TOMINGLEY
GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)
ABN 53 149 040 371

Tomingley Gold Operations
Annual Review
1 January – 31 December 2017

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Definitions

Term	Definition
$CaCO_3$	Calcium carbonate
Council	Narromine Shire Council
CCC	Community Consultative Committee
DSC	Dam Safety Committee
EEC	Endangered ecological community
EC	Electrical Conductivity
EPA	Environment Protection Authority
EP&A	*Environment Planning and Assessment Act 1979*
EPL	Environment Protection Licence
DP&E	Department of Planning & Environment
DRE	Division of Resources and Energy (Department of Trade and Investment, Regional Infrastructure and Services)
ha	Hectares
HVAS	High volume air sampler
LDP	Licensed discharge point
LFA	Landscape function analysis
Mining Act	*Mining Act 1992*
MOP	Mining operations plan
ML	Mining Lease
NGERS	National Greenhouse and Energy Reporting Scheme
NMP	Noise Management Plan
NOW	NSW Office of Water
NSS	Noise and Sound Services
OEH	Office of Environment and Heritage
PM10	Particulate matter
RMS	Roads and Maritime Services
SEEC	Strategic Environmental and Engineering Consulting
TARP	Trigger action response plan
TEOM	Tapered Element Oscillating Microbalance
TGO	Tomingley Gold Operations
TGP	Tomingley Gold Project
TSP	Total suspended particulates
WAD	Weak acid dissociable cyanide
WAL	Water access licence
WHS	Workplace Health & Safety
TIM	Total Insoluble Matter
WRE	Waste rock emplacement
LOR	Limit of Reporting

Title Block

Table 1: Annual Review title block

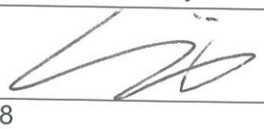
Name of operation	Tomingley Gold Operations
Name of operator	Tomingley Gold Operations Pty Ltd
Development consent / project approval #	PA 09_0155 (MOD 3)
Name of holder of development consent / project approval	Alkane Resources Ltd
Mining lease #	ML 1684
Name of holder of mining lease	Tomingley Gold Operations Pty Ltd
Water licence #	WAL20270; WAL28643; WAL29266
Name of holder of water licence	Alkane Resources Ltd
MOP/RMP start date	14 April 2014
MOP/RMP end date	31 March 2021
Annual Review start date	01 January 2016
Annual Review end date	31 December 2016

I, Mark Williams, certify that this audit report is a true and accurate record of the compliance status of Tomingley Gold Operations for the period 01 January to 31 December 2016 and that I am authorised to make this statement on behalf of Alkane Resources Pty Ltd.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Name of authorised reporting officer	Mark Williams
Title of authorised reporting officer	Environment and Community Manager
Signature of authorised reporting officer	
Date	7 March 2018

1 Statement of Compliance

Table 2 provides a statement of compliance status for Tomingley Gold Operations Pty Ltd (TGO) with its project approval (PA) and mining lease (ML), as at the end of the reporting period.

Table 2: Statement of Compliance

Were all conditions of the following approvals complied with?	
PA 09_0155	NO
ML 1684	NO

Table 3 provides a summary of approval conditions not complied with as at the end of the reporting period.

Table 3: Non-compliances

Relevant approval	Condition #	Condition description (summary)	Compliance status	Comment	Relevent Section
PA 09_0155	Schedule 3, Condition 3	Exceedance of noise criteria	Non-compliant	Investigated and addressed	6.1
PA 09_0155	Schedule 3, Condition 17	Exceedance of 24 hour average PM_{10} and deposited dust criteria	Non-compliant	Reported Investigated and addressed	6.3

Compliance status key for Table 3		
Risk level	**Colour Code**	**Description**
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

2 Introduction

2.1 Tomingley Gold Mine

This Annual Review reports on operational and environmental management activities undertaken at Tomingley Gold Operations Pty Ltd (TGO) during the calendar year 2017, and provides details on activities proposed for 2018. The report has been produced in accordance with the *Post-approval requirements for State significant mining developments. Annual Review Guideline* (DP&E, October 2015) to meet the annual reporting requirements conditioned in the TGO Mining Lease (ML 1684) and Project Approval (PA09_0155).

TGO is a wholly owned subsidiary of Alkane Resources Ltd. TGO is a medium-sized gold project with approximately 612,000 ounces of gold in the current defined resource space. TGO aims to produce 50,000-70,000 ounces of gold per year, over the next 12 months, based on an annual ore throughput of approximately one million tonnes.

The Tomingley area has a long history of gold mining and exploration, with gold first discovered and mined from the Tomingley Goldfield in the 1880s. Numerous underground mining operations were subsequently located in the McPhail area, immediately south of the TGO minesite. The last economic 'mining' activities were completed in the late 1990s and involved the re-treatment of tailings from the McPhail Mine.

The current mining operations are focused on the area immediately north of the historic Myalls United Mine. Mining commenced in three open cut mines (Wyoming One, Wyoming Three and Caloma) in November 2013, with mining commencing in Caloma 2 in November 2016. The process plant, with associated residue facilities were commissioned between December 2013 and February 2014.

2.2 Mine Contacts

The primary contacts for the TGO during the review period are detailed in Table 4.

Table 4: Tomingley Gold Operations Key Contacts

Key Contact	Position	Contact Details
Simon Parsons	Mining Manager	PO Box 59 Peak Hill, NSW, 2869 Phone: (02) 6867 9780
Mark Williams	Environment and Community Manager	PO Box 59 Peak Hill, NSW, 2869 Phone: (02) 6867 9780
Community Information Line		(02) 6865 6116

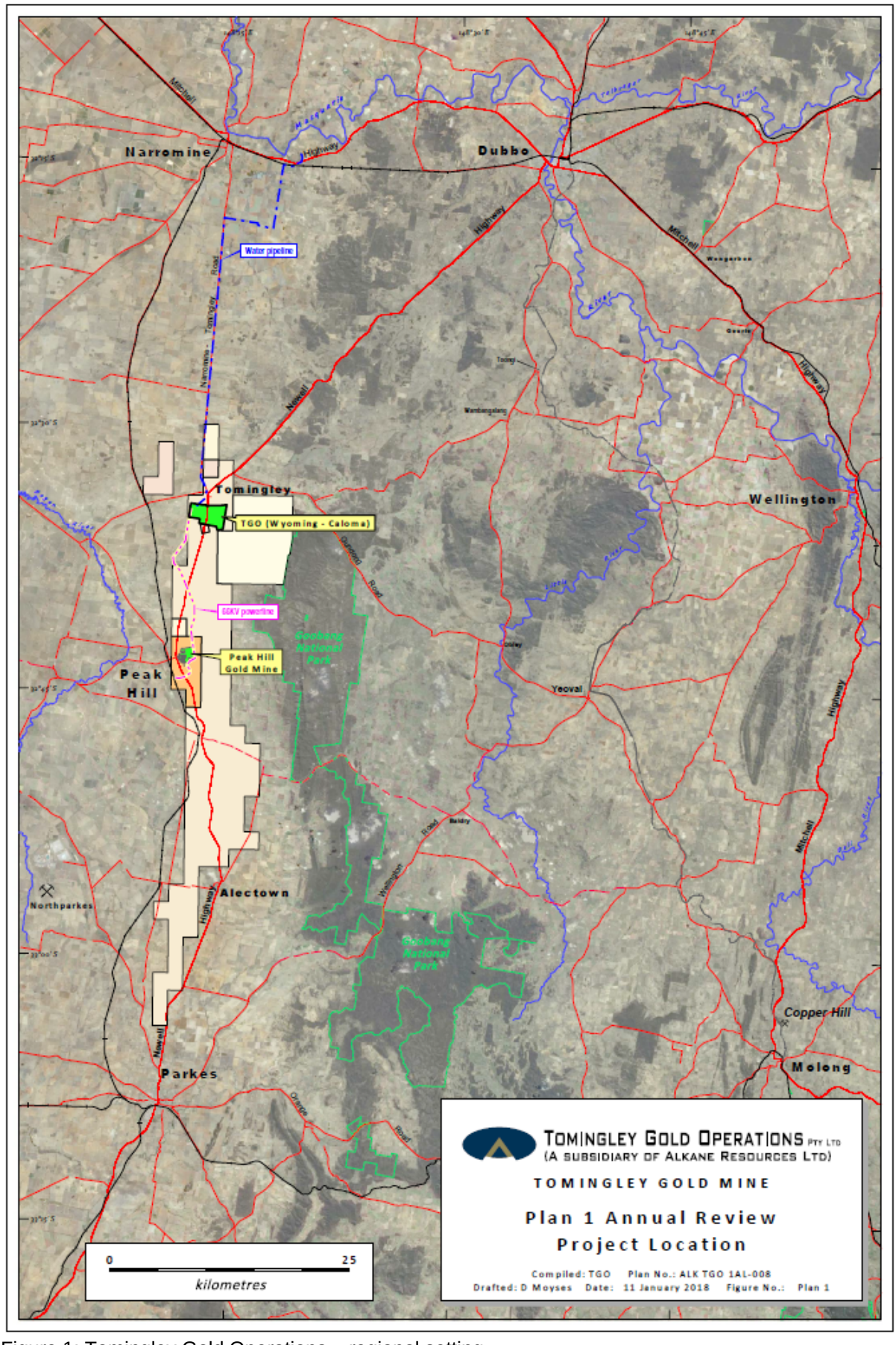


Figure 1: Tomingley Gold Operations – regional setting.

