



Licence Number L8579/2011/2

Licence Holder AngloGold Ashanti Australia Limited

ACN 008 737 424

File Number: 2012/006902

Premises
Sunrise Dam Gold Mine
Mining tenements M39/1116 and L38/176
LAVERTON WA

Date of Amendment 12 September 2017

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance

with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Date signed: 12 September 2017

Tim Gentle

Manager Licensing (Resource Industries)

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Definitions and interpretation

Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 33 Cloisters Square PERTH WA 6850 info-der@dwer.wa.gov.au
CS Act	<i>Contaminated Sites Act 2003 (WA)</i>
CTD TSF	Centrally Thickened Discharge Tailings Storage Facility
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DER	The former Department of Environment Regulation
DWER	Department of Water and Environmental Regulation
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>

Licence Holder	AngloGold Ashanti Australia Limited
m ³	cubic metres
mtpa	million tonnes per annum
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Amendment Notice applies, as specified at the front of this Amendment Notice.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>
SWL	standing water level
TSF	Tailings Storage Facility
WAD-CN	weak acid dissociable cyanide

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

The following guidance statements have informed the decision made on this amendment:

- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Decision Making (November 2016)*
- *Guidance Statement: Risk Assessment (November 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment description

This amendment is the result of an application made by the Licence Holder on 6 July 2017 to authorise the Stage 11 perimeter embankment raise to the CTD TSF (Centrally Thickened Discharge Tailings Storage Facility). This will result in a rise of between 0.7 m and 2.5 m height to the perimeter embankment. At the same time the spillway embankment between the CTD TSF and stormwater storage pond will be raised. Raises to the internal causeway will be made progressively outside of the scope of work for the perimeter embankment raise. Works to be authorised by this Amendment Notice are as shown in Figure 1 following.

Additionally the mining tenure within the Premises boundary has been consolidated into two mining tenements. The physical premises boundary is unchanged, only the underlying tenure. There are no proposed changes to the category thresholds on the Licence.

Amendment history

Table 2 provides the amendment history for L8579/2011/2.

Table 2: Licence amendments

Instrument	Issued	Amendment
L8579/2011/2	10/09/2015	Amendment to increase capacity of categories 5 and 52 and authorise construction of additional gas generators.
L8579/2011/2	27/02/2017	Amendment to increase capacity of category 52 and authorise construction of 3 additional gas generators. Change to premises boundary and DER administrative changes.
L8579/2011/2	12/09/2017	Amendment Notice 1 to authorise Stage 11 perimeter embankment raise to the CTD TSF. Prescribed premises location amended to reflect recent consolidation of mining tenements into one tenement.

Location and receptors

Table 3 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 3: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Granny Smith Gold Mine and accommodation camp	32 km to the north of the Premises
Mt Margaret Aboriginal Community	40 km to the north west of the Premises

Table 4 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 4: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Lake Carey	On the Premises boundary; 3 km from the CTD TSF.

