



Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L4611/1987/12
Licence Holder	Agnew Gold Mining Company Pty Ltd
ACN	098 385 883
File Number	2012/006836-1
Premises	Agnew Gold Mine Mining Tenements M36/27, M36/32, M36/53, M36/55, M36/65, M36/150, M36/174, M36/248, M36/314, M36/450 LEINSTER WA 6437 As defined by the Premises map in Schedule 1 to the Revised Licence
Date of Report	5 July 2021
Decision	Revised licence granted

**A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES**

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

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1. Decision summary

Licence L4611/1987/11 is held by Agnew Gold Mining Company Pty Ltd (Licence Holder) for the Agnew Gold Mine (the Premises), located within mining tenements M36/27, M36/32, M36/53, M36/55, M36/65, M36/150, M36/174, M36/248, M36/314, M36/450 and L36/174, Leinster.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during operation of the Premises. As a result of this assessment, Revised Licence L4611/1987/12 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing Licence previously granted in relation to the Premises. The Revised Licence has been granted in a new format with existing conditions being transferred, but not reassessed, to the new format. The licence is due for renewal in October 2022.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary

On 10 November 2020 and 2 February 2021, the Licence Holder submitted separate applications to the department to amend Licence L4611/1987/11 under sections 59 and 59B of the *Environmental Protection Act 1986* (EP Act). Following consultation with the Licence Holder, the Department has elected to combine both applications into a single assessment and amendment process, with recommendations and a decision on both applications being determined in this Amendment Report. The following amendments are being sought:

- Construction of an additional 11.66-kilometre pipeline to divert dewatering discharge from the New Holland, Genesis, Waroonga and Vivien mining pits;
- Three additional dewatering discharge points located in the previously mined Cox, Pilgram and Deliverer pits of the Crusader Complex; and
- Construction of a new three stage crushing and screening plant to replace the existing crusher at Agnew Gold processing plant.

This amendment is limited only to changes to Category 5 and Category 6 infrastructure and will not cause an increase in production capacities on the existing licence. No changes to the aspects of the existing licence relating to Category 89 have been requested by the Licence Holder.

Table 1 below outlines the proposed changes to the existing Licence.

Table 1: Proposed changes

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
5	1,400,000 tonnes per annual period	No change	Construction and operation of a new three stage crusher to replace the existing crusher that will be decommissioned and removed from the ROM processing area.
6	2,000,000 tonnes per annual period	No change	Construction and commissioning of a 11.66 km pipeline from the existing pipeline to Hidden Secret open pit located in the northern area of Agnew Gold Mine to the Crusader Complex comprising of three inactive mine pits (Cox, Pilgrim and Deliverer) located in the south, which will become approved discharge points. No changes proposed to existing authorised extraction and discharge volumes.

2.3 Premises description and licence summary

Agnew Gold Mining Company Pty Ltd is wholly owned by Gold Fields Limited; an international producer of gold with operating mines in Australia, Ghana, Peru and South Africa. Agnew Gold has operated its Agnew Gold Mine (Agnew) under this licence since October 2013.

The Premises is located approximately 26 kilometres south-west from the Leinster Township, within the Shire of Leonora. Two underground mining operations, namely Waroonga and New Holland, are currently occurring at Agnew, with groundwater abstracted and pumped to the surface for discharge within the Premises boundary. The EMU processing plant uses a Carbon-in-Pulp (CIP) process to separate gold from primary ores. The primary ore is crushed by an obsolete ball crusher plant which is the subject of 2 February 2021 licence amendment application. Section 2.3.1 explains the amendment to category 5 crushing operations at Agnew.

Tailings from the process plant are deposited into two active in-pit Tailings Storage Facilities (TSFs), being the Redeemer (TSF3) and Songvang (TSF4). Excavation of tailings for paste backfill also occurs at Agnew (TSF2).

Two borefields, Fairyland and New Woman, are used to supply water to for the operation of the process plant, dust suppression, drinking water and on-site offices. Water is also used from the Hidden Secret and Daisy Queen pits.

Four landfill facilities are located at Agnew including the combined putrescible and inert waste (Type 1 and 2) in the New Holland, Waroonga and Waroonga North Waste Rock Landforms (WRL); and special wastes (Type 1 and 2) at Redeemer Waste Rock Landform (asbestos and biomedical containers).

Agnew currently discharges settled water from the Waroonga and New Holland Underground mining operations to the inactive Hidden Secret open pit. Ramelius Resources who operate the nearby Vivien Pit, also discharge their mine dewater into Hidden Secret Pit. Noting Agnew's underground mines are progressing towards the Hidden Secret open pit and given the prosperity of the pit itself, which is proposed for further mining, Agnew is seeking an alternative location for dewatering discharge which is the subject of the 10 November 2020 application. Section 2.3.2 below discusses in further detail the Licence Holder's proposed amendment to Category 6 of the current operating Licence.

2.3.1 Amendment to Category 5 primary activities

Agnew operates a crushing facility at their CIP Processing Plant. The current crushing infrastructure is over 20 years old and has become challenging to operate and maintain. The proposed licence amendment will allow the construction of a new crushing facility to replace the current obsolete crushing facility whilst maintaining the production throughput of up to 1.4 million tonnes per annum (Mtpa).

The new three-stage crusher infrastructure proposed for Agnew will be a vendor package supplied by a multinational engineering company (Sandvik). The production limit is governed by the ore feed into the run of mine (ROM) bin and the discharge from the fine ore bin conveyor (124-CV-007) into the new fine ore bin (125-BN-001) prior to ore processing.

The new crusher infrastructure will be operated consistent with current management practices including no further ground disturbance and reduces the potential for adverse ground and surface water impacts.

A description of the proposed three-stage crusher infrastructure follows.

Primary Crushing

ROM ore is drawn from the ROM bin with a capacity of approximately 50 m³, controlled by a variable speed reciprocating plate feeder, which discharges onto a vibrating grizzly screen with an aperture of 100 mm. The vibrating grizzly oversize will report to a single toggle jaw crusher (CJ412). A fixed rock breaker will be utilised to break up oversize material that reports to the jaw crusher. The jaw crusher product and grizzly undersize will discharge onto the primary crusher sacrificial conveyor (CV-001). The secondary and tertiary crushed product will also discharge onto CV-001. A belt magnet at the head chute of CV-001 will remove any tramp metal prior to discharge onto the primary crusher dry screening conveyor (CV-002). The feed rate to the primary crusher will be controlled by the calculated difference between the weight meter readings on CV-002 and CV-006, which will be used to control the speed of the reciprocating plate feeder.

