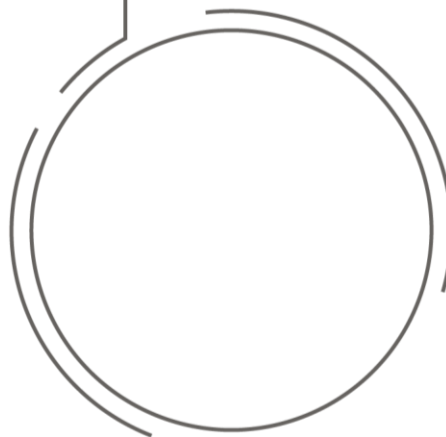




Integra Underground 2022 Annual Review

1 January to 31 December



Title Block


Name of operation	Integra Underground Mine
Name of operator	HV Coking Coal Pty Limited
Development consent/ project approval	PA 08_0101
Name of holder of development consent/ project approval	Integra Underground Project
Mining lease and Exploration Lease #	CL 382, ML 1437, ML 1551, ML 1525, ML 1518, ML 1437, ML 1676, ML 1786, ML1740 and ML1742
Name of holder of mining lease	HV Coking Coal Pty Limited
Water licence #	WAL 484, WAL 485, WAL 960, WAL 961, WAL 1172, WAL 1173, WAL 1242, WAL41562, WAL41563, 20BL167917, 20BL169571, 20BL169573, 20BL169574, 20BL171707, 20BL171708, 20BL171710, 20BL171813, 20BL171870, 20BL172277, 20BL172278, 20BL172279
Name of holder of water licences	HV Coking Coal Pty Limited
Annual Review start date	1 January 2022
Annual review end date	31 December 2022
<p>I, Scott Wolfenden, certify that this audit report is a true and accurate record of the compliance status of Integra Underground for the period 01/01/2022 to 31/12/2022 and that I am authorised to make this statement on behalf of Integra Underground.</p> <p><i>Note.</i></p> <p><i>a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p><i>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of authorised reporting officer	Scott Wolfenden
Title of authorised reporting officer	Environment and Community Manager
Signature of authorised reporting officer	
Date	27/03/2023

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1. Statement of Compliance

Integra Underground Mine (Integra Underground) operates in accordance with Project Approval (PA) 08_0101, Environment Protection Licence (EPL) 3390 and several mining tenements. A summary of compliance with these major approvals during 2022 is provided in **Table 1-1**.

Where non-compliances have been recognised, they are listed in this section and detailed in later sections of this Annual Review.

Table 1-1 – Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	Yes/No
PA 08_0101	Yes
EPL 3390 (reference to sch.3 cond.26 of PA08_0101)	Yes
CL 382	Yes
ML 1437	Yes
ML 1518	Yes
ML 1525	Yes
ML 1551	Yes
ML 1676	Yes
ML 1740	Yes
ML 1742	Yes
ML 1786	Yes

There were no non-compliances at Integra Underground during 2022.

2. Introduction

2.1 Background

Integra Underground is an underground coal mine located approximately 12 km north-west of Singleton, in the Singleton Local Government Area (LGA) of the Hunter Region of New South Wales (NSW) (refer **Figure 2-1**).

Integra Underground mining operations are approved at a maximum extraction rate of 4.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until 31 December 2035 under Project Approval (PA) 08_0101. This approval allows longwall mining of the Hebden, Barrett and Middle Liddell seams to produce high quality, semi-hard coking coal for export. The approved underground mine layout in the Middle Liddell Seam is shown in **Figure 2-2**.

This Annual Review covers the period of 1 January to 31 December 2022 (herein referred to as the reporting period). During the reporting period Integra Underground completed the mining of Longwall 17 and commenced the mining of Longwall 18. Surface activities at Integra Underground during the reporting period included the construction of gas drainage wells, pipelines and access roads for Longwalls 18 and 19. Rehabilitation was undertaken at eight gas well locations including access tracks and pipelines.

2.2 History of Operations

On 18 December 2015, HV Coking Coal Pty Limited (HVCC) (a 100% Glencore-owned company) purchased the Integra Complex. Bloomfield Collieries Pty Limited (Bloomfield) subsequently purchased from Glencore the Integra Open Cut (IOC), coal handling preparation plant (CHPP), train loading infrastructure and the rail loop. EPL 3390 was applicable to the Integra Complex until 21 December 2015. At this time the EPL was varied to cover Integra Underground only, with the existing Rix's Creek EPL (3391) varied to also cover Rix's Creek North (previously IOC).

Prior to HVCC's purchase of Integra Underground, the Integra Complex operated under a single project approval which combined PA 08_0101 (Integra Underground) and PA 08_0102 (IOC). Following the respective sales of the underground and open cut mines in December 2015, approval was sought to separate the combined project approval. This separation of the combined project approval was granted through Modification (Mod) 5 on 23 August 2016. Until this modification was approved, an agreement between Bloomfield and HVCC outlined the separation of responsibilities under the Project Approval and EPL.

HVCC recommenced underground operations in 2017, with infrastructure development and early workings resuming in February 2017 and longwall extraction resuming in May 2017 in accordance with the Extraction Plan as required under Condition 20 of Schedule 3 of PA 08_0101.

An application for Modification 8 (Mod 8) to PA 08_0101 and accompanying EA was lodged with DPIE in November 2017. The purpose of Mod 8 was to seek approval to continue longwall mining of the Middle Liddell Seam further to the north of the previously approved longwall panels, and construction and operation of ancillary surface infrastructure required to support the proposed mining activities. Subsequently, approval was granted by DPIE on 16 April 2018. The construction of these ancillary surface infrastructure commenced in February 2019 and was completed in June 2020. Longwalls 15 to 20 were included in the approved mine plan for Mod 8.