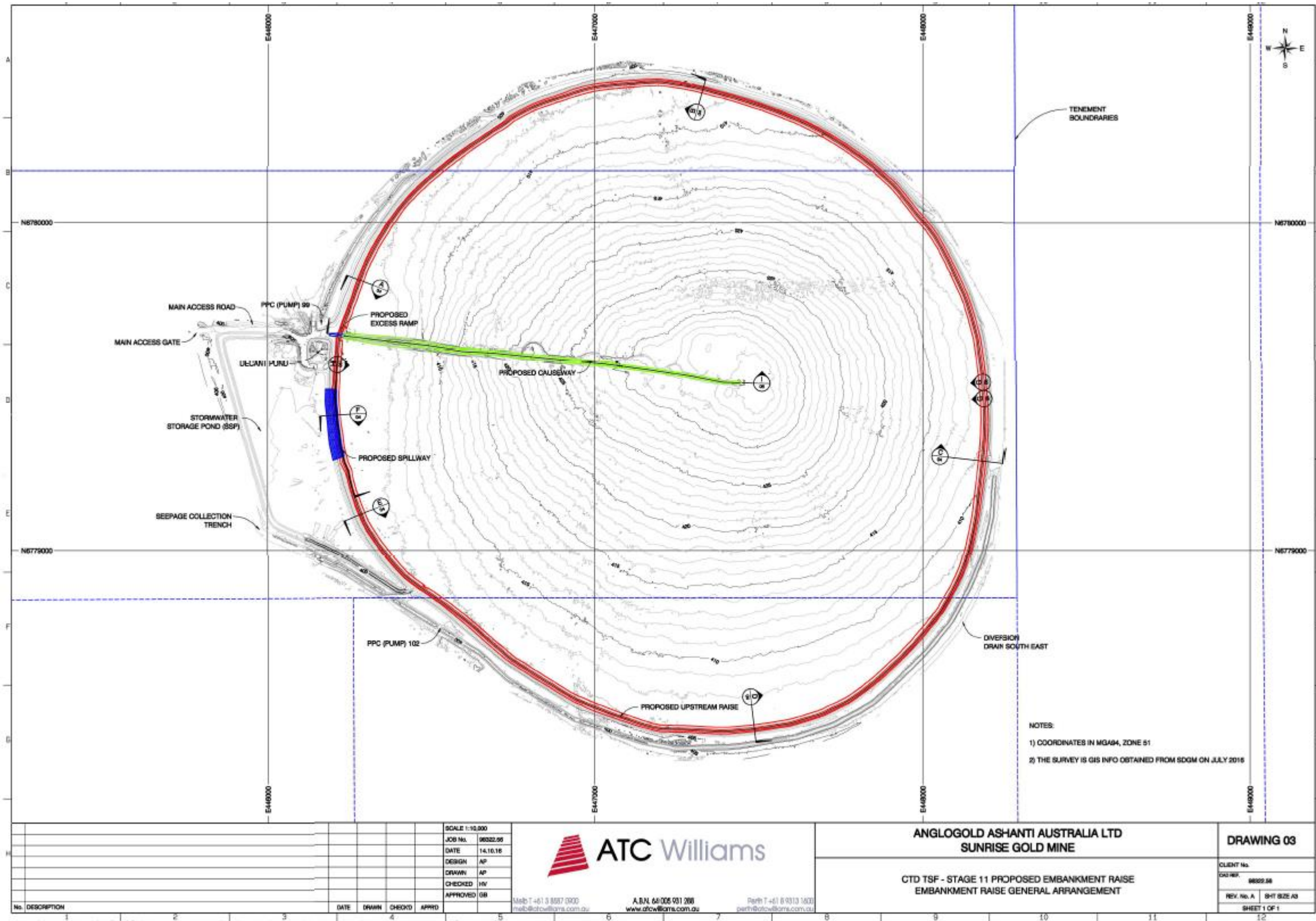


Figure 1: Proposed construction works for the CTD TSF highlighted in colour (noting that the causeway raise is scheduled to be completed outside this amendment) (ATC Williams 2016)

