

# Statement of Reasons

## PRIMARY GOLD LIMITED – TOMS GULLY UNDERGROUND PROJECT NOTICE OF AN ALTERATION – CLAUSE 14(A)

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### PROPOSAL

The Northern Territory Environment Protection Authority (NT EPA) decided on 23 April 2014 that the Primary Gold Limited (the Proponent) Toms Gully Underground Project (the Proposal) requires assessment under the *Environmental Assessment Act* (EA Act) at the level of an Environmental Impact Statement (EIS). The Proponent made the draft EIS available for comment between 26 September and 6 November 2015.

The Proponent wrote to the NT EPA on 8 June 2018 to provide notice of an alteration to the Proposal under clause 14A of the Environmental Assessment Administrative Procedures (EAAP).

The Proposal is located at the Old Mount Bunday Station, approximately 90 km south-east of Darwin. Mining at the site of the Proposal has occurred intermittently since 1988 and the site presents a number of legacy environmental issues, including significant acidic and metalliferous drainage (AMD) from mine infrastructure and a pit containing poor quality water (low pH and high metal content).

The original referral outlined the proposal to recommence gold mining and processing, utilising the existing mine footprint and dewatering the existing pit to gain access to historic underground workings. Ore would be processed onsite using the existing carbon in leach processing plant, which would be upgraded to accommodate 350 000 tpa throughput. The existing tailings storage facilities would also be upgraded via wall lifts and used for tailings storage. Potentially acid forming waste rock from the Proposal (~ 1.7 Mt) would be stored underground or at the base of the pit, constraining acid production once the underground workings and pit are flooded post closure.

A 2.1 GL capacity valley fill water storage dam was proposed to store treated water from dewatering of the pit during the Dry season. Water would then be discharged to Mount Bunday Creek during subsequent Wet seasons.

Two tailings storage facilities containing tailings from previous mining campaigns exist at the Proposal site. The original referral proposed to cap and rehabilitate one facility or to rehandle materials for placement in the pit. The other facility would be upgraded and a HDPE liner used to separate the existing tailings from new tailings (~ 0.9 Mt). The facility would be capped or placed in the pit.

The Proponent initially proposed a number of options for the treatment and storage of water to facilitate mine dewatering.

The Proposal would have an operational life of up to four years, produce approximately 144 000 oz of gold and provide 104 jobs during peak production.

In 2014, the NT EPA identified the potential impacts to Terrestrial environmental quality, Inland water environmental quality, Hydrological processes, Aquatic ecosystems and Social, economic and cultural surroundings from the Proposal.<sup>1,2</sup> In particular, it was considered there were potential impacts to regional groundwater, Mount Bunday Creek and the Mary River National Park from dewatering, treatment and discharge (active and passive) of water from the site. It was also

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<sup>1</sup> Northern Territory Environment Protection Authority, 2014. *Statement of Reasons – Primary Gold Limited – Toms Gully Mine Project*. Northern Territory Environment Protection Authority, Darwin, Australia.

<sup>2</sup> Northern Territory Environment Protection Authority, 2014. *Terms of Reference for the Toms Gully Mine Project*. Northern Territory Environment Protection Authority, Darwin, Australia.

considered that there was potential for ongoing contamination of downstream environments from AMD, should the recommissioning and rehabilitation be inadequately designed and/or implemented.

### Altered Proposal

The Proposal has been altered to include:

- a dedicated, stand-alone water treatment plant. The plant would use the 'BioAqua Process' to strip out metals and use bacteria to remove sulfates. This process would also be used to process existing and future tailings to extract gold, mixed metal oxides, sulfur and silica
- two new options for tailings management. The Proponent's preferred option would be to reprocess tailings from both facilities and assess and upgrade the facilities to ANCOLD Guidelines.<sup>3</sup> The facilities would be used to store reprocessed and new tailings and subsequently be capped and rehabilitated *in situ*
- a contingency option (non-preferred) to use an existing facility for tailings storage and build a new, lined facility to ANCOLD Guidelines.<sup>3</sup> The facilities would both receive reprocessed and new tailings. The Proponent would rehabilitate the footprint of the former facility, and the operational facilities (one existing, one new) would subsequently be capped and rehabilitated *in situ*. Tailings would not be stored in the pit or underground workings under either option
- a reduction from the originally proposed 2.1 GL water storage dam to 1 GL and to relocate the water storage dam within the same catchment but away from the main watercourse. New topsoil stockpiles would also be located in this footprint identified for the new dam. The overall clearing footprint would be reduced by 10 ha and the site layout would be reconfigured by the altered Proposal
- an option to use diesel generators if power cannot be gained from the local grid at a competitive price.

