Government of Western Australia
Department of Environment Regulation

Amendment Notice #1

Licensee	Millennium Minerals Limited
ACN	003 257 556
Licence Number	L8675/2012/1
File Number:	DER2014/002927
Premises	Nullagine Gold Operation – Golden Eagle Project Mining Tenements M46/186, M46/300, M46/267, M46/432, M46/264, M46/436, M46/444, M46/265, M46/138, M46/443, M46/266, M46/445, P46/1760, M46/261, M46/446, M46/430, P46/1759, M46/262, M46/272, M46/447, L46/45, M46/441, M46/3, M46/164, L46/88, M46/64, M46/98, M46/302, M46/431, M46/282, M46/273, M46/182, M46/199, M46/225, M46/277, M46/146, M46/198, M46/276, M46/275, L46/105, M46/274, M46/434, M46/433, M46/200, M46/163, P46/1758, M46/129, P46/1757, L46/98, M46/47, P46/1707, G46/2, L46/89, L46/90, L46/91, L46/92, L46/115, L46/33, M46/50, M46/57, M46/166, M46/167, M46/170, M46/187, M46/189, M46/192, M46/263, M46/278, M46/279, M46/283, M46/303, M46/426, M46/427, M46/428, M46/429, M46/442, M46/448, P46/1670, P46/1671, P46/1672, P46/1673, P46/1674, P46/1675, P46/1676, P46/1703, P46/1704, P46/1705, P46/1706, P46/1761, P46/1804, P46/1823, P46/1824, P46/1855, and P46/1856 NULLAGINE WA 6758
Date of amendment	14 March 2017

Amendment

The Chief Executive Officer (CEO) of the Department of Environment Regulation (DER) has amended the above licence in accordance with section 59 of the *Environmental Protection Act 1986* 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 and follows.

Date signed: 14 March 2017

Danielle Eyre

Senior Manager – Resource Industries

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

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.

This notice is limited only to an amendment for Category 5 and 89. No changes to the aspects of the original licence relating to Category 7 and 85 have been requested by the Licensee.

The following DER Guidance Statements have informed the decision made on this amendment*:*

- *Guidance Statement: Regulatory Principles* (July 2015);
- *Guidance Statement: Setting Conditions* (October 2015);
- *Guidance Statement: Licence Duration* (November 2015);
- *Guidance Statement: Decision Making* (February 2017);
- *Guidance Statement: Risk Assessment* (February 2017); and
- *Guidance Statement: Environmental Siting* (November 2016).

Amendment Description

On 23 March 2016 and 31 January 2017, Millennium Minerals Limited (Licensee) submitted separate applications to DER to amend the Nullagine Gold Operation – Golden Eagle Project (Nullagine Gold) licence (L8675/2012/1).

This Notice is the result of the Licensee applying for amendments under section 59B of the EP Act. The Licence Holder has applied to make the following changes:

1. Removal of Condition 1.3.14; and
2. Construction and Operation of Tailings Storage Facility (TSF) 2.

1. Removal of Condition 1.3.14

The Licensee has requested that Condition 1.3.14 (fencing requirements) be removed due to the location and regular movement of the landfill (it follows the extension of the Golden Eagle waste rock dump). The Licensee has stated that "*the logistics and practicability of continually moving the proposed boundary fence across steep and uneven terrain has been the main driver for requesting the department to remove this condition*" (MML, 2017).

The Licensee will employ the following operational management practices:

- Deep trenches between the hill systems to assist in keeping all waste contained inside the landfill deposit area; and
- Increase in the frequency of inspections, with any windblown waste collected deposited back into the facility.

Decision

The Delegated Officer has considered the request to remove Condition 1.3.14 and accepts that the removal of this condition presents a low risk to the environment. The Delegated Officer also notes that due to the removal of Condition 1.3.14 the likelihood of windblown waste outside the landfill facility will increase. Due to this, the Delegated Officer has updated Condition 1.3.15 via this Notice to ensure that any windblown waste is returned back to the tipping area on at least a weekly basis rather than on a monthly basis.

2. Construction and Operation of TSF2

The Licensee was proposing to construct a new TSF at Nullagine Gold as TSF1 was reaching capacity. TSF2 has been designed for a starter embankment and two subsequent lifts, allowing an annual tailings discharge of 1,095,000 cubic metres (m^3) (1.7 million tonnes per annum (Mtpa)). Design capacity is a total of 6,550,000m^3 tailings discharge (10 million tonnes) over a 6 year period.

TSF2 is to be constructed into encapsulating topography, which will utilise two hills as embankment walls, ensuring that any seepage or potential integrity issues resulting in leakage will be contained within a small impact area.

Due to the sloping nature of the ground the starter embankment height will vary. The height of the embankment will vary from 3m to 7m and have a crest at Reduced Level (RL) 393.0m. Stages one and two will be 3m embankment raises, taking the final height of the embankment to RL399.0m.

On 1 February 2017, DER was notified in writing by the Licensee that they had already constructed cell one of TSF2, without a works approval or licence conditions relating to the construction/operation of TSF2 being issued by DER. This Notice will now authorise the operation of TSF2 with specified infrastructure requirements.

Other approvals

The Department of Mines and Petroleum (DMP) approved a Mining Proposal (REGID 58774) for the area covered by the TSF on 27 July 2016.

Clearing

The clearing of native vegetation is not approved under this Licence. A Native Vegetation Clearing Permit (CPS 4976/4) was approved on 16 June 2016.

Consultation

A letter of referral was sent to the Department of Water (DoW) and DMP on 4 November 2016.

DER received the following comments from DoW on 18 November 2016:

- The Licensee has previously referred the design report for assessment to which a response was provided in March 2016;
- The Licensee submitted further clarification and a Technical Memorandum in April 2016;
- The supporting information was considered acceptable from a water resource perspective and response sent in May 2016; and
- The proposed Part V licence contains monitoring conditions which align with the advice given by the Department.

DER received a draft response from DMP on 15 December 2016 stating the following:

- DMP has no comments on the draft amendments to the licence;
- DMP approved a Mining Proposal (REGID 58774) on 27 July 2016 for the area covered by the TSF of which this amendment to the licence predominately refers;
- A Native Vegetation Clearing Permit (CPS 4976/4) was approved by DMP on 16 June 2016; and
- Closure of the facility will be governed by the project wide Mine Closure Plan, currently

under revision and due for re-submission in 2017.

Location, environmental siting and potential receptors

Nullagine Gold is located approximately 10km south of the township of Nullagine in the Shire of East Pilbara in the north of Western Australia.

The workforce for Nullagine Gold is housed at the Accommodation Village, which is located approximately 1.5km south-west of TSF2. As the Accommodation Village is operated by the Licensee, it will not be considered a sensitive land use or receptor.

Tables 1 and 2 list the relevant sensitive land uses and specified ecosystems in accordance with DER's Guidance Statement: *Environmental Siting*.

Table 1: Receptors and distance from prescribed premises

Residential and sensitive premises	Distance from Prescribed Premises
Closest residential zoned premises (zoned residential Shire of East Pilbara Planning Scheme No. 4)	The residential area of Nullagine is approximately 7km to the north-west of TSF2

Table 2: Specified ecosystems

Environmental receptors	Distance from Prescribed Premises
Public Drinking Water Source Area (PDWSA)	TSF2 is located within the Priority 3 PDWSA – Nullagine Water Reserve The boundary of the Priority 1 PDWSA – Nullagine Water Reserve is located approximately 3.5km north-west of TSF2
Declared Rare Flora	There are no Declared Rare Flora at Nullagine Gold *Lepidium catapycnon* (previously a Declared Rare Flora, now a Priority 4 Flora) is located within the Nullagine Gold premises
Priority Ecological Communities	The Priority 3(iii) Ecological Community of the Stony saline plains of the Mosquito Land System (Parks and Wildlife, 2016) is located within the Nullagine Gold premises boundary, but approximately 5km from TSF2

The distances to groundwater and water sources are shown in Table 3.

Table 3: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental Value
Groundwater and groundwater salinity	Groundwater is approximately 20 - 25 metres below ground level (mbgl)	Groundwater salinity (Total Dissolved Solids) at TSF2 is 7,000 – 14,000mg/L which is considered saline (Department of Water, Salinity status classifications) The groundwater contours suggest that the groundwater beneath TSF2 is flowing towards the north of the facility in the direction of the Priority 1 PDWSA however the Mosquito Creek Formation has low permeability
Rights in Water and Irrigation Act 1914	Nullagine Gold is located within the Proclaimed Pilbara Groundwater Area	N/A

Groundwater and water sources	Distance from Premises	Environmental Value
	and Proclaimed Pilbara Surface Water Area	
Watercourses	Cajuput Creek is located approximately 1.5km to the west of TSF2 Nullagine River is located approximately 5.5km north-west of TSF2 Five Mile Creek is located approximately 6km east of TSF2	Many of the creeks in the region are ephemeral watercourses which are typically dry

Risk assessment

Cell one of TSF2 has already been constructed without a Part V works approval or licence conditions. Table 4 below describes the Risk Events associated with the operation of TSF2 consistent with DER's Guidance Statement*: Risk Assessments*. This table identifies whether the emissions present a material risk to human health or the environment, requiring regulatory controls.