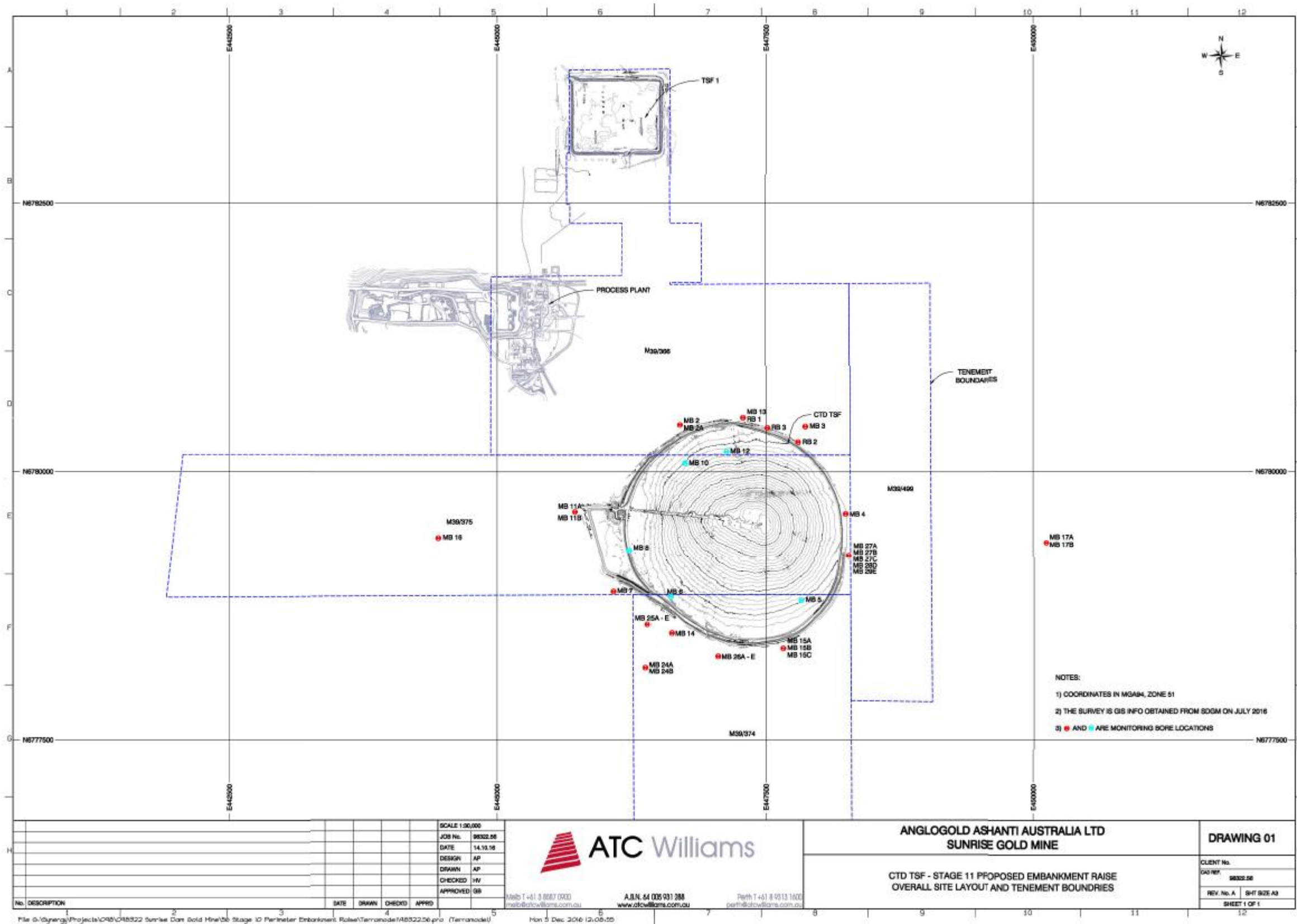


Figure 2: Location of existing groundwater monitoring bores and seepage recovery bores around the CTD TSF (ATC Williams 2016)

Risk assessment

Tables 7 and 8 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls. The risk rating is determined for risk events in accordance with the matrix set out in Table 5 below.

Table 5: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER assesses the consequence and likelihood of the Risk Event in accordance with Table 6 below.