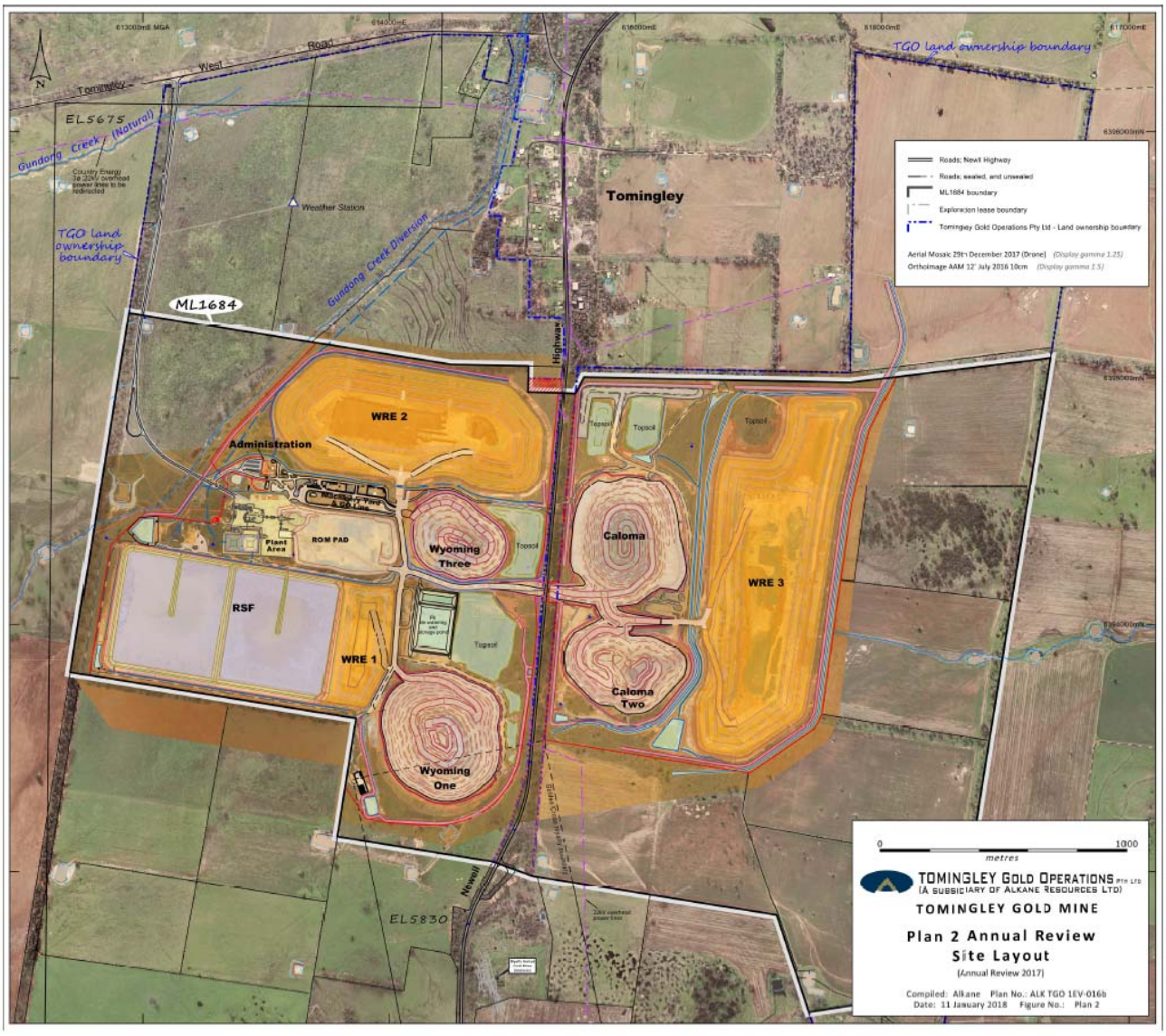


Figure 2: Tomingley Gold Operations – site layout

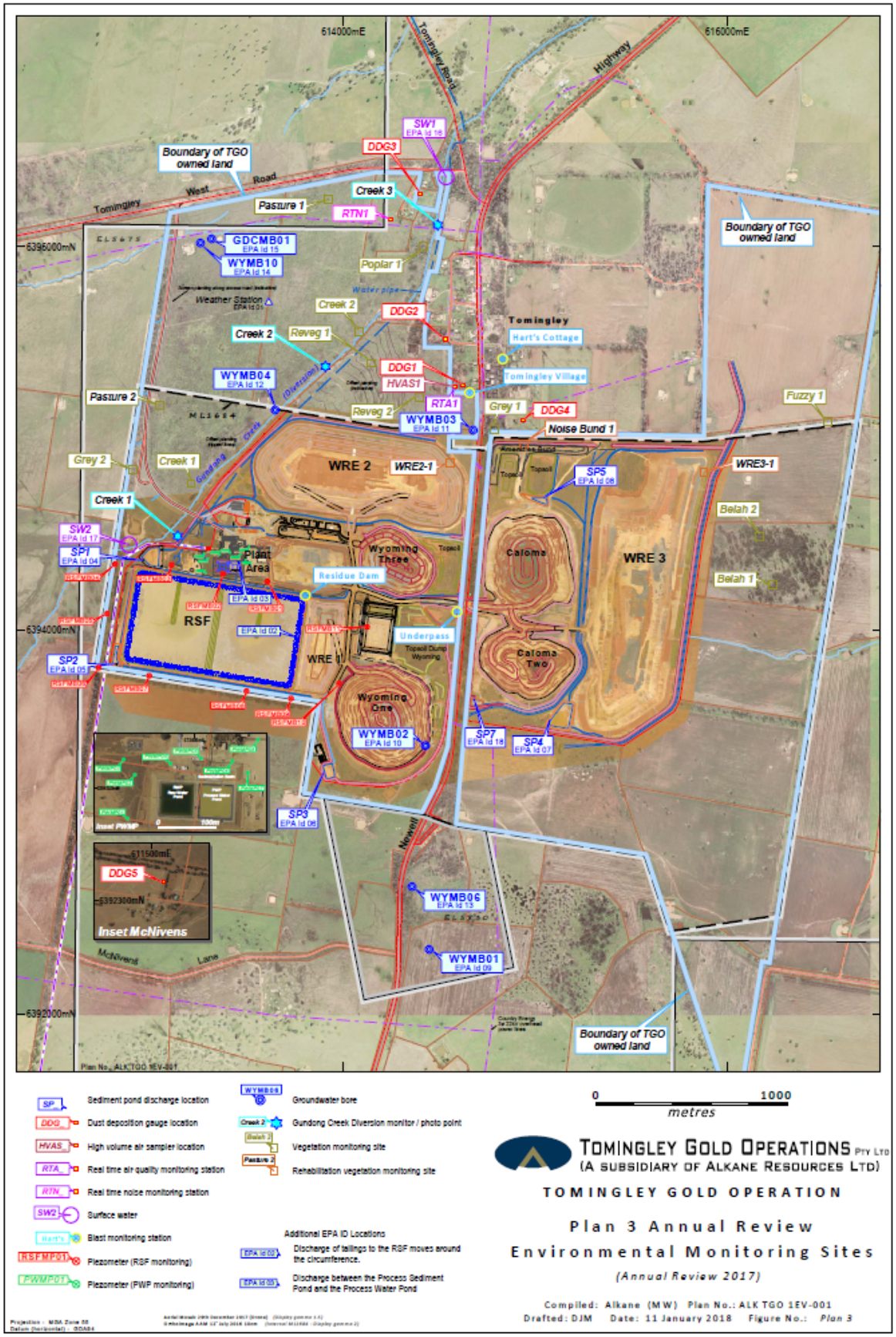


Figure 3: Tomingley Gold Operations – environmental monitoring locations.

3 Approvals

TGO operates under the environmental consents, leases and licenses specified in Table 5.

Table 5: Consents, leases and licenses

Title	Legislation	Regulatory Authority	Approval Duration/ Expiry
Project approval 09_0155 (MOD 1 – 24 July 2012) (MOD 2 – 13 May 2015) (MOD 3 – 5 July 2016)	Environmental Planning & Assessment (EP&A) Act 1979	NSW Department of Planning and Environment (DPE)	31 December 2022
Mining Lease 1684	Mining Act 1992	NSW Department of Planning and Environment – Resources and Energy	11 February 2034
Environment Protection License (EPL) 20169	Protection of the Environment Operations (POEO) Act 1997	NSW Environment Protection Authority (EPA)	Ongoing until surrendered (Next review 23 October 2018)
Flood Works Approval 80FW723901 (Gundong CK levy)	Water Management Act 2000	NSW Office of Water (NOW)	02 January 2028
Groundwater licences WAL20270, WAL28643 and WAL29266	Water Management Act 2000	NSW Office of Water (NOW)	N/A
Notification of Dangerous Goods NDG200150	Work Health & Safety Act (WHS) 2011	WorkCover NSW	NA

4 Operations Summary

4.1 Mining

Open cut mining operations continued in Caloma 1, Caloma 2 and Wyoming 1 pits throughout the reporting period. Mining ceased in Wyoming 3 in late 2015 and, following approval of MOD3 to PA 09_0155, mining commenced in Caloma 2 in November 2016. Waste rock was hauled to Waste Rock Emplacement (WRE) 1, 2 and 3. Ore was hauled to the Run-of-mine (ROM) stockpile pad for processing at the site processing plant. Process residue was emplaced in the onsite residue storage facility (RSF).

Allowing for replacement plant and temporary introduction of additional plant for short projects, the TGO open cut mobile plant fleet remained generally consistent with the indicative mining fleet presented in the MOD 3 Environmental Assessment (R.W. Corkery, November 2015) during the reporting period.