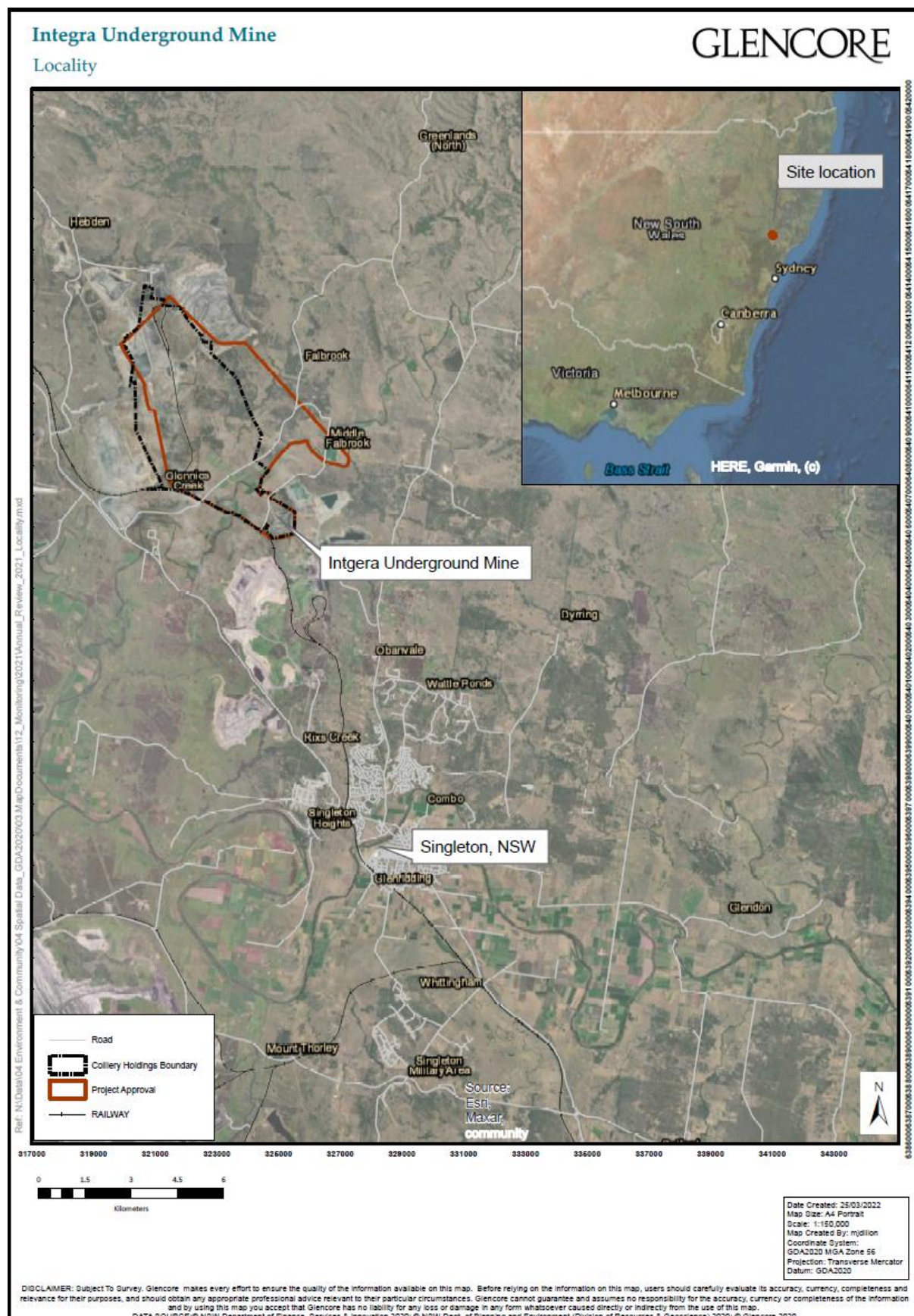


Figure 2-1 - Locality

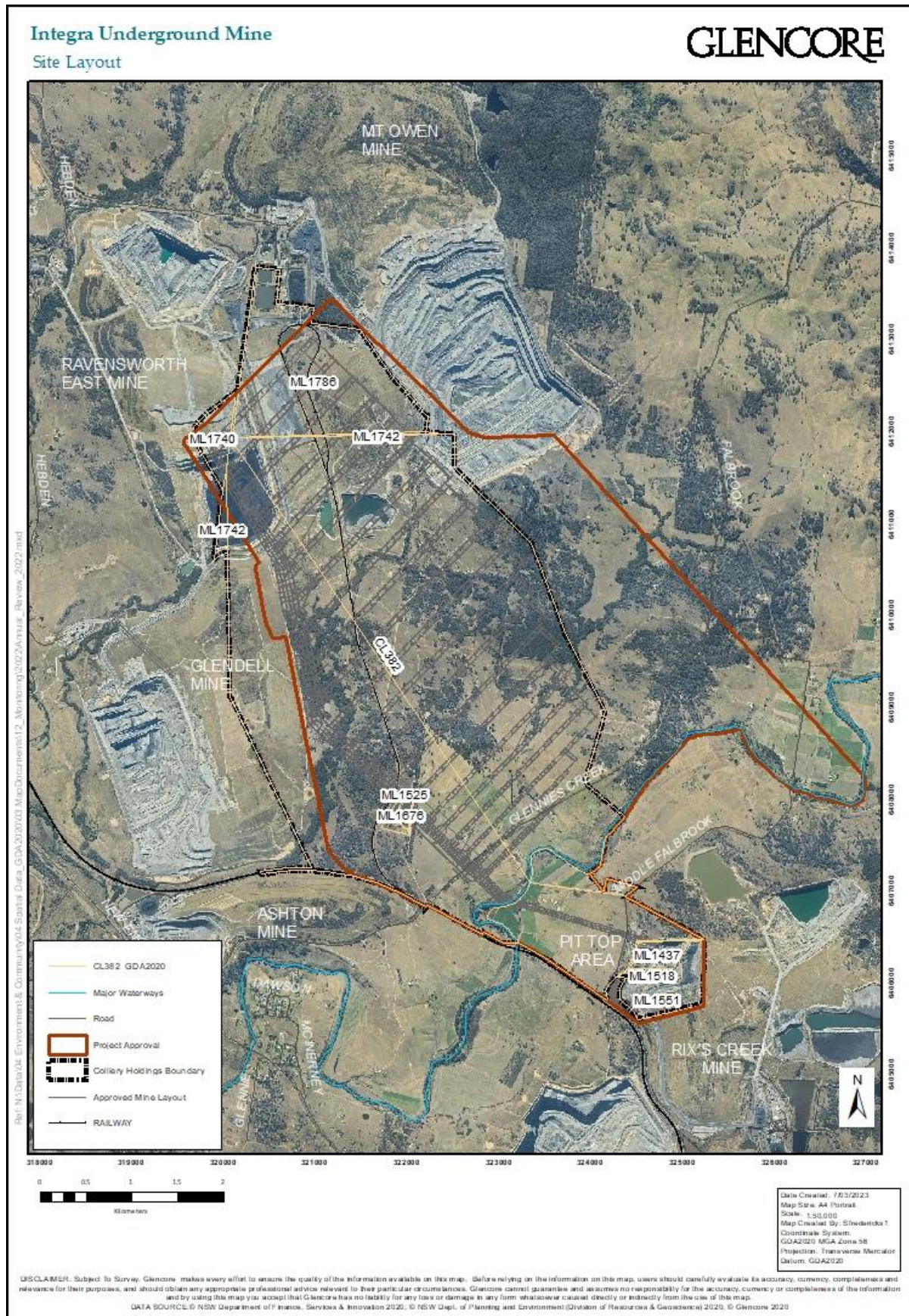


Figure 2-2 – Site Layout

2.3 Purpose

This Annual Review has been prepared to provide a summary of the performance of the operation over the reporting period in accordance with:

- The NSW Department of Planning and Environment (DPE) publication *Post Approval Requirements for State Significant Mining Developments – Annual Review Guideline* (NSW Government 2015);
- Schedule 5, Condition 11 of PA 08_0101;
- Commitments in the Rehabilitation Management Plan (RMP) outside of Annual Rehabilitation Report requirements;
- Commitments contained within the Integra Underground Environmental Management System (EMS);
- Summary of progress against actions in the latest Independent Audit of the site; and
- Outcomes of and feedback from regulators following the 2021 Annual Review.

A summary of relevant requirements relating to this Annual Review is provided in **Table 2-1**.

Table 2-1 – Annual Review Requirements

Condition	Section Addressed
PA08_0101	
Schedule 5, Condition 11 By the end of March each year, or other timing as may be agreed by the Secretary, the Proponent must submit a report to the Department reviewing the environmental performance of the project to the satisfaction of the Secretary. This review must: a) describe the works (including any rehabilitation) that were carried out during the previous calendar year, and the works that are proposed to be carried out over the current calendar year;	Sections 4, 5, 8 and 12
b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the: <ul style="list-style-type: none"> • relevant statutory requirements, limits, or performance measures/criteria; • monitoring results of previous years; and • relevant predictions in the documents referred to in condition 2 of Schedule 2; 	Sections 6, 7, 8 and 0
c) identify any non-compliance over the previous calendar year, and describe what actions were (or are being) taken to ensure compliance;	Sections 1 and 11
d) identify any trends in the monitoring data over the life of the project;	Sections 6, 7 and 8
e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and	Sections 6, 7 and 8
f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the project.	Sections 6, 7 and 8
