Tropicana Joint Venture

Tropicana Gold Mine (TGM)
Ministerial Statement No 839
Annual Compliance Assessment Report
24 September 2017 to 23 September 2018

20 December 2018

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Tropicana Gold Project, Annual Compliance Assessment Report

Ministerial Statement No. 839

This report has been developed by AngloGold Ashanti Australia on behalf of the Tropicana Joint Venture.

Revision	Author	Reviewer	Date
Draft - for internal review	S. Brown	R. Lane	15 December 2018
Final – for review and release	S. Brown	D. Stewart	20 December 2018

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1 Introduction

The Tropicana Gold Mine (TGM) (the Project) is an open cut gold mine located approximately 330 kilometres (km) east northeast of Kalgoorlie on the western edge of the Great Victoria Desert (GVD) (Figure 1). The operation is a joint venture (Tropicana JV) between AngloGold Ashanti Australia Ltd (70% stakeholder and manager) and Independence Group NL (30% stakeholder).

The Project was approved under the Environmental Protection Act 1986 (EP Act) in September 2010 and issued with Ministerial Statement No. 839 (MS839). Condition M4.6 of MS839 requires the preparation and submission of an annual Compliance Assessment Report for the preceding 12 months.

This report has been prepared to meet Condition M4.6 and covers the period 24 September 2017 to 23 September 2018. The TGM Ministerial Statement audit compliance table updated for the reporting period is provided in Appendix 1.

The TGM is comprised of:

- *Operational area*

Open pits, waste landforms, stockpiles, tailings storage facility, processing plant, mine village, aerodrome and other supporting infrastructure.

- *Infrastructure corridor*

Including an access road and communications corridor linking the operational area to existing communications and road networks of the Goldfields regions. This corridor is referred to as the Pinjin Corridor.

- *Process water supply area*

Containing the process water supply borefield (PWSB).

This is the eighth Compliance Assessment Report (CAR) prepared by AGAA on behalf of the Tropicana JV for the Project and has been prepared in accordance with the approved Compliance Assessment Plan (CAP) dated 13 December 2010 prepared and submitted to the Office of the EPA in 2010.

1.1 Approvals History

Subsequent to the issuance of MS839 in September 2010, the Tropicana JV has sought and gained approvals under section 45C of the EP Act to implement non-substantial changes to the original approved Project (Table 1).

Table 1: Non-substantial changes to MS839 Key Characteristics

Application	Date Approved	Element	Original Proposal	Approved Change to Proposal
Tailings Storage Facility Design – Two Cell vs. Single Cell. August 2012	19 November 2012	Tailings Storage Facility	Up to 7 mtpa; two-cell paddock tailings storage facility with possible in-pit TSF deposition. Maximum height of 372 mRL. Approximately 1330 m wide by 1850 m.	Up to 7 mtpa; single-cell paddock tailings storage facility with possible in-pit deposition. Maximum height of 372 mRL. Maximum 292 ha footprint.
Water Supply Area Increased Footprint and Abstraction Volume. September 2014	17 December 2014	Mining Rate	Up to 75 mtpa (ore and waste)	Removed as not a significant key characteristic relevant to the environment.
		Stripping ratio	8:1	Removed as not a significant key characteristic relevant to the environment.
		Water Supply	Up to 7GL/year	Up to 9 GL/year
		Mine Access Road	Pinjin Option – 370 km (~210 km of road construction)	Pinjin Route – 370 km (~210 km of road construction.
		Communications	Fibre Optic or Microwave via either Pinjin or Tropicana Transline Corridor	Removed as not a significant key characteristic relevant to the environment.
		Main Power Supply	Onsite power station with an installed capacity of up to 40 Mw	Removed as regulated under Part V of the *Environmental Protection Act 1986*.
		Disturbance Area	Not more than 3,440 ha comprising: • Operational area – 2,570 ha • Water supply area – 200 ha • Infrastructure area – 670 ha	Not more than 3,540 ha comprising: • Operational area – 2,570 ha within 27,241 ha Operational Development Envelope. • Water supply area – 300 ha within 19,663 ha Water Supply Area Development Envelope. • Infrastructure areas – 670 ha within 4,269 ha Infrastructure Development Envelope.
		Figures	Figure 1 – Regional location of mine site Figure 2 – Proposal footprint and conceptual layout of key components	Figure 1 and 2 of Schedule 1 replaced by: Figure 1: Development Envelopes Table 2: Development Envelopes – Map Grid of Australia (MGA) Zone 51 Coordinates.
Operational Area Waste Landform. October	8 December 2016	Overburden and waste	Not more than 800 mt	Not more than 800 mt placed in waste landforms
		Waste landform	Not more than 1,200 hectares. Maximum height 375 mRL. Slope with maximum angle of 15 degrees	Not more than 1,200 hectares. Maximum height 417 mRL including rehabilitation cover. Slope with maximum angle of 15 degrees.