Table 6: Production Summary

Material	Approved limit (specify source)	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Waste rock (m^3)	-	6,405,394	6,660,971	971,646
Ore (kt)	1,500 (PA 09_0155)	1,114	1,307	1,087
Process Residue (tailings) (t)	-	1,077,262	1,122,456	1,082,975
Saleable Product (Oz)	-	54,868	87,409	81,283
Note: No course process waste produced at TGO				

4.2 Other Operations

In accordance with Schedule 3, Condition 4 of PA 05_0155, vegetation clearing and topsoil stripping was confined to the hours of 6am-6pm and rehabilitation was undertaken between 7am and 10pm.
.

TGO employed 157 people onsite as at 31 December 2017, meeting Condition 9 of ML 1648, which requires that:

"The lease holder must: (a) ensure that at least 30 competent people are efficiently employed in relation to the mining process or mining operations on the lease area OR (b) expend on operations carried out in the course of prospecting or mining the lease area, an amount of not less than $525,000.00 per annum whilst the lease is in force."

4.3 Next reporting period

During the next reporting period, open cut mining will cease in the 3rd quarter 2018 and processing operations will enter into care and maintenance late 2018 , early 2019 depending on the economics at the time for processing low grade ore. The Alkane Board will give consideration to the development of the underground resource and rehabilitation will continue as described in the MOD 3 EA and 2014 MOP (amended in July 2016).

5 Actions required from previous Annual Review

No formal review meeting of the 2016 TGO Annual Review was held during the reporting period. A summary of actions resulting from verbal comments or email responses from government agencies are presented in Table 7.

Table 7: Actions from review of 2016 Annual Review

Actions Required from review of previous Annual Review	Requested by	Action taken by Operator	Section where discussed
Requested that future annual review include a review of the environmental performance of the project against the relevant predictions of the Environmental Assessment Where there is a difference between predicted and actual impacts (as shown by monitoring), this should be accompanied by an analysis of any significant discrepancies. If there are no such discrepancies a statement to that effect should be included in the relevant section of the Annual Review.	DPE	Consideration given in each relevant section	6.1 6.2 6.3 6.4 6.5 7.4 7.6
1. In accordance with Condition 3(a) of ML 1684 (1992), prepare a revised Mining Operation Plan (the Plan) that reflects altered rehabilitation schedules documented in the Annual Review submitted on 3/03/2017. **2.** In accordance with Condition 3(b) (v) of ML 1684 (1992), the Plan must be prepared in accordance with the *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* as published on the Department's website. **3**. In accordance with Condition 3(b)(iii) of ML 1684 (1992), the Plan must include final rehabilitation objectives and post mining land use outcomes, paying particular attention to: **a**.Post Mining Land Use Goals; **b**.Rehabilitation Objectives; **c**.Risk Assessment; **d**.Rehabilitation Planning; **e**.Revised schedule of works with achievable timeframes; **f**. Performance Indicators and Completion Criteria; and rehabilitation Monitoring and Research. **4**. In accordance with Condition 3(b) (v) of ML 1684 (1992), all operations described in the Plan must be consistent with relevant Project Approval or Development Consent. **5**. The Plan must be accompanied by a Rehabilitation Cost Estimate that accounts for all rehabilitation liabilities, and the fulfilment of mine closure obligations under ML 1684 (1992). The measure referred to above must be carried out by 28/09/2017	DPE - RG	Revised Mining Operations Plan submitted on 12/10/17 and approved on 08/11/17	

6 Environmental performance

6.1 Noise management

Statutory attended noise monitoring (to meet the requirements of EPL 20169 Condition M4.1) was completed over a three evening and night periods (14-16 November 2017). (see appendix 1) The monitoring indicated noise generated by TGO complies with DA noise limits at all six monitored locations, as shown in
Table 8. This is maintains the improvements seen in 2016 where no exceedances were recorded, with 2015 monitoring indicating exceedances at four locations (R2, R3, R29 & 7 Burrill St), and 2014 monitoring indicating exceedance at one location (R3).

To address PA 09_0155, Condition 6 of Schedule 3 of the Project Approval, a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results has been completed. The validation compares monthly attended monitoring results against the closest assessed unattended monitoring location.

Currently, TGO has one unattended real-time monitoring terminal installed at the Brooklands property (nearest to R23). Figure 3 identifies the location of the monitor. It is noted that the Brooklands unattended monitor is situated 600m west of the attended noise monitoring location R23, therefore, background (LA90) noise levels are significantly lower due to offset distance to highway traffic.

A comparison of mine noise contributions between attended and unattended noise monitoring demonstrates a general consistency between attended and unattended results. It was noted that highway traffic noise influenced measured noise levels for this assessment. Furthermore, for November 2017, results remained below the relevant criteria for both attended and unattended locations.
(see Table 8)

As required by PA 09_0155 Appendix 7, supplementary attended monitoring is undertaken for the 11 months each year that statutory EPL attended monitoring does not occur. (see TGO web page for all reports)

http://www.alkane.com.au/operations/tomingley-gold-operations/tgo-environment/environmental-reports/ .

1 exceedance of PA noise criteria were measured during this supplementary monitoring:

- 15 February 2017 (evening) - 5dB exceedance of statutory noise limits at R3/R29 The source noise source was determined to be from the ore conveyor which experienced mechanical failure. The problem was rectified and there has been no reoccurrence of the issue.

TGO's noise consultant also reviews real time monitoring data on a weekly basis to monitor compliance. Whilst this is only an indicator due to not being able to validate data in the field, a 1dB exceedance was recorded on the 27 April 2017. The matter was investigated and after reviewing recordings, thought to be as a result of truck movements.

TGO received 3 noise related complaints for the reporting period from 2 complainants. The noise data was reviewed and the complainants were advised that the mine was operating in accordance with the prescribed limits. One complainant also lives a significant distance from the mine.

Whilst TGO does not consider the number of complaints to be a measure of compliance, this is down from 10 noise complaints received in 2016 (5 from same person), 11 noise complaints received in 2015, and 35 complaints in 2014.

Table 8: Attended Noise Monitoring Summary

Night time noise at Residence	Approval criteria[1] LAeq 15 min (dBA)	2017 Noise levels (dBA)	2016 Noise levels (dBA)	2015 Noise levels (dBA)	Key management implications	Implemented/ proposed management actions
R2	36	30-33	23-33	32-42	Compliance with PA 09_0155/ EPL 1684 noise limits	No additional new actions are proposed due to the current operations continually complying with requirements
R3/ 29	40	- [3]	37-40	39-46		
R4	36	<28	28-34	- [2]		
R5	37	28-30	23-28	35		
R6	36	<33 - 33	30-34	30		
R23	39	- [3]	34-39	42-46		

Notes:
1. Approval Criteria from PA 09_0155, Schedule 3, Condition 3, based on 2016 MOD 3 Noise Assessment Criteria
2. Location R4 not measured in 2015
3. Mine in inaudible. See full report for further details. (appendix 1)

6.1.1 Management Measures

A program to acoustically assess and treat 18 residential dwellings in, or near, Tomingley village was completed early in 2016. Treatment of the dwellings included:
improved glazing to windows and doors including removal of existing elements,

- installation of awning style aluminium windows fitted with 6.38mm laminated glass;
- full asbestos assessments for any house assumed constructed prior to 1986;
- installation of Mitsubishi industrial air-conditioning including maintenance for life of
- open pit mining;
- painting, plastering, patching, recladding and removal of old air conditioner (where
- required); and
- contribution to electricity for life of open pit mining. These electricity payments were made in July 2017.

Evening and night time mining and waste rock emplacement practices were modified during the reporting period to reduce offsite noise impact, including:

- preferential operation of noise-generating plant in the deepest open cuts or as close behind acoustic bunds; and
- short-tipping of waste rock, with dozer pushing of short-tipped waste rock during day time.

6.1.2 Proposed Improvements

TGO has demonstrated ongoing compliance with the presrcibed noise limits. With the downsizing of the dig fleet and with no further tipping to be carried out on the waste rock emplacements on night shift, TGO will continue to minitor noise levels however it is not envisaged that any addional improvements will be required to maintain compliance.

6.1.3 Environmental Assessment Predictions

TGO's noise levels were consistant with and/or below those predicted in the EA for PA MOD 3 (2016).

6.2 Blasting

Blasting at TGO is managed in accordance with the Blast Management Plan (BMP), which was prepared to meet Schedule 3, Condition 14 of PA 09_0155 and relevant conditions of EPL 20169.

During the reporting period 118 blasts were shot at TGO. All blasts were below the prescribed levels for over pressure and vibration.

Table 9: Blasting Management

Aspect	Approval criteria* (dB (Lin Peak))	Approval criteria*(mm/s)	Airblast overpessure and vibration exceedances during reporting period	Key management implications	Implemented/ proposed management actions
Airblast Over-pressure	120	10	0	No change in blast management required.	No change proposed to current practices.

*Approval Criteria from PA 09_0155, Schedule 3, Condition 7

No blasting complaints were received during the reporting period, which is consistant with the the 2016 period. There were three complaints in 2015 and two complaints in 2014.

With regards to blast timing, TGO complied with:

- Schedule 3, Condition 8 of the DA, which restricts TGO to blasting between 9am and 5pm, Monday to Saturday (excluding public holidays); and
- Schedule 3, Condition 9 of the DA, which restricts TGO to three blasts per day.

6.2.1 Management Measures

Blasts are designed and scheduled to ensure airblast overpressure and ground vibration levels remain within DA blast criteria. Weather conditions are also monitored to avoid blasting in conditions that will enhance offsite impacts, such as south westerly winds and low cloud cover. These management measures have been successful in prevent any exceedances during 2017.

6.2.2 Proposed Improvements

Recommended modifications to TGO blast design and preparation procedures, resulting from the presplit blast over pressure investigation in 2016, were continued during the reporting period

No exceedance of blast limits was recorded following implementation of these procedural modifications and accordingly TGO is not considering any further improvements.

