of the paste filled stopes when compared with rock-filled stopes or voids (which were originally proposed and assessed) are predicted to result in more rapid recovery of groundwater levels.

As illustrated in **Figure 4**, AGE predicts that groundwater levels would initially recover to 90% of pre-mining levels within 6 months of the cessation of mining, compared to 63% during the same period for the approved project (i.e. with rock-filled stopes and voids). This will result in:

- groundwater levels in landowner bores recovering at a faster rate; and
- a faster stabilisation in groundwater discharge to Spring and Majors Creeks.

This may also have the advantage of enabling BIM to scale back or cease its compensatory flow program earlier than would otherwise be the case with the approved project.

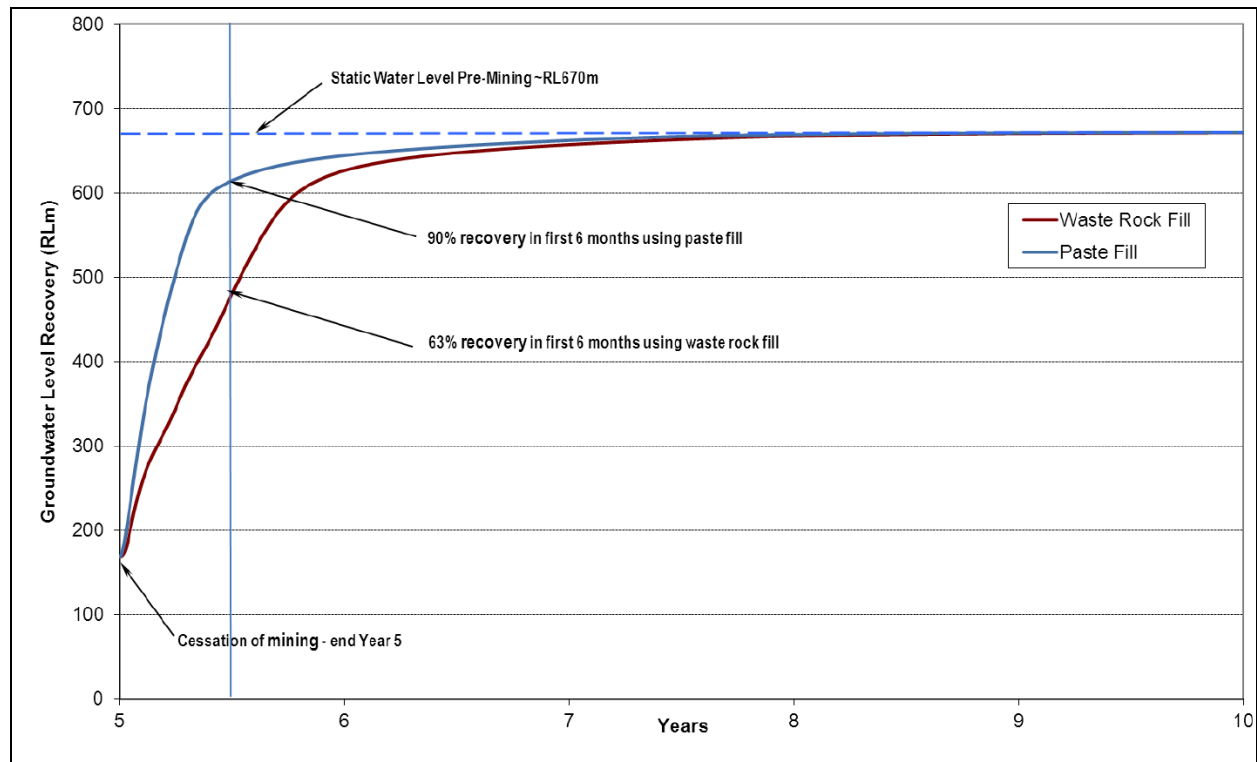


Figure 4: Predicted Recovery of Groundwater Levels

In summary, the Department is satisfied that the paste fill mixture and leachate that may be produced by the paste fill have been adequately characterised and tested and that the paste filling operations are unlikely to cause adverse impact on existing groundwater quality. The Department notes that the proposed modification would result in the benefit of more rapid recovery of groundwater levels and return of pre-mining rates of groundwater discharge to Majors and Spring Creeks than would occur under the approved project.