Table 4: Risk assessment for TSF2 during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential Emissions**	**Potential Receptors**	**Potential Pathway**	**Potential Adverse Impacts**				
Category 5 TSF2	TSF2 surface	Dust: Release of particulate matter from TSF surface	Township of Nullagine approximately 7km north-west of TSF2	Air: Transport through air then transfer through respiratory system	Human health impacts – respiratory illness	Slight	Unlikely	Low	Due to the distance from TSF2 to the township of Nullagine, the Delegated Officer considers that impacts on human health will be **slight** and **unlikely** to occur. The risk rating for dust impacts from the TSF2 surface on human health is therefore **low**
			Terrestrial vegetation near TSF2	Air: Transport through air then deposition	Smothering and the potential to be deposited on vegetation which may prevent photosynthesis and plant respiration	Slight	Unlikely	Low	The Delegated Officer considers the natural dust tolerance of vegetation species should prevent vegetation impacts. There are also no Declared Rare Flora or Priority Ecological Communities within a 5km radius of TSF2 The Delegated Officer considers the impacts on vegetation will be **slight** and **unlikely** to occur. The risk rating for dust impact to vegetation is therefore **low**
	TSF	Overtopping of TSF2 with tailings	Terrestrial ecosystems adjacent to TSF2	Direct discharge to land and infiltration to soil	Soil contamination inhibiting vegetation growth and survival, and health impacts	Moderate	Possible	Medium	Refer to detailed risk assessment below

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential Emissions	Potential Receptors	Potential Pathway	Potential Adverse Impacts				
					to fauna				
		Tailings liquor containing cyanide, metals/metalloids emitted as seepage from TSF2	Priority 1 PDWSA – Nullagine Water Reserve located approximately 3.5km away Groundwater dependent ecosystems	Seepage from base and internal walls of TSF2 direct to groundwater	Contamination of surrounding soils and surface water systems, infiltration of contaminants to groundwater with potential to impact the Nullagine Water Reserve Groundwater mounding	Major	Unlikely	Medium	Refer to detailed risk assessment below
		Spillage of tailings through leaks, pipeline ruptures or failure	Contamination of surrounding soils, vegetation and surface water systems, infiltration of contaminants to groundwater with potential impact to the Nullagine Water Reserve	Direct discharge to land and infiltration to soil and groundwater	Soil contamination inhibiting vegetation growth and survival, and health impacts to fauna	Minor	Unlikely	Medium	Refer to detailed risk assessment below

Risk assessment

Overtopping of TSF2 with tailings

MML, 2016a states *"the tailings beach will assume the form of a cone, hence the ability of the facility to safely store an elevated body of water during a rainstorm or excessive event. The minimum operational freeboard has been set at 300mm (the height between the tailings beach at the embankment and the embankment crest) with the minimum total freeboard of 845mm (operational freeboard 300mm plus pond freeboard 200mm and storm freeboard 345mm)".*

The Licensee has also stated that TSF2 has been designed to achieve the required factors of safety; will be operated according to the TSF operating manual to minimise decant pond; is protected by a flood protection bund; will be subject to regular visual inspections and annual TSF audits; and will be operated to accommodate a 1 in 100 year 72 hour rainfall event.

The Delegated Officer has considered the location of TSF2 within a Priority 3 PDWSA and composition of tailings (comprise mainly quartz, plagioclase and muscovite, with traces of pyrite and chlorite. The tailings have been classified as potentially acid forming as they contain some pyrite, however, it has been assessed that neutral to alkaline conditions should prevail within the operating TSF) and determined that there will be mid level on-site impacts. Therefore, the Delegated Officer considers the consequence to be **moderate.**

The Delegated Officer has considered the controls in place for TSF2 including embankment freeboard, capacity to accommodate a 1 in 100 year 72 hour rainfall event, and infrastructure requirements and determined that while overtopping of TSF2 will only occur in exceptional circumstances, impacts could occur if overtopping occurs. Therefore, the Delegated Officer considers the likelihood of the consequence occurring to be **possible.**

The overall rating for the risk of overtopping of TSF2 on sensitive receptors during operation is **medium**, subject to regulatory controls

Tailings liquor containing cyanide, metals/metalloids emitted as seepage from TSF2

Seepage modelling undertaken by Coffey, 2016 suggests that the seepage flux through the base of TSF2 will be of the order of 200-300m^3/day during the design life of this facility. This rate of seepage has the potential to adversely affect groundwater quality if the base of the TSF is not engineered to have a low hydraulic conductivity (DER, 2016).

The Licensee's Annual Environmental Report for the 2014-2015 reporting period was reviewed by DER. The review found that the groundwater at Nullagine Gold contains concentrations of arsenic (up to 800 micrograms per litre (µg/L)), nickel (up to 16,000µg/L) and copper (up to 400µg/L) at levels of environmental concern as they are well above ANZECC/ARMCANZ, 2000 guidelines. The ANZECC/ARMCANZ, 2000 guideline trigger values for freshwater (95% species) for arsenic, nickel and copper is 13µg/L, 11µg/L and 1.4µg/L respectively.

The following considerations were incorporated into the design of TSF2 to reduce the risk of seepage:

- Hydraulic testing of the area shows low conductivity (1×10^{-7}) clay oxide in the north of the footprint and low conductivity (8×10^{-7}) siltstone/fine-grained sandstone to the south of the footprint. Permeability was analysed and used to calculate likely travel time of groundwater underlying the TSF2 as <1m/year
- Naturally low permeability of clay/oxide sediments in the construction zone
- Decant structures to recover the highest percentage of process water in each cell. The decant structure and toe drain submersible pumps have the capacity to deliver 15L/s and have been designed to operate for the expected life of the TSF2 facility

- An underdrainage system, comprising a finger drain network at the base of each cell is incorporated into the design of the facility to assist with the recovery of water from the consolidation of the tailings and to reduce potential seepage loss. The total design length for the underdrainage lines for the proposed TSF2 facility is approximately 3.5km and is aimed at collecting water from the near surface sand layer that is present over some of the proposed site. The underdrainage system will discharge any collected water into a water return sump
- Downstream toe drain installed parallel to the toe of the perimeter embankments, with water return sumps installed at the lowest points. These sumps were constructed using large diameter concrete pipes, placed vertically on top of each other building up through the tailings as required. Water collected at these points is either pumped back into the TSF2 facility or via the decant drain and back to the processing plant
- Additional nested piezometer monitoring bores drilled and installed
- Groundwater regularly monitored and measured against baseline conditions to ensure that groundwater quality is not affected
- Two production bores (KCB12 and KCB12B) to act as an interception and pump back system, if required
- Tailings discharge conducted so that the supernatant water is constantly positioned around the central decant structure ensuring that ponding is kept away from the perimeter containment embankment

The Delegated Officer has considered the location of TSF2 within a Priority 3 PDWSA; distance to the Priority 1 PDWSA; distance to groundwater (20-25 mbgl); and the high levels of arsenic, nickel and copper and determined that there will be high level on-site impacts and mid level off-site impacts on a local scale. Therefore, the Delegated Officer considers the consequence to be **major.**

The Delegated Officer has considered the infrastructure requirements for TSF2 on the licence (including requirement for additional engineering works to reduce the hydraulic conductivity of regolith beneath TSF2 footprint to meet permeability of $1x10^{-9}$ m/s) and low permeability of the Mosquito Creek Formation and determined that the impact of seepage to the Priority 1 PDWSA will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence occurring to be **unlikely**

The overall rating for the risk of seepage from TSF2 to the Priority 1 PDWSA during operation is **medium,** subject to regulatory controls.

Spillage of tailings through leaks, pipeline ruptures or failure

The Licensee has stated that:

- Tailings and return water pipelines are located within open trenches to contain any spillage in the event of pipeline failure
- Automated systems are installed to monitor pipeline flow and pressure
- Inspections of the tailings and return water pipelines are to occur at a minimum of two times per shift

The Delegated Officer has considered the location of TSF2 within a Priority 3 PDWSA, composition of tailings and that there are no Priority Ecological Communities or Declared Rare Flora within a 5km radius of TSF2 and determined that a tailings spillage impact would result in low level on-site impacts. Therefore, the Delegated Officer considers the consequence to be **minor**

The Delegated Officer has considered the infrastructure requirements for the TSF2 pipelines (tailings and return water) on the licence; distance to specified ecosystems; and low

permeability of the Mosquito Creek Formation and determined that the environment impact from a tailings spill will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence occurring to be **unlikely**

The overall rating for the risk of a tailing spill during operation is **medium,** subject to regulatory controls.

Decision

The Delegated Office has determined the key emissions association with the operation of TSF2.

Based on the application supporting documentation, the Delegated Officer has determined that the operation of TSF2 to the extent proposed in the application may result in emissions which have an unacceptable impact to the environment, in the longer term.

The Delegated Officer considers the overall risk of TSF2 from overtopping, spillages of tailings, tailings deposition and associated seepage to be *medium*, subject to regulatory controls. This is due to the location of TSF2 within a Priority 3 PDWSA, distance to the Priority 1 PDWSA and elevated levels of arsenic, nickel and copper having been detected in the underlying groundwater.

Existing Condition 1.3.3 has been updated via this Notice to include TSF2 (C3) and associated containment infrastructure requirements. The previous map of storage locations has been replaced via this Notice (Attachment 2) to include C3.

Existing Condition 1.3.4 has been updated via this Notice as the total freeboard is 845mm, as opposed to 900mm (operational freeboard 300mm, beach freeboard 200mm and stormwater freeboard 345mm). This has also been approved by DMP.

Existing Conditions 1.3.5 and 1.3.7 have been updated via this Notice to ensure that the conditions incorporate both TSFs (TSF1 and TSF2).

The Licence Holder has committed to constructing TSF2 to the specifications provided in MML, 2016a and Coffey, 2016. As cell one of TSF2 has already been constructed, Condition 1.3.16 has been added to the licence via this Notice for the infrastructure requirements for TSF2 and pipelines (tailings and return water). Figure 1 (diagram depicting the underdrainage system, decant structure, toe drain and piezometers) and Figure 2 (diagram depicting the alternative rock ring decant structure) have also been included (Attachments 5 and 6) via this Notice.