Schedule 3, Condition 36: The proponent must: (d) report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary.	Section 6.8
Statement of Commitments	
The current groundwater monitoring program will continue with ongoing review and possible modification of the program as further data is obtained and interpreted. Annual reports documenting and interpreting the collected data will be prepared	Section 7.6
Emissions and abatement strategies will be reported annually as part of the internal environmental reporting and National Greenhouse and Energy Reporting obligations and in the Annual Review.	Section 6.3
Surface Water - Monitoring results will be reported in the Annual Review and distributed to the relevant Government agencies, CCC members and other relevant stakeholders.	Section 7.5
Greenhouse gas emissions will be estimated and reported annually.	Section 6.3
Following the completion of extraction of each longwall panel, a report will be prepared that summarises relevant monitoring data. Relevant monitoring and management activities for each year will also be reported in the Annual Review.	Section 6
Rehabilitation Management Plan	
If seed mixes are updated, records will be kept and reported within the Annual Review.	Section 8
The results and outcomes of the rehabilitation monitoring are reported into the Annual Rehabilitation Monitoring Report and the Annual Review.	Section 8.1

Condition	Section Addressed
Integra Underground will evaluate the rehabilitation monitoring and methodologies annually based on performance and consultation with key stakeholders. Any changes will be outlined in the RMP and Annual Review.	Section 8.1

2.4 Mine Contacts

Contact details for key personnel responsible for the environmental management at Integra Underground are provided in **Table 2-2**.

Table 2-2 – Mine Contacts

Name	Position	Contact
Charles Allan	General Manager	(02) 6577 4200
Scott Wolfenden	Environment and Community Manager	(02) 6577 4200

3. Approvals

Operations at Integra Underground are regulated by a range of leases, licences, and approvals, which are summarised in the following sections.

3.1 Project Approval

PA 08_0101 (as modified) allows for the extraction, processing, and transportation of up to 4.5 Mtpa until 31 December 2035. Eight modifications to PA 08_0101 have been approved. Details of the approval and subsequent modifications are provided in **Table 3-1**.