6.2.3 Environmental Assessment Predictions

TGO's over pressure and vibration levels are consistent with and/or below those predicted in the EA for PA MOD 3 (2016).

6.3 Air Quality

The TGO Air Quality and Greenhouse gas Management Plan (AQGGMP) was prepared to describe dust control measures at TGO and meet Schedule 3, Condition 19 of PA 09_0155.

All five depositional dust gauges were below the long term assessment limit of 4g/m^2/month (annual average). DDG 4 again showed a slight increase from 2016 (1.6g/$m^{2/}$month) reporting periods with an annual average of 2.0 g/m^2/month 2017, but still considerably lower when compared with 8.2 g/m^2/month in 2015 and 8.5 g/m^2/month in 2014.

During the reporting period, 3 results exceeded the 24 hour average limit for PM_{10}, as measured at the RTA1 TEOM. These PM_{10} results are shown in Table 10. The 3 exceedences were investigated and 1 reported to NSW government regulators. This is an improvement from the three exceedances

recorded in 2016, ten exceedances recorded in 2015, and 20 excceedances recorded in the eight months of 2014 that the TEOM was operational.

The 12th and 21st February 2017 exceedances were both considered to be as a result of contributions from external influences rather than soley from mining operations. The February exceedances were as a result of extremely hot and dry conditions. It was widely reported that New South Wales experienced the hottest weather on record on the 12th February and it is noted that many of the EPA's PM10 monitoring stations recorded elevated levels of PM10 across regional areas and the Hunter valley during February. On the 21st of February assessment of the data and observations from day show wind was predominatly from off site and high levels of smoke was also noted. The September exceedance was due to other sources as the RTA1 TEOM is located north of TGO and wind direction on that day was from the north east to north-west and was not reported. (see table 10)

Total Suspended Patrticulates (TSP), as measured via high volume air sampler (HVAS) at monitoring location HVAS1, are compared with the long term assessment limit of 90 µg/m^3 (annual average). The annual average for TSP was 47.0 µg/m^3, which is below the long term assessment limit and a slight increase from 38.32 µg/m^3 in the previous reporting period however significantly reduced from 59.4 µg/m^3 recorded in 2014.

Air quality monitoring results for the reporting year presented in Appendix 2.

Table 10: Air Quality Management

Date	Approval criteria* PM_{10} (ug/m^3)	Performance during reporting period	Key management implications	Implemented management actions
PM_{10} as measured at RTA1				
12/02/2017	50 µg/m^3	73.5 µg/m³	Extreme weather conditions.	Section 6.3.1 and regulator notification
21/02/2017		53.256	Smoke and wind from E-NE	N/A
03/09/2017		57.18	Non-mining sources - wind from the north of site.	N/A

*Approval Criteria from PA 09_0155, Schedule 3, Condition 17, based on 2012 Project EIS Assessment Criteria

During the reporting period, TGO received one dust complaint which was Peak Hill. Given the results recorded on site and the distance from the mine from where the compalinat resides it is not considered physically possible that the mine is responsible for dust in Peak Hill, which is consistant with 1 complaint in 2016 from two complaints in 2015. There were 11 complaints in 2014.

6.3.1 Management Measures

As is desribed in the Dust Site Specific Procedure -, Shift supervisors, and the mining production team are provided with forecasts of high dust risk weather (such as hot, dry south westerly winds) in pre-shift meetings, sourced from the TGO Weatherzone portal. During these conditions, PM_{10} levels measured at RTA1 are monitored online and, where required, modifications are made to mining operations until conditions improve. Such modifications include the:

- reduction, cessation or relocation of dust generating activities;
- increased watering of the operational footprint.

The TGO Air Quality and Greenhouse Gas Management Plan and Dust SSP (incorporating the site dust Trigger Action Response Plan) were revised by an independent air quality consultant (Pacific Environment) during the previous reporting period to ensure consistency with industry leading practice.

TGO considers that the continual decline in the number of dust exceedances is as a direct result of these proactive management tools.

6.3.2 Proposed Improvements

TGO will continue with its current dust management systems so as to maintain its ongoing level of compliance.

It is not proposed that there will be any changes to the Dust SSP unless there is a new issue idenfitied.

6.3.3 Environmental Assessment Predictions

TGO's performance in relation to dust emissions consistent with and/or below those predicted in the EA for PA MOD 3 (2016).

6.4 Biodiversity

Biodiversity at TGO is managed under the Biodiversity Management Plan (BMP), completed in accordance with Schedule 3, Condition 37 of PA 09_0155. The BMP details the actions implemented at TGO to mitigate impacts on native fauna and vegetation from mining related activities such as storage of potentially hazardous process residue and the clearing of native vegetation.

Along with mitigation of mining impacts, the major biodiversity enhancement measure at TGO is the establishment, management and long-term protection of biodiversity offset areas in accordance with Schedule 3, Conditions 33 and 34 of PA 09_0155. To facilitate long-term security for the offset areas, a Property Vegetation Plan (PVP) was agreed to by TGO and approved by Local Land Services NSW in April 2015. The BMP incorporates measures and activities to manage and enhance TGO biodiversity offset areas, as required by the PVP.

6.4.1 Management Measures

Clearing Management

1 White Cypress Pine (Callitris glaucophylla) tree was removed during the reporting period to facilitate the the placement of the RSF downstream buttress A pre-clearing survey was completed in accordance with PA 09_0155 Schedule 3, Condition 35 and the BMP. No roosting or nesting sites were identified.

Offset Management

In accordance with the authorised activities and management actions required by the PVP, 6.4ha broadcast seeding and cover slashing was carried out within biodiversity offset area between the mine access road and Gundong creek was carried out in 2017 to extend remnant native vegetation communities.Plate 1 shows the area seeded. Plate 2 shows exclusion fencing constructed surrounding offeset areas to the east of the mining area.

Other management measures within biodiversity offset area included the:
spraying of African boxthorn (Lycium ferocissimum) throughout offset areas;

- trapping of feral predators - 6 feral cats caught and euthanased;
- Installation of fencing to separate offset areas from cropping/grazing areas to allow stock to graze areas outside offsets.
- Continued exclusion of agricultural activities (including cultivation and livstock grazing from areas not fenced); and
- Ongoing slashing of pasture areas to reduce competition for replanted native tubestock.

6.4.2 Biodiversity Monitoring

TGO biodiversity monitoring is completed annually by DNA Environmental (see apendix 3) to assess the condition and development of remnant and re-established native vegetation communities.

Monitoring methodology is based on Landscape Function Analyses (LFA) and ecosystem diversity / habitat value measurements adapted from the Biometric methodology. Ten monitoring sites were established in August 2014, consisting of six remnant woodlands sites, two EEC woodland revegetation sites and two riparian woodland sites along Gundong Creek. These sites were re-monitored in August 2016. Two pasture reference sites and one rehabilitation monitoring site were also established in 2016. 2 new pasture rehabilitation sites were established on WRE2 and WRE3 in 2017 Key observations from the biodiversity monitoring program are summarised below:

6.4.2.1 General Observations:

- The extreme seasonal conditions experienced over the past few years has had a significant impact on the composition and diversity of the vegetation communities at the TGO and these have been reflected in the ecological monitoring data.
- This year there was a reduction from a total of 191 to 152 plant species recorded in the 10, 50 x 20m monitoring quadrats with 44 (29%) of these being exotic species.
- In the woodland reference sites there was also a decline total floristic diversity as a result of the prolonged dry conditions with 45 - 66 species being recorded in the 50 x 20m monitoring plot.
- In the enhancement and revegetation sites there was also a decrease in total species diversity across all sites except Creek 2. Reveg 2 and Belah 1 contained a comparable diversity of species with 47 and 56 different plants being recorded in these sites respectively.
- This year the lowest total floristic diversity was recorded in Poplar 1 with 36 species. Belah 1 continued to be the only site to meet native diversity targets with 42 native species.
- This year only the two Belah woodland enhancement areas contained the acceptable maximum of 14 exotic species with the other sites being weedier than desired.

6.4.2.2 Remnant Woodland Areas (sites Fuzzy 1, Poplar 1, Grey 1 & Grey 2,):

- The woodland reference sites (Fuzzy 1, Grey 1 and Grey 2) were structurally and functionally different to each other but all had relatively high perennial plant components due to the mature eucalypts and established perennial grasslands. .
- They had a well developed leaf litter layer and/or patches which had hard crusted soil surfaces which have been stabilised by cryptogams
- Poplar 1 was similar in structure and composition to Fuzzy 1 and had a well developed litter and humus layer and in combination with the sandy soils which have deposited onto the floodplain during periodic flood events.
- The soils were typically sandy clay loam and these were usually highly stable beneath the organic surface covers but may have been slightly unstable when exposed.
- This site has exceeded all aspects of ecological functional capacity.

6.4.2.3 Woodland Revegetation Areas (Reveg 1 & Reveg 2)

- Reveg 1 and Reveg 2 were old cropping paddocks which were essentially recovering native grasslands that had been direct seeded with local woodland species. In the early development stages there were rows of bare soil as a result of the ground preparation techniques such as scalping, cultivation and direct seeding and in these areas resources were being mobilised and potentially being lost.
- The ground cover vegetation and cryptogams have since continued to colonise the exposed soils and have significantly increased the functional patch areas to 100% in both revegetation sites. Creek 1 was also positioned within an old cropping paddock which was similar in composition to Reveg 1 and Reveg 2, with most of the rip lines now having a good grassy ground cover.
-

6.4.2.4 Creek Revegetation Sites (Creek 1 & Creek 2)

- Sites Creek 1b and Creek 2 incorporated a flat upper floodplain which extended down the sloping creek banks.
- In these sites there were some bare and eroding areas due to a long disturbance history with compacted animal/vehicle tracks and some historic bank erosion.
- There has typically been an increasing trend in patch area in both sites due to increasing ground cover.