DER determined that *"additional engineering works be undertaken to further reduce the hydraulic conductivity of regolith beneath TSF footprint*" to meet permeability of 1 x 10^{-9} m/s and "*to increase the uniformity of the hydraulic properties of these materials. The earthworks should include importing suitable clayey material to develop a well-engineered clay liner for the base of TSF2*" (DER, 2016). This requirement for additional engineering works for the TSF2 base has been implemented via Condition 1.3.16.

The inclusion of Condition 1.3.17 allows for the operation of TSF2 following submission of the document required under Condition 5.3.1. The requirement to submit the document to the CEO of DER within 14 days from date of this issued Notice and identify any departures has been implemented via Condition 5.3.1.

Condition 3.3.1 has been updated via this Notice to include the requirement to monitor the water reclaimed from TSF2 for use onsite. The Delegated Officer considers this condition necessary due to the elevated concentrations of arsenic, copper and nickel in the underlying groundwater and to enable an assessment of the water quality as part of the current risk-based review.

Condition 3.4.1 has been updated via this Notice to incorporate the groundwater monitoring bores (TSF2MB1S/D to TSF2MB5S/D, KCB07F, KCB12 and KCB41) associated with TSF2.

The previous map of monitoring locations has been replaced (Attachment 3) and the map of production bores has been included (Attachment 4) via this Notice.

DER is currently undertaking a detailed risk-based review of the licence to align the licence with DER's risk-based Regulatory Framework. The review will incorporate these amendments into the Revised Licence.

Other amendments

During this amendment the following changes have also been made:

- Premises tenure has been updated as some tenure were invalid or no longer registered with DMP (MML, 2016c). The premises map has been amended via this Notice (Attachment 1).
- The licence duration has been extended from 29 September 2018 to 29 September 2026 in line with DER's Guidance Statement: *Licence Duration* and the Notice of Amendment of Licence Expiry Dates, dated 29 April 2016.
- Previous Conditions 1.3.8, 5.2.3 and 5.2.4 have been removed via this Notice as TSF1 Stage 4 Lift for which these conditions were associated was completed in June 2016 and compliance documentation received by DER on 17 August 2016.
- Previous Condition 4.1.1 has been removed from the Licence under this Notice. The Licence Holder submitted the document *"Nullagine Gold Project, DER IR1 & IR2 Response: Groundwater Management Improvement Plan"* (MRL, 2016b) to DER on 24 January 2017 and this information will be incorporated into the risk-based review of Nullagine Gold, which is currently being undertaken by the Department.
- Condition 5.2.1 has been updated in line with licence conditions.
- Form GR1 has been updated for the monitoring of ambient groundwater quality to include the bores associated with TSF2 and Form PR2 included for the monitoring of tailings reuse water.

DER is also implementing changes to update the Licence in accordance with recent administrative changes, as follows:

- Addition of definitions for 'Anniversary Date', 'Annual Audit Compliance Report', 'Department', 'mbgl' and 'RL' and updates to the definition of 'Annual Period', 'CEO for the purpose of correspondence' and 'six monthly'.
- Updates to the Annual Audit Compliance Report submission and reporting requirements specified under Conditions 5.1.3 and 5.2.1.
- Removal of the Annual Audit Compliance Report Template from Schedule 2.

Amendment History

Table 5 provides the amendment history for L8675/2012/1.

Table 5: Licence amendments

Instrument	Issued	Amendment
L8675/2012/1	24/12/2013	Licence amendment to allow discharge of treated effluent to Tailings Storage Facility 1
L8675/2012/1	3/07/2014	Licence amendment to allow disposal of tyres on site
L8675/2012/1	23/10/2014	Licence amendment to increase production capacity from 1.5Mtpa to 2Mtpa

L8675/2012/1	27/08/2015	Licence amendment to add improvement conditions requiring a Corrective Action Plan to improve the groundwater monitoring and the development of groundwater limits. Update to licence under Departmental reform program
L8675/2012/1	19/11/2015	Licence amendment to authorise TSF1 Stage 4 lift. Improvement conditions updated. Groundwater limits applied.
L8675/2012/1	14/03/2017	Amendment Notice 1 Licence amendment to authorise the operation of TSF2 with specific infrastructure requirements

Licence Holder's Comments

The Licence Holder was provided with the draft Amendment Notice on 8 March 2017. The Licence Holder provided a signed waiver form on 10 March 2017 and no comments were received.

Amendment

1. The licence prescribed premises location is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

   Nullagine Gold Operation – Golden Eagle Project
   Mining Tenements M46/186, M46/300, M46/267, M46/432, M46/264, M46/436, M46/444, M46/265, M46/138, M46/443, M46/266, M46/445, ~~M46/1123~~, ~~P46/1604,~~ P46/1760, ~~P46/1605,~~ M46/261, M46/446, M46/430, P46/1759, M46/262, M46/272, M46/447, ~~C46/2,~~ L46/45, M46/441, M46/3, M46/164, L46/88, M46/64, M46/98, M46/302, M46/431, M46/282, M46/273, M46/182, M46/199, M46/225, M46/277, M46/146, M46/198, M46/276, M46/275, L46/105, M46/274, M46/434, M46/433, M46/200, M46/163, P46/1758, M46/129, P46/1757, L46/98, M46/47 ~~and~~ P46/1707, ***G46/2, L46/89, L46/90, L46/91, L46/92, L46/115, L46/33, M46/50, M46/57, M46/166, M46/167, M46/170, M46/187, M46/189, M46/192, M46/263, M46/278, M46/279, M46/283, M46/303, M46/426, M46/427, M46/428, M46/429, M46/442, M46/448, P46/1670, P46/1671, P46/1672, P46/1673, P46/1674, P46/1675, P46/1676, P46/1703, P46/1704, P46/1705, P46/1706, P46/1761, P46/1804, P46/1823, P46/1824, P46/1855, and P46/1856***
   NULLAGINE WA 6758

2. The licence duration has been extended from 29 September 2018 to 29 September 2026.

3. The licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below for section 1.1.2:

   ~~'AHD' means the Australian height datum;~~

   'Anniversary Date' means 1 July of each year;

   'Annual Audit Compliance Report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website;

   ***'A~~a~~nnual P~~p~~eriod'** means **a 12 month** ~~the inclusive~~ period **commencing** from 1 October ~~to~~ **until** 30 September in the following year;*

   ***'CEO'** for the purpose**s** of ~~correspondence~~ **notification** means;*

   Chief Executive Officer
   *Department **Division 3, Part V of** ~~Administering~~ the Environmental Protection Act*

1986
Locked Bag 33 ***Cloisters Square***
PERTH ~~*CLOISTERS SQUARE*~~ *WA 6850*
~~*Email:*~~ *info@der.wa.gov.au;*

'Department' means the department established under section 35 of the Public Sector Management Act 1994 and designated as responsible for the administration of Division 3 Part V of the Environmental Protection Act 1986;

'mbgl' means metres below ground level;

'RL' means Reduced Level;

'six monthly' *means the 2 inclusive periods from 1 October to 31 March* ***in the following year*** *and 1 April to 30 September ~~and in the following year~~;*

4. Condition 1.3.3 of the licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

1.3.3 The Licensee shall ensure that tailings, decant water and treated effluent from the wastewater treatment plant are only discharged into containment cells and/or ponds with the relevant infrastructure requirements and at the locations specified in Table 1.3.1 and shown in the map in Schedule 1.

Table 1.3.1: Containment infrastructure			
Containment point reference	***Containment cell or dam number(s)***	***Material***	***Infrastructure requirements***
C1	*TSF**1***	*Tailings and treated effluent from the wastewater treatment plant*	*Stage 4 lift to RL 406.5m **at completion***
C2	*Process Pond*	*Tailings thickener overflow, decant return, process catchment water and bore water from production bores 6B and 6C*	*Lined with high density polyethylene liner with a permeability of at least <10^{-9} m/s or equivalent*
C3	***TSF2***	***Tailings and treated effluent from the sewage treatment plant***	***Lift to RL 399.0m at completion*** ***Permeability across the base of TSF meets 1 x 10^{-9} m/s or less*** ***Underdrainage system installed at the base of TSF cell 1 and cell 2 draining to underdrainage collection sumps depicted in Figure 1 and 2*** ***Toe drain depicted in Figure 1 and 2***

5. Condition 1.3.4 of the licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

1.3.4 *The Licensee shall manage **the** containment ~~cells and/or dam or ponds~~ **infrastructure** in Table 1.3.1 such that:*

*(a) a minimum top of embankment freeboard of ~~900~~ **845**mm or a 1 in 100 year/72 hour storm event (whichever is greater) is maintained at the TSF**s**;*

(b) a minimum top of embankment freeboard of 300mm is maintained at the Process Pond; and

(c) methods of operation minimise the likelihood of erosion of the embankments by wave action.

6. Condition 1.3.5 of the licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

*1.3.5 The Licensee shall manage the TSF**s** such that:*
*(a) a seepage collection and recovery system is provided and used to capture seepage from the TSF**s**;*
*(b) seepage is returned to the TSF**s** or re-used in process; and*
*(c) the supernatant pond on the TSF**s** is minimised as far as practicable.*

7. Condition 1.3.7 of the licence is amended by the insertion of the bold text shown in underline below:

*1.3.7 The Licensee shall undertake an annual water balance for **each of** the TSF**s**. The water balance shall as a minimum consider the following:*
(a) site rainfall;
(b) evaporation;
(c) decant water recovery volumes;
(d) seepage recovery volumes; and
(e) volumes of tailings deposited.