Table 6: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> onsite impacts: catastrophic offsite impacts local scale: high level or above offsite impacts wider scale: mid-level or above Mid to long-term or permanent impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Specific Consequence Criteria (for public health) are significantly exceeded Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> onsite impacts: high level offsite impacts local scale: mid-level offsite impacts wider scale: low level Short-term impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Specific Consequence Criteria (for public health) are exceeded Local scale impacts: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Specific Consequence Criteria (for public health) are at risk of not being met Local scale impacts: mid-level impact to amenity

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
		Environment	Public health* and amenity (such as air and water quality, noise, and odour)	
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> Specific Consequence Criteria (for public health) are likely to be met Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> onsite impact: minimal Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> Local scale: minimal to amenity Specific Consequence Criteria (for public health) met

[^] Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

"onsite" means within the Prescribed Premises boundary.

Note that the geotechnical stability and engineering of the TSF structure is not assessed by DWER under the EP Act. Instead this is regulated by the Department of Mines, Industry Regulation and Safety under the *Mines Safety and Inspection Act 1994*.

Table 7: Risk assessment for proposed amendments during construction

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Category 5: Construction of progressive embankment raises to the TSF	Dust: associated with construction activities Noise: associated with construction activities	No residential premises within 32 km of the Premises	Air	Health and amenity impacts	N/A	N/A	N/A	No adjacent receptors

Table 8: Risk assessment for proposed amendments during operation

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Category 5: Processing or beneficiation of metallic and non-metallic ores – Operation of the Tailings Storage Facility	Tailings Seepage	Adjacent native vegetation.	Inundation of vegetation rootzones from rising groundwater levels	Poor vegetation health or death	Moderate	Unlikely	Medium	Seepage impacts from the operation of the CTD TSF are managed through the use of three recovery bores (RB1 – RB3 as shown in Figure 2), and three seepage recovery trenches. Four drainage wells within the CTD TSF transport decant water from the TSF to the lined decant pond or lined stormwater storage pond, reducing the time water is ponding against the embankment. To date groundwater and vegetation monitoring programs have not detected impacts to vegetation from seepage. Changes in groundwater due to seepage are able to be detected through the existing groundwater monitoring program required by

								<p>Condition 3.5.1. Data on the groundwater levels and quality in the vicinity of the TSF is available back to 1999. The long term trends for water levels have remained relatively stable with the use of seepage recovery measures, except for the western bores (AGAA 2016).</p> <p>Given the CTD TSF's location adjacent to Lake Carey, standing water levels to the west of the CTD TSF are close to the surface. Changes in groundwater levels may also be due to rainfall events, particularly on the western side of the CTD TSF (AGAA 2016).</p> <p>Condition 3.5.3 of the Licence requires annual monitoring of vegetation in the zone of influence of the CTD TSF. The latest results from 2016 noted that there was no evidence that vegetation was being affected by changes in hydrology or soil chemistry as a result of the CTD TSF (AGAA 2016).</p>
	Tailings Decant		Overtopping of the TSF, the decant pond or the Stormwater Storage Pond causing a release to ground	Poor vegetation health or death from tailings inundation.	Moderate	Rare	Medium	<p>500mm freeboard is provided as a minimum for the perimeter of CTD TSF (ATC Williams 2016). Four decant drainage wells are installed through the embankment between the CTD TSF and the decant pond (wells 1 and 2) and the stormwater storage pond (wells 3 and 4) to capture decant and stormwater off the CTD TSF. The capacity of the stormwater storage pond is sufficient to store a 1 in 100 year, 72 hour rainfall event generated over the 310 ha area of the CTD TSF. Providing storage capacity is</p>

									maintained in the stormwater storage pond then there is adequate containment.
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Decision

CTD TSF Embankment Raise (Stage 11)

The proposed perimeter embankment raise is authorised. Licence Holder controls for the construction of the works will be conditioned on the Licence to ensure that the design requirements in relation to stormwater capacity and placement of low permeability construction material on the inner embankment are met. It is noted that a centrally thickened discharge tailings storage facility differs from a paddock style above ground TSF, in that the tailings are more dense (70 - 80% solids) and the method of capturing surface run off and decant water (of which there is less due to the solids density) differs in that runoff/decant flows towards the embankments and from there travels via gravity flow to separate ponds or impoundments (in this case the Stormwater Storage Pond and the Decant Pond). A risk of seepage through the embankments remains where runoff pools against the embankment and hence the existing seepage controls need to be maintained. To that effect, existing condition 1.3.8 of the Licence specifies the use of a seepage recovery system, which will be amended to better reflect the existing seepage management infrastructure (use of a stormwater storage pond rather than a supernatant pond on the TSF). Table 1.3.5 will be amended to include design requirements for the 'Stage 11' embankment raise and the stormwater storage pond.