Application	Date Approved	Element	Original Proposal	Approved Change to Proposal
		Tailings Storage Facility (TSF)	Up to 7 mtpa; single-cell paddock tailings storage facility with possible in-pit deposition. Maximum height of 372 mRL. Maximum 292 ha footprint.	Single-cell tailings storage facility with possible in-pit deposition.

2 Current Status

Key activities undertaken during the reporting period included:

- Continuation of mining in the Tropicana, Boston Shaker and Havana Open Pits.
- Commencement of mine development of the Havana South Open Pit.
- Expansion of waste landform height in accordance with approved Section 45C.
- Continued Processing plant operation and gold production.
- Groundwater abstraction from the Process Water Supply Borefield.
- Approval of the TGM Mine Closure Plan by the Department of Mines, Industry Regulation and Safety (DMIRS) in October 2017.
- Submission of the Tropicana Operational Area Underground Mining Section 45C application.

Table 2 provides an overview of the Project's key characteristics and current status while the updated disturbance footprint is shown in Figure 1, Figure 2 and Figure 3.

Table 2: Tropicana Gold Project Key Characteristics Table Status Report

Element	Description	Status / Comment
General		
Project Life	Approximately 15 yr. of mining; total project duration up to 25yr (including post closure monitoring)	Mining and Processing activities continued at a steady rate during the reporting period.
Mining and Processing		
Number of pits	Up to 4	3 current Open Pits (Tropicana, Havana and Boston Shaker)
Open pit void/s	Not more than 400 hectares	Current open pit area: 285.29 ha
Max. length of pit/s	6 kilometres (if pits combine)	Current max. open pit length: 4.13 km (Havana/Tropicana combined)
Max width of pit/s	1.5 kilometres	Current maximum width of Havana pit is approximately 780 m
Overburden & waste	Not more than 800 million tonnes placed in waste landforms.	182.9 Mt of waste material placed in waste landforms LEA – 106.5 Mt LTA – 15 Mt LWE – 61.4 Mt
Waste landform	Not more than 1200 hectares. Maximum height 417 mRL including rehabilitation cover. Slope with maximum angle of 15 degrees.	Current Waste landform area: 634.42 ha Current max height: 397.3 mRL (AHD71).
Water Supply	9 gigalitres per annum	3.93 GL in reporting period.
Dewatering Rate	1,000 to 5,000 kilolitres per day	306,300 kL total volume dewatered during reporting period. Average dewatering rate of 839 kL per day.
Infrastructure		
Mine access road	Pinjin Route –370 km (~210 km of road construction)	Pinjin Mine Access Road construction was completed during the 2012 reporting period.
Aerodrome	All weather strip 2.4 km long	Aerodrome completed and commissioned. 2.1 km all weather strip.
Water Pipeline	Approximately 50 km in length from the borefield (located north northwest of Operational Area) to the process plant	Pipeline completed and commissioned. Pipeline length is approximately 42 km.
Tailings Storage Facility (TSF)	Single-cell tailings storage facility with possible in-pit deposition.	Single-cell TSF constructed and operated.

Element	Description	Status / Comment
	Disturbance Areas	
Disturbance Area	Not more than 3,540 ha comprising: • Operational area – 2,570 ha within 27,241 ha Operational Development Envelope. • Water supply area – 300 ha within 19,663 ha Water Supply Area Development Envelope. • Infrastructure areas – 670 ha within 4,269 ha Infrastructure Development Envelope.	Total current disturbance footprint: 2833.71 ha Operational Area: 2059.96 ha Water Supply Area: 203.13 ha Infrastructure Area: 620.62 ha Note 1 – the Operational Development Envelope and the Infrastructure Development Area defined by Schedule 1 of MS839 overlap. To avoid duplication of disturbance data, the Infrastructure Development Envelope has been cropped to outside the Operational Development Envelope for reporting purposes. Note 2 – The reported disturbance footprint for the Operational Area Development Envelope has decreased by 168.13 ha between 2017 and 2018. This decrease is due to the previous incorrect reporting of Exploration disturbance within the Operational Development Envelope against MS839. Exploration disturbance has been subsequently removed from reporting against MS839 for the 2018 CAR.

Note – Data recorded as at 30 September 2018

3 Compliance

The 2017-2018 reporting period represents the eighth reporting period for the TGM and the fifth full operating period for the TGM, with the processing plant commencing operation during September 2013.

During the 2018 reporting period the Tropicana JV was compliant with all ministerial conditions associated with the Conditions of MS839. A completed audit table providing further detail on compliance with conditions is included in Appendix 1.

As advised in previous Compliance Assessment Reports (CAR) for Ministerial Statement 839 (MS 839), the Tropicana JV identified and self-reported that the spatial extent of the Infrastructure Development Envelope does not completely align with the *Mining Act 1978* tenure upon which the Pinjin Mine Access Road is constructed. A Section 45C application was submitted to the then OEPA in August 2017 seeking to revise Figure 1 and Table 2 of MS839. On advice of the OEPA Assessing Officer, this application was withdrawn and has been subsequently re-submitted as a component of the Tropicana Operational Area Underground Mining Section 45C.