8. The licence is amended by the deletion of the following Condition 1.3.8:

~~*1.3.8 The Licensee shall construct the Tailings Storage Facility Lift Stage 4 in accordance with the documentation listed in Table 1.3.3.*~~

~~***Table 1.3.3: Construction requirements[1]***~~		
~~***Document***~~	~~***Parts***~~	~~***Date of Document***~~
~~*Licence Amendment Application. Golden Eagle Project Tailings Storage Facility Lift Stage 4*~~	~~*All*~~	~~*June 2015*~~
~~*Millennium Minerals Ltd Golden Eagle Project, Nullagine. TSF Stage 4 Raising Design Report. Coffey Mining Pty Ltd*~~	~~*All*~~	~~*23 June 2015*~~

~~*Note 1: Where the details and commitments of the documents listed in condition 1.3.8 are inconsistent with any other condition of this licence, the conditions of this licence shall prevail.*~~

9. The licence is amended by the deletion of the following Condition 1.3.14:

~~*1.3.14 The Licensee shall:*~~
~~*(a) erect and maintain suitable fencing around the landfill facility and irrigation area that acts as an effective barrier to unauthorised persons, cattle, horses and other stock; and*~~
~~*(b) undertake regular inspections of all security measures and repair damage as soon as practicable.*~~

10. Condition 1.3.15 of the licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

*1.3.15 The Licensee shall ensure that wind-blown waste is contained within the landfill area and that wind-blown waste is returned to the tipping area on at least a **weekly** ~~monthly~~ basis.*

11. The licence is amended by the insertion of the following Condition 1.3.16:

1.3.16 The Licensee shall ensure that the infrastructure or equipment specified in Table 1.3.7 is designed in accordance with the requirements specified in Table 1.3.7.

Table 1.3.7: Infrastructure requirements	
Infrastructure	***Requirements (design)***
TSF2	***The TSF2 must:*** ***(a) be no more than 109 hectares;*** ***(b) be no more than RL 399.0m;*** ***(c) include additional engineering works to the base to further reduce the hydraulic conductivity of regolith beneath the TSF footprint and to increase the uniformity of the hydraulic properties of these materials so that the permeability across the base meets 1 x 10^{-9} m/s or less;*** ***(d) include an underdrainage system, comprising a finger drain network at the base of each cell to assist with the recovery of water from the consolidation of the tailings and to reduce potential seepage loss;*** ***(e) include water return sumps installed at the lowest points and constructed using large diameter concrete pipes founded on a concrete base. The underdrainage system discharges any collected water into a water return sump as depicted in Figure 1 of Schedule 1;*** ***(f) include piezometers TSF2MB1S/D, TSF2MB2S/D, TSF2MB3S/D, TSF2MB4S/D, TSF2MB5S/D monitored prior, during and after beaching operations across TSF2;*** ***(g) include groundwater monitoring bores KCB07F, KCB12, KCB41 depicted in the map of monitoring locations in Schedule 1 with baseline monitoring conducted of the parameters listed in Table 3.4.1 locations during commissioning and before operation;*** ***(h) include two production bores KCB12 and KCB12B to act as an interception and pump back system should they be required to manage any potential seepage as depicted in the map of production bores in Schedule 1;*** ***(i) be designed to accommodate a 1 in 100 year 72 hour rainfall event;*** ***(j) be designed to have a freeboard of 500mm above storm water capacity elevation; and*** ***(k) include centrally located decant structures to recover the highest percentage of process water in each cell.***
Pipelines (tailings and return water)	***Pipelines constructed of high density polyethylene*** ***Pipelines located within a bunded trench, with sufficient capacity to contain any spill for a period equal to the time between routine inspections*** ***Return water pipeline with a series of valves to allow water to be diverted into the tailings line for flushing purposes via junction points*** ***Flow meters positioned at the start and end of the tailings pipeline to monitor flows and pressure losses. In the event of pipeline failure, Shift Supervisor is to be notified and the pipeline shut down until repaired*** ***Spigots placed at approximately 18m centres around the TSF2 perimeter***

12. The licence is amended by the insertion of the following Condition 1.3.17:

1.3.17 The Licensee shall operate TSF2 in accordance with the conditions of this Licence, following submission of the document required under condition 5.3.1.

13. Condition 3.3.1 of the licence is amended by the insertion of the bold text shown in underline below:

3.3.1 The Licensee shall undertake the monitoring specified in Table 3.3.1.

Table 3.3.1: Process monitoring				
Monitoring point reference	***Process description***	***Parameter***	***Units***	***Frequency***
P1 being the pipe feeding TSF from the wastewater-treatment plant	*Treated wastewater quality*	*pH[1]*	*pH units*	*Fortnightly*
		Biochemical oxygen demand	*mg/L*	
		Total suspended solids	*mg/L*	
		Total nitrogen	*mg/L*	
		Total phosphorus	*mg/L*	
		E.coli	*org/100mL*	
P2 being the tailings reuse water	***Water recovered from the TSF2 for reuse onsite***	***pH[1]***	***pH units***	***Quarterly***
		Electrical conductivity	***µS/cm***	
		Total dissolved solids	***mg/L***	
		Hardness	***mg/L***	
		Hydroxide	***mg/L***	
		Silicon dioxide	***mg/L***	
		Carbonate	***mg/L***	
		Bicarbonate	***mg/L***	
		Potassium	***mg/L***	
		Calcium	***mg/L***	
		Magnesium	***mg/L***	
		Chloride	***mg/L***	
		Sulfate	***mg/L***	
		Nitrate	***mg/L***	
		Aluminium (dissolved)	***mg/L***	
		Arsenic	***mg/L***	
		Boron	***mg/L***	
		Barium	***mg/L***	
		Beryllium	***mg/L***	
		Mercury	***mg/L***	
		Molybdenum	***mg/L***	
		Lead (dissolved)	***mg/L***	
		Selenium	***mg/L***	
		Antimony	***mg/L***	
		Strontium	***mg/L***	
		Zinc (dissolved)	***mg/L***	
		Chromium (VI) (dissolved)	***mg/L***	
		Copper	***mg/L***	
		Iron (dissolved)	***mg/L***	
		Manganese	***mg/L***	
		Nickel	***mg/L***	
-	-	*Volumes of tailings and treated effluent from the Wastewater Treatment Plant deposited into the TSF**s***	*m^3*	*Continuous*
-	-	*Volumes of water recovered from the TSF**s***	*m^3*	*Continuous*
-	-	*Phreatic surface levels within TSFs embankments*	*mAHD*	*Monthly*
-	-	*Volumes of seepage recovered*	*m^3*	*Continuous*

Note 1: In-field non-NATA accredited analysis permitted.

14. Condition 3.4.1 of the licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table and record and investigate results that do not meet any limit specified.

Table 3.4.1: Monitoring of ambient groundwater quality					
Monitoring point reference	***Parameter***	***Limit***	***Units***	***Averaging period***	***Frequency***
GEWB01, GEWB02, GEWB04, GEWB05, GEWB06, GEWB09, GEWB012A, GEWB013A, GEWB014A, GEWB015, GEWB016, GEWB019, GEWB020, GEWB023	*Volume[1]*	*None specified*	*kL*	*Continuous*	*Monthly*
	pH[1]		*-*	*Spot sample*	*Quarterly*
	Electrical conductivity[1]		*µS/cm*		
	Total dissolved solids[1]		*mg/L*		
GEWB021, GEWB024, M01-M04, M16, M17, GEWB05, GEWB02, GEWB016, M05, M06, M07, 11SDMW08, TDMB1S/D, TDMB2S/D, TDMB3S/D, TDMB4S/D, TDMB5S/D, TDMB6S/D, ***TSF2MB1S/D, TSF2MB2S/D, TSF2MB3S/D, TSF2MB4S/D, TSF2MB5S/D, KCB07F, KCB12, KCB41***	*pH[1]*	*None specified*	*-*	*Spot sample*	*Annually~~:~~ GEWB021, GEWB024, M01-M04, M16, M17* *Six monthly: GEWB05, GEWB02, GEWB016,M05, M06, M07,11SDMW08* *Quarterly: TDMB1S/D, TDMB2S/D, TDMB3S/D, TDMB4S/D, TDMB5S/D, TDMB6S/D* ***TSF2MB1S/D, TSF2MB2S/D, TSF2MB3S/D, TSF2MB4S/D, TSF2MB5S/D, KCB07F, KCB12, KCB41***
	Electrical conductivity		*mg/L*		
	Total dissolved solids				
	Hardness				
	Hydroxide				
	Silicon dioxide				
	Carbonate				
	Bicarbonate				
	Potassium				
	Calcium				
	Magnesium				
	Chloride	*1500*	*mg/L*		
	Sulfate	*3000*	*mg/L*		
	Nitrate	*50*	*mg/L*		
	Aluminium (dissolved)	*2*	*mg/L*		
	Arsenic	*5*	*mg/L*		
	Boron	*5*	*mg/L*		
	Barium	*5*	*mg/L*		
	Beryllium	*0.6*	*mg/L*		
	Mercury	*0.01*	*mg/L*		
	Molybdenum	*0.5*	*mg/L*		
	Lead (dissolved)	*0.1*	*mg/L*		
	Selenium	*0.1*	*mg/L*		
	Antimony	*0.03*	*mg/L*		
	Strontium	*4*	*mg/L*		
	Zinc (dissolved)	*3*	*mg/L*		
	Chromium (VI) (dissolved)	*~~Not yet specified (IR2)~~*	***mg/L***		
	Copper				
	Iron (dissolved)				
	Manganese				
	Nickel				
GEWB05, GEWB02, GEWB016, M05, M06, M07, 11SDMW08	*Total recoverable hydrocarbons*	*5*	*mg/L*	*Spot sample*	*Six monthly*
TDMB1S/D, TDMB2S/D, TDMB3S/D, TDMB4S/D, TDMB5S/D,	*Total cyanide*	*None specified*	*mg/L*	*Spot sample*	*Quarterly*
	Free cyanide	*0.8*	*mg/L*		