Finally, the Department notes that the existing approved Groundwater Monitoring Program includes an extensive groundwater monitoring program, which has been designed to detect changes within, and surrounding the project site. However, this Program will be required to be updated to the satisfaction of the Department in consultation with EPA and NOW to reflect physical testing of the paste fill and monitoring of groundwater.

4.2 Other Issues

Other residual issues associated with the proposed modification are examined in **Table 2** below.

Table 2 Assessment of Other Potential Issues

Issue/Impact	Impacts / Consideration	Conclusion / Recommendation
Revised mining rate	<p>The Department notes there would be slight changes to the mining rate predicted as part of the modification.</p> <p>The Department has assessed the potential consequences of these changes, and considers them to be negligible.</p> <p>The Department considers the revised mining rates have been adequately assessed and is satisfied that the proposal would remain within acceptable limits, without further augmentation to infrastructure (beyond what has been proposed).</p>	The Department is satisfied the proposal as modified would continue to be able to comply with the limits and performance measures outlined in the existing conditions of approval.
Noise	<p>The modification would require the installation and operation of a small number of electric pumps and associated infrastructure. The EA states that the noise generated by these pumps would be negligible, and that the modification would therefore result in a negligible change to the overall noise levels generated at the site.</p> <p>The EPA requested additional information in relation to cumulative noise levels and potential impacts at sensitive receivers. This information was provided in the RTS and confirms that cumulative noise levels at surrounding residences are not expected to change as a result of the modification. It is also noted that, even if a small increase in noise was to result, the noise levels of the operation would still remain below the existing noise limits in the project approval.</p> <p>The EA did not include a traffic noise assessment. However, the Department notes that the original traffic noise assessment (Spectrum Acoustics Pty Ltd, 2010) allowed for 10 heavy vehicle movements per hour, which was predicted to generate noise levels that were 5dB(A) below the relevant traffic noise criteria. Given that only 4 heavy vehicle movements per hour were approved, it follows that the traffic noise generated by the project would be well below the criteria and that, even with an additional two trucks (i.e. four movements) per day, the traffic noise levels would remain well below the applicable criteria.</p>	The Department is satisfied that the proposed modification would result in very minor changes to the existing operational or traffic noise levels generated by the project and that the existing noise criteria can be complied with.
Waste	The EA indicates that the paste fill would be classified as a "General Solid Waste" in accordance with the EPA's <i>Waste Classification Guidelines</i> (EPA, 2009). In its submission the EPA noted that this classification requires BIM to conduct frequent testing of the waste (i.e. paste fill) to ensure it continues to meet the classification throughout the period it is emplaced. In its response, BIM committed to undertake this testing.	The Department is satisfied with the waste classification of the paste fill and notes that BIM will be required to update the existing Waste Management Plan to include a program to monitor the paste fill to determine ongoing compliance with the classification.
Biodiversity	<p>The only potential impacts to biodiversity associated with the modification are changes to groundwater discharge volumes and/or quality and associated impacts on downstream ecological communities and aquatic ecology.</p> <p>As discussed in Section 4.1, Hydrobiology state that groundwater discharges to Spring and Majors Creek would return to pre-mining levels faster than the approved project and that the leachate that may be produced from the paste fill would not adversely impact groundwater quality. The Proponent therefore concludes that the proposed modification would not have an adverse impact on any ecological communities, aquatic ecology or groundwater dependent ecosystems.</p>	No change to the existing conditions of approval.