6.4.2.5 Belah Revegetation Sites (Belah 1 & Belah 2)

- Belah 1 and Belah 2 had also suffered a heavy and relatively recent grazing history with the ridges of the gilgais being predominantly bare and eroding and perennial plant cover was particularly low in 2014 and 2015.
- In Belah 1, the open clearings contained a patchy grassy understorey and the level of ground cover remained high this year with 100% functional patch area.
- In Belah 2 there was little to no protective cover under the mature tree canopies in previous years with no functional patch area being recorded in 2014 and 2015.
- Last year there was an increase in litter and plant cover in patches but these patches were relatively weak. This year ground cover had greatly improved with there being 91% functional patch area.

6.4.3 Fauna Monitoring

Field survey for the biannual fauna monitoring program was completed in December 2016 however the report was not available at the time of writing the 2016 annual review. Fauna survey report was futher delayed when bat monitoring data was found to be corrupted and work was repeated. The work was carried out by ecologists form OzArk OHM. (see appendix 4)

During the field survey, 41 fauna species were recorded. Of these, two were invertebrate pest species found in low densities. Current pest management methods deployed at the TGO Property should continue as is, subject to further monitoring.

Of the 41 fauna species, four vulnerable species listed under the TSC Act were recorded:

- Grey Crowned Babblers (Pomatostomus temporalis temporalis).
- Little Pied Bat (Chalinolobus picatus).
- Eastern Bentwing Bat (Miniopterus schreibersii oceanensis).
- Yellow-bellied Sheathtail Bat (Saccolaimus flaviventris).

Only one of the five bio-indicator species were observed during the 2016 monitoring survey. A bio-indicator species is a species whose presence and abundance provide guidance on the condition of the local environment. Of the bio-indicator species, the Superb Parrot (Polytelis swainsonii) could not be observed as it migrates to southern NSW during spring and summer to breed. Future biodiversity monitoring should include a survey for Superb Parrots during winter, when they are present in central NSW. The known Grey-Crowned Babbler population at TGO was observed in its designated habitat area of TGO property. Once vegetation quality improvements are made, it is expected more bio-indicator species will inhabit the BOAs.

The BMP requires inspection and monitoring of the RSF to reduce potential for interaction between native fauna and potentially cyanide-contaminated water in the RSF. Such measures were continued through the reporting period, and include:

- daily sampling and monitoring of WAD cyanide levels in RSF residue;
- management of RSF decant water to minimise appeal to native avifauna; and
- regular inspection of the RSF for fauna deaths.

2 fauna deaths were recorded during the 2017 period, compared to none in 2016, one bird death in 2015, and two bird deaths in 2014. TGO was unable to retreive the bird and wallaby from the RSF to enable an austospy to be carried out, however it should be noted that no previous deaths were caused by cyanide following veterinary examination.

6.4.4 Proposed Improvements

During the next reporting period, TGO will continue to implement the biodiversity conservation and enhancement measures outlined in the BMP.

Management actions, such as livestock exclusion in the areas to the east and feral animal/weed controls will be continued.

6.5 Heritage

A Cultural Heritage Management Plan (CHMP), which outlines measures to manage Aboriginal and Non-Aboriginal heritage sites at TGO, was prepared during the 2013 reporting year, and reviewed during the 2016 reporting year, with no changes made. The CHMP was developed from a previous assessment, which identified 60 Aboriginal sites and eight Non-Aboriginal heritage features.

With all existing or relocated sites adequately maintained, no active cultural heritage management occurred during the reporting period.

6.5.1 Management Measures

As recorded heritage sites are located away from site operational areas, and no new sites or items were identified during the reporting year, management of the existing sites mainly consisted of weed control and ensuring approriate signage remains in place.

6.5.2 Proposed Improvements

No improvements to the management of cultural heritage sites and items is proposed in the next reporting period.

Plate 1: Biodiversity offset seeding area

Plate 2: Improved fencing around eastern Biodiversity Offset Area

6.6 Contaminated Land

As TGO is a relatively new site with compliant bunding structures in place, the risk of site contamination remains relatively low. The contamination assessment completed as part of the project environmental assessment, also determined risk of land contamination onsite to be very low.

No newly identified areas of contamination were recorded. No remediation of hydocarbon contamninated soil is carried out on site. All contaminated soil is placed in drums and disposed of off site by licensed contractor.

During the reporting period 6 minor hydrocarbon spills and 1 contaminated water spills was reported at TGO, including:

- 3/1/17- leak from Banlaw fun at fuel bay
- 9/2/17 – fuel spill in workshop area
- 9/3/17 – oil leak from blown hose on drill rig in Caloma 1 pit
- 10/5/17- oil leak from blown hose on digger in Caloma 2 pit
- 29/5/17 – oil leak from in worshop area
- 11/10/17 – seepage interception pump failed on RSF embankment. Seepage contained to embankment area.
- 24/10/17 – hydraulic hose failed on excavator resulting in oil spill on WRE2

This compares to six hydorcarbon spills in 2016, four minor hydrocarbon spills reported in 2015. No major spill incidents were reported.

6.6.1 Management Measures

The safe and responsible storage and handling of hazardous materials remains the key strategy to preventing, and therefore managing, land contamination.

All chemical and hydrocarbon storage at TGO has been designed and constructed in accordance with the relevant Australian Standard, including:

- AS/NZS 4452: The Storage and Handling of Toxic Substances; and
- AS 1940-2004: The storage and handling of flammable and combustible liquids

Vehicle washdown and re-fuelling facilities were upgraded during reporting period, which will assist in the prevention of land contamination.

6.6.2 Proposed Improvements

No improvements to the management of contaminated sites is proposed in the next reporting period.

7 Water Management

Following a substantial consultation and revision period, the TGO Water Management Plan (WMP) including water balance was updated in 2017 to include changes as a result of the downstream buttress construction on the RSF and the commencemnt of backfilling of the WY3 pit.

The WMP details how TGO will manage site water to comply with the *Water Performance Measures* contained in Schedule 3, Condition 27 of PA 09_0155. Table 11 presents these measures and where each measure is addressed in this Water Management section.

Table 11: Water Performance Measures (PA 09_0155, Schedule 3, Condition 27)

Feature	Performance Measure	Relevant Section
Water management - General	Minimise the use of clean water on site Minimise the need for make-up water from external potable water supplies	7.1
Construction and operation of infrastructure	Design, install and maintain erosion and sediment controls generally in accordance with the series Managing Urban Stormwater: Soils and Construction including Volume 1, Volume 2A – Installation of Services and Volume 2C – Unsealed Roads Design, install and maintain the infrastructure within 40 m of watercourses generally in accordance with the: • *Guidelines for Controlled Activities on Waterfront Land (DPI 2007)*, or its latest version • *Guidelines for fish habitat conservation and management – Chapter 4 (DPI 2013*), or its latest version.	7.5
Clean water diversion & storage infrastructure	Design, install and maintain the clean water system to capture and convey the 100 year ARI flood Maximise as far as reasonable and feasible the diversion of clean water around disturbed areas on site	7.3
Sediment dams	Design, install and maintain the dams generally in accordance with the series *Managing Urban Stormwater: Soils and Construction – Volume 1 and Volume 2E Mines and Quarries*. Ensure the capacity of all sediment dams is sufficient to contain rainfall up to a 10 day 90 percentile rain event	7.5
Mine water management system, including residue storage facility and associated collection pond	• No unlicensed or uncontrolled discharge of mine water off-site (except in accordance with condition 23) • Ensure that the capacity of the residue storage facility and associated collection pond is designed to meet the requirements of the Environmental Guidelines – Management of Tailing Storage Facilities (Vic DPI, 2004), or its latest version, and that the floor and walls are lined to achieve a permeability standard of at least 1 x 10-9 m/s, unless otherwise agreed by the EPA and the Secretary • Maintain adequate freeboard (i.e. minimum 500 mm) in the residue storage facility at all times • All water storages on site that receive chemical or salt laden water, including the dewatering ponds, raw water dams and process water dams are lined to achieve a permeability standard of at least 1 x 10-9 m/s, unless otherwise agreed by the EPA and the Secretary • Maintain adequate freeboard (i.e. minimum 200 mm) in the process water and raw water dams at all times	7.4
Chemical and hydrocarbon storage	Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standards	6.6.1
Gundong Creek	Maintain or improve baseline channel stability	7.3

	Develop site-specific water quality trigger levels in accordance with ANZECC 2000 and Using the ANZECC Guidelines and Water Quality Objectives in NSW procedures (DECC 2006), or its latest version	

7.1 Water Supply

The principal source of water for TGO is a licensed production bore located approximately 7km east of Narromine, with water transported to the TGO site Raw Water Dam via the Narromine water pipeline. During extensive dry periods, emergency water haulage from Peak Hill Mine may also be used; however, this option was not utilised during the reporting period.

Maximum Harvestable Rights Dams Capacity (MHRDC) is the volume of water landholders are entitled to capture and use without need for licencing. Landholders are permitted to intercept and store a proportion of runoff from their property without a licence under the *Water Management Act 2000*. In addition, no licence is required for water stored within
dams that:

- Control or prevention of soil erosion.
- Capture, contain and recirculate drainage.
- Have no catchment (i.e. “turkey’s nests”).

The existing surface water storages that are part of TGO all fall into one of the above categories and therefore do not require licensing.

Processing water (including RSF decant) is recovered and pumped to the Process Water Dam for re-use in processing. During the year, it is estimated that 541 ML was recycled process/decant water, significantly reducing the volume of water needing to be imported.

An onsite water treatment plant is used to produce potable water onsite, eliminating the requirement to import potable water.