Table 3.4.1: Monitoring of ambient groundwater quality					
Monitoring point reference	***Parameter***	***Limit***	***Units***	***Averaging period***	***Frequency***
TDMB6S/D, ***TSF2MB1S/D, TSF2MB2S/D, TSF2MB3S/D, TSF2MB4S/D, TSF2MB5S/D, KCB07F, KCB12, KCB41***					
GEWB01, GEWB02, GEWB04, GEWB05, GEWB06, GEWB09, GEWB012A, GEWB013A, GEWB014A, GEWB015, GEWB016, GEWB019, GEWB020, GEWB023, GEWB07, GEWB08, GEWB012, GEWB013, GEWB014, GEWB021, GEWB024, M01- M07, M16, M17, TDMB1S/D, TDMB2S/D, TDMB3S/D, TDMB4S/D, TDMB5S/D, TDMB6S/D, ***TSF2MB1S/D, TSF2MB2S/D, TSF2MB3S/D, TSF2MB4S/D, TSF2MB5S/D, KCB07F, KCB12, KCB41***	*Water level*	*None specified*	*mbgl*	*Spot sample*	*Monthly*

Note 1: In-field non-NATA accredited analysis permitted.

15. The licence is amended by the deletion of the following Condition 4.1.1:

~~*4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date of completion in Table 4.1.1.*~~

~~*Table 4.1.1: Improvement program*~~		
~~***Improvement reference***~~	~~***Improvement***~~	~~***Date of completion***~~
~~*IR1*~~	~~*The Licensee shall submit to the CEO a report including, but not limited to:*~~ ~~*a) Development of TSF1 monitoring bore water level limit values.*~~	~~*1 October 2016*~~
~~*IR2*~~	~~*The Licensee shall submit to the CEO a report including, but not limited to:*~~ ~~*a) Environmental risk assessment of impacts to Cajuput Creek Hyporheic Zone from potentially elevated input of Copper, Total Iron, Hexavalent Chromium, Manganese and Nickel;*~~ ~~*b) Development of groundwater quality limit values for Copper, Total Iron, Hexavalent Chromium, Manganese and Nickel using baseline water quality results and in the context of Australian freshwater guidelines. These limits should be used to evaluate water quality results and to guide management of groundwater resources on the site.*~~	~~*1 October 2016*~~

16. Condition 5.1.3 of the licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

*5.1.3 The Licensee **must submit** ~~shall complete~~ **to the CEO within 90 days after the Anniversary Date,** an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions **in this** ~~of the~~ Licence~~, and any previous licence issued under Part V of the Act for the Premises~~ for the ~~previous~~ **A**~~a~~nnual **P**~~p~~eriod.*

17. Condition 5.2.1 of the licence is amended by the deletion of the text shown in strikethrough and the insertion of the bold text shown in underline below:

5.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 90 calendar days after the end of the annual period. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

Table 5.2.1: Annual Environmental Report		
Condition or table (if relevant)	***Parameter***	***Format or form***[1]
-	*Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken*	*None specified*
1.3.7	*TSF**s** water balance*	*None specified*
Table 3.2.1	*Inert Waste Type 1, Putrescible Waste and Clean fill tonnage* *Inert Waste Type 2 weight*	*None specified*
Table 3.3.1	*pH, biochemical oxygen demand, total suspended solids, total nitrogen, total phosphorus and E. coli*	*PR1*
	pH, Electrical conductivity, Total dissolved solids, Hardness, Hydroxide, Silicon dioxide, Carbonate, Bicarbonate, Potassium, Calcium, Magnesium, Chloride, Sulfate, Nitrate, Aluminium (dissolved), Arsenic, Boron, Barium, Beryllium, Mercury, Molybdenum, Lead (dissolved), Selenium, Antimony, Strontium, Zinc, (dissolved), Chromium (VI) (dissolved), Copper, Iron (dissolved), Manganese and Nickel	***PR2***
	*Volume of tailings and treated effluent from the wastewater treatment plant deposited into the TSF**s***	*None specified*

Table 5.2.1: Annual Environmental Report		
Condition or table (if relevant)	***Parameter***	***Format or form[1]***
	*Volumes of water recovered from the TSF**s***	*None specified*
	*Phreatic surface levels within TSF**s** embankments*	*None specified*
	Volumes of seepage recovered	*None specified*
Table 3.4.1	*Volume, pH, Electrical conductivity, Total dissolved solids, Hardness, Hydroxide, Silicon dioxide, Carbonate, Bicarbonate, Potassium, Calcium, Magnesium, Chloride, Sulfate, Nitrate, Aluminium **(dissolved), Arsenic,** Boron, Barium, Beryllium, Mercury, Molybdenum, Lead **(dissolved),** Selenium, Antimony, Strontium, Zinc, **(dissolved),** , Chromium **(VI) (dissolved),** Copper, Iron **(dissolved**), Manganese, Nickel, Total recoverable hydrocarbons, Total cyanide, Free cyanide and Water level*	*GR1*
5.1.2	*Compliance*	*~~Annual Audit Compliance Report (AACR)~~* ***None specified***
5.1.3	*Complaints summary*	*None specified*
5.1.4	*Records of waste types and quantities received at the site and disposed of at the site.*	*None specified*

Note 1: Forms are in Schedule 2

18. The licence is amended by the deletion of the following Condition 5.2.3:

~~5.2.3 The Licensee shall submit a compliance document to the CEO, following the completion of the works under condition 1.3.8 and prior to commissioning of the same.~~

19. The licence is amended by the deletion of the following Condition 5.2.4:

~~5.2.4 The compliance document shall:~~

~~(a) certify that the works were constructed in accordance with the conditions of the Licence;~~

~~(b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.~~

20. Condition 5.3.1 of the licence is amended by the insertion of the bold text shown in underline below:

5.3.1 The Licensee shall ensure that the parameters listed in Table 5.3.1 are notified to the CEO in accordance with the notification requirements of the table.

Table 5.3.1: Notification requirements			
Condition or table (if relevant)	***Parameter***	***Notification requirement[1]***	***Format or form[2]***
-	*Breach of any limit specified in the Licence*	*Part A: As soon as practicable but no later than 5pm of the next usual working day.*	*N1*
		Part B: As soon as practicable	
-	*Production ceasing for an unspecified period of time*	*As soon as practicable after the decision has been made*	*None Specified*
-	*Production recommencing*	*At least 28 days prior to production recommencing*	*None specified*

1.3.16	***The Licensee must submit to the CEO a document certified by a suitably qualified professional engineer which clearly details how TSF2 has been constructed to meet the infrastructure requirements of Condition 1.3.16 and identify any departures***	***Within 14 days from the date of this issued amendment***	***None specified***

Note 1: Notification requirements in the licence shall not negate the requirement to comply with s72 of the Act
Note 2: Forms are in Schedule 2