Table 3-1 – PA 08_0101 and Modifications

Approval	Date Granted	Expiry
PA 08_0101 Original approval	26 November 2010	31 December 2035
Mod 1 - Extend the open cut dump and increase emplacements height	18 March 2012	
Mod 2 - Amendments to consent wording	1 February 2013	
Mod 3 - Extend timeframes for conditions	5 October 2012	
Mod 4 - Modify biodiversity offset areas	24 February 2016	
Mod 5 - Separate into two project approvals for IOC and Integra Underground	23 August 2016	
Mod 6 - Approved to correct an administrative error which unintentionally altered the previously approved mine plan for the project	21 December 2016	
Mod 7 - Construct a water pipeline from Integra Underground to the Mount Owen Complex	15 September 2017	
Mod 8 - Realignment of main headings, extension of approved longwalls, development of up to three additional longwalls to the northwest in the Middle Liddell Seam and changes to ancillary surface infrastructure and water management	16 April 2018	
Mod 9 – Removal of requirement for Resource Regulator approval of Rehabilitation Management Plan following update to RMP process.	Pending approval	

3.2 Leases

The leases outlined in **Table 3-2** are applicable to the operations at Integra Underground. Integra Underground submitted renewal applications for ML 1525 and ML1740 during the reporting period.

Table 3-2 – Integra Underground Mining Leases

Title	Date Granted	Expiry
ML 1437	28 April 1999	27 March 2032
ML 1518	14 June 2004	27 March 2032
ML 1525 (shaft)	18 November 2002	17 November 2023
ML 1551	10 January 2006	27 March 2032
ML 1676	5 June 2013	4 January 2026
CL 382	12 November 1991	11 November 2033
ML1740	6 April 2020	30 December 2023
ML1742	6 April 2020	22 October 2034
ML 1786	28 May 2019	31 December 2031

3.3 Licences

3.3.1 Environment Protection Licence

Integra Underground operates under EPL 3390, with an anniversary date of 31 August. There were no variations made to EPL 3390 during the reporting period.

3.3.2 Surface Water Licences

Integra Underground currently holds the surface water licences detailed in **Table 3-3**.

Table 3-3 – Integra Underground Surface Water Licences

Licence No	Work Approval	Date Granted	Expiry	Share	Water Source
WAL 484	20CA200060	1 July 2004	Perpetuity	3	Hunter Regulated River - any part of Glennies Creek
WAL 485				99	Hunter Regulated River - Zone 3A of Glennies Creek
WAL 960	20WA201234			50	
WAL 961	20WA201236			150	
WAL 1172	20CA201763			3	
WAL 1173				303	
WAL 1242				13	

3.3.3 Groundwater Licences

Integra Underground currently holds the groundwater licences outlined in **Table 3-4**.

Table 3-4 – Integra Underground Groundwater Licences

Licence No.	Date Granted	Expiry	Allocation (ML)	Type of Works
WAL41562	7 June 2018	Perpetuity	450	Bore - Groundwater extraction for dewatering purpose
WAL41563	7 June 2018	Perpetuity	500	
20BL167917	15 August 2000	Perpetuity	-	Monitoring Bore
20BL169571	7 March 2005			
20BL169573				
20BL169574				
20BL171707	17 August 2007			
20BL171708				
20BL171710				
20BL171813	3 April 2008			
20BL171870	15 May 2008			
20BL172277	15 September 2009		-	
20BL172278				
20BL172279				

3.3.4 Sewage Management

Integra Underground has approval to operate a system of sewage management under On-site Sewerage Management (OSSM) Approval Number 3969/2008. This approval was granted 25 January 2012. The approval was renewed for the period 1 July 2022 to 30 June 2023.

3.4 Other Approvals

3.4.1 Mining Operations Plan / Rehabilitation Management Plan

The Integra Underground MOP was submitted to the Resources Regulator in November 2018 following the approval of Mod 8 to PA 08_0101 with a completion date of 31 December 2023 (SLR, 2018). This MOP was approved 19 November 2018. An amendment (known as Amendment A) was submitted in late 2018, which was revised in mid-2019. Subsequently, MOP Amendment A (Version 2) was approved on 22 July 2019. A further MOP Amendment B (MOPB) was approved on 28 July 2020.

The Rehabilitation Management Plan (RMP) was prepared to replace the approved MOP in July 2022. The plan addresses new DPE RMP requirements (refer **Section 4.5.4**).

3.4.2 Extraction Plan

The Integra Underground Longwalls 17 to 20 Extraction Plan (LW17-20 EP) was prepared for approval of secondary extraction within these panels. The LW17-20 EP was prepared in accordance with Schedule 3, Condition 20 of PA 08_0101 and was submitted to DPIE on 25 May 2020. Approval was received on 1 March 2021.

4. Operations During the Reporting Period

4.1 Mining Operations

Integra Underground commenced mining Longwall 17 in May 2021 and finished mining in April 2022. Secondary extraction in Longwall 18 commenced in May 2022. Development of first workings took place in Longwall 18, Longwall 19 and Longwall 20 in 2022. Coal extraction during 2022 is shown in **Figure 4-1**.

All ROM coal is sent to Rix's Creek North (owned by Bloomfield) for processing, therefore tailings/rejects are not relevant to Integra Underground. The 2022 production summary is presented in **Table 4-1**.

Table 4-1 – Production Summary 2022

Material	Approved Limit (PA 08_0101)	2022 reporting period (actual)	2023 reporting period (forecast)
Waste Rock/ Overburden (bcm)	N/A	N/A	N/A
ROM Coal (t)	4,500,000	1,796,320	2,204,529
Reject Material (Tailings) (t)	N/A	N/A	N/A
Saleable product (t)	N/A	1,195,628	1,592,687

4.2 Exploration

No exploration holes were drilled in 2022.

4.3 Rehabilitation

Rehabilitation was undertaken at eight gas well locations including gas well pads, access tracks and pipelines. This is further detailed in **Section 8**.

4.4 Other Operations

4.4.1 Coal Processing

All ROM coal was stockpiled by Integra Underground before being hauled by Bloomfield operations on their internal haul roads to Rix's Creek North (owned by Bloomfield) CHPP for processing.