Table 12: Water Supply

Water Licence	Water sharing plan, source and management zone (as applicable)	Entitlement (ML)	Passive take / inflows	Active pumping	TOTAL
WAL20270 (Narromine Pipeline)	Lower Macquarie Zone 6 Groundwater Source	1000	nil	574.7	574.7
WAL28643 & WAL29266 (open cut)	NSW Murray Darling Basin Fractured Rock Aquifer	220	Negligible (not measurable)	nil	negligible
N/A	Direct rainfall and catchment runoff captured under harvestable rights	N/A	403*	nil	403
WAL 34968 (Peak Hill Gold Mine)	Upper Bogan River Water Source/ Macquarie Bogan Unregulated and Alluvial Water Sources 2012	300	nil	nil	nil

* Direct rainfall and catchment runoff volume based on modelled in WB

7.2 Water Balance

As part of the WMP finalisation, the site water balance was reviewed during the reporting period. The water balance indicates that TGO is dependent on raw water imported via Narromine pipeline which is expected to account for approximately 50% of TGO’s water supply. The modelling also predicts minimal risk of offsite discharge, although the risk always remains.

During the next reporting period it is not proposed that there will be any physical changes ot the site footprint that will require further review of the water balance.

7.3 Clean Water Management (Surface)

For reporting purposes, clean water management is divided into:

- Site Water;
- Gundong Creek; and
- offsite discharge.

7.3.1 Site Water

Clean water consists of through-flow from offsite and water from onsite non-mine disturbed catchments. This water is diverted away from contamination sources (mine disturbance and infrastructure) and directed offsite. Management includes the construction of drains and bunds to collect and divert surface water flow past, or away from, mining disturbed catchments. Site drains and sediment basins were remediated as discussed in Section 7.5.

7.3.2 Gundong Creek

Gundong Creek is an ephemeral watercourse which flows along the northern and western boundaries of the TGO site. TGO samples the creek weekly during each flow, which is over and above the requirements prescirbed in condition M2 of EPL 20169, which requires sampling on discharge. (sic *from Sediment Basin 1*) Gundong Creek flowed for short periods during the reporting period following storms. 9 samples were collected from monitoring sites SW01 (Gundong Creek upstream) and SW02 (Gundong Creek downstream) during flow events for laboratory analysis. 1 discharge to Gundong Creek occurred during the reporting period from sedimnt basin 1. This is further discussed in 7.3.3.

Laboratory analysis of water samples from Gundong Creek indicate levels of copper, lead, phosphorous and zinc exceeding EPL 20169 limits upstream (SW1) and downstream (SW2) of the TGO mine site, suggesting that background levels of these pollutants may be naturally higher than the concentration limits included in EPL 20169 (based on the 95% species protection trigger values for freshwater aquatic ecosystems (ANZECC, 2000)). Total Suspended Solids (TSS) results exceeded EPL 20169 concentration limits at SW2 down stream of site, which is indicative of the degraded nature of the stream as a result of historic construction and farming practices and the storm/flood flows that occur in Gundong Ck. In considering levels of magnitude, the difference between up stream and downstream of site is considered to be minmal. A summary of analytical results for Gundong Creek samples are presented in Table 13.

The 2017 results are consistent with sampling from 2014,2015 and 2016 which generally indicated levels copper, lead and zinc at both SW01 and SW02 above the adopted EPL 20169 concentration limits.

Table 13: Gundong Creek water quality samples at SW1 (upstream) and SW2 (downstream)

Parameter	Unit	EPL 20169 Limit	Gundong Ck Upstream (SW1)				Gundong Ck Downstream (SW2)			
			No. samples	Average	Max	Min	No. samples	Average	Max	Min
Arsenic	mg/L	0.024	9	0.0033	0.007	0.001	9	0.018	0.139	0.001
Cadmium	mg/L	0.0002	9	0.000067	0.0002	<0.0001	9	<0.0001	<0.0001	<0.0001
Copper	mg/L	0.0014	9	0.0056	0.016	0.002	9	0.021	0.153	<0.001
Electrical conductivity	µS/cm	350	9	318	405	154.2	9	268	352	146.2
Lead	mg/L	0.0034	9	0.021	0.097	0.002	9	0.0091	0.048	0.001
Nickel	mg/L	0.011	9	0.0057	0.016	0.002	9	0.016	0.112	0.001
Total Nitrogen	mg/L	250	9	1.3	3.9	0.5	9	1.3	2.8	0.6
Total Phosphorus	mg/L	20	9	114	350	50	9	85	250	30
pH	pH units	6.5-8.5	9	7.6	8.35	7.27	9	7.8	8.69	7.38
Total Suspended Solids	mg/L	50	9	36	139	<5	9	124	950	5
Zinc	mg/L	0.008	9	0.013	0.034	<0.005	9	0.03	0.187	<0.005

7.3.3 Discharge

During and following a heavy rainfall event of severe intensity on the 2 December 2017 (104.8mm) Sediment Basin 1 (SP1) discharged at the spillway (EPA ID 4) into the Gundong Creek.The sediment basin discharged as a result of the rainfall event exceeding the design criteria included in the TGO-WMP. The sediment basin discharged for approximately 18hrs.

The water is classified as being “dirty water” in the TGO WMP. The volume of the discharge is unknown. TGO activated its pollution Response Managent Plan and notified the EPA and downstream neighbours. A full report has been provided to the DPE, (various divsions) EPA and NSC.

The EPA has verbally advised that they will be taking no further action in relation to the discharge.

The capacity of the sediment basin has since been doubled in an effort to further minimise the liklihood of re-occurence.

7.4 Mine Water Management

Water which has been impacted by mining operations, is not considered not suitable for offsite discharge and requires onsite managmeent or treatment is known as mine water. This includes:

- ***Sediment Laden Water -*** retained in sediment basins. If required, flocculated to promote the settlement of sediment load and/or pumped to Wyoming Central Dam (WyCD) large cell.
- ***Open cut pit water*** – retained onsite in the WyCD - large cell and re-used for site operations.
- ***Process water*** – recycled for re-use via decant from the RSF, the raw water dam and process water dam.
- ***Oily water*** – treated at onsite oily water separator, with clean discharge to Sediment Basin 1.
- ***Onsite sewerage*** - treated at an onsite treatment plant and used to irrigate site revegetation areas.

Table 14: Stored Water

Description and structure name	Storage Capacity m^3	Start of Reporting Period m^3	At end of Reporting Period m^3
Raw Water Dam[1]	10,700	10,700	10,700
WyCD – small cell	14,000	13,420	9,520
WyCD – large cell	140,000	9,500	140,000
Residue Storage Facility	423,870 [2]	60,000	52,500
Process Water Dam[1]	9,200	9,200	7,500

[1] Operational water storage - volumes fluctuate frequently based on operational demand.
[2] Water storage capacity as at January 2016.

Decant water from the RSF is sampled twice daily during the reporting period for Weak Acid Dissociable (WAD) Cyanide, with no WAD Cyanide concentrations above the 90th percentile limit of 20 mg/L. This is consistant with the 2016 reporting period compared to from two WAD Cyanide samples in 2015 and one sample in 2014 above 20mg/L (but still below the maximum limit of 30mg/L).

7.5 Erosion and Sediment Control

Inspections of drains and sediment basins were conducted throughout the reporting period, with all sediment basins being inspected once per quarter. Following heavy rain and/or dewatering, sediment basins were inspected and, when water levels allowed, sampled for reference purposes.

Remediation works were commenced on the northern end of the flood levey to rectify some rilling that had been identified during routine inepctions. Works included re-profiling, topdressing with 50mm of topsoil with 10t/ha gypsum and pasture seed mix. Ongoing windy conditions have prevented the application of straw – mulch to date.

Works were carried out in December to desilt the culverts under the WRE3 haul road dirty water drain crossing. This included removal of silt from the culvert pipes and reconsturction of the drain inlet from the haul road with geotech fabric and rip-rap lining.

7.6 Groundwater

Sampling and inspection of local district groundwater bores and RSF monitoring piezometers continued during the reporting period.

Visable groundwater inflows into the open cut pits could be best desrcibed as seepage and intermitent. Ground water inflows are not measurable. This is due to the nature of the factured rock zone that the ground water is captured in. There is no water table present at TGO.

As shown in Table 15, three of the seven bores (WYMB03, WYMB04 and WYMB10) recorded relatively steady groundwater levels during the reporting period. These groundwater levels are of similar depth range to the previous year's results. WYMB01 and WYMB06 are to the south of site and are inluenced from rain fall and surface water inflows into the historic McPhails underground workings. Levels and water quality are not influenced by site activities. WYMB04, WYMB03, WYMB04 and WYMb10 are deep bores around the perimeter of the mine and show very little movement in depth consistant with them being located in a fractured rock aquifer. GDCMB01 is located in the shallow Gundong creek aquifer and any variations in levels are dependant on rainfall.

Field and laboratory water quality measurements for the reporting period were also comparable to the previous reporting period. Water quality trigger values based on the 95% species protection recommended by ANZECC and ARMCANZ (2000a) have been adopted only for bore GDCMB01 due

to its location within the alluvium. Due to the high electrical conductivity of water within the deep aquifers, and no registered production bores within 8km of TGO, trigger values for the deep water bores (WYMB01 – 04, WYMB06 and WYMB10) are based on community groundwater complaints. No groundwater complaints were received during the reporting period consistant with the previous reporting period. GDCMB01 exceeded the adopted water quality trigger values for Copper in four of the four monitoring rounds for 2017. Copper exceedances were also recorded in the 2015 and 2016 reporting period. Single round exceedances were also recorded for Chromium (September) Nickel (September) and double round exceedances for Iron (March and September).Exceedances for these metals were also recorded in the previous reporting period. Analytical results are shown in Appendix 5.

Table 15: Groundwater bore water levels during reporting period.