In accordance with the CAP, the CAR for the 2018 reporting period will be made publicly available once the Tropicana JV has received acknowledgement from the DWER that the report has been accepted. A copy of the CAR 2018 will then be placed on the Tropicana JV website.

No changes have been made to the previously approved CAP during this reporting period (Condition 4.1 of MS839).

4 Environmental Monitoring

During the 2018 reporting period groundwater, surface water, vegetation condition and fauna monitoring programs were undertaken and the results were analysed. Details of monitoring activities conducted throughout 2018 and further analysis on monitoring results is provided to the Department of Mines, Industry Regulation and Safety (DMIRS) and Department of Water and Environmental Regulation (DWER) in separate annual reports.

Groundwater monitoring from the sixteen (8 deep and 8 shallow) monitoring bores installed around the TSF and waste landform footprints (Figure 4) was undertaken throughout 2018. A summary of results from the sampling events are provided in Appendix 3. Results obtained from these monitoring bores were compared with trigger values which were established in 2014. Analysis of results indicates that changes in groundwater quality (baseline groundwater quality +/- 10%) has occurred at some monitoring bores.

ENVMB001, located to the north of the TSF, has displayed results for multiple parameters that are above baseline water quality triggers values, including Calcium (Ca), Chloride (Cl), Cobalt (Co), Magnesium (Mg), Nitrate (NO_3), Sodium (Na), WAD Cyanide (Cn), Electrical Conductivity (EC) as well as Total Dissolved Solids (TDS). Groundwater quality changes at ENVMB001 are influenced by the operation of the nearby TSF.

Conversely, monitoring for ENVMB004 has recorded results below the minimum trigger values for three (3) parameters, including Bicarbonate Alkalinity ($CaCO_3$), Boron (Bo), Chloride (Cl), Iron (Fe), Manganese (Mn), Sulphate (SO_4) and Zinc (Zn). Results recorded lower than the minimum trigger value are considered to be associated with natural fluctuations in groundwater quality and not associated with operational activities.

Localised changes in groundwater quality are not considered to have any detrimental impact to environmental values. The existing groundwater environment is typically saline to hypersaline and has no known beneficial users. No stygofauna were identified within the Operational Area during baseline surveys. Monitoring of vegetation condition in proximity to operational areas has not identified any impacts to vegetation health associated with changes in groundwater quality.

To mitigate potential impacts to environmental values, AGAA implemented a Seepage Mitigation Project in 2016. The Seepage Mitigation Project was continued throughout the reporting period, including ongoing operation of ten (10) seepage recovery bores. During the current reporting period the following improvements have been made to the project:

- Drilling of five (5) additional groundwater recovery bores on the southern and northern side of the TSF;
- Installation of four (4) additional groundwater recovery bores (TSFRB18 and TSFRB 19) to the South as well as two (TSFRB17 and TSFRB23) to the North of the TSF**;**
- Installation of eleven (11) additional monitoring bores surrounding the TSF.

AGAA will continue to monitor groundwater across the TGM and will implement additional mitigation actions as and when required to minimise the environmental impacts of the operation. The next review of the Environmental Monitoring Strategy will re-evaluate the 10% variation against baseline groundwater quality trigger, particularly in the context of a saline to hypersaline groundwater environment.

Stormwater (previously referred to as surface water) monitoring sites have been established around the TSF and waste landforms (Figure 5) as required by Condition 8.2. Due to the absence of continuous standing surface water, samples from these locations have only been obtained following rainfall events where there is stormwater runoff (>20 mm rainfall in 24 hours). Results from stormwater sampling locations are provided in Appendix 4.

Monitoring of vegetation condition and abundance is required on an annual basis across TGM in accordance with Condition 5-2 of MS839. A Vegetation Monitoring Strategy (VMS) was developed in 2011 to achieve the requirements of Condition 5-2. The VMS was designed using an integrated remote sensing (entire site) and targeted field assessment (local scale) approach to detect and quantify decline in vegetation condition that may result from any of the identified impacting processes. In 2017 health and cover indices were recorded using a combination of remote sensing and field assessment techniques.

The VMS establishes the vegetation monitoring triggers for the Project. Triggers relate to native vegetation cover and productivity, indicator species, clearing boundaries, weeds, and rehabilitation. The 2017 program involved an assessment of the survey findings against three of the Project triggers – Trigger 1 (25% deviation in cover or productivity within monitoring (impact) sites relative to reference sites), Trigger 5 (Identification of a weed species in a site where it had not previously been recorded) and Trigger 6 (25% increase of weed species in abundance or cover relevant to reference site) as outlined in the VMS.

The 2017 monitoring program was undertaken by Eco Logical Australia Pty Ltd in October 2017 (Appendix 9). The monitoring program involved assessment of high resolution digital multi-spectral imagery and field survey verification at 112 quadrats (20m by 20m in size). The locations of the vegetation monitoring sites are shown in Figure 6.