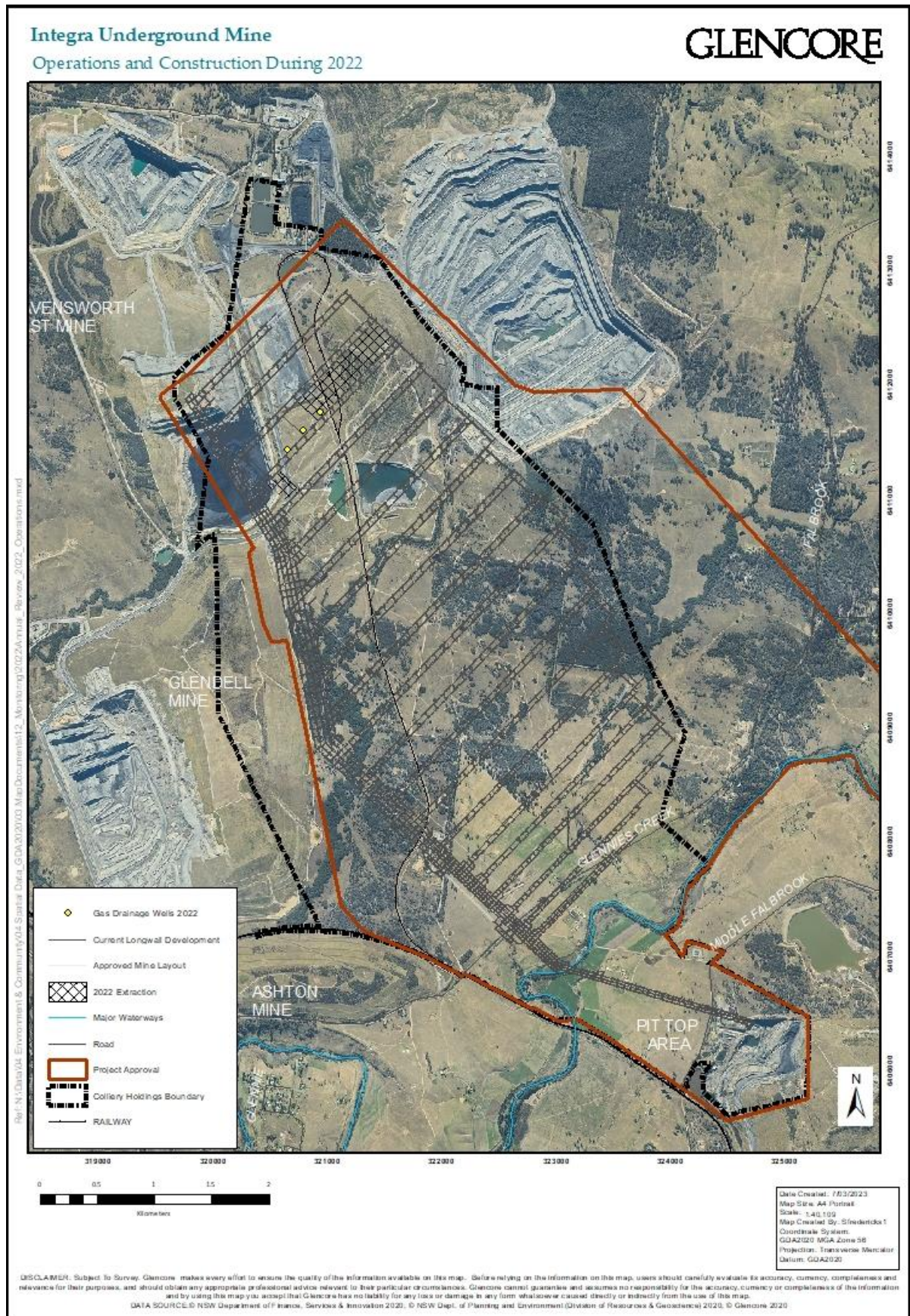


Figure 4-1 – Operations and Construction during 2022

4.4.2 Construction

Surface activities at Integra Underground included the construction of gas drainage wells, pipelines, and access roads for Longwalls 18 and 19. The gas wells constructed during 2022 are listed in **Table 4-2**. Surface disturbance from construction is shown in **Figure 8-1**.

Table 4-2 – Gas Wells Constructed in 2022

Gas well	Drilled Date	Commissioned	Drill Depth (m)
GW18/6	09/06/2022	Not yet commissioned	464
GW18/7	20/07/2022	Not yet commissioned	435
GW18/8	10/08/2022	Not yet commissioned	439

4.4.3 Mobile Plant and Equipment

Table 4-3 details the type, quantity and function of mobile plant and equipment used for operations at Integra Underground.

Table 4-3 – Integra Underground Mobile Plant and Equipment

Equipment Type	Number Routinely in Operation	Function
Personnel transporters	13	Personnel movement
Load haul dump (LHD/FBL)	13	Materials movement
Shield hauler	1	Materials movement
Grader	1	Underground road maintenance
Continuous miner	1	Mine development
Shuttle car	3	Mine development
Bobcat	2	Underground belt cleaning
Surface forklift	2	Surface and stores
Longwall unit	1	Coal production
Light Vehicles	8	Surface transportation
Telehandlers	1	Surface and stores

4.4.4 Construction Traffic Management

A *Construction Traffic Management Plan* (CTMP) was developed to satisfy Schedule 3 Conditions 42 of PA 08_0101 for the construction activities included in Mod 8 to PA 08_0101 and was effective as of 10 September 2018.

The majority of the construction approved under Mod 8 was completed prior to the reporting period. During the reporting period, gas drainage wells and associated minor infrastructure, such as access tracks and pipelines, continued to be progressively constructed with all traffic management undertaken as outlined in the CTMP. These construction areas were inspected monthly by the Environment and Community Department with no construction traffic related issues observed. No night-time construction works were undertaken during the reporting period. No traffic complaints were received regarding construction traffic and there were no construction traffic related incidents.

4.4.5 Land Subdivision & Ownership Transfers

No land subdivision or ownership transfers were completed in the reporting period.