21. The Premises map in Schedule 1 is deleted and replaced with the map in Attachment 1 of this Notice.

22. The Map of storage locations in Schedule 1 is deleted and replaced with the map in Attachment 2 of this Notice.

23. The Map of monitoring locations in Schedule 1 is deleted and replaced with the map in Attachment 3 of this Notice.

24. The licence is amended by the insertion of the Map of production bores in Attachment 4 of this Notice.

25. The licence is amended by the insertion of Figure 1 in Attachment 5 of this Notice

26. The licence is amended by the insertion of Figure 2 in Attachment 6 of this Notice.

27. The licence is amended by the deletion of the Annual Audit Compliance Report Proforma in Schedule 2.

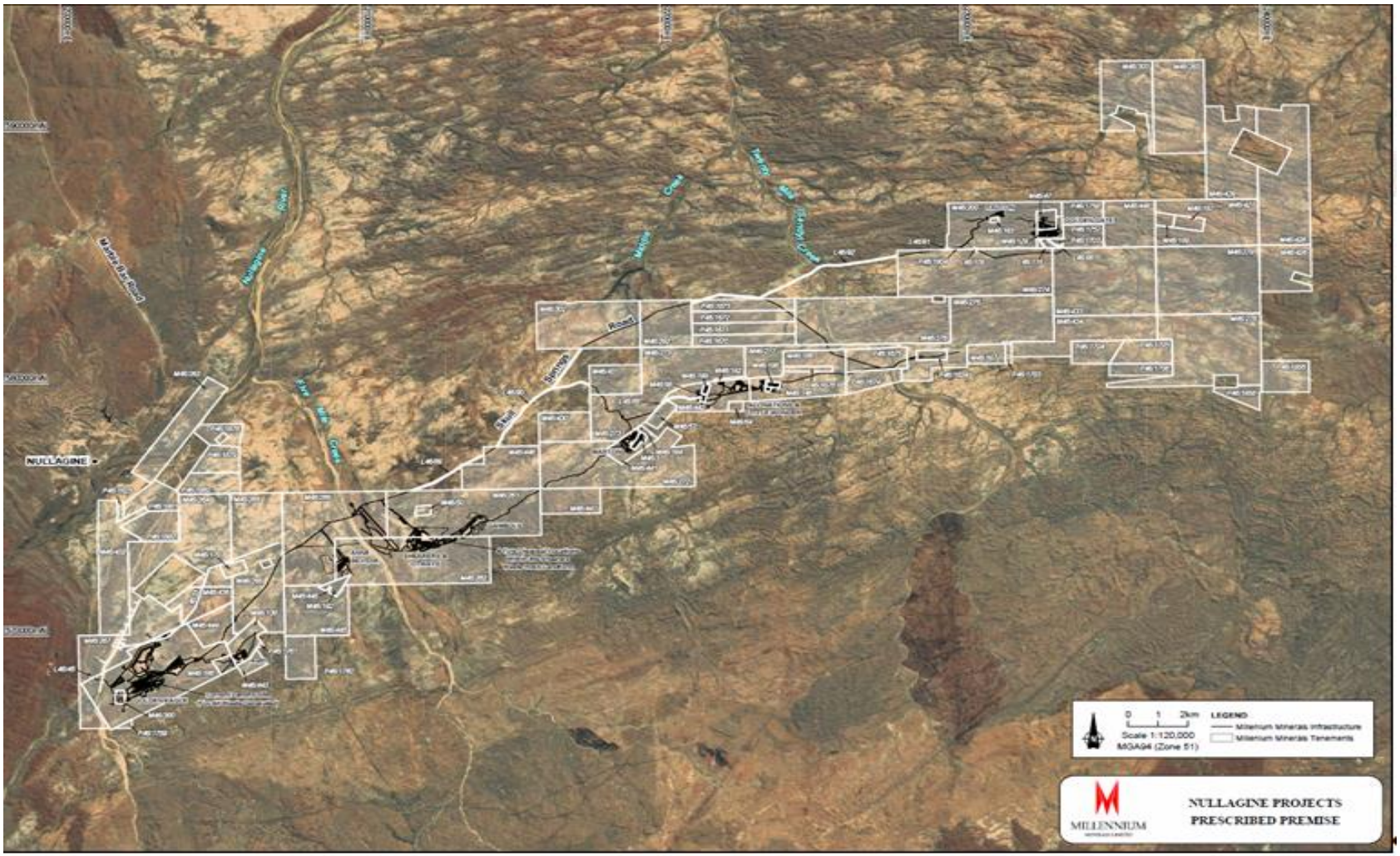
28. Form GR1 is amended by the insertion of the bold text shown in underline in Attachment 7.

29. The licence is amended by the insertion of Form PR2 in Attachment 8 of this Notice.

Attachment 1

Premises map

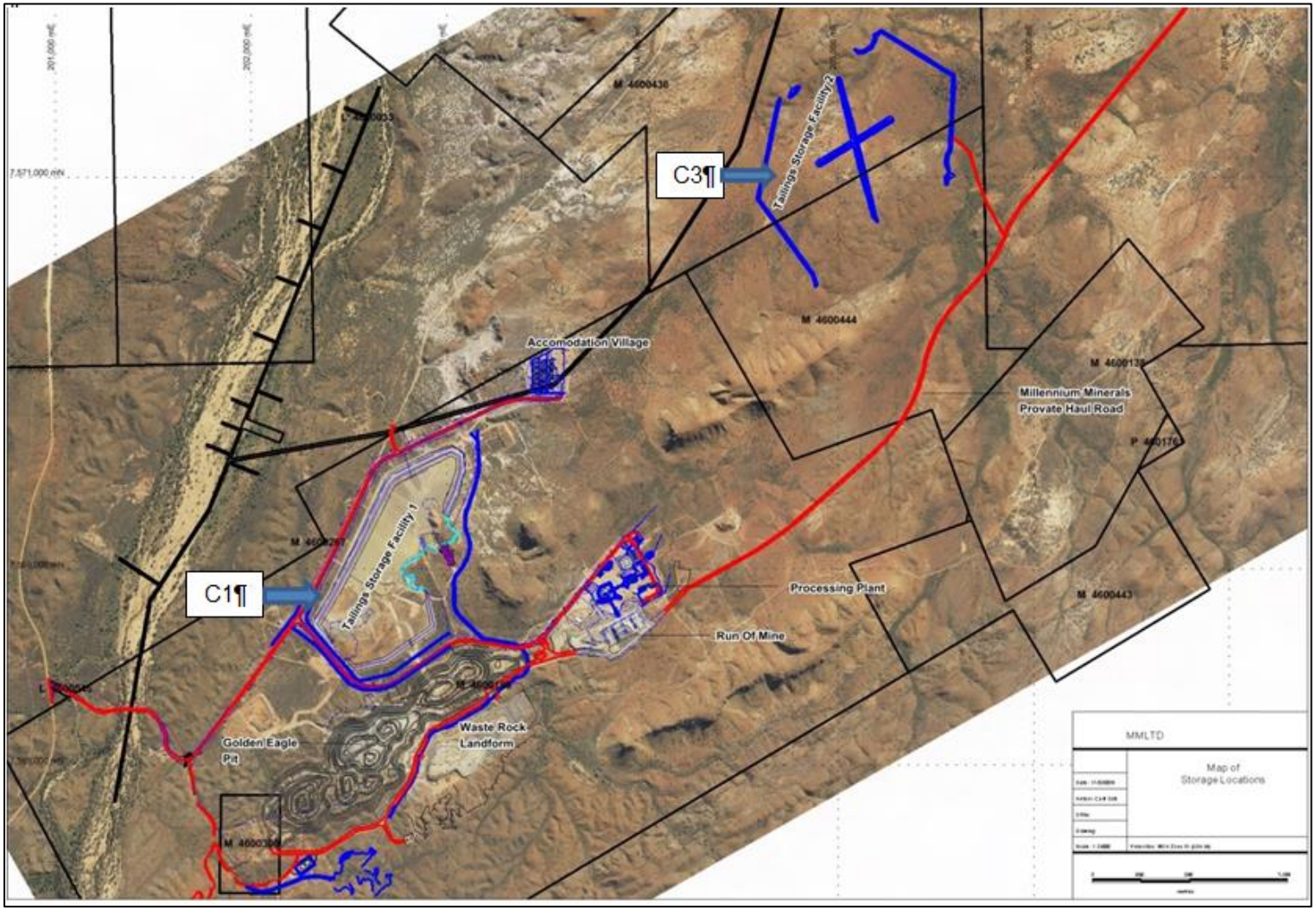
The Premises and landfill locations is shown in the map below. The white line depicts the Premises boundary.



Attachment 2

Map of storage locations

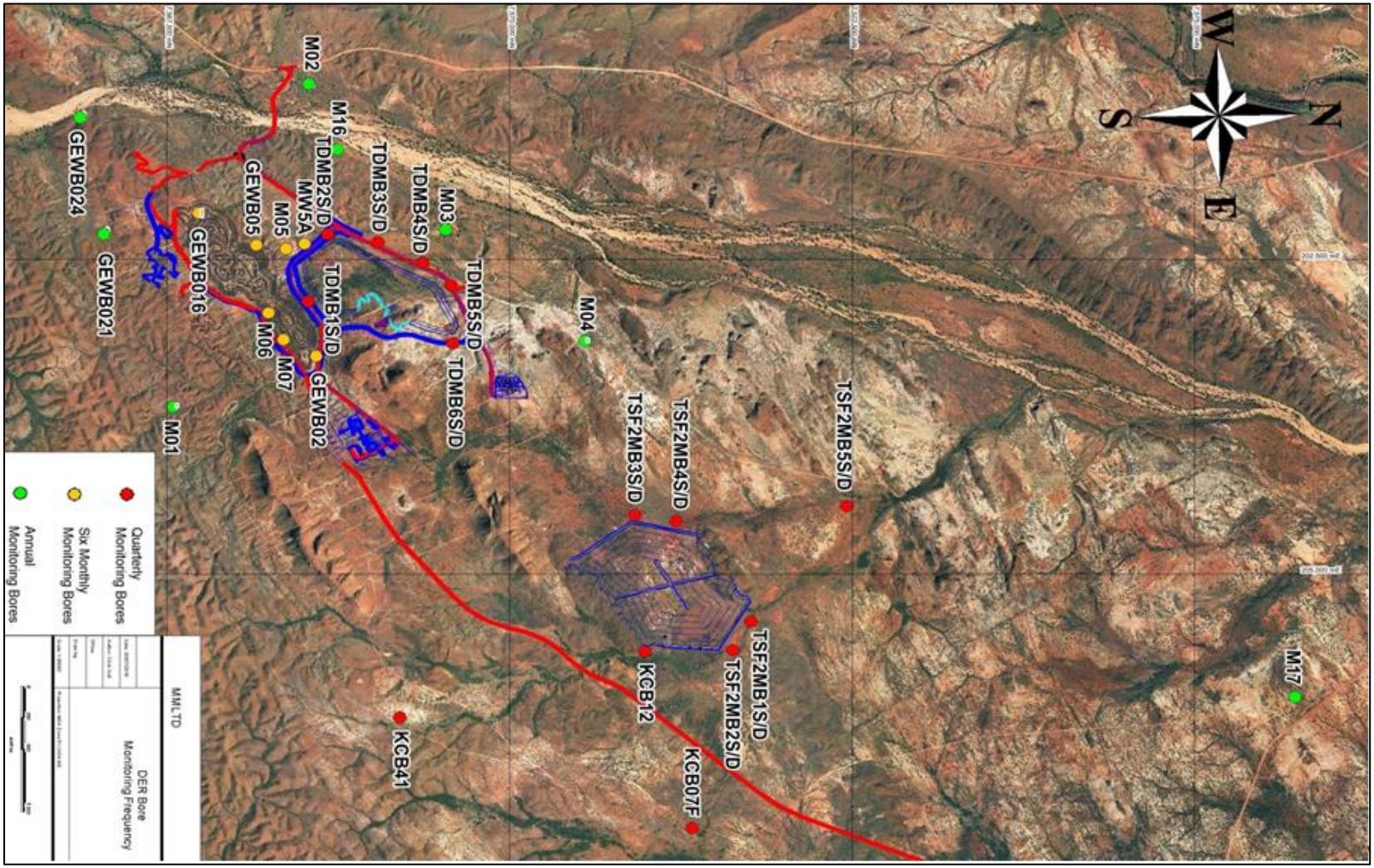
Storage locations C1 and C3 defined in Table 1.3.1 is shown below.