The remote sensing analysis did not detect any changes in vegetation that were directly or indirectly attributable as an impact from the Project. Furthermore, no significant change was detected within any of the field monitoring sites. The results of the remote sensing analysis were consistent with field survey results and confirm the process as a sensitive and robust tool for quantitatively measuring change.

Overall no impact sites in any of the three core areas required further investigation under Triggers 1, 2, 5 or 6.

Operational Area:

One impact site, A7a-2, had a decrease in % deviation of overall foliar cover (%) which exceeded 25% between baseline - 2017. There was no change at this site from 2016 - 2017. As noted in previous years, this result is likely due to termite activity and natural senescence of Triodia and is not due to the Project activities. The paired reference has also experienced a similar decrease in overall Tropicana Gold Mine 2017 Vegetation Monitoring Program foliar cover between baseline - 2017. As for previous years, this site has been noted to have some drought affected vegetation.

No weed species were recorded in any quadrats in the Operations Area, and therefore Trigger 5 (Identification of a weed species in a site where it had not previously been recorded) and Trigger 6 (25% increase of weed species in abundance or cover relevant to reference site) do not require further investigation.

Infrastructure Corridor

Within the Infrastructure Corridor, four impact sites (E4-9, S8-2, S8-3 and S8-7) exceeded the 25% threshold for Trigger 1 (Figure 3-19 and Figure 3-23). Site, E4-9, had a decrease in % deviation of overall foliar cover (%) which exceeded 25% between 2016 – 2017 and baseline - 2017. The reduction in overall foliar cover (%) was due to a lightning initiated fire which occurred following 2016 monitoring and prior to 2017 monitoring. The paired reference site for impact site E4-9 (E4-10) was also burnt during the same fire event and experienced the same decrease in % deviation of overall foliar cover (%). The remaining sites, S8-2, S8-3 and S8-7, had a decrease in overall foliar cover due to fire (%) which exceeded 25% deviation between baseline – 2017.

The introduced species (weed) Salvia verbenaca (Wild Sage) was again recorded at sites A3-3 and A3-4, along the Infrastructure Corridor, though no change in abundance for this species was detected. The above-mentioned sites are located within the Pinjin Pastoral Station and the presence of Wild Sage is associated with pastoral activities. As this species has been recorded previously and there was no change in its abundance, Triggers 5 and 6 were not exceeded and do not require further investigation.

Process Water Supply Borefield:

At each of the sites within the Borefield, foliar cover (%) across all strata either increased or remained consistent with 2016 data. No decreases in foliar cover (%) were evident in the overstorey or midstorey. Three sites (E2-3, M1-1 and M1-4) recorded increases of 10% in both the overstorey and understorey, while many other sites recorded slight increases of up to 5%. Within the understorey, one site (M1-2) recorded a reduction in cover of 15%. This reduction was due to growth of some shrub species post-fire; in 2016 these shrubs were recorded in the understorey layer, though have grown tall enough to now be included in the midstorey. Resultantly, there was an increase in midstorey foliar cover (%) for site M1-2. Many other sites (E2-1, X1-6, X1-7, X1-12 and X1-13) which had been previously burnt also recorded some cover in the overstorey for the first time since the fire occurred.

Fauna monitoring conducted during the reporting period has included:

- Daily wildlife inspections at the Tailings Storage Facility (TSF).
- Fauna observations at the TSF by Donato Environmental Services to support the TGM Cyanide Code certification.
- Photographic monitoring of artificial water sources (Plate 1 to Plate 3).

Several artificial water sources have been established around the TSF to provide an alternate water source for wildlife which are monitored via motion sensing cameras and periodically reviewed. Photographic monitoring has captured a number of fauna species utilising the artificial ponds including a variety of birds, marsupials, mammals and reptiles.

5 Endorsement

This Report has been endorsed by:

Mr Richard McLeod
General Manager
Tropicana Gold Mine
AngloGold Ashanti Australia

I have reviewed this document and accept that the information provided is an accurate account of the activities undertaken during the current reporting period (24 September 2017 to 23 September 2018).