4.5 Next Reporting Period

4.5.1 Mining

Integra Underground will undertake the following mining activities during 2023:

- First workings development in the Middle Liddell Seam for Longwall 20 using continuous miners;
- Longwall mining within the Middle Liddell seam, in Longwall 18 and Longwall 19;
- Extraction of ROM coal;
- Subsidence monitoring and remediation as per the approved Extraction Plan;
- Storage of ROM coal at the pit top;
- Hauling and processing of coal from Integra Underground to be undertaken by Bloomfield Collieries and its Rix's Creek North CHPP;
- Operation of workshop and administration areas; and
- Installation, commissioning, and operation of gas management infrastructure for Longwalls 18, 19 and 20, including pads, access tracks and pipelines.

4.5.2 Exploration

No exploration is planned for 2023 but if required, any exploration activity will be reported in the next Annual Review.

4.5.3 Construction

Gas drainage wells and associated infrastructure, such as access tracks and pipelines, will continue to be constructed during 2023. No night time construction work is planned. The Construction Traffic Management Plan will continue to apply to all construction work.

4.5.4 Rehabilitation and Mine Closure

During 2023, Integra Underground will progress and complete rehabilitation in accordance with the RMP and approved Forward Plan.

Integra Underground will continue planning for activities associated with mine closure, including the preparation of a RMP to address the closure phase of the operation.

5. Actions Required from Previous Annual Review

There were no actions required from the 2021 Annual Review report.

6. Environmental Performance

This chapter provides a summary of environmental monitoring and management undertaken during the reporting period. In accordance with the *Post Approval Requirements for State Significant Mining Developments – Annual Review Guideline* (October 2015), this report contains a summary of environmental monitoring data where it is required to explain trends or environmental performance during the report period.

6.1 Meteorology

Meteorological Station Sentinex13-M1 was operated in accordance with Schedule 3, Condition 16 of PA 08_0101. The weather station records rainfall, relative humidity, wind speed, wind direction and sigma theta at 10-minute intervals and temperature at two-minute intervals. The data is transferred by a telemetry link to the weather display and is used to evaluate weather conditions. The weather station achieved acceptable data recovery during the reporting period with no extended malfunctions for the measured parameters. A summary of conditions recorded in 2022 is provided in **Table 6-1**.

Sentinex13-M1 recorded 1103.8mm rainfall in 2022.

Table 6-1 – Summary of 2022 from Meteorological Station Sentinex13-M1

Month	2m Temperature (°C)			Wind Speed (m/s)		Prevailing Wind Direction	Rainfall (mm)
	Min	Ave.	Max	Ave.	Max	Ave.	Total
January	14.4	23.7	35.8	2.6	10.2	SE	65.8
February	11.6	21.9	36.0	2.7	12.0	SE	97.6
March	11.6	20.2	32.3	2.1	10.6	SE	343.0
April	7.8	18.0	29.4	1.9	10.3	SE	38.0
May	4.1	14.6	26.4	2.2	16.3	SE/WNW	37.8
June	0.5	10.8	20.4	3.9	14.0	NW	9.6
July	0.3	10.9	19.2	2.5	13.4	NW	151.8
August	3.0	12.6	23.5	2.6	13.7	NW	67.6
September	3.6	14.4	24.3	2.5	13.8	SE/NW	86.2
October	4.5	17.2	28.6	2.4	13.9	SE	81.4
November	6.8	16.7	33.8	3.2	15.2	WNW	91.2
December	7.1	20.6	35.2	3.0	13.0	SE	33.8

6.2 Air Quality

6.2.1 Criteria

Schedule 3 Condition 12 of PA 08_0101 stipulates the criteria for PM₁₀, TSP and deposited dust as presented in **Table 6-2**.

Table 6-2 – PA 08_0101 Air Quality Criteria

Pollutant	Criterion *	Averaging Period
TSP	90 µg/m ³ (Cumulative impact - increase in concentrations due to the project plus background concentrations due to all other sources)	Annual
PM ₁₀	50 µg/m ³ (Incremental impact - incremental increase in concentrations due to the project on its own)	24-hour
	30 µg/m ³ (Cumulative impact - increase in concentrations due to the project plus background concentrations due to all other sources)	Annual
Deposited Dust	4 g/m ² /month (Cumulative impact - increase in concentrations due to the project plus background concentrations due to all other sources)	Annual
	2 g/m ² /month (Incremental impact - incremental increase in concentrations due to the project on its own)	Annual

**Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity which has been endorsed by the EPA and then agreed to by the Secretary.*