The annual workforce requirements, ancillary infrastructure, processing circuit and anticipated volumes of tailings and waste rock would not change by the altered Proposal.

## **CONSULTATION**

The has been reviewed as a notification under the EA Act in consultation with Northern Territory Government (NTG) advisory bodies (see Attachment A) and the responsible Minister, in accordance with clause 14A(3) of the EAAP.

## **JUSTIFICATION**

The NT EPA is satisfied that the Proposal has been altered from that previously considered as outlined in the Proponent's notification and summarised above. It is acknowledged that the alterations are largely a result of completing additional studies and updating the impact assessments, consistent with comments made on the draft EIS.

The Proposal in consideration of the notification was assessed against the NT EPA's environmental factors and objectives.

### **1. Terrestrial environmental quality**

Objective: Maintain the quality of land and soils so that environmental values are protected.

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<sup>3</sup> Australian National Committee on Large Dams (ANCOLD), 2012. *Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure*. ANCOLD, Victoria, Australia.

The Proposal site is currently in care and maintenance and existing mine features are contributing to poor environmental condition (e.g. unrehabilitated tailings dams, waste rock dumps, pit, etc.). The Proposal will require well-considered design and implementation to recommission the site without exacerbating the existing site condition. Similarly, long-term rehabilitation success would need to achieve a landform that is compatible with the surrounding landscape and environmental values; physically safe for humans, flora and fauna; geotechnically stable; geochemically non-polluting/non-contaminating; and capable of sustaining an agreed land use, without unacceptable liability to the Northern Territory.

The altered Proposal presented two new options for tailings management. These options would ensure the facilities are constructed to ANCOLD Guidelines<sup>3</sup> and capped and rehabilitated *in situ*. The Proponent would also reprocess the existing tailings to extract gold, mixed metal oxides, sulfur and silica, thereby reducing the quantity of existing on-site tailings and altering the quality of tailings for long-term storage. If practicable the Proponent would also use the technology in other areas to reduce the AMD profile across the Proposal site.

The Proponent has provided greater certainty and improvements to tailings containment and management, which would be consistent with Australian best available guidance for the operation of tailings dams. The altered Proposal would also see that tailings are not stored in the underground workings or the base of the pit. There are no other changes to the use, management and overall closure of other mine features (e.g. flooding the pit, Proponent to investigate the long-term options for closure of the existing sulphide and oxide water rock dumps, etc.).

The NT EPA considers that the land management and closure principles to support the Proposal are still significant and that the potential impacts to Terrestrial environmental quality are consistent to those initially referred to the NT EPA.

## 2. Aquatic ecosystems

Objective: Protect aquatic ecosystems to maintain the biological diversity of flora and fauna and the ecological functions they perform.

The Proposal is located approximately 3 km from the Mary River National Park and less than 100 m from the Mary River coastal floodplain site of conservation significance (measured from the closest distance between the MLN1058 and park/site boundaries). The extensive wetland and floodplain systems associated with these areas are rich in biodiversity and are significant nationally and internationally.<sup>4,5</sup> The Mary River is the most significant and reliable breeding habitat for magpie geese in the Northern Territory, and is an important breeding and feeding grounds for other important water, shore and sea-birds.<sup>4</sup>

While the Proposal is not located within the Park or site of conservation significance, the NT EPA previously considered the Proposal could reasonably act as a source of contaminants, and impact the aquatic health and physicochemical properties of the water entering the Park/site via Mount Bunday Creek, if adequate control measures were not implemented.<sup>2</sup>