Dry Screening

The crushed product will feed a 2.4 m wide by 6.1 m long double deck vibrating screen. The vibrating screen will be fitted with a 25 mm aperture top deck, and an 8 mm aperture bottom deck to produce mill feed. Oversize from the top deck of the screen will be directed to the secondary crushing circuit. Oversize from the bottom deck will be primarily directed to the tertiary crushing circuit or can be manually directed to the secondary crushing circuit via a bypass chute. Undersize from the screen will report to a reversible conveyor, which can be directed to either the fine ore bin or a fine ore stockpile. A weight meter on CV-002 will indicate the instantaneous and totalised feed to the vibrating screen.

Secondary Crushing

The oversize from the top deck of the vibrating screen will be conveyed to a single secondary cone crusher (Sandvik CH840i) via a surge bin and pan feeder. The oversize from the bottom deck can also be directed to the tertiary crushing circuit. The secondary crushed ore will be combined with the tertiary crushed ore on the dry screening feed conveyor (CV-006) and returned to CV-001. A static tramp magnet and a metal detector will prevent tramp metal from entering the secondary crusher. The metal detector, when activated, will stop the dry screening secondary conveyor (CV-005). Tramp metal will be manually removed from the conveyor by the operator and deposited into a tramp metal bunker. A weight meter on CV-005 will indicate the instantaneous and totalised feed to the secondary crusher.

Tertiary Crushing

The oversize from the bottom deck of the vibrating screen will be conveyed to a single tertiary cone crusher (Sandvik CH840i) via a surge bin and pan feeder. The crusher closed side setting will be set to 13 mm in the 1.35 Mtpa sustaining case, up to 1.4 Mtpa. The tertiary crushed ore

will be combined with the secondary crushed ore on CV-006 and returned to CV-001. A static tramp magnet and a metal detector will prevent tramp metal from entering the tertiary crusher. The metal detector, when activated, will stop the dry screening tertiary conveyor (CV-004). Tramp metal must be manually removed from the conveyor by the operator and deposited into a tramp metal bunker. A weight meter on CV-006 will indicate the instantaneous and totalised feed to the secondary and tertiary crushing circuits.

Fine Ore Storage

The dry crushing screen undersize will report to a reversible conveyor (CV-003) which can be directed to either the fine ore bin feed conveyor (CV-007) or the stockpile feed conveyor (CV-008). The fine ore bin will have a live capacity of 528 m³ and will provide a mill feed surge capacity of 5.6 hours. Under normal operating conditions the crushing rate to the surge bin will exceed the rate of withdrawal of ore to the milling circuit. Excess crushed ore feeding the bin will overflow via a rill window and chute arrangement into a bunker.

Figure 1 shows the crusher upgrade design in the existing mill processing disturbance footprint.

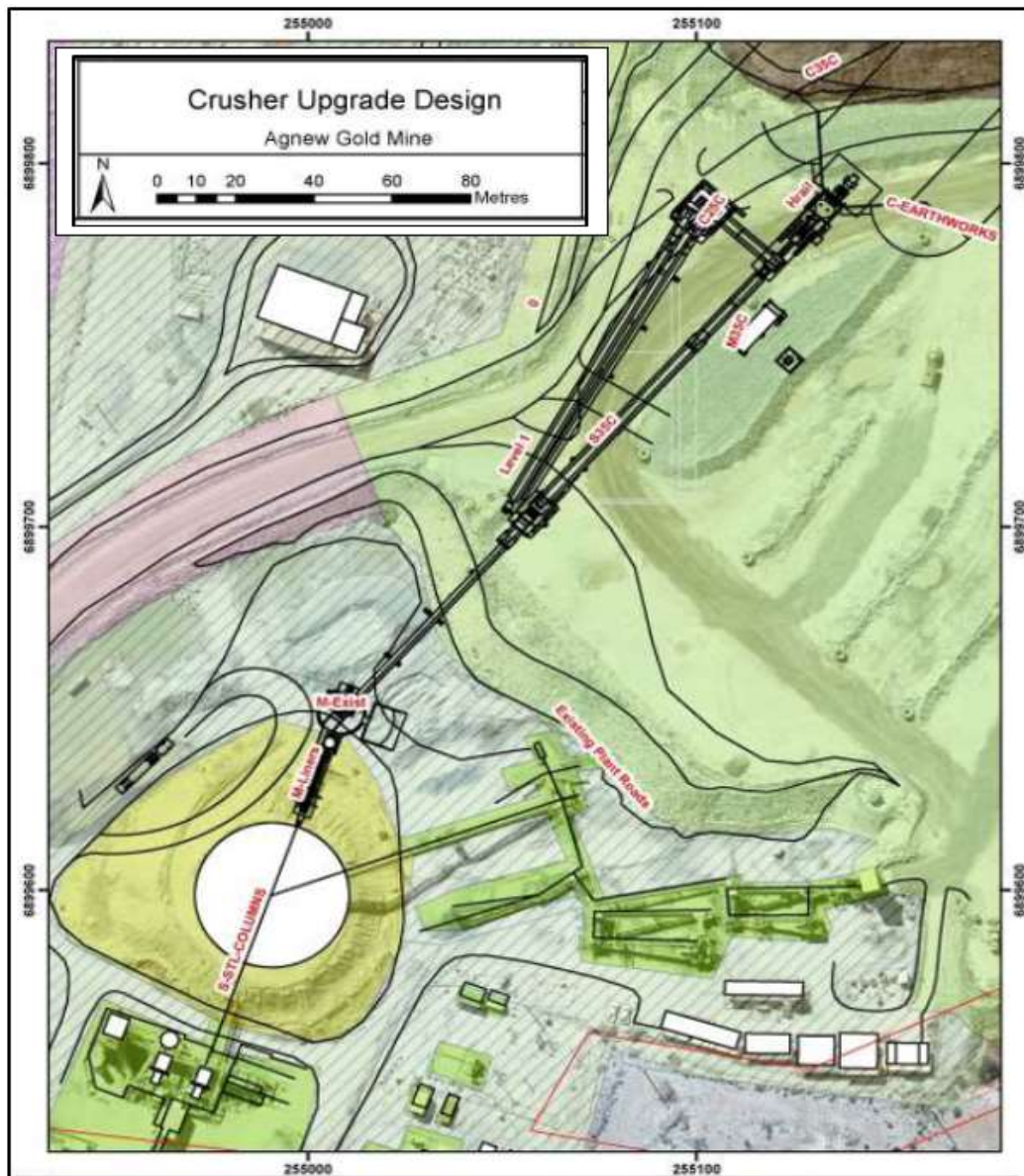


Figure 1: Crusher upgrade location and disturbance footprint

2.3.2 Amendment to Category 6 primary activities

The dewatering proposal associated with this amendment includes the construction of additional pipeline infrastructure allowing for the diversion of mine dewatering effluent from the New Holland, Genesis, Waroonga and Vivien mining operations into nearby settlement ponds before discharging to an additional storage location at the Crusader Complex that includes three inactive pits (Cox, Pilgrim and Deliverer). The Licence Holder plans to eventually conclude dewatering discharge into the Hidden Secret open pit and divert all dewatering to the Crusader Complex due to the advancing of underground operations in the vicinity of the pit and the pit itself being prospective for further mining. The discharge location at Hidden Secret will continue to be utilised until Hidden Secret is ready to be used for further mining operations. A pipeline will be constructed from the offtake of the existing pipeline to the Crusader Complex and establish three discharge pipes into each pit. The discharge pipework will represent an arrangement similar to that currently utilised at Hidden Secret where groundwater discharge occurs onto a bench.