Traffic and Transportation	<p>The cement component of the paste fill would need to be transported to the site. The EA states that this would result in an average of one additional truck entering and leaving the site (i.e. two movements) via the approved transport route per day. During a six month period in Year 3 of the project, when paste fill production is expected to be at its maximum, this would increase to two trucks (i.e. four movements) per day.</p> <p>The Proponent suggests that the additional truck movements represent an average increase of 11% in the approved heavy vehicle movements along the approved transport route. The Department agrees that this would have a negligible impact over the life of the project.</p>	The Department is satisfied that the increases in heavy vehicle movements associated with the modification would be minor and that the existing time restrictions for heavy vehicle movements would ensure that the project would not result in adverse impact on the local road network or road users.
Air Quality	<p>The EA states that the proposed modification would not increase the approved area of disturbance, and may actually result in a reduction in the area required for the TSF.</p> <p>In addition, the EA indicates that the proposed binder silo would be fitted with reverse pulse dust collectors which would ensure that the dust emissions from the silo would be negligible.</p>	No change to the existing conditions of approval.
Visual	<p>The proposed modification would require the construction of a binder silo approximately the same height as the top of the approved primary crusher housing. The EA stated that the silo would be constructed of neutral-coloured, non-reflective material and would not be visible from publically accessible vantage points surrounding the project site.</p> <p>The EA therefore concludes that the proposed modification would not result in visual amenity-related impacts any greater than those already approved.</p>	The Department is satisfied that the visual impacts associated with the binder silo would be insignificant.
Surface Water	The additional infrastructure required for the proposed modification would be constructed wholly within the approved processing plant footprint. The EA states that the existing approved surface water management measures within this area are adequate to manage surface water runoff from the entire area, including the additional infrastructure area associated with the modification.	The Department is satisfied that the existing surface water management measures are adequate and that the modification would not result in adverse impacts to surface water beyond those already approved.
Heritage	The additional infrastructure required for the proposed modification would be constructed wholly within the approved processing plant footprint. The EA therefore states that the proposed modification would not result in any impacts to heritage items.	The Department is satisfied that the proposed modification would not result in adverse impact to Aboriginal or European heritage beyond those already approved.
Socio-economic	<p>The EA states that the proposed modification would result in additional contributions to the State and National economy through additional capital costs (\$5 million) and ongoing expenditure associated with the purchase of the binder required for the paste fill (\$1.3 - \$3 million per year). The proposed modification would also result in the extraction of 300,000 tonnes of material that would otherwise be sterilised.</p> <p>The EA states that these benefits would be achieved with negligible or reduced environmental impacts when compared to those associated with the approved project.</p> <p>The EA therefore states that the proposed modification would result in a net socio-economic benefit.</p>	The Department is satisfied that the proposed modification would result in a net socio-economic benefit.

5 RECOMMENDED CONDITIONS

The Department has drafted recommended conditions for the modification. These include removing restrictions on the use of tailings to backfill stopes and incorporating restrictions on the number of trucks containing cement components that can enter the site per day.

BIM has reviewed and accepted the Department's proposed conditions.

6 CONCLUSION

The Department has assessed the modification application and associated EA in accordance with the relevant requirements of the EP&A Act, including the objects of the Act and the principles of ecologically sustainable development.

The Department is satisfied that the use of paste fill as back fill in the underground mining operation can be undertaken with negligible impact on the environment, and allow BIM to achieve maximum extraction of economically viable resource in a safe and efficient manner.

Consequently, the Department is satisfied that the proposed modification is in the public interest and should be approved, subject to conditions.

7 RECOMMENDATION

It is RECOMMENDED that the Director Mining and Industry Projects as a delegate to the Minister for Planning and Infrastructure:

- **consider** the findings and recommendations of this report;
- **determine** that the proposed modification is within the scope of section 75W of the EP&A Act;
- **approve** the application to modify the project approval, subject to conditions, under section 75W of the EP&A Act; and
- **sign** the attached notice of modification (**Appendix D**).

Felicity Greenway 6/7/12
Felicity Greenway
Team Leader
Mining & Industry Projects

Kitto 12/7/12
David Kitto
Director
Mining & Industry Projects