Existing condition 1.3.7 specifies a minimum freeboard for all containment infrastructure. Inspections of the perimeter embankment freeboard on the TSF are also conditioned by Table 1.3.4 of Condition 1.3.9. Table 3.5.1 of Condition 3.5.1 has been amended to reduce the groundwater monitoring requirements for the decommissioned TSF1 and to also include all the current operational groundwater monitoring bores for the CTD TSF.

Additionally an annual assessment of vegetation, including surface soil analysis of pH, salinity and heavy metals within the zone of the CTD TSF is required by existing Condition 3.5.3. This provides a further check that fluctuating water levels to the west of the CTD TSF are not impacting on vegetation health.

Prescribed Premises Boundary Tenure Change

The physical location of the premises is unchanged; however the underlying mining tenure has been consolidated into one mining tenement and a miscellaneous tenement as of 19 July 2017 (DMIRS 2017). Accordingly the location reference has been updated via this Amendment Notice. The Premises map in Schedule 1 of the Licence has also been replaced as per clause 8 of this Amendment Notice, as shown below.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 8 September 2017. The Licence Holder had no comments on the draft.

Amendment

1. Table 1.3.3 of Condition 1.3.6 of the Licence is amended by the insertion of the red text shown in underline below

Table 1.3.3: Containment infrastructure		
Storage vessel or compound	Material	Requirements
WWTP evaporation ponds one, two, three, six and seven	Primary treated sewage	Clay lined or equivalent
WWTP over-flow ponds four and five	Over-flow of primary treated sewage from evaporation ponds	None specified
Process water pond	CTD TSF return water, borefield and mine dewater	Lined with at least 0.5 m of clay with a permeability of $<10^{-9}$ m/s or equivalent

Water storage ponds/ dewatering ponds	Mine dewater	None specified
CTD TSF	Tailings	Lined with 4-mm HDPE <u>clay</u> to achieve a permeability of at least $<10^{-7}$ m/s or equivalent

2. Condition 1.3.8 of the Licence is amended by the deletion of the text in strikethrough and the insertion of the red text shown in underline below

1.3.8 The Licensee shall manage TSFs such that:

- a seepage collection and recovery system is provided and used to capture seepage from the TSF;
- seepage is returned to the TSF or re-used in process; and
- the ~~supernatant~~ stormwater storage pond is managed so as to provide capacity for a 1 in 100 year, 72 hour rainfall event on the TSF is minimised as far as practicable.

3. Table 1.3.4 of Condition 1.3.9 of the Licence is amended by the insertion of the red text shown in underline below:

Table 1.3.4: Inspection of infrastructure		
Scope of inspection	Type of inspection	Frequency of inspection
Tailings pipelines	Visual integrity	Twice daily
Return water lines	Visual integrity	Twice daily
Embankment freeboard	Visual to confirm required freeboard capacity is available	Daily
Tailings deposition	Visual assessment of beaching	Daily
Decant pond & <u>stormwater storage pond</u>	Visual assessment of pond size and position	Daily
Water storage ponds/ dewatering ponds	Visual assessment of freeboard	Daily