The Cox, Pilgrim and Deliverer pits will provide a combined total storage capacity of 3,609,516 cubic metres (m³). A water balance assessment undertaken by the Licence Holder determined that the three pits receiving dewatering effluent have the capacity to support dewatering for the mining operations for the life of the mine, which is expected to be four years.

Figure 2 provides an overview of the proposed pipeline route which will extend over a length of 11.266 kms from the Hidden Secret open pit located in the northern area of the site to the Crusader Complex located in the south. The Licence Holder proposes to lay the dewatering pipework within or adjacent to existing roadside corridors and pit margins which have been previously cleared and are highly disturbed. The Licence Holder has advised that it is not likely the clearing of native vegetation will be required to install the dewatering pipeline infrastructure as existing infrastructure corridors will be utilised. However, the mining proposal REGID 92409 has allowed for 3.2 hectares of clearing as a contingency to ensure the pipeline is safely established and maintained. If clearing is required, the Licence Holder intends to apply the Regulation 5, Item 20 exemption under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Clearing will be spread across multiple tenements within the Prescribed Premises boundary.

The majority of the pipeline route will be contained within an existing bunded pipeline corridor adjacent to the haul road. As illustrated in Figure 3, there will be two sections of the pipeline route that will be un-bunded (approximately 2.134 kilometres in total). The first section is approximately 1.884 kilometres in length and is in the northern part of the pipeline route, commencing at the Hidden Secret discharge point to the start of the pipeline bund corridor near the TSF2 return water ponds. This un-bunded portion of the pipeline occurs within an active mining area that contains previously cleared native vegetation in a completely degraded (Keighery, 1994) condition. A mound of material has been built up on one side of the pipeline to help channel the water back into the Hidden Secret Pit. The second section is approximately 250 metres in length and is located at the southern end of the pipeline corridor at the Crusader Complex where the pipeline will be diverted off the main haul road into the three inactive pits. This un-bunded section of the pipeline occurs within a laydown and hardstand area that contains no native vegetation.

The pipeline route will contain 20 sumps where the pipeline intersects surface creek lines to capture any spills and leaks. Telemetry systems will be installed along the pipeline path to detect leaks. Monitoring will include visual inspection of the pipeline daily when operating and weekly when not operating.

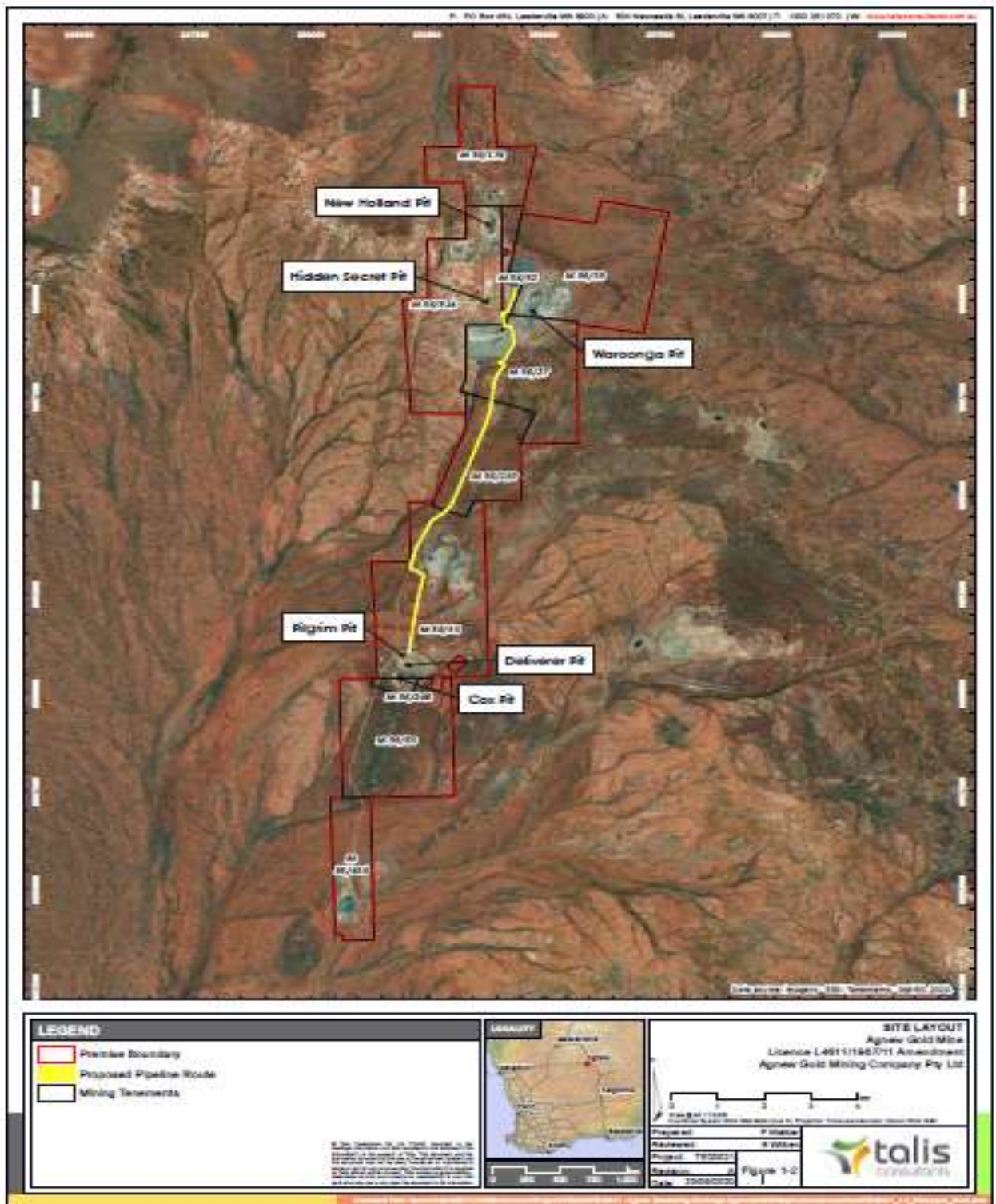


Figure 2: Site Layout Plan of proposed pipeline route (Image provided by the Licence Holder)