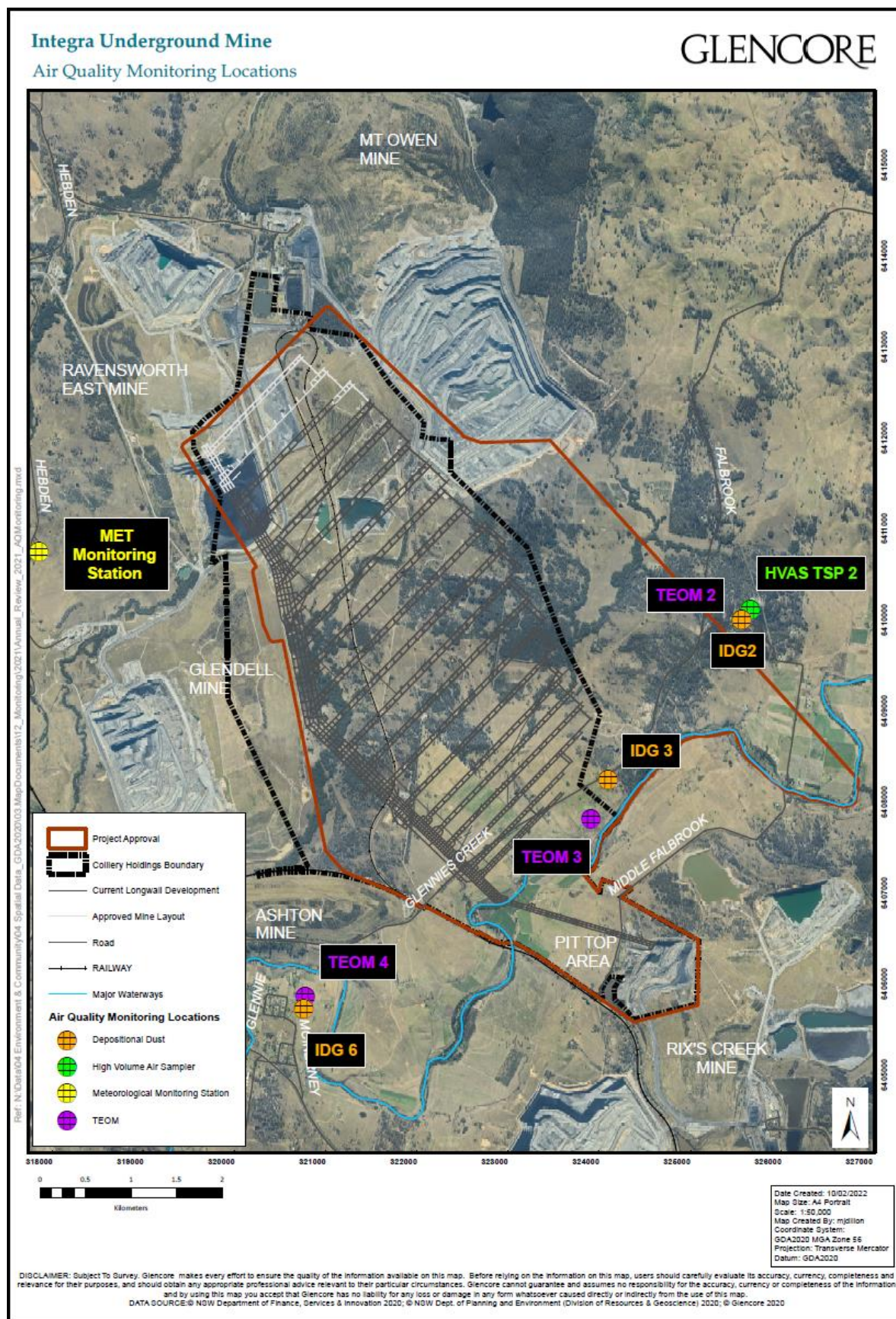


Figure 6-1 – Air Quality Monitoring Locations

6.2.2 Management and Mitigation Measures

Air quality management and mitigation measures include:

- Maintenance of coal handling areas, stockpiles, roads, and trafficked area in a moist condition using water carts and/or water sprays to minimise wind-blown and traffic-generated dust;
- Restricting vehicle speeds on unsealed roads that have not been treated with water or chemical stabilisers;
- Review of the location and operation of water sprays prior to the commencement of longwall operations (secondary extraction) where deemed necessary;
- Minimisation of disturbance areas;
- Limiting of development of minor roads and clear definition of minor road locations;
- Minimising double handling of material; and
- Minimising underground dust generation by the application of water and/or use of dust suppressants.

6.2.3 Key Environmental Performance

The *Air Quality and Greenhouse Gas Management Plan* (2021) is one of a series of environmental management plans that form the EMS for Integra Underground.

Air quality in the vicinity of Integra Underground's operation is monitored via ambient air quality monitoring and meteorological monitoring.

Air quality monitoring is conducted at the locations identified in **Figure 6-1** and includes:

- Three Tapered Element Oscillating Microbalance (TEOM) continuous air quality monitors that measure the concentration of particulate matter less than ten microns in diameter (PM₁₀);
- Three Deposition Dust Gauges used for monitoring of larger dust particles (typically >50µm) collected every 30 +/- 2 days; and
- One High Volume Air Sampler (HVAS) that monitors Total Suspended Particulates (TSP) over a 24-hour period every sixth day.

6.2.3.1 Depositional Dust Gauges

Deposition dust gauge data collected during the reporting period is available on the Integra Underground website. The depositional dust results presented in **Table 6-3** have been corrected for contamination of samples (by bird droppings or insects). The annual average deposition rate of insoluble solids is presented as g/m²/month.

Table 6-3 – Depositional Dust Data (2022)

Statistic	g/m ² /month			
	IDG2	IDG3	IDG6	Criterion
Annual average	2.2	1.0	1.3	4.0

During 2022, the annual average deposition dust results from all sources were below the 4 g/m²/month criteria at all three monitoring locations. Integra Underground did not exceed the “incremental impact” criteria from PA 08_0101 (2g/m²/month).

A comparison of the last three years of deposition dust monitoring data is provided in **Table 6-4**.

Table 6-4 – Depositional Dust Gauge Trends (2020 – 2022)

Gauge	Insoluble Matter Deposited (g/m ² /month)			Consent Criteria (g/m ² /month)
	2020	2021	2022	
IDG2	2.8	3.0	2.2	4.0
IDG3	2.5	1.5	1.0	
IDG6	2.4	1.6	1.3	

As shown in **Table 6-4**, all data was within the consent criteria. There are no discernible trends in the monitoring data, however it is noted that two of the three depositional dust gauge locations (IDG3 and IDG6) showed reduced dust levels in 2022, when compared to 2020 and 2021. This is likely associated with increased rainfall in 2022 (refer to **Section 6.1**).

6.2.3.2 TEOM (PM₁₀)

TEOM results for PM₁₀ concentrations are available in the Environmental Monitoring Reports on the Integra Underground website. **Table 6-5** summarises the 24-hour average and annual average for PM₁₀ concentrations.