	Groundwater level (metres below Top of Casing)						
	WYMB 01 (EPA09)	WYMB 02 (EPA10)	WYMB 03 (EPA11)	WYMB 04 (EPA12)	WYMB 06 (EPA13)	WYMB 10 (EPA14)	GDCMB 01 (EPA15)
February	-27.25m	-60.21m	-53.85m	-62.41m	-26.26m	-72.99m	-1.36m
June	-32.2m	-60.34m	-53.44m	-63.5m	-32.03m	-72.00m	-1.43m
September	-33.52m	-60.68m	-52.97m	-62.26m	-32.27m	-71.99m	-1.53m
December	33.77m	-61.19m	-52.90m	--62.12m	-31.95m	-71.90m	-1.37m
Range (within period)	6.52	0.98	0.95	1.38	6.01	1.09	.17

RSF Piezometers

Monitoring piezometers RSFMB01, RSFMB02 and RSFMB04, and RSFMB09 were largely dry and saw little variation in water depth during the reporting period with RSFMB 01 indicating small ammounts of water during the last 2 months of the reporting period Water levels in all other piezometers recorded a total movement of <1m due to a low rainfall winter compared to previous years. Most of these piezometers recorded a subsequent fall in water levels towards the end of the reporting period, coenciding with high tempratures and low rainfall during the early summer months.

During the reporting period, two samples were collected from RSFMB06 and two samples were collected from RSFMB03. While other piezometers were pumped quarterly, none produced a quantity of water that was able to be sampled.

RSFMB monitoring analytical results for the reporting period are included in Appendix 6.

RSFMB03 and was removed in reporting year due to operational development, but will be reinstated in next reporting period. No other improvements are proposed to groundwater management at TGO in the next reporting period.

Results show that water chemistry it is consistant with it being water from existing shallow aquifers as were intercepted during the RSF construction, indicating that there is no seepage from the RSF.

7.7 Environmental Assessment Predictions

7.7.1 Surface Water

Through an ongoing process of continual improvement and review of the water catchments, the site continues to improve performance in relation to dirty water surface management. More frequent discharges were predicted in the original EA, with the suggested processes for managing discharges in the original proven to be not practical in the operational environment.

7.7.2 Ground Water

The initial ground water modelling and assessment that accompanied the EA predicted some groundwater draw down and ground water production in the pits. This has not occurred.

8 Rehabilitation

On the 28th June 2017, the Department of Industry – Division of Resouces and Geosciences issued a direction in relation to the area of rehabilition completed not meeting the targets contained within the approved Mining Operations Plan (MOP). TGO was required to submit a revised MOP containing new rehabiliation targets and this was approved on the 8th December 2017

The 2017 Annual Review reporting period was the fourth year of mining operations at TGO and largely overlapps with the 2016/17 Financial Year (FY) and 2017/18FY. To ensure the MOP tables align with the TGO FY based works schedule, the rehabilitation completion figures are now based on a FY rather than a Calendar Year. Whilst his conflicts with the timing of this report, it presnts a more accurate record of the rehabiliation completed, commenced and planned. It should also be noted that the MOP 'year' was reset. 2017/18 FY is MOP Year 1.

The amended MOP progressive rehabilitation table (MOP Table 20), 101.6ha of final rehabilitation is scheduled to have been seeded by the end of the 2017/18 FY:

101.6 ha of Primary Domain 4 – *Waste Rock Emplacements* / Secondary Domain C *Woodlands*; TGO is ontrack to complete this work by 30 June 2018.

8.1 Rehabilitation during reporting period

During the reporting period, The Figure 4 shows land management activities completed for the reporting period. These works included:

- Bulk shaping of entire the surface WRE 2 to final land form design (Plate 3)
- Continued bulk shaping of WRE3 (Plate 4)
- Construction of down slope drains and berm drains on WRE2 and WRE3 (Plate 3 and 4)
- Completion of 'doming' of the dump top on WRE2 to ensure the dump top drains to the down slope drains.
- Comencement of 'doming' on top of WRE3
- Pushing out of topsoil to a nominal depth of 200mm on WRE2 and WRE3 (Plate 3 and 4)
- Stockpiling and sorting of waste rock for downslope drains, berm drains and rip-rap for future use on site.

Progress against key rehabilitation performance indicators is shown in Table 16. Mine disturbance and rehabilitation activities activities are shown on Figure 4.

Plate 3: Reshaping and rehabilitation works at WRE 2.

Plate 4: Reshaping and revegetation at WRE 3.

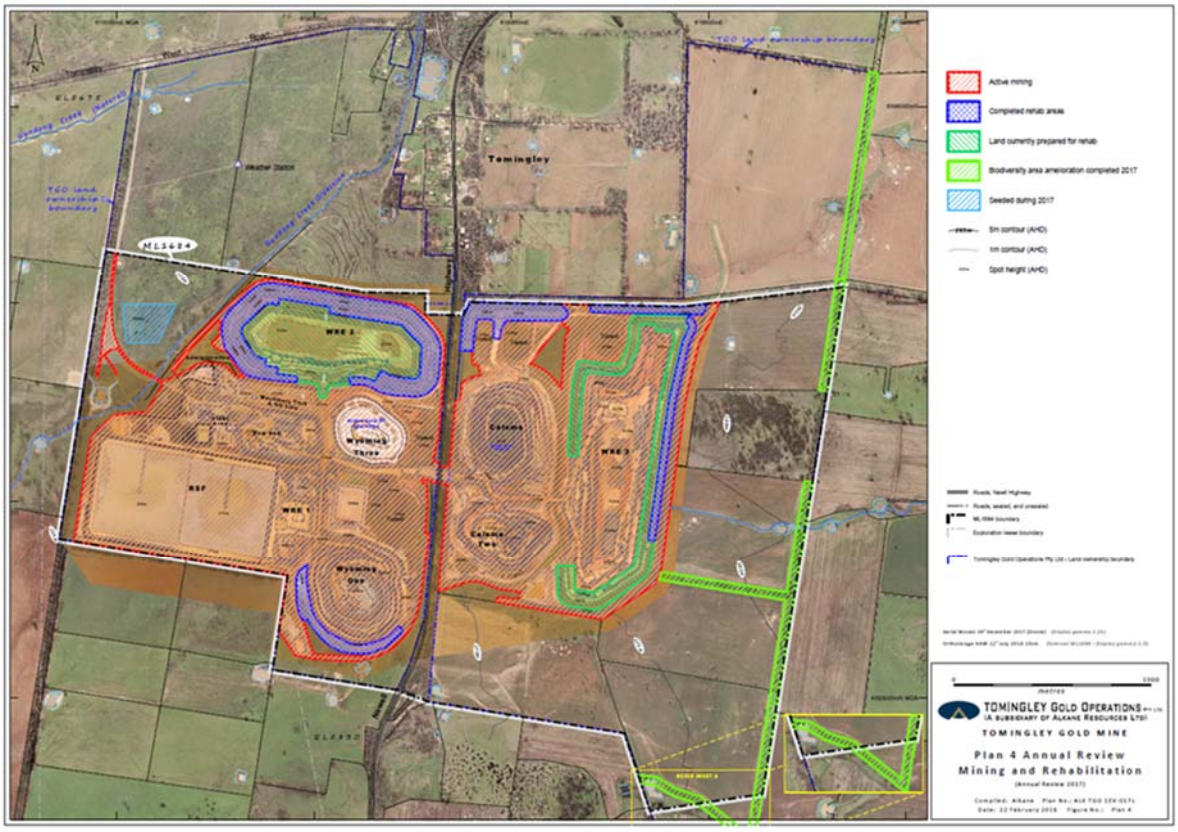


Figure 4: Rehabilitation and land management activities completed during the reporting period.

8.2 Post Rehabilitation Land use

As approved in the MOP, the TGO post rehabilitation area is proposed to consist of the following land uses.

- Infrastructure - entrance roads and void safety berms
- Water Management Areas - water bodies on floor of final voids
- Grasslands – rehabilitated WRE outside batters
- Woodlands - rehabilitated WRE outside batters
- Rural Land – existing open buffer land
- Final Void – residual open cut voids
- Conservation and Biodiversity Offset – registered offset areas under PVP.

These post-rehabilitation land uses are shown on MOP Plan 4, included as Figure 5.

8.3 Buildings, Infrastructure and other Rehabilitation

All buidings and infrastructure were still operational during the reporting period and no decommissioning, removal or demolition was undertaken.

8.4 Completed Rehabilitation

No areas of final rehabilitation have received formal relinquishment sign-off from DRE. Nor are any areas anticipated to do so in the next reporting period.