The altered Proposal would include a water treatment plant, which would treat water to revised site-specific trigger values. These values were recently reviewed and revised by CSIRO Land

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<sup>4</sup> Department of Natural Resources, Environment, the Arts and Sport, 2011. *Sites of Conservation Significance - Mary River coastal floodplain*. Northern Territory Government. Available at: [http://www.territorystories.nt.gov.au/bitstream/handle/10070/254276/13\\_mary.pdf](http://www.territorystories.nt.gov.au/bitstream/handle/10070/254276/13_mary.pdf)

<sup>5</sup> Parks and Wildlife Commission of the Northern Territory, 2015. *Mary River National Park Joint Management Plan – March 2015*. Available at: [https://dnc.nt.gov.au/\\_data/assets/pdf\\_file/0006/260493/Mary-River-final-JMP\\_March2015\\_sml.pdf](https://dnc.nt.gov.au/_data/assets/pdf_file/0006/260493/Mary-River-final-JMP_March2015_sml.pdf)

and Water.<sup>6</sup> The water treatment method is yet to be tested at the Proposal site and approval is being sought from the Department of Primary Industry and Resources for the placement and operation of a pilot plant. The trials would be used to refine the process to meet the requirements of the Proposal.

The Proponent has provided greater certainty regarding the preferred water treatment methodology and water quality targets to underpin on-site water management as part of the altered Proposal. However, the NT EPA considers that the proposed emerging technology has yet to be fully tested at the scale required to support full production of the altered Proposal and uncertainty exists regarding its potential success. Therefore, there is still the potential to significantly impact the downstream aquatic ecosystems and the NT EPA considers that the environmental significance of the Proposal has not changed in relation to this factor

### 3. Inland water environmental quality

Objective: Maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.

The Proposal site is located in an area of declared beneficial uses gazetted under the *Water Act*. The beneficial uses are environment, riparian and cultural for surface water (all tributaries that enter that waterway and all lakes, lagoons, swamps and marches situated in the catchment) and environment, riparian and agriculture for groundwater.<sup>7</sup> The surface water declaration for Mount Bunday Creek (including the section on MLN1058) was revoked and declared aquatic ecosystem protection for the upper and lower reaches.<sup>8</sup> A short section (~ 3 km) of Mount Bunday Creek located immediately downstream from MLN1058 is for stock water supply.<sup>8</sup>

The altered Proposal would treat water to revised site-specific trigger values using a dedicated water treatment plant. The review of these values by CSIRO Land and Water was undertaken in consideration of the declared beneficial uses and included recommendations for continual improvement.<sup>6</sup> There are no other changes to the dewatering requirements and surface water management from the altered Proposal.

As discussed above, the Proponent intends to reduce the AMD profile across the Proposal site by improvements to water treatment and tailings management. The altered Proposal would still require the dewatering and treatment of 2.6 GL of poor quality water from the pit and underground workings for site recommissioning and the ongoing treatment of water from existing mine features with AMD. The potential impacts to Inland water environmental quality from the altered Proposal are consistent with the initial referral and the NT EPA considers that the environmental significance has not changed in relation to this factor.

### 4. Hydrological processes

Objective: Maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.

A tributary to Mount Bunday Creek to the west of the Proposal site would not be dammed by the altered Proposal. A smaller, purpose built 1 GL water dam would be constructed away from

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<sup>6</sup> Stauber, J.L. and Batley, G.E., 2018. *Review of Site-Specific Trigger Values for Toms Gully Mine, NT*. CSIRO Land and Water, Australia.

<sup>7</sup> Northern Territory Government, 2002. *Gazette G6, 13 February 2002*. Available at: [http://territorystories.nt.gov.au/bitstream/handle/10070/225332/EJ\\_NTGG\\_2002\\_G06.pdf?sequence=1&isAllowed=y](http://territorystories.nt.gov.au/bitstream/handle/10070/225332/EJ_NTGG_2002_G06.pdf?sequence=1&isAllowed=y)

<sup>8</sup> Northern Territory Government, 1997. *Gazette G23, 11 June 1997*. Available at: [http://territorystories.nt.gov.au/bitstream/handle/10070/223918/EJ\\_NTGG\\_1997\\_G23.pdf?sequence=1&isAllowed=y](http://territorystories.nt.gov.au/bitstream/handle/10070/223918/EJ_NTGG_1997_G23.pdf?sequence=1&isAllowed=y)

the main waterway but within the same catchment. Inundation and surface water flow disruption in this catchment would be less significant by the altered Proposal.