4. Table 1.3.5 of Condition 1.3.10 of the Licence is amended by the insertion of the red text shown in underline below:

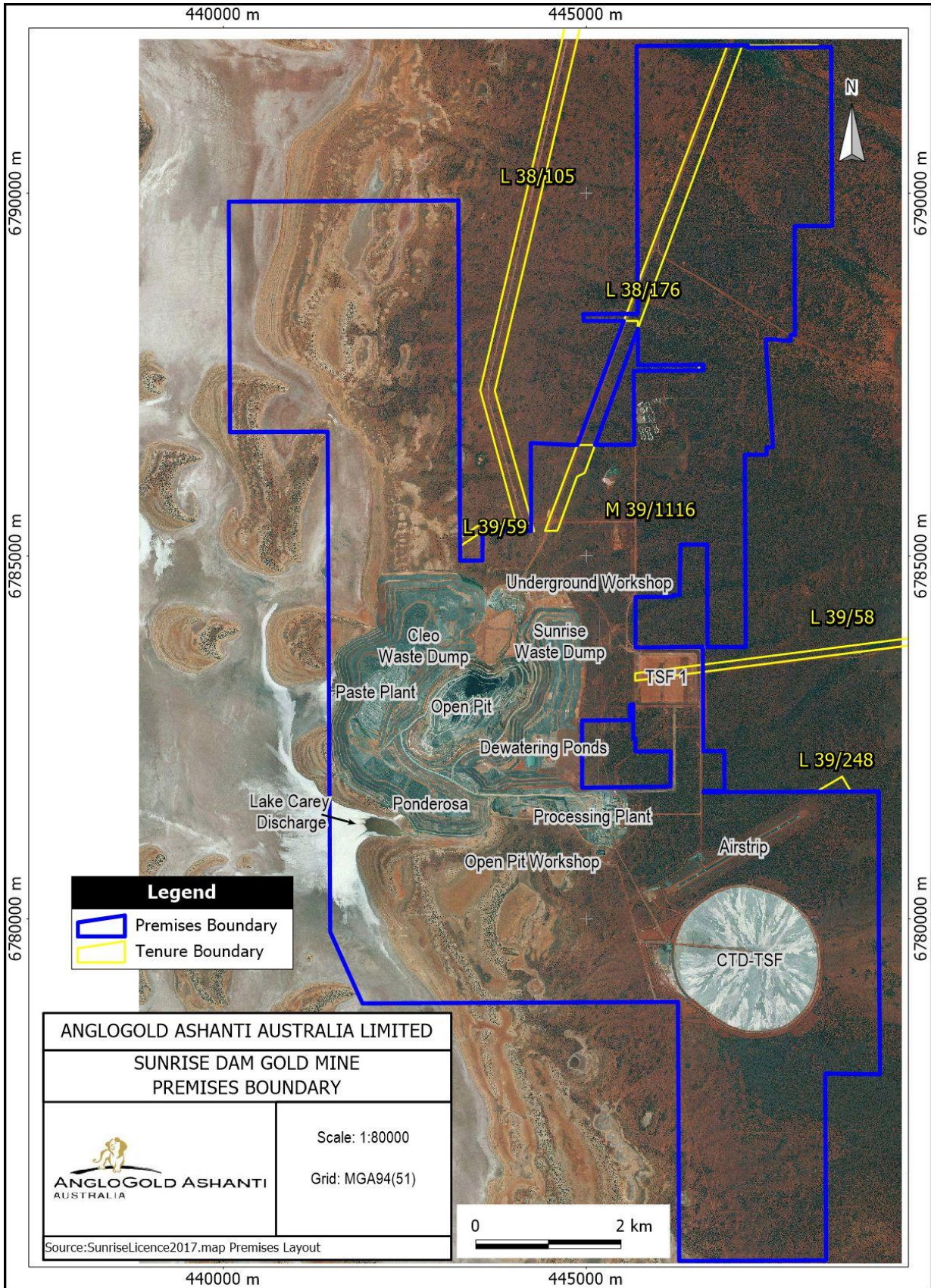
Table 1.3.5: Works specifications	
Column 1	Column 2
Infrastructure	Specifications (Design and Construction)
4 MW Gas generator engine x 3	3 x 4MW CAT CG260-16
	Located in new building (Station D), 30m north of existing Station C, as shown in Figure 2
	Vent emissions to be exhausted to air via a 13m high stack
<u>Stage 11 CTD TSF perimeter embankment raise</u>	<u>CTD TSF upstream perimeter embankment raise of between 0.7m (at the spillway) and 2.5m at the highest point (total heights equivalent to the range between 8.1m and 14.7m).</u>
	<u>Zone 1 low permeability material (hydraulic conductivity of not less than 1×10^{-8} m/s) to be placed on the inner embankment.</u>
	<u>Stormwater storage pond embankment raise to ensure capacity to store a 1 in 100 year, 72 hour rainfall event generated from the CTD TSF.</u>