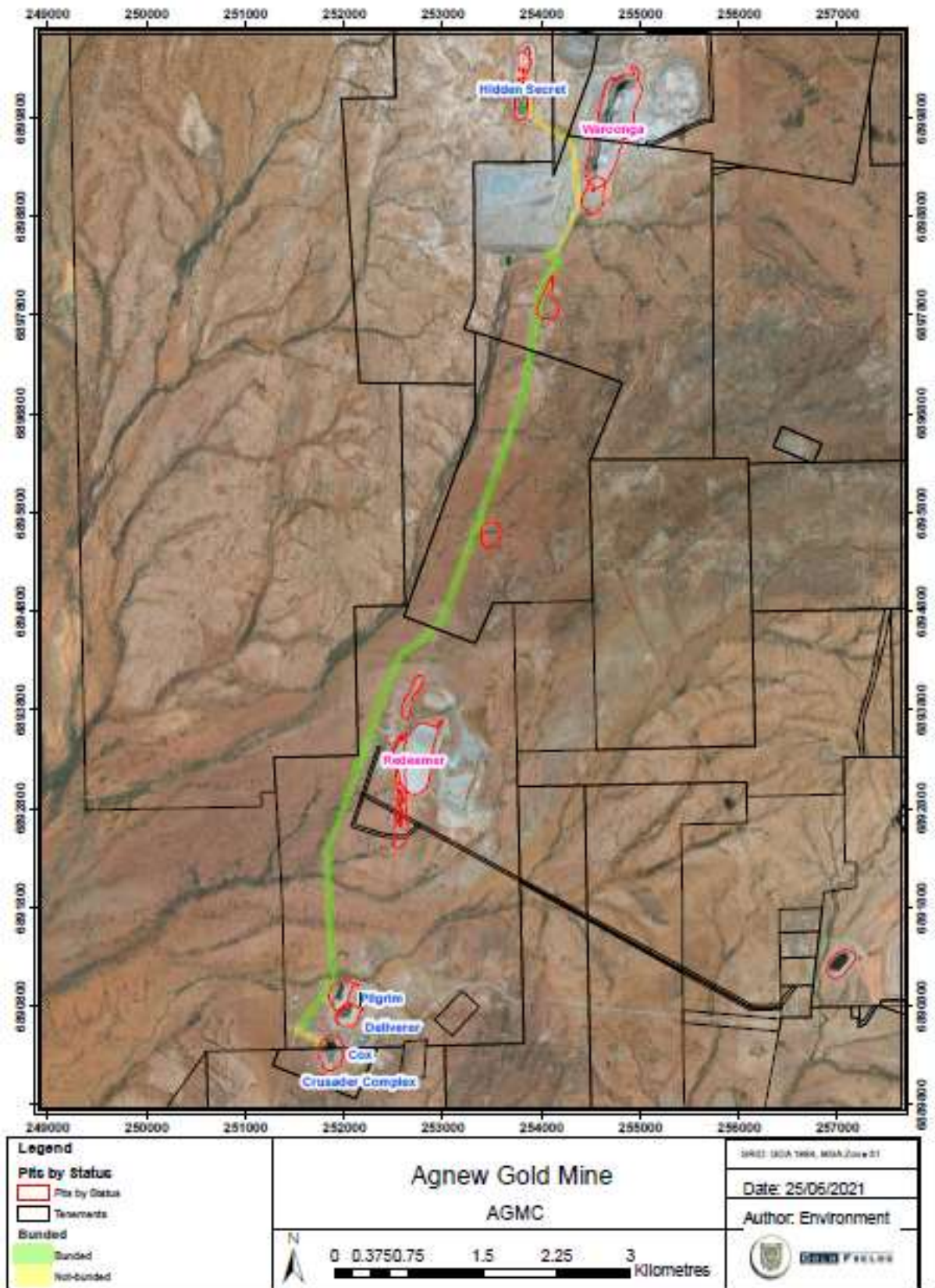


Figure 3: Map showing length of dewatering pipeline infrastructure that is bunded and un-bunded (Image provided by the Licence Holder)

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guidance Statement: Risk Assessments* (DER 2017).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
<i>Dust & Noise Category 5 construction</i>	<i>Construction of tertiary crusher infrastructure, vehicle movements, earthworks construction including sump construction, ROM pad, perimeter bunds, etc.</i>	<i>Air/windborne pathway</i>	<i>Dust will be managed during construction as per the premises Dust Management Plan and the Process Dust Management procedure. No community receptors within 20 km of new crusher. Mine camp is located 3 km from the new crusher.</i>
<i>Noise Category 5 operations</i>	<i>Crushing and screening of ROM ore.</i>	<i>Air/windborne pathway</i>	<i>New crusher located in an active mining area with no community receptors within 20 km. Mine camp is located 3 km from the new crusher.</i>
<i>Dust Category 5 operations</i>	<i>Crushing and screening of ROM ore.</i>	<i>Air/windborne pathway</i>	<i>Dust suppression sprinklers on entire crusher circuit. Fine ore bin contains fine material after crushing and prior to processing in the mill. No community receptors within 20 km of new crusher. Mine camp is located 2.5 km from the new crusher. Dust will be managed during operations as per the premises Dust Management Plan and the Process Dust Management procedure.</i>
<i>Contaminated water run-off</i>	<i>Water run-off from within crusher</i>	<i>Emissions to land or</i>	<i>Contaminated water to be retained using modified bunding and sumps around the</i>