Table 16: Rehabilitation Status

Mine Area Type	Reporting Period FY17/18 to date EOM February 2018	Next Reporting Period (Forecast)
	MOP Year 1 (ha)	MOP Year 2 (ha)
A. Total mine footprint	434.9	434.9
B. Total active disturbance	405	405
C. Land being prepared for rehabilitation	3.3	32
D. Land under active rehabilitation	36.1	40.7
E. Completed rehabilitation	33.2	113.3

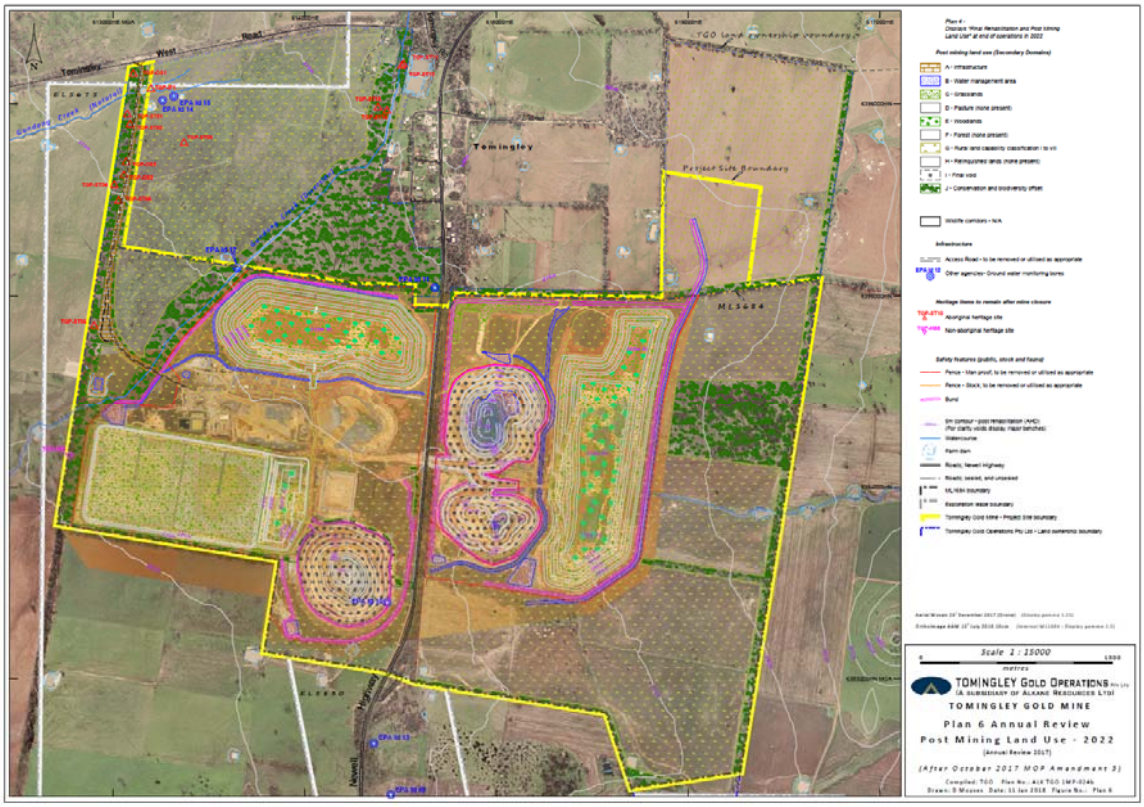


Figure 5: MOP Plan 4 showing proposed final land uses at TGO

8.5 Trials, Monitoring and Research

TGO invested significant time and resources in 2015 and 2016 to ensure the final landform design is constrcuted to protect the dispersive waste material and ameliorate the sodic topsoil used for vegetation establishment. TGO has continued to engage with soil and waste dump specialists from SLR Consulting with 2 site visits during the reporting period to review civil works, remediation of a void in the northern end of WRE2 and vegetation establishment.

As WRE landform areas are rehabilitated, monitoring plots are established and incorporated into the biodiversity monitoring program (see Section 6.4.1 for details).

During 2016 biodiversity monitoring, the first rehabilitation monitoring plots was established and monitored, along with two pasture reference sites. 2 additional pasture montoring sites were established in 2017. Monitoring is carried out annually by DNA Environmental with a comprehensive report tracking progress over time. (see appendix 3)

8.6 Key rehabilitation risks

As mentioned in Section 8.5, the main threats to successful rehabilitation stem from the sodic properites of the subsoil and near surface overburden that dominate the TGO project area. The WRE design, devised to address this threat, has undergone review during the reporting period. No changes were made to the overall design however TGO is now using 63mm graded stone on the berm drains. It was necessary to review the berm drain treatmenst due to a deficiency of crusher dust on site.

SLR Consulting have also recommended that the pasture areas have a DAP fertiliser applied. This is scheduled to occur in April 2018 and will be undertaken using a helicopter.

8.7 Actions for next reporting period

During the next reporting period it is scheduled that WRE2 rehabiliation will be finalised by July 2018 with WRE3 to be finlalised by July 2019 subject to favorable weather conditions.

9 Community

9.1 Consultation

The key strategy to ensure an effective passage of information between TGO and the surrounding community is the Community Consultative Committee (CCC). The CCC is an independently chaired ten member committee representing TGO, the local community, the Aboriginal community. During the reporting period, the CCC met on the:

- 9 February;
- 11 May;
- 17 August; and
- 16 November.

At CCC meetings, members are updated by TGO personnel on the progress of current and proposed mining operations and projects. Community representatives are given the opportunity to raise concerns regarding the project and to offer advice regarding TGO's consultation with the community. CCC meeting minutes are available via the Alkane Resources website (www.alkane.com.au). Quarterly CCC meetings will continue in the next reporting period.

In addition to the CCC, TGO utilised a number of methods of communication/consultation with the community during the reporting period, including:

- Making relevant information regarding mine approvals, operations and environmental monitoring available to the public on the Alkane Resources website;
- Distributing a community newsletter, to provide the Tomingley community with information on TGO operations;
- Providing a 24 hour community information;
- Sending issue-specific letters to the residents of Tomingley regarding TGO's approach to sensitive issues such as residentail acoustic treatment.

These methods of community consultation will continue during the next reporting period.

9.2 Support

Over the life of the mine, TGO has committed to contribute (subject to annual CPI increases):

- $430 000 to the Tomingley Gold Project - Community Fund
- $360 000 for road maintenance and
- $160 000 for Narromine Shire Council environmental expertise.

The Tomingley Gold Project Community Fund has been established to support projects within the Narromine Shire that promote the long term economic growth, community connectivity, education and training, or community infrustructure.

Allocation of funds is decided by a fund panel, consisting of two TGO representatives and two from Narromine Shire Council, based on annual applications from community members, groups or organisations.

9.2.1 Tomingley Village Water Supply

A variation to the Voluntary Planning Agreement with Narromine Shire Council (NSC) was agreed in March 2016, prior to approval of MOD 3. A component of the varied agreement required TGO to fund a 'water supply options' report to investigate the practicalities of providing water to the township of Tomingley using the Narromine pipeline. GHD was commission to do the work with the draft report provided to Council in November 2017.

TGO installed valves and a piple line connecting the Narromine – TGO borefield pipeline to the the NSC water supply dams. This will ensure that the village has a reliable supply of raw water whilst ever the mine is operational. Upon mine closure the entire system will be handed over to the NSC.

9.3 Complaints and enquiries

TGO manage complaints in accordance with the protocols and procedures contained in the EMS. During the reporting period, 5 complaints were received. The majority of these complaints were received through the community information line or other Alkane/TGO phone lines, with three received by email or text message and three in person. TGO complaint history is presented in Table 17, with complaint number and type for the current and previous reporting periods presented in Figure 7.

TGO staff responded to all complainants and conducted investigations into specific concerns. Investigation outcomes consisted of corrective action, where required, and follow-up communication with the complainant. All enquiries and complaints have been closed out for the reporting period.

A register of complaints and enquiries received from the commuinity is maintained by TGO. A modified version of this register (excluding personal details of complainants) is published on the Alkane Resources website. A copy of the TGO community complaints register for the reporting period is included as Appendix 7.

Table 17: TGO complaint history

Year	Number of complaints	Complaint Type				
		Dust	Noise	Blasting	Traffic/ Road Safety	Other
2017	5	0	3	0	0	1 (use of TGO land)
2016	18	1	10	0	3	4 (lighting, TV reception)
2015	16	2	11	3	0	0
2014	53	11	35	2	4	1 (UHF radio misuse)
2013	9	4	0	0	3	2 (property damage)
2012	2	0	0	0	0	2 (property damage)

10 Independent Audit

An Independent Audit was conducted during the 2015 reporting period.

The next Independent Audit is scheduled for 2018. Pitt and Sherry have been approved by DPE to do the audit.

11 Incidents and non-compliances during reporting period

This section provides further detail on the incidents and non-compliances reported in Section 1 as well as any other official regulatory interaction that occurred during the reporting period.

11.1 Exceedance of noise criteria

15 February 2017 (evening) - 5dB exceedance of statutory noise limits at R3/R29 The source noise source was determined to be from the ore conveyor which experienced mechanical failure. The problem was rectified and there has been no reoccurrence of the issue. (see Section 6.1)

11.2 Exceedance of 24 hour average PM10 and deposited dust criteria

Monitoring of particulate matter at the nearest residence to TGO identified three exceedences of the 24 average PM_{10} criteria as included in Schedule 3, Condition 17 of PA 09_0155. These exceedances were recorded on the 12 and 21st February . These exceedances are described in Section 6.3.

11.3 Official Regulatory Interaction

TGO received an Notice from DPE – RG to take steps to to give effect to condition 3 of ML 1684, as detailed in Table 7.

12 Activities to be completed in next reporting period

Environmental activities and initiatives to be implemented in the next reporting period will focus on reduction of offsite impacts such as noise and dust, management of biodiversity offset areas, refining WRE rehabilitation processes, and increasing the rate of rehabilitation. Details on these activities are shown in Table 18.

Table 18: Environmental management activities proposed for 2017

Proposed Activities	**Location**	**Proposed Completion Date**
Feral animal trapping program in offset areas	Offset areas	Ongoing
Control of boxthorn and other noxious weeds	TGO site and offset areas	Ongoing
Carry out LFA monitoring of biodiversity and rehabilitation areas.	Biodiversity and rehabilitation areas	October 2018
Ongoing rehabilitation of WRE2 and WRE3	Waste rock emplacements	July 2018 WRE 2, July 19 WRE3
Noise, air quality, blasting and water quality monitoring in accordance with EPL and PA.	TGO site and district	Ongoing
Ensure open cut contractor area is left in a satisfactory condition, free of waste and hydrocarbon contamination.	Contractor work area	December 2018
Sorting of waste rock for down slope drains and future remediation and drainage works	WRE 3	Ongoing