While the major waterway would be avoided by the altered Proposal, the new water dam would be positioned over minor waterways in the catchment and would result in alternations to surface water flows. Surface flow diversions may also be required to accommodate the new topsoil stockpiles and the construction of a new tailings storage facility, should that option be pursued.

There are no other changes to the dewatering requirements, groundwater use and surface water management from the altered Proposal.

The NT EPA considers that the water requirements and related infrastructure to support the altered Proposal are still significant and the potential impact to Hydrological processes has not changed.

## **5. Social, economic and cultural surroundings**

Objective: Protect the rich social, economic, cultural and heritage values of the Northern Territory.

The Mary River National Park is visited by local, interstate and international visitors for recreational fishing and wildlife watching.<sup>5</sup> Local fishing tour operators also utilise the wetland areas in and adjacent to the Park. There is potential for the Proposal to impact the biological, recreational and tourism values of Mary River National Park<sup>5</sup> should the recommissioning and rehabilitation be inadequately designed and/or implemented.

The altered Proposal provides greater certainty regarding water treatment and discharge methods to protect the health of the downstream environment. As discussed above, the NT EPA considers the potential significant impacts to downstream aquatic ecosystems from the altered Proposal have not changed. The health of the aquatic ecosystems of the Mary River National Park is intrinsically linked to production of fish species and fish stock to support the social and economic values of the Park. Therefore, there is still the potential to significantly impact the Social, economic and cultural surroundings and the NT EPA considers that the environmental significance of the Proposal has not changed in relation to this factor.

### **Conclusion**

The NT EPA considers that the altered Proposal has the potential to significantly impact the environment and some of those impacts cannot be adequately characterised a more comprehensive assessment.

The NT EPA considers that the Proposal has the potential to have significant environmental impacts and the NT EPA's environmental objectives for Terrestrial environmental quality, Inland water environmental quality, Hydrological processes, Aquatic ecosystems and Social, economic and cultural surroundings from the Proposal are unlikely to be met based on the information provided. A more comprehensive evaluation of those impacts and potential mitigation measures is required to enable the NT EPA to form a view about whether its environmental objectives can be met. The altered Proposal will continue to be assessed at the level of an EIS.

## DECISION

The Proposal has been altered in such a manner that its environmental significance has not changed. The Proposal is capable of having a significant effect on the environment and its environmental significance is such that the preparation of an EIS is still necessary with respect to the proposed action.



JANICE VAN REYK

MEMBER

NORTHERN TERRITORY ENVIRONMENT PROTECTION AUTHORITY

24 JULY 2018

**Attachment A: Northern Territory Government Agencies consulted on the Notice of Intent**

<b>Department</b>	<b>Division</b>
Department of Environment and Natural Resources	Flora and Fauna Water Resources Weeds Environment Bushfires NT Rangelands
Department of Infrastructure, Planning and Logistics	Lands Planning Infrastructure Transport
Department of Primary Industry and Resources	Fisheries Mining Compliance Petroleum Primary Industry
Department of Tourism and Culture	Heritage Tourism NT Arts and Museums Parks and Wildlife
NT Police, Fire and Emergency Services	Business Improvement and Planning
Department of Health	Environmental Health Medical Entomology
Department of Trade, Business and Innovation	Economics and Policy Strategic Policy and Research
Department of Housing and Community Development	Maintenance Planning Housing supply
Power and Water Corporation	
Aboriginal Areas Protection Authority	Technical
Department of the Attorney-General and Justice	Commercial Division NT Worksafe
Land Development Corporation	
Department of the Chief Minister	Economic and Environmental Policy