Emission	Sources	Potential pathways	Proposed controls
<i>Category 5 operations</i>	<i>footprint.</i>	<i>waterways</i>	<i>ore stockpiles and new crusher infrastructure.</i>
<i>Dust Category 6 construction</i>	<i>Construction of dewatering infrastructure requiring the removal of native vegetation</i>	<i>Air/windborne pathway</i>	<i>Licence Holder has proposed to construct dewatering pipeline infrastructure within previously disturbed areas (road side corridors and pit margins) to limit clearing and additional disturbance to native vegetation.</i>
<i>Discharge of mine dewatering effluent to land Category 6 operations</i>	<i>Rupture of dewatering pipeline</i>	<i>Direct discharge to soils and native vegetation Seepage through soils to groundwater</i>	<p><i>The applicable dewatering pipeline controls from the existing licence are outlined below:</i></p> <ul style="list-style-type: none"> <i>• equipped with automatic cut-outs in the event of a pipe failure; and/or</i> <i>• provided with a secondary containment sufficient to contain any spill for a period equal to the time between routine inspections; and/or</i> <i>• equipped with telemetry systems and pressure sensors along pipelines allowing the detection of leaks and failures; and</i> <i>• inspections conducted daily when pipeline is in operation and weekly to detect leaks and spills when pipeline is in operation.</i> <p><i>In addition to the controls outlined above, the applicant has advised that 20 sumps will be installed along the bunded pipeline where the pipeline intersects surface creek lines.</i></p>
<i>Storage of dewatering effluent within the pits Category 6 operations</i>	<i>Overtopping of pit water</i>	<i>Direct discharge onto soil and native vegetation</i>	<p><i>Flow meter to be installed at the discharge points at Cox, Pilgrim and Deliverer pits to calculate volumes of mine dewater discharged.</i></p> <p><i>Top of embankment freeboard of 3m to be installed and maintained for Cox, Pilgrim and Deliverer pits.</i></p>
<i>Discharge of mine dewatering effluent to pits Category 6 operations</i>	<i>Mounding of groundwater table within the vicinity of the pits</i>	<i>Lateral movement of pit lake water through pit walls</i>	

3.1.2 Receptors

In accordance with the *DWER Guideline: Risk Assessment* (February 2017 revised December 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence

Holder from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 3 below provides a summary of potential environmental receptors that may be impacted as a result of activities upon or emissions and discharges from the prescribed premises (*DWER Guideline: Environmental Siting* (November 2016 revised December 2020)).

Table 3: Sensitive environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Native Vegetation	Surrounding new dewatering infrastructure pipeline
Conservation significant flora: <i>Baeckea sp. Sandstone</i> (C.A. Gardner s.n. 26 Oct. 1963) (Priority 3)	~9.3km north east of the new crusher stockpile footprint and 14.4km north west of the Pilgram Pit located within the Crusader Complex.
Contaminated sites	All mining tenements identified as awaiting classification under CS Act. Referenced as DEC2263 & DEC14349.
Groundwater	<p>Tenements located within the Goldfields Groundwater Area. Agnew holds a current GWL64335/8 with allocation of 4.11GL/an from the Fractured Rock aquifer.</p> <p>Average depth to groundwater based on monitoring undertaken in 2017 for the surrounding historical bores at the Crusader Complex (Pilgrim, Deliverer and Cox pits) is approximately 28.87m below ground level (Goldfields Australia Pty Ltd, 2021).</p> <p>No other groundwater users located in the Crusader Complex area (Goldfields Australia Pty Ltd). The nearest station is Pinnacles Station located 10.5km west of the Crusader Complex (Goldfields Australia Pty Ltd, 2021).</p>

There are no human receptors in the vicinity of the Prescribed Premises relevant to the proposed amendment. The nearest township is located ~22km east north east of the Prescribed Premises boundary being the Leinster townsite.

Several Aboriginal Heritage Sites occur within or in close proximity to the Prescribed Premises boundary. The Licence Holder has advised that no Aboriginal Heritage Sites will be disturbed as a result of the proposed activities and that management of the sites will in accordance with the sites Aboriginal Heritage Plan.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *DWER Guideline: Risk Assessment* (February 2017 revised December 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

The Revised Licence L4611/1987/12 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 5 & Category 6 activities.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Additional regulatory controls may be imposed where the Licence Holder’s controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

Table 4. Risk assessment of potential emissions and discharges from the Premises during construction, commissioning and operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of revised licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
Construction								
<u>Category 5</u> Construction of tertiary crusher, materials conveyors plus materials bins and associated equipment including construction vehicle movements. Construction of stormwater sump, stockpile perimeter bunds, ROM pad, etc.	Dust	Air/windborne pathway causing impacts to health and amenity	Residences greater than 20km north east of crusher location.	Refer to Section 3.1	Not applicable as no credible pathway for impacts.	Y	Condition 23 and Table 11 has been included that describes tertiary crusher infrastructure to be constructed.	Ensure tertiary crusher infrastructure has been constructed as proposed.
	Noise		No vegetation clearing required nor significant stands within 2km of crusher location.	Refer to Section 3.1		Y	Conditions 24 and 25 have been included to require Environmental Compliance report to be submitted once construction has been completed.	An Environmental Compliance report confirms the infrastructure as proposed (including emission controls) has been constructed.
<u>Category 6</u> Construction of 11.66km of pipelines from Agnew and Vivien underground mining to	Dust	Air/windborne pathway causing impacts to	Residences greater than 20km north east of northern end of pipeline location.	N/A	Not applicable as no credible pathway for impacts.	N/A	Condition 23 and Table 11 has been included that describes dewatering pipeline infrastructure to	Ensure dewatering pipeline infrastructure has been constructed as proposed. An Environmental

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of revised licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
Cox, Pilgrim and Deliverer mine voids.		health and amenity	Clearing of native vegetation to construct dewatering infrastructure. Surrounding native vegetation along the pipeline corridor.	No Applicant Controls outlined in submission.	C = Slight L = Rare Low Risk	Y	be constructed. Conditions 24 and 25 have been included to require Environment Compliance report to be submitted once construction has been completed.	Compliance report confirms the infrastructure as proposed (including emission controls) has been constructed.
	Noise		Residences greater than 20km north east of northern end of pipeline location.	N/A	Not applicable as no credible pathway for impacts.	N/A		
Commissioning and Operation								
<u>Category 5</u> Tertiary crusher loading, unloading, ore conveyance and ore stockpiling prior to processing at CIP plant. Vehicle movements on the ROM pad.	Dust	Air/windborne pathway causing impacts to health and amenity	Residences greater than 20km north east of crusher location. No vegetation clearing required nor significant stands within 2km of crusher location.	Refer to Section 3.1	Not applicable as no credible pathway for impacts.	Y	No conditions required. Applicant has a dust management plan that will address localized emissions and provides adequate management controls.	N/A
	Noise	Air/windborne pathway causing impacts to health and amenity	Residences greater than 20km north east of crusher location.	Refer to Section 3.1	Not applicable as no credible pathway for impacts.	Y	No conditions required. Receptors are sufficient distance away from the crusher operations as not to require controls. Noise emissions must comply with the EP Noise Regulations.	N/A
<u>Category 5</u> Contaminated stormwater	Sediment laden	Overland runoff	No waterways within 370m of ore	Refer to Section 3.1	C = Minor	Y Stormwater	Receptors are sufficient distance away from the	N/A