Date: 20 December 2018

Richard McLeod
General Manager
Tropicana Gold Mine
AngloGold Ashanti Australia

FIGURES

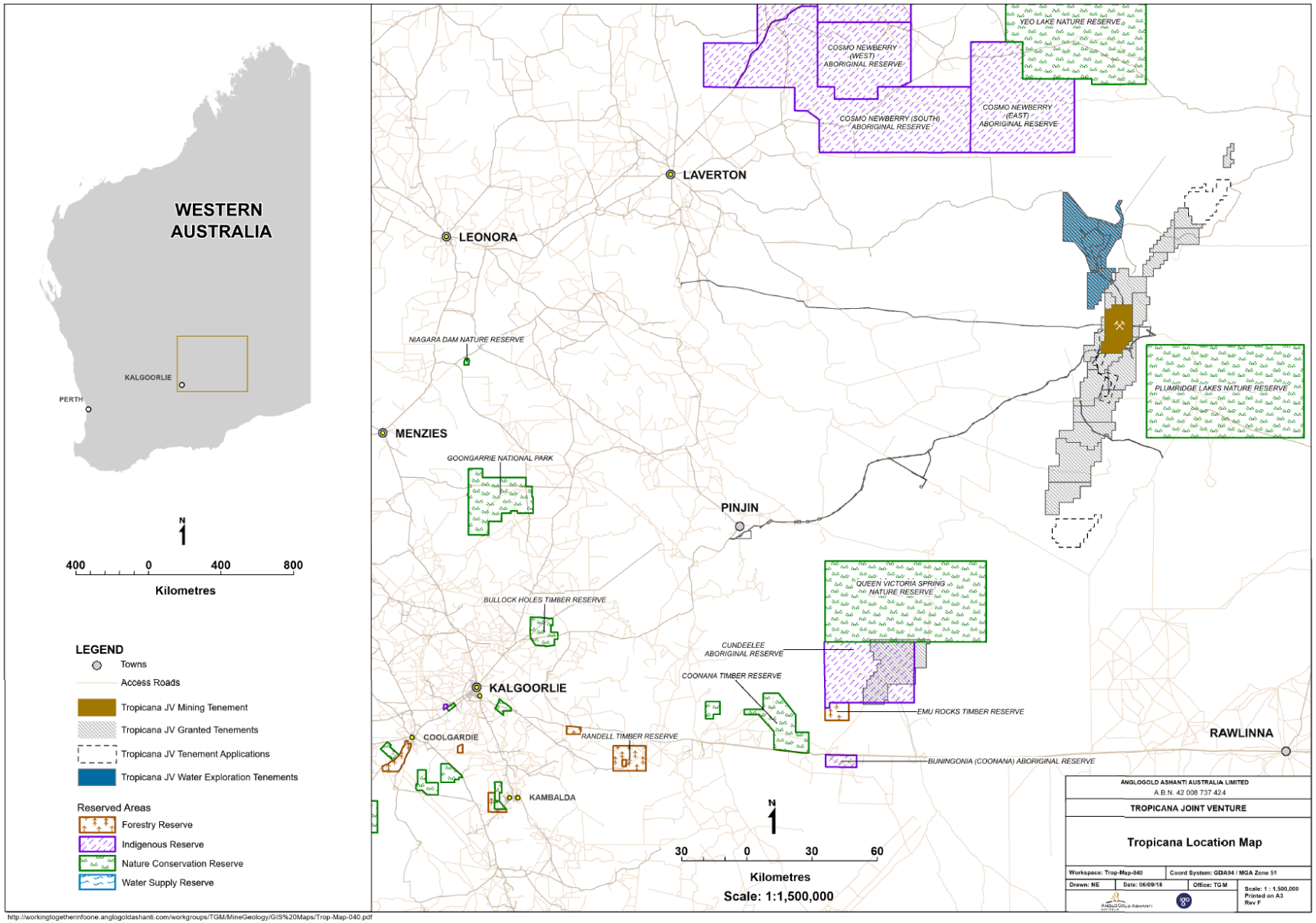

Figure 1: General Location of the Tropicana Gold Mine

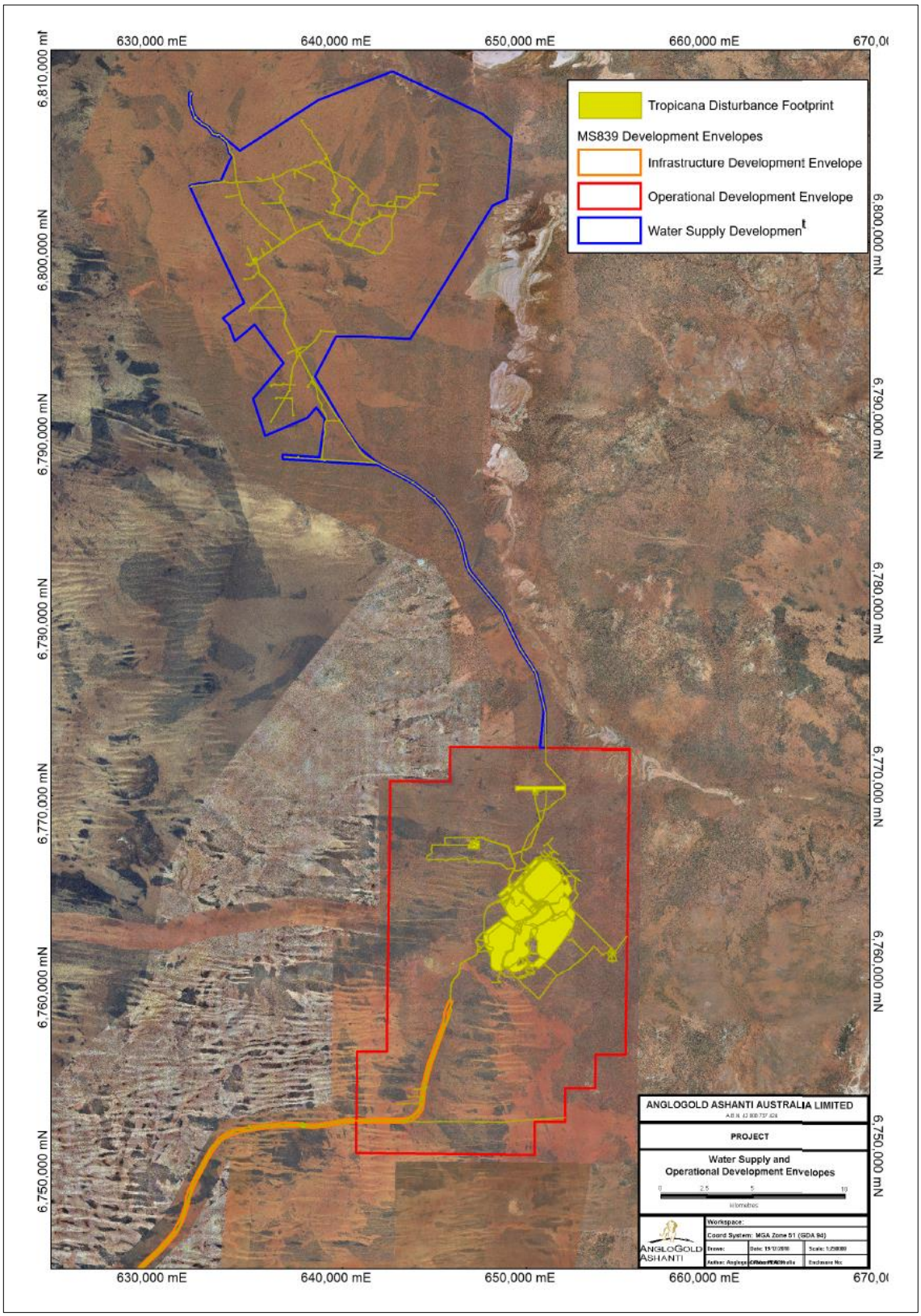

Figure 2: Water Supply and Operational Development Envelopes

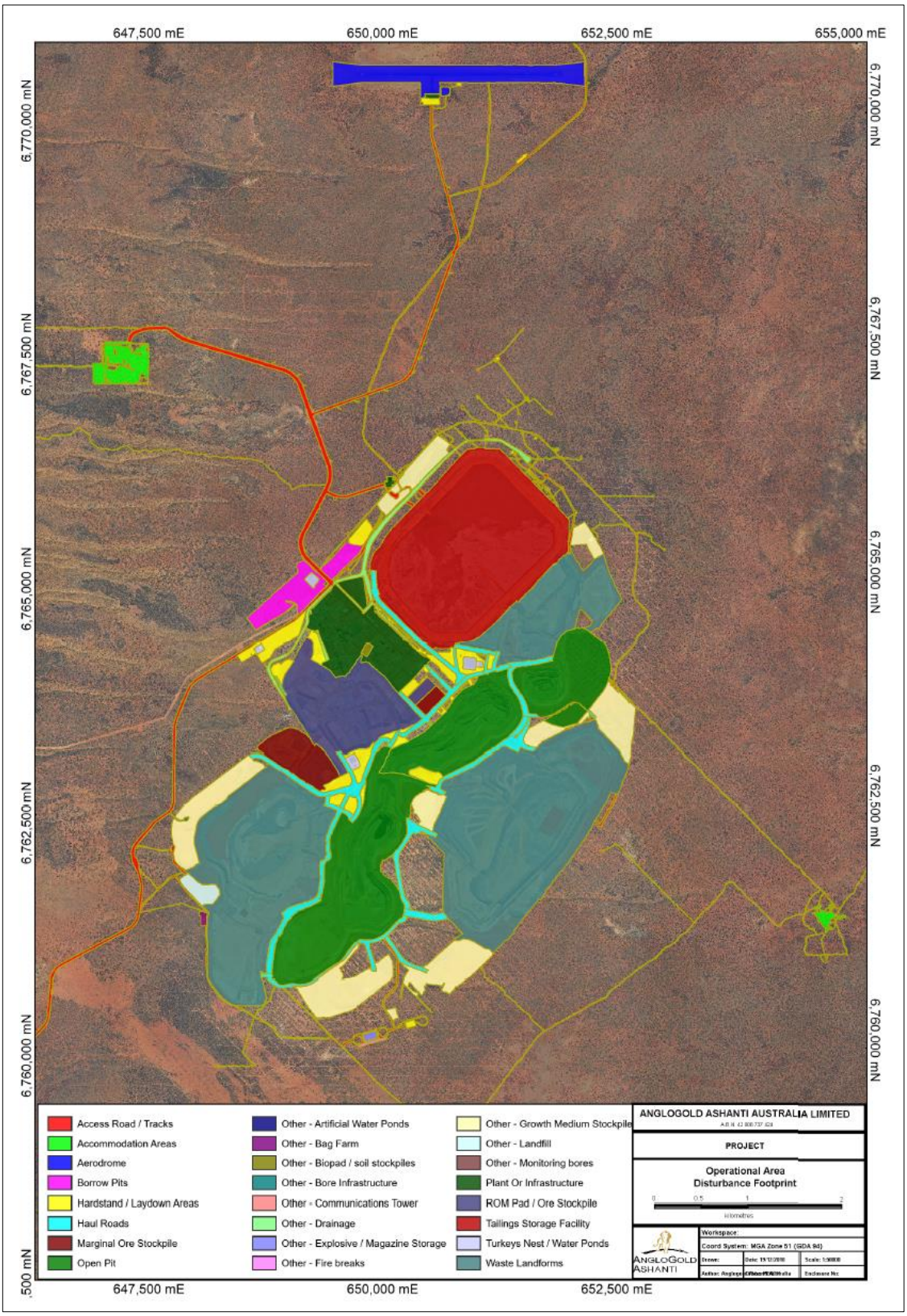