Table 6-5 – PM₁₀TEOM Monitoring Results (2022)

Statistic	TEOM 2	TEOM 3	TEOM 4	Criterion
Maximum 24-hour average in µg/m³				
Measurement	34.2	39.6	38.1	50
Annual average in µg/m³				
Measurement	10.0	13.2	15.3	30

As shown in **Table 6-5**, the PM₁₀ concentrations at all three monitors were below the annual average criteria. There were no 24-hour average results above the 24-hour criterion. A comparison of the 2022 TEOM data, against the 2020 and 2021 data is presented in **Table 6-6**.

Table 6-6 – TEOM Monitoring Trends – 2020 - 2022

Gauge	Annual Average (µg/m ³)			Annual Ave Criteria (µg/m ³)	No. of days above 24h criteria			24h Criteria (µg/m ³)
	2020	2021	2022		2020	2021	2022	
TEOM 2	14	14	10	30	1	1	0	50
TEOM 3	17	15	13		9	0	0	
TEOM 4	21	20	15		17	4	0	

As shown in **Table 6-6**, the annual average PM₁₀ recorded at the TEOMs has been within the 30 µg/m³ annual average criteria for the last three years. During 2022, the number of days that the 24h PM₁₀ reached the daily limit of 50 µg/m³ was lower than previous years, with the number of daily occurrences generally decreasing at all monitors since 2020. This is due to increased rainfall in 2022.

6.2.3.3 HVAS (TSP)

HVAS results for TSP concentrations are available on the Integra Underground website under the Environmental Monitoring section (<https://www.glencore.com.au/operations-and-projects/coal/current-operations/integra-underground/monitoring-documents>). The 2022 annual average for TSP2 is detailed in **Table 6-7**. The annual average TSP concentration was well below the 90 µg/m³ criterion.

Table 6-7 – TSP Monitoring Results (2022)

Statistic	TSP2	Criterion
Annual average in µg/m ³		
Measurement	37.8	90

A comparison of the 2022 HVAS results for TSP concentrations against the 2020 and 2021 results is shown in **Table 6-8**. The annual average for 2022 is significantly lower than previous years due to increased rainfall.

Table 6-8 – HVAS Monitoring Trends 2020 - 2022

Monitoring Point	Annual Average (µg/m ³)			Annual Average Criteria (µg/m ³)
	2020	2021	2022	
HVAS - TSP2	62.0	56.5	37.8	90

6.2.4 Comparison with Predictions

Integra Underground operates in close proximity to a number of mining operations which are potential sources of additional atmospheric emissions. Other potential sources of emissions in the area include road and rail vehicle movements, vehicle exhaust emissions, windblown dust from exposed soils, bushfires, and agricultural activities.

The predictions made in the 2009 Air Quality Assessment (AQA) (ERM, 2009) have been assessed against air quality monitoring results for the reporting period. It should also be noted that the predictions made in the AQA and the AQIA were based on operations occurring at the Integra Complex at the time (i.e. both open cut and underground operations).

The 2009 AQA predicts the concentrations of depositional dust, PM₁₀ and TSP for multiple scenarios. Scenario 4 was chosen as it represents Year 8 of operations i.e. 2017, which was the most representative scenario for 2022 operations. **Table 6-9** outlines the predictions made in the AQA (ERM, 2009) and the results for the 2022 reporting period.

Table 6-9 – Comparison of 2022 Air Quality Data Against Predictions (ERM, 2009)

Sites	2009 Predictions (Scenario 4)	2022 Actual
Depositional Dust (g/m²/month)		
IDG2	5	2.2
IDG3		1.0
IDG6		1.3
PM ₁₀ (µg/m³) 24h Average		
TEOM 2	58	10.0
TEOM 3		13.2
TEOM 4		15.3
TSP (µg/m³)		
HVAS – TSP2	119	37.8

As shown in **Table 6-9**, during 2022 the depositional dust, PM₁₀ and TSP results were lower than the particulate emission predictions made in the AQA (ERM 2009). Based on the air quality monitoring data presented, the current operations are not causing air quality impacts above predictions.

6.2.5 Comparison with Long Term Data

As outlined in **Section 2.2**, in November 2016 Glencore decided to recommence operations at Integra Underground with first workings recommencing February 2017. Therefore, site data prior to 2017 can assist comparing the difference in environmental performance between when the site was in care and maintenance and during operation by Glencore.

Site TSP2 – Middle Falbrook was sampled for PM₁₀ concentrations between April 2006 and January 2018, with the results shown in **Table 6-10**. Annual averages for PM₁₀ concentrations at TSP2 ranged from 17.8µg/m³ to 24.9µg/m³, between 2006 and 2017.

Sampling of PM₁₀ ceased at TSP2 in January 2018, sampling of TSP commenced from December 2017 (until present). The 2020-2022 annual average data for TSP is presented in **Table 6-8**.

Table 6-10 – Long Term Annual PM₁₀ Concentrations Recorded at TSP2 – Middle Falbrook 2006 - 2018

Year	Minimum annual PM ₁₀ (µg/m ³)	Maximum annual PM ₁₀ (µg/m ³)	Average annual PM ₁₀ (µg/m ³)
2006*	4.0	63.0	20.1
2007	2.0	103.0	24.2
2008	1.0	79.0	24.0
2009	2.0	61.0	22.4
2010	2.0	68.0	21.0
2011	4.0	65.0	20.2
2012	3.0	94.0	23.0
2013	3.0	68.0	21.7
2014	4.0	49.0	20.5
2015	1.0	55.0	19.3
2016	1.0	48.0	17.8
2017	1.0	90.0	24.9

* Monitoring of PM₁₀ at TSP2 occurred between April 2006 and January 2018. Compliance monitoring of TSP at TSP2 commenced from December 2017 (until present).

The 2022 PM₁₀ results from sites TEOM 2 (former site TSP2), TEOM 3 and TEOM 4 of 10.0 µg/m³, 13.2 µg/m³ and 15.3 µg/m³ are generally lower than the historical PM₁₀ data provided in **Table 6-10**, further supporting the statement in **Section 6.2.2** that the current operations have not been causing adverse air quality impacts.

6.2.6 Proposed Improvement to