5. Table 3.5.1 of Condition 3.5.1 of the Licence is amended by the insertion of the red text shown in underline below:

Table 3.5.1: Monitoring of ambient groundwater quality				
Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Monitoring bores TSF1 (closed): MB1-MB4, MB6-MB7, MB9-MB12	pH	-	Spot sample	Quarterly <u>Annually</u>
	Standing water level (SWL)	m(AHD)		
	TDS, weak acid dissociable	mg/L		

<u>TSFMB9, TSFMB10, TSFMB11, TSFMB12</u>	cyanide (WAD-CN), sodium, potassium, calcium, magnesium, arsenic, chromium, copper, lead, manganese, nickel, selenium, boron.			
MB5 and MB8	SWL	m(AHD)		
Monitoring bores CTD: CTDMB2, CTDMB2A, CTDMB3, CTDMB4, CTDMB7, CTDMB11A, CTDMB11B, CTDMB13, CTDMB14, CTDMB15A, CTDMB15B, CTDMB15C, CTDMB16, CTDMB17A, CTDMB17B <u>CTDMB24A-B,</u> <u>CTDMB25A-E,</u> <u>CTDMB26A-E,</u> <u>CTDMB27A-E</u>	pH	-		Quarterly
	SWL	m(AHD)		
	TDS, WAD-CN, sodium, potassium, calcium, magnesium, arsenic, chromium, copper, lead, manganese, nickel, selenium, boron.	mg/L		

6. Condition 4.2.3 of the Licence is amended by the insertion of the red text shown in underline below:
- 4.2.3 The Licensee shall submit a compliance document to the CEO, following the construction of the power station upgrade and TSF embankment raise works as specified in Table 1.3.5 and prior to commissioning of the same.
7. The Licence is amended by the deletion of the Premises map in Schedule 1 and the replacement with the map following:



Appendix 1: Key documents

	Document title	In text ref	Availability
1	ATC Williams (2016) <i>AngloGold Ashanti Australia Ltd, Sunrise Dam Gold Mine Tailings Storage Facility Laverton, WA: CTD TSF – Stage 11 Perimeter Embankment Raise Design Report</i> , December 2016	ATC Williams 2016	DWER internal document reference: A1484619
2	Letter from Regional Mining Registrar Leonora, Department of Mines, Industry Regulation and Safety to AngloGold Ashanti Australia Limited, <u>Applications for Mining Leases 39/1116 & 39/1117</u> , dated 19 July 2017	DMIRS 2017	DWER internal document reference: A1484624
3	Licence L8579/2011/2 – Sunrise Dam Gold Mine	L8579/2011/2	accessed at www.dwer.wa.gov.au
4	L8579 Licence Amendment Application and attachments signed 5 July 2017	Application	DWER internal document references: A1484616, A1484619, A1484624
5	Annual Environmental Report Prescribed Premise Licence L8579/2011/2 - Sunrise Dam Gold Mine, 1 January 2016 – 31 December 2016	AGAA 2016	DWER internal document reference: zA108248
6	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	DER 2015	accessed at www.dwer.wa.gov.au
7	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER 2016a	
7	DER, November 2016. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER 2016b	