Figure 3: Operational Area Disturbance Footprint

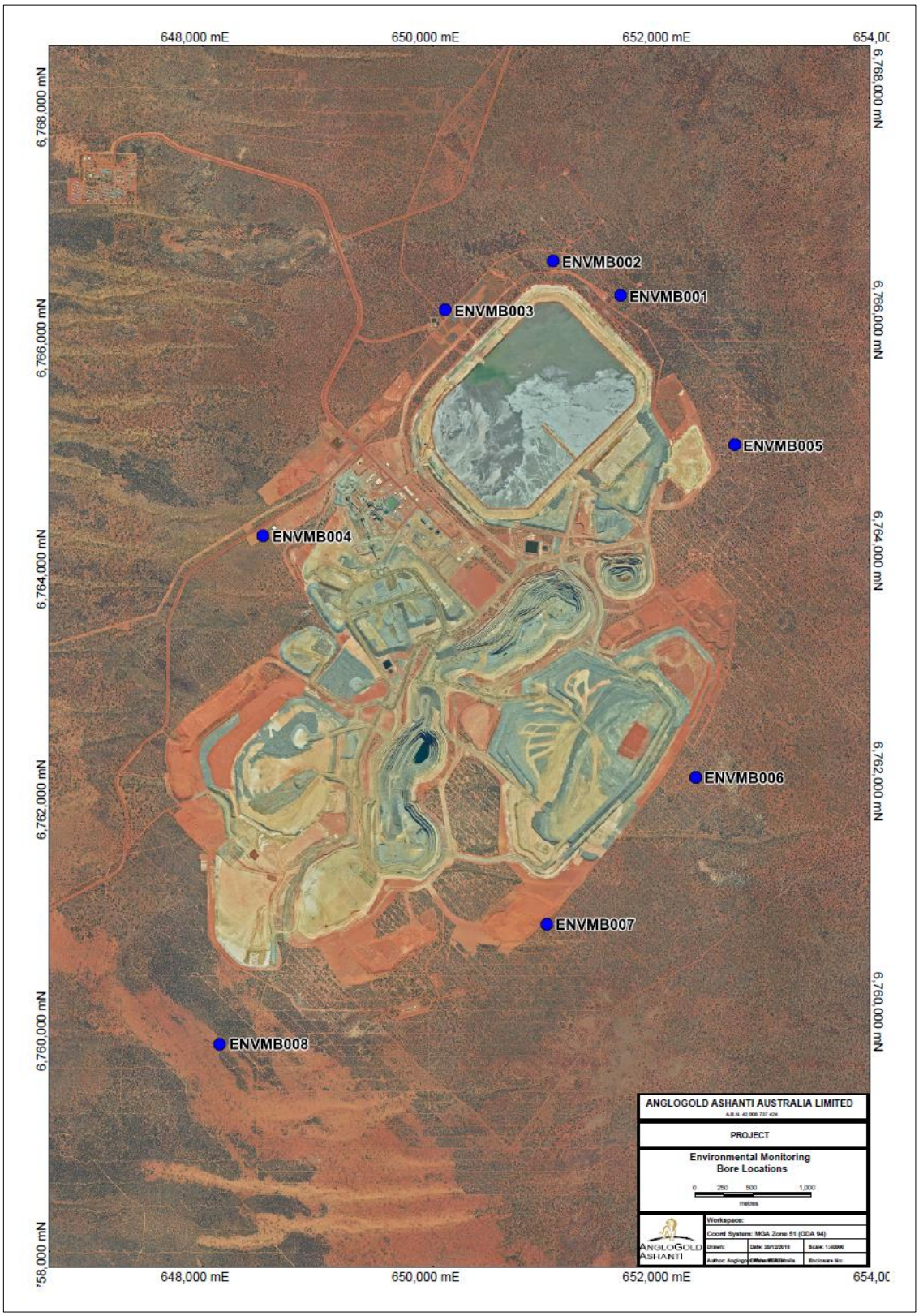

Figure 4: Ministerial Groundwater Monitoring Bore Locations

Figure 5: Surface Water Monitoring Locations

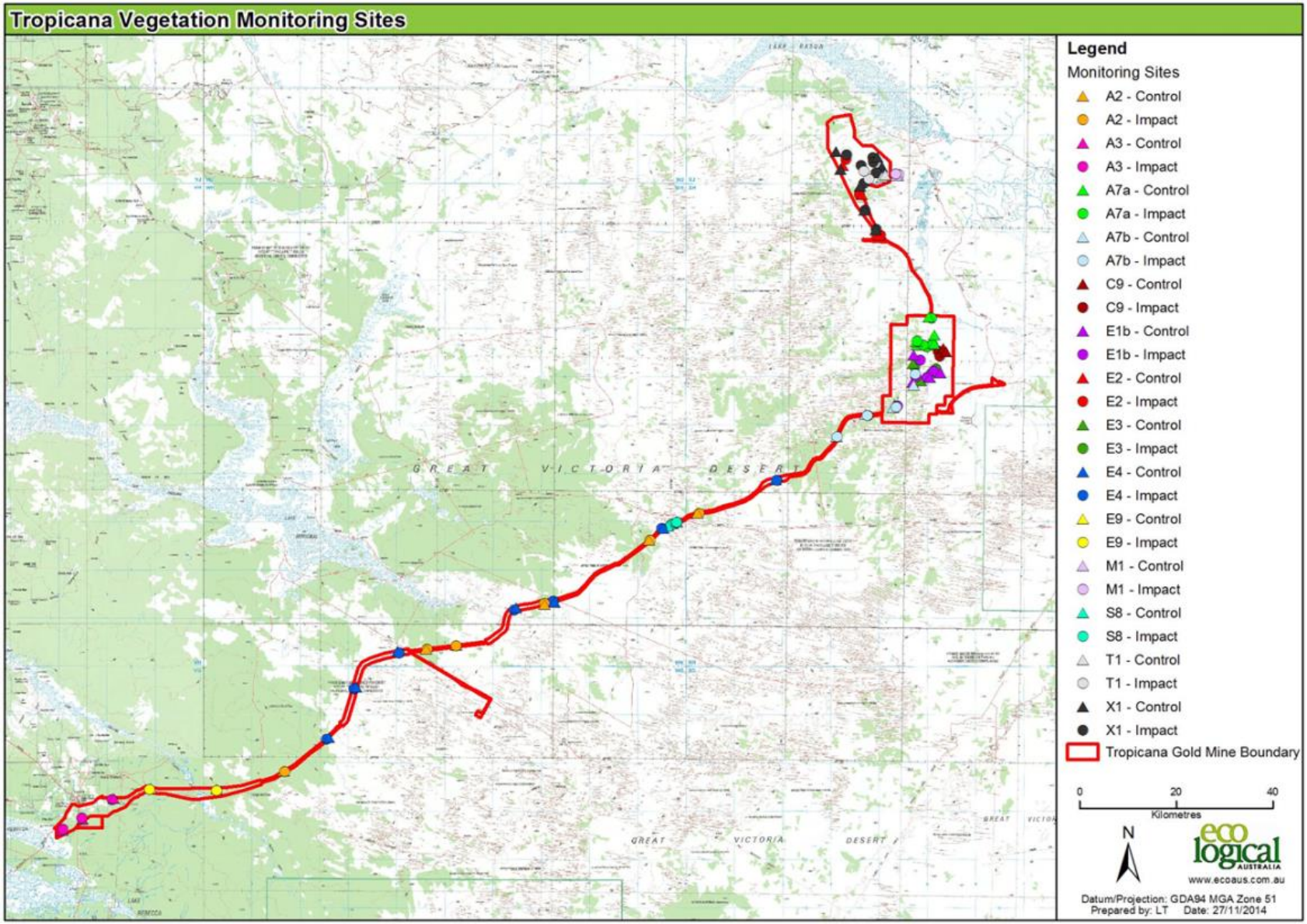

Figure 6: Vegetation condition monitoring quadrat locations (2015)

SITE PHOTOGRAPHS

Plate 1: Photo monitoring of TSF artificial water sources [TSF ART 7] – Emu and Chicks (July 2018)

Plate 2: Photo monitoring of TSF artificial water sources [TSF ART 7] – Wedge Tailed Eagles (May 2018)

Plate 3: Photo monitoring of TSF artificial water sources [TSF ART 5] – Galah (August 2018)

APPENDICES

Appendix 1 – Tropicana Gold Project Ministerial Statement No. 839 Audit Table

Appendix 2: Rehabilitation Summary

Appendix 3: Groundwater Monitoring

Appendix 4: Stormwater Monitoring

Appendix 5: Water Quality Monitoring Methodology - Internal Audit

Appendix 6: Threatened Species and Communities Management Strategies – Internal Audit

Appendix 7: Ground Disturbance Permits (GDPs)

Appendix 8: Vegetation Monitoring Report