Attachment 3

Map of monitoring locations

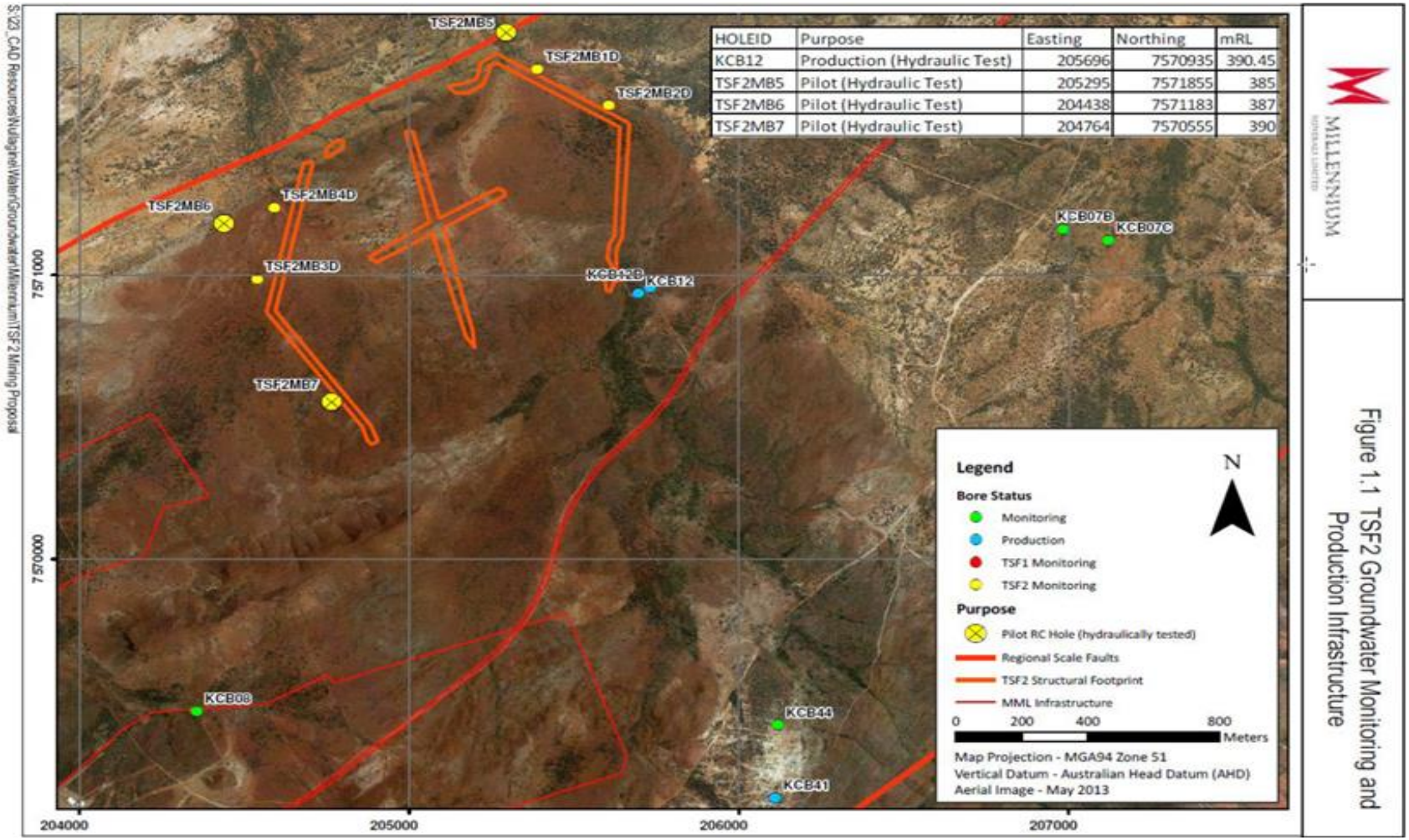
The locations of the monitoring points defined in Table 3.4.1 are shown below.



Attachment 4

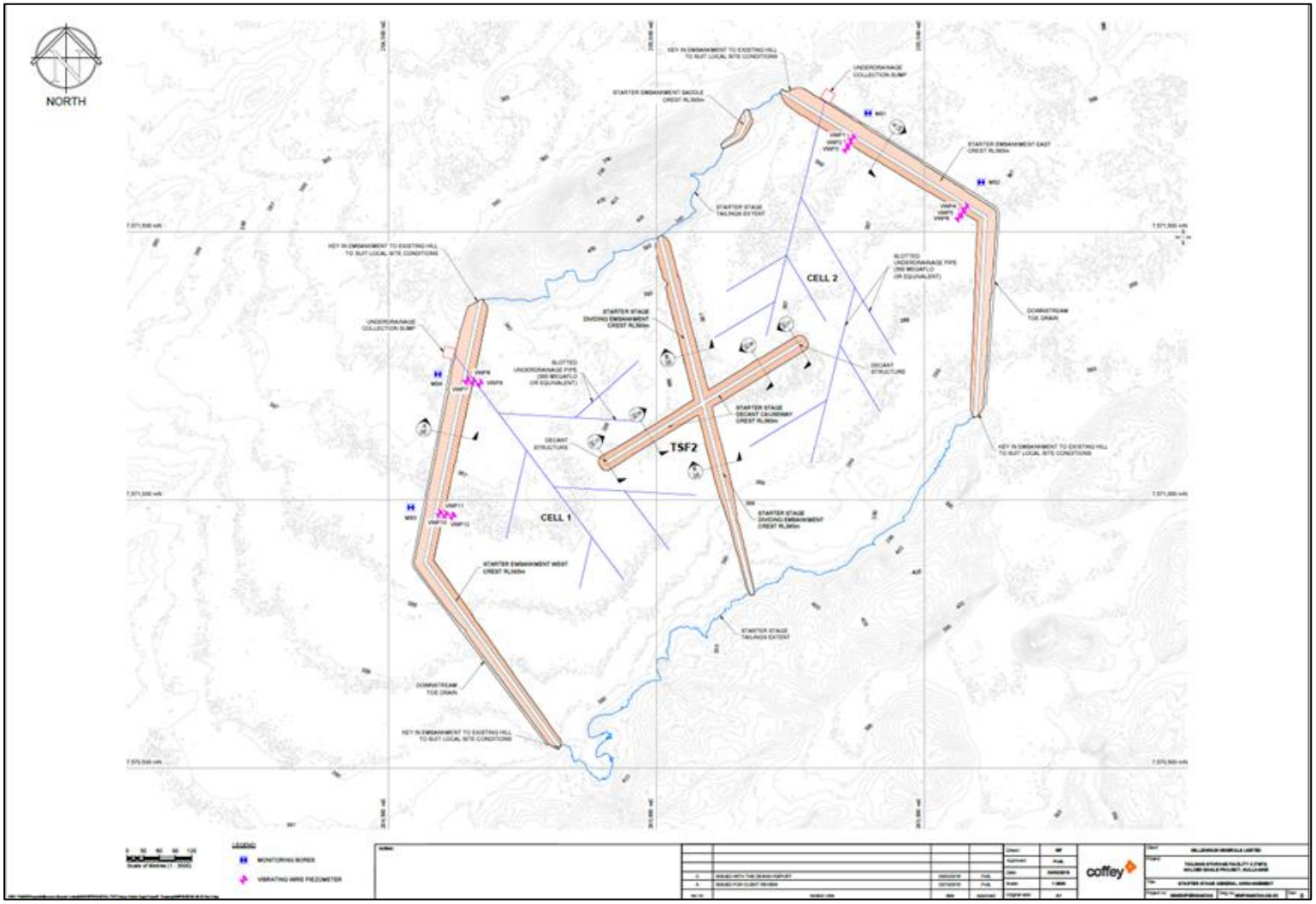
Map of production bores

The location of the production bores KCB12 and KCB12B that are to act as in interception and pump back system should they be required to manage any potential seepage.