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of revised licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
<p>discharging from ROM pad and crusher and materials conveyors.</p> <p>Vehicle movements on the ROM pad.</p>	stormwater	potentially causing ecosystem disturbance or impacting surface water quality	<p>stockpile and ROM.</p> <p>Stormwater reports to collection sumps via stockpile perimeter bund.</p> <p>No vegetation clearing required nor significant stands within 2km of crusher location.</p>		<p>L = Rare</p> <p>Low Risk</p>	<p>reports to detention basin with zero discharge.</p> <p>Crusher pad and material stockpile is bunded.</p>	crusher operations as not to require controls.	
<p><u>Category 6</u></p> <p>Operation of 11.66km of dewater discharge pipelines from Agnew and Vivien underground mining to the Crusader Complex (Cox, Pilgrim and Deliverer mine pits).</p>	Mounding of groundwater table within the vicinity of the pits	Lateral movement of pit lake water through pit walls, leading to mounding of groundwater into the root zone of the surrounding native vegetation causing stress of death.	Native vegetation surrounding the pits	No Applicant Controls outlined in submission.	<p>C= Minor</p> <p>L = Unlikely</p> <p>Medium risk</p>	Y	<p>Condition 12 and Table 7 has been amended to include the requirement to monitor the volume of inputs and outputs at the Cox, Pilgrim and Deliverer mine pits.</p> <p>Condition 23 and Table 11 has been included on the Licence to require a 3m freeboard to be maintained at the Cox, Deliverer and Pilgrim pits to mitigate the risk of groundwater mounding. Condition 1 and Table 1 of the Licence has also been amended to include this requirement.</p> <p>Condition 2 and Table 2 has been amended to include the requirement to visually assess the Cox, Deliverer and Pilgrim pits to confirm required freeboard capacity is available.</p>	<p>The Licence Holder demonstrated through the provision of a water balance assessment that the three pits within the Crusader Complex contain sufficient storage capacity to store the expected mine dewater over the life of mine forecast to be four years. The Crusader Complex has a total capacity of approximately 3,184,856 m³ with a 3 m freeboard included. The water balance assessment determined that approximately only 41.1% of the pit's total capacity would be used based on the requirement that in total a storage capacity of approximately 1,310,596KL per year would be required each year over the life of mine.</p> <p>The Delegated Officer has taken into consideration that given only 41.1% of the pits capacity will be used, mine dewater is unlikely to reach</p>

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of revised licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
								<p><i>the 3 m freeboard and the risk of groundwater mounding is low.</i></p> <p><i>In addition, the Delegated Officer also took into consideration that the native vegetation surrounding the pits is not associated to any threatened or priority ecological communities, nor does it contain any records of conservation significant flora or fauna and the water being transported to the pits is of a relatively good quality being brackish to saline. Therefore, the controls outlined in Section 3.1 by the Licence Holder are considered to be sufficient for managing the risk of groundwater mounding.</i></p>
<p><u>Category 6</u></p> <p><i>Operational discharge of excess mine dewater to Cox, Deliverer and Pilgrim mine pits</i></p>	<p><i>Overtopping of pit water</i></p>	<p><i>Direct discharge onto soil and native vegetation causing topsoil contamination and plant stress or death.</i></p>	<p><i>Native vegetation surrounding the pits</i></p>		<p><i>C= Minor</i></p> <p><i>L = Unlikely</i></p> <p>Medium risk</p>	<p>Y</p>	<p><i>Condition 23 and Table 11 has been included on the Licence to require a 3m freeboard to be maintained at the Cox, Deliverer and Pilgrim pits to mitigate the risk of overtopping. Condition 1 and Table 1 of the Licence has also been amended to include this requirement.</i></p> <p><i>Condition 2 and Table 2 has been amended to include the requirement to visually assess the Cox, Deliverer and Pilgrim pits to confirm required</i></p>	<p><i>The Delegated Officer considers that due to the Licence conditions requiring maintenance of a minimum 3m freeboard and visual monitoring, and the relatively good quality of the water being transported to the Cox, Deliverer and Pilgrim pits, the risk associated with overtopping to the environment is low.</i></p> <p><i>These controls have been added to the licence to ensure adequate freeboard is maintained to mitigate the risk of the Cox, Deliverer and Pilgrim pits overtopping.</i></p>

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of revised licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
							freeboard capacity is available.	
<u>Category 6</u> New pipelines and dewatering infrastructure (breach)	Rupture of pipeline causing discharge of mine dewatering effluent to land	Direct discharge to soils Direct discharge onto native vegetation causing topsoil contamination and plant stress or death.	Native vegetation surrounding pipelines and dewatering infrastructure	Refer to Section 3.1	C= Minor L = Possible Medium risk	Y	Condition 23 and Table 11 has been included to require the installation of sumps along the pipeline where surface creek lines are intersected.	As discussed under Section 2.3.2 of this Amendment Report, approximately 2.134 kilometres of the dewatering pipeline is un-bunded. The Delegated Officer took into consideration the existing condition (condition 3) on the Licence that requires automatic cut-offs in the event of pipeline failure, therefore any spill duration will be minimised. In addition, the Delegated Officer took into consideration that un-bunded sections of the pipeline are located within largely pre-disturbed/previously cleared areas and the water quality if a spill did occur is brackish to saline with an average Total dissolved Solids of 4080mg/L. Therefore, the risk to pipeline rupture to the environment (on vegetation and soils) is low. The Applicant's controls will be conditioned as construction requirements on the Licence in accordance with the Guidance Statement: Risk Assessments (December 2020).

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guidance Statement: Risk Assessments* (DER 2017).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

L4611/1987/12 (Amendment Date 5 July 2021)

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4. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
<i>Local Government Authority advised of proposal (27/01/2021 & 26/3/2021)</i>	<i>None received</i>	<i>N/A</i>
<i>Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (27/01/2021 & 26/3/2021)</i>	<i>None received</i>	<i>N/A</i>
<i>Licence Holder was provided with draft amendment on 20 May 2021</i>	<i>Comments from Licence Holder received on 14 June 2021 and 25 June 2021. Comments are summarised in Appendix 1.</i>	<i>Refer to Appendix 1.</i>

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 6 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process. Table 7 provides a summary of administrative amendments undertaken as part of the amendment.