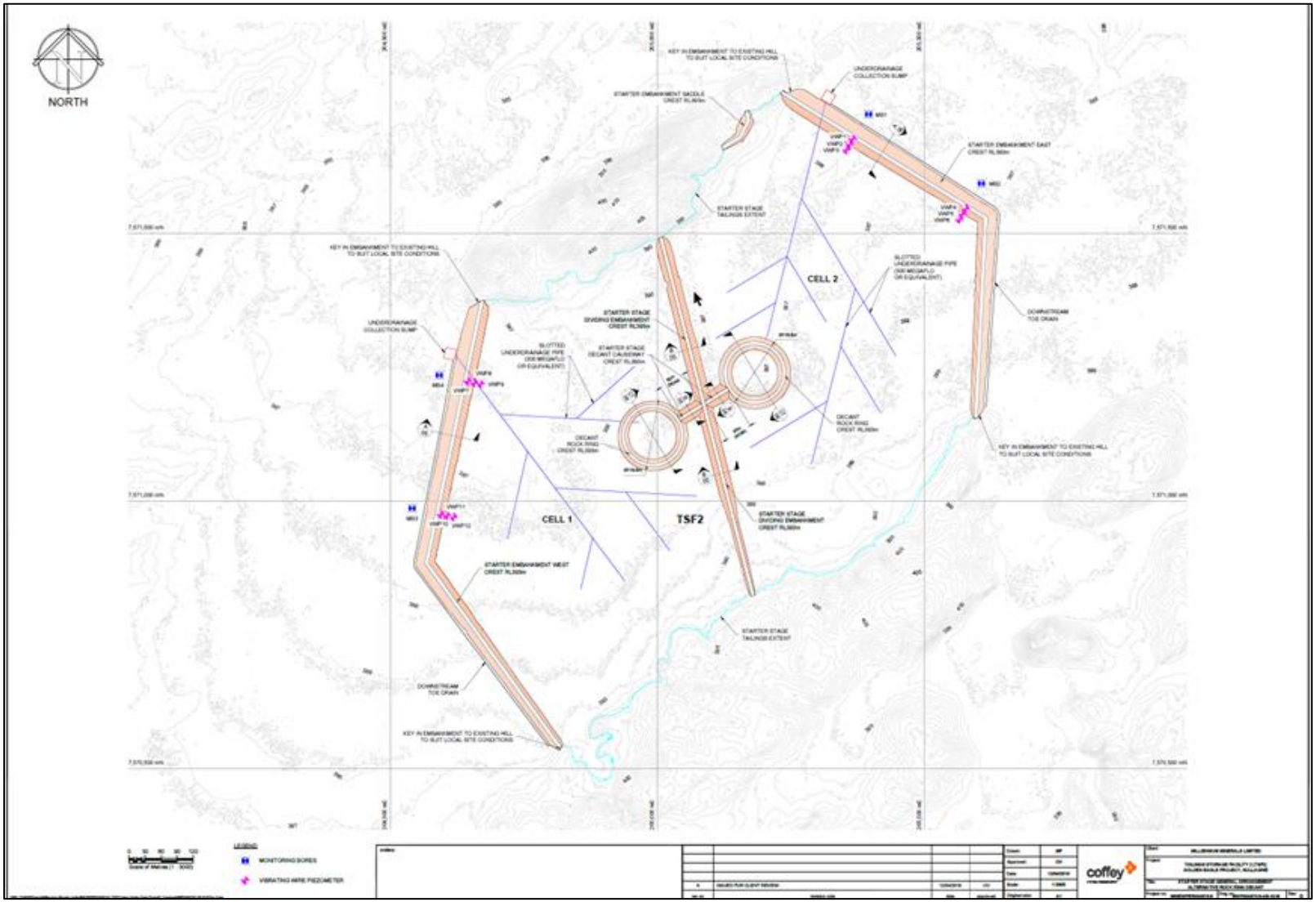
Attachment 5

Figure 1: Diagram depicting the underdrainage system, decant structure, toe drain and piezometers



Attachment 6

Figure 2: Diagram depicting the alternative rock ring decant structure



Attachment 7

Licence: L8675/2012/1
Form: GR1
Name: Monitoring of ambient groundwater quality

Licensee: Millennium Minerals Limited
Period:

Form GR1: Monitoring of ambient groundwater quality						
Monitoring point	**Parameter**	**Result**	**Unit**	**Averaging period**	**Method**	**Sample date & times**
GEWB01 – 6 GEWB09 GEWB012A – 14A GEWB015 – 16 GEWB019 – 20 GEWB023	Volume		m^3	Spot sample		
	pH		-			
	Electrical conductivity		µS/cm			
	Total dissolved solids		mg/L			
GEWB02 GEWB05 GEWB016 GEWB021 GEWB024 M01-M07 M16 M17 11SDMW08 TDMB1S/D - TDMB6S/D **TSF2MB1S/D - TSF2MB5S/D** **KCB07F** **KCB12** **KCB41**	pH		-	Spot sample		
	Electrical conductivity		µS/cm			
	Total dissolved solids		mg/L			
	Hardness		mg/L			
	Hydroxide		mg/L			
	Silicon dioxide		mg/L			
	Carbonate		mg/L			
	Bicarbonate		mg/L			
	Potassium		mg/L			
	Calcium		mg/L			
	Magnesium		mg/L			
	Chloride		mg/L		(a)	
	Sulfate		mg/L			
	Nitrate		mg/L			
	Aluminium (dissolved)		mg/L			

Form GR1: Monitoring of ambient groundwater quality						
Monitoring point	**Parameter**	**Result**	**Unit**	**Averaging period**	**Method**	**Sample date & times**
	Arsenic		mg/L			
	Boron		mg/L			
	Barium		mg/L			
	Beryllium		mg/L			
	Mercury		mg/L			
	Molybdenum		mg/L			
	Lead (dissolved)		mg/L			
	Selenium		mg/L			
	Antimony		mg/L			
	Strontium		mg/L			
	Zinc (dissolved)		mg/L			
	Chromium (VI) (dissolved)		mg/L			
	Copper		mg/L			
	Iron (dissolved)		mg/L			
	Manganese		mg/L			
	Nickel		mg/L			
GEWB02 GEWB05 GEWB016 M05 - M07 11SDMW08	Total recoverable hydrocarbons		mg/L	Spot sample		
TDMB1S/D - TDMB6S/D **TSF2MB1S/D - TSF2MB5S/D** **KCB07F** **KCB12**	Total cyanide		mg/L	Spot sample		
	Free cyanide		mg/L			

Form GR1: Monitoring of ambient groundwater quality						
Monitoring point	**Parameter**	**Result**	**Unit**	**Averaging period**	**Method**	**Sample date & times**
KCB41						
GEWB01 GEWB02 GEWB04 - 09 GEWB012A – 14A GEWB012 – 16 GEWB019 - 21 GEWB023 GEWB024 M01 - M07 M16 M17 TDMB1S/D - TDMB6S/D **TSF2MB1S/D - TSF2MB5S/5D** **KCB07F** **KCB12** **KCB41**	Water level		mbgl	Spot sample		

Signed on behalf of Millennium Minerals Limited …….. Date: …….

Attachment 8

Licence: L8675/2012/1
Form: PR2
Name: Process monitoring

Licensee: Millennium Minerals Limited
Period:

Form PR2: Process monitoring						
Emission point	Parameter	Unit	Result	Averaging period	Method	Sample date & times
P2	pH	-		Spot sample		
	Electrical conductivity	µS/cm				
	Total dissolved solids	mg/L				
	Hardness	mg/L				
	Hydroxide	mg/L				
	Silicon dioxide	mg/L				
	Carbonate	mg/L				
	Bicarbonate	mg/L				
	Potassium	mg/L				
	Calcium	mg/L				
	Magnesium	mg/L				
	Chloride	mg/L				
	Sulfate	mg/L				
	Nitrate	mg/L				
	Aluminium (dissolved)	mg/L				
	Arsenic	mg/L				
	Boron	mg/L				
	Barium	mg/L				
	Beryllium	mg/L				

	Mercury	mg/L				
	Molybdenum	mg/L				
	Lead (dissolved)	mg/L				
	Selenium	mg/L				
	Antimony	mg/L				
	Strontium	mg/L				
	Zinc (dissolved)	mg/L				
	Chromium (VI) (dissolved)	mg/L				
	Copper	mg/L				
	Iron (dissolved)	mg/L				
	Manganese	mg/L				
	Nickel	mg/L				

Signed on behalf of Millennium Minerals Limited …….. Date: …….

Appendix 1: Key Documents

	Document Title	In text ref	Availability
1	DER *Guidance Statement: Licence duration (August 2016)*		accessed at http://www.der.wa.gov.au
2	DER *Guidance Statement: Risk Assessments* (February 2017)		
3	DER *Guidance Statement: Decision Making* (February 2017)		
4	Licence L8675/2012/1 – Nullagine Gold Operation – Golden Eagle Project	L8675/2012/1	accessed at http://www.der.wa.gov.au
5	Millennium Minerals Limited, Golden Eagle Project, Nullagine, TSF2 Design Report, prepared by Coffey Mining Pty Ltd (MINEWPER00497AN), 16 May 2016	Coffey, 2016	DER records (A1101577)
6	National Water Quality Management Strategy, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand and Conservation Council and Agriculture and Resources Management Council of Australia and New Zealand, 2000	ANZECC/ ARMCANZ, 2000	accessed at http://www.environment.gov.au
7	Nullagine Gold Operation, TSF 2 construction, July 2016, received from Dr Steve Appleyard (DER), dated 20 July 2016	DER, 2016	DER records (A1134948)
8	Nullagine Gold Project – Supporting Document – Tailings Storage Facility 2, Golden Eagle Project Environmental Protection Act 1986 Licence L8675/2012/1, Millennium Minerals Limited, 21 March 2016	MML, 2016a	DER records (A1072274)
9	Nullagine Gold Project, DER IR1 & IR2 Response: Groundwater Management Improvement Plan, Millennium Minerals Limited, December 2016	MML, 2016b	DER records (A1364674)
10	Priority Ecological Communities for Western Australia Version 24, Department of Parks and Wildlife, Species and Communities Branch, 24 June 2016	Parks and Wildlife, 2016	accessed at http://www.dpaw.wa.gov.au
11	RE: Millennium Minerals Prescribed Premises Licence Amendment	MML, 2017	DER records (A1368025)

	Document Title	In text ref	Availability
	L8675/2012/1 – Landfill, received from Millennium Minerals Limited, 30 January 2017		
12	RE: Nullagine Gold Operation – tenure, received from Ian Gale (Millennium Minerals Limited), 14 December 2016	MML, 2016c	DER records (A1339911)
13	Understanding-salinity – Salinity status classifications, by total salt concentration table, Department of Water	DoW, Salinity status classification	accessed at http://www.water.wa.gov.au/water-topics/water-quality/managing-water-quality/understanding-salinity