Table 6: Summary of licence amendments

Condition no.	Proposed amendments
1 and Table 1	Inclusion of containment infrastructure requirement for the Cox, Pilgrim and Deliverer pits receiving mine dewater from Waroonga, Genesis and New Holland and Vivien mining operations
2 and Table 2	Inclusion of visual inspections of Cox, Pilgrim and Deliverer pits to confirm required freeboard capacity is available.
9 and Table 5	Inclusion of the new discharge points at the Cox, Pilgrim and Deliverer pits.
11 and Table 6	Inclusion of monitoring the new discharge points at the Cox, Pilgrim and Deliverer pits.
12 and Table 7	Inclusion of quarterly monitoring of cumulative groundwater volumes at the Cox, Pilgrim and Deliverer pits.
23 and Table 11	Inclusion of new condition for the construction of the tertiary crusher and dewater discharge pipeline

24	Inclusion of new condition that requires the submission of a construction compliance report once the new infrastructure has been constructed or installed.
25	Inclusion of a new condition that stipulates the requirements of the construction compliance report

Table 7: Administrative amendments

Existing condition	Condition summary	Revised Licence condition	Conversion notes
Conditions 1.1.1 to 1.1.4	General licence conditions	Licence Interpretation	Condition 1.1.1 to 1.1.4 in existing current licence are now covered by licence interpretation
1.2.1 and Table 1.2.1	Containment infrastructure	Condition 1 and Table 1	Restructure of licence conditions
1.2.2	Containment infrastructure related to freeboard requirements	Removed from licence	Condition removed as Table 1 updated to include the freeboard requirements for each in-pit TSF
1.2.3 and Table 1.2.2	Inspection of infrastructure	Condition 2 and Table 2	Restructure of licence conditions
1.2.4	Pipeline infrastructure	Condition 3	Restructure of licence conditions
1.2.5 and Table 1.2.3	Management of waste	Condition 4 and Table 3	Restructure of licence conditions
1.2.6 and Table 4	Cover requirements	Condition 5	Restructure of licence conditions
1.2.7	Windblown waste	Condition 6	Restructure of licence conditions
1.2.8	Cyanide detoxification unit	Condition 7	Restructure of licence conditions
2.1.1	General emissions	Condition 8	Restructure of licence conditions
2.2.1 and Table 2.2.1	Point Source Emissions to groundwater	Condition 9 and Table 5	Restructure of licence conditions
3.1.1	General monitoring	Condition 10	Restructure of licence conditions
3.2.1 and Table 3.2.1	Monitoring of point source emissions to groundwater	Condition 11 and Table 6	Restructure of licence conditions
3.3.1 and Table 3.3.1	Monitoring of inputs and outputs	Condition 12 and Table 7	Restructure of licence conditions
3.4.1 and Table 3.4.1	Ambient Environmental Quality Monitoring	Condition 13 and Table 8	Restructure of licence conditions
3.4.2	Groundwater Recovery Plan	Condition 14	Restructure of licence conditions

3.4.3	Groundwater Recovery Plan	Condition 15	Restructure of licence conditions
3.4.4	Groundwater Recovery Plan	Condition 16	Restructure of licence conditions
4.1.1	Records	Condition 17	Restructure of licence conditions
4.1.2	Records – Annual Audit Compliance Report	Condition 18	Restructure of licence conditions
4.1.3	Records – Complaints Management System	Condition 19	Restructure of licence conditions
4.2.1 and Table 4.2.1	Reporting – Annual Environmental Report	Condition 20 and Table 9	Restructure of licence conditions
4.2.2	Reporting - Annual Environmental Report	Condition 21	Restructure of licence conditions
4.3.1 and Table 4.3.1	Notification requirements	Condition 22 and Table 10	Restructure of licence conditions
N/A	Specified action- Construction of tertiary crusher and dewater discharge pipeline	Condition 23 and Table 11	Inclusion of new condition 23 with the requirements specified in Table 11 for the construction of the tertiary crusher and dewater discharge pipeline
N/A	Provision of Construction compliance document	Condition 24	Inclusion of new condition 24 for the provision of staged construction report
N/A	Construction compliance document requirements	Condition 25	Restructure of licence conditions
Schedule 1: Maps	Map of monitoring bore locations	Figure 2A, 2B & 2C of Schedule 1	Reference to Table 3.4.1 has been removed and updated to refer to Figures 2A, 2B & 2C as defined in Table 8
Schedule 1: Maps	Map of landfill locations	Figure 3 of Schedule 1	Map of landfill locations labelled as Figure 3
N/A	Construction Plans: Construction of tertiary crusher and dewater discharge pipeline	Figure 4 of Schedule 4	Inclusion of Figure 4 under Schedule 4: Location of Tertiary crusher infrastructure
N/A	Construction Plans: Location of dewater discharge pipeline infrastructure	Figure 5 of Schedule 4	Inclusion of Figure 5 under Schedule 4: Location of dewater discharge pipeline infrastructure

References

1. Application Form IR-F09 version 13, *Agnew Gold Mining Company Pty Ltd (AGMC)* signed on 9 November 2020, DWER reference DWERDT364192 & A1998615.
2. Application Form IR-F09 version 13, *Agnew Gold Mining Company Pty Ltd (AGMC)* signed on 2 February 2021, DWER reference DWERDT408297 & A1987825.
3. Department of Water and Environmental Regulation, Request for further information dated 23 March 2021, DWER reference A1990888.
4. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
5. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
6. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
7. Gold Fields Australia (2021) Licence Holder's response to request for further information, dated 19 April 2021, DWER reference DWERDT441173
8. Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Amended Licence		
<p>Condition 1 (Table 1) 'Containment Infrastructure' of the Amended Licence</p> <p>DWER requested that the Licence Holder confirm if mine dewater from SongVang Pit is still being discharged to Hidden Secret Pit</p>	<p>The Licence Holder confirmed that there is no mine dewatering occurring from SongVang Pit to Hidden Pit and this can be removed from Table 1, Condition 1 of the Amended Licence.</p>	<p>Noted and updated Condition 1 (Table 1) of the Amended Licence accordingly.</p>
<p>Condition 9 (Table 5) 'Point source emissions to groundwater' of the Amended Licence.</p> <p>DWER requested that the Licence Holder confirm that Agnew operations comprises of the Waroonga, Genesis and New Holland mines.</p> <p>DWER requested that the Licence Holder confirm that Hidden Secret Pit will be used as an emission point until the construction of the dewatering pipeline to the Cox, Deliverer and Pilgrim pits has been completed.</p>	<p>The Licence Holder confirmed that Agnew operations comprises of the Waroonga, New Holland and Genesis mines.</p> <p>The Licence Holder has requested to retain Hidden Secret as a licenced discharge point. The Licence Holder advised that the plan is to divert all dewatering to the Crusader Complex, however given the variable nature of mining and further work required to finalise the prospectiveness of Hidden Secret open pit, Agnew would like to retain Hidden Secret as a discharge location. There will be a period of time where Agnew may require mine dewatering to be discharged to both the Crusader Complex and Hidden Pit.</p> <p>The Licence Holder also advised that Vivien water is also discharged to Hidden Secret, however through a neighbouring operation.</p>	<p>Noted and updated Condition 9 (Table 5) of the Amended Licence and Section 2.3.2 of the Amendment Report accordingly.</p>
<p>Condition 11 (Table 6) 'Monitoring of point source emissions to groundwater' of the Amended Licence.</p>	<p>The Licence Holder noted that sampling will only occur at the pits where water is being discharged/operational. If there is no discharge to the pits, no sampling of discharge water at the pits will be undertaken.</p>	<p>Noted.</p>
<p>Condition 12 (Table 7) 'Monitoring of inputs and outputs' of the Amended Licence.</p>	<p>The Licence Holder noted that monitoring of the pits will only occur when they are being discharged to/operational.</p>	<p>Noted.</p>

Condition	Summary of Licence Holder's comment	Department's response
<p>Condition 23 (Table 11) 'Infrastructure requirements – tertiary crusher and dewater discharge pipeline'.</p> <p>DWER requested that the Licence Holder advise of the material type and diameter of the dewater discharge pipeline'.</p>	<p>The Licence Holder noted that the material type for the pipeline will be white poly with a diameter of 200mm.</p> <p>The Licence Holder advised that the majority of the dewatering pipeline will be contained within an existing bunded pipeline corridor adjacent to the haul road. However, approximately 2.134 kilometres of the 11.266 kilometre pipeline will be un-bunded. This includes one section located at the northern end of the pipeline, 1.884 metres in length that will run from the Hidden Secret Pit to the TSF2 return water ponds. The second section of pipeline is located at the southern end of the pipeline corridor and is 250 metres in length. This un-bunded area is situated at the Crusader Complex where the pipeline is diverted to the three inactive pits. The Licence Holder provided figures to indicate and demonstrate that the locations of the un-bunded sections of pipeline occurred with pre-disturbed/active mining areas that contained little to no native vegetation.</p> <p>The Licence Holder asserted that given the quality of the water is brackish (average Total dissolved solids of 4080mg/L) and the pre-disturbed areas where the un-bunded pipelines are situated, the risk for the receiving environment if a spill was to occur is considered to be low.</p>	<p>Noted and updated Condition 23 (Table 11) of the Amended Licence accordingly.</p> <p>Section 2.3.2 of the Amendment Report has been updated with this information accordingly. The Delegated Officer has taken into account the location of the un-bunded areas which are within pre-disturbed/active mining areas, the water quality and the existing condition on the Licence for automatic shut-off in the event of pipeline failure and has determined that the risk rating would remain as 'low'.</p>
Amendment Report		
<p>Section 2.3.2 of the Licence Amendment Report.</p> <p>DWER requested that the Licence Holder advise of the amount of clearing proposed and which exemption is applicable under the <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i> if clearing is required for the installation of the dewatering pipeline infrastructure.</p>	<p>The Licence Holder advised that it is unlikely native vegetation will be required to be cleared for the installation of the dewatering pipeline infrastructure as existing infrastructure corridors will be utilised. The Licence Holder noted that the clearing of 3.2 hectares of native vegetation has been granted under Mining Proposal REGID 92409 as a contingency measure so the pipeline can be safely installed and maintained if any clearing was to be required. The Licence Holder confirmed that they intend to apply the Regulation 5, Item 20 exemption under the <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i> if required.</p>	<p>Noted and updated Section 2.3.2 of the Amendment Report accordingly.</p>

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY				
Application type				
Amendment to licence	Current licence number:	L4611/1987/11		
	Relevant works approval number:		N/A	<input checked="" type="checkbox"/>
Date application received	10/11/2020 & 02/02/2021 (two separate applications received)			
Applicant and Premises details				
Applicant name/s (full legal name/s)	Agnew Gold Mining Company Pty Ltd			
Premises name	Agnew Gold Mine			
Premises location	M36/27, M36/32, M36/53, M36/55, M36/150, M36/174, M36/248, M36/314 & M36/450			
Local Government Authority	Shire of Leonora			
Application documents				
HPCM record reference:	DWERDT364192 & DWERDT408297			
Key application documents (additional to application form):	<p><u>Agnew Gold Mine replacement three stage crusher Category 5 Amended 2020 Licence L4611 Premises map, Processing dust control management plan & New Crushing facility supporting document.</u></p> <p><u>Agnew Gold Mine Dewatering Discharge arrangements – Category 6 Premises map, Regional map & Fee calculation sheet</u></p>			
Scope of application/assessment				
Summary of proposed activities or changes to existing operations.	<p><u>Licence (L4611/1987/11) amendment received on 10/11/2021:</u></p> <p>Mine dewatering infrastructure. The constructed pipeline will divert dewatering discharge from Hidden Secret pit (which currently receives dewatering from the Agnew underground mining operations and the Vivien mining operations) to the three pits located in the Crusader complex. These pits will provide an additional storage capacity for 2million cubic metres (mm³) capable of supporting dewatering operations for the Agnew underground mining operations until the end of life (LOM).</p> <p><u>Licence (L4611/1987/11) amendment received on 2/02/2021:</u></p> <p>This licence amendment proposes the replacement and decommissioning of the current crushing facility with a new, three stage crushing plant to feed the ball mills at the Agnew Gold Mine.</p> <p>A licence amendment to alter the Category 5 approval to allow a permanent throughput to increase to 1.4 Mtpa.</p>			

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: processing or beneficiation of metallic or non-metallic ore.	1,400,000 tonnes per annual period temporary production capacity	1,400,000 tonnes per annual period <u>permanent</u> production capacity.
Category 6: Mine dewatering premises on which water is extracted and discharged into the environment to allow mining of ore.	Proposed – dewatering discharge diverted from Hidden Secrete pit to three pits located in the crusader complex 2,000,000 tonnes per annual period.	No Change proposed to production capacity

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision Not applicable
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Mining lease / tenement <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	Not applicable as premises on Mining tenement.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A Clearing assessed under mining act.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: Licence/permit No: GWL64335(10), GWL151398 & GWL55840
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Not applicable
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Not applicable
Is the Premises subject to any other Acts	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<i>Mining Act 1978.</i>

or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx</i>)		
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Lake Carey catchment
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	No requirements
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Classification: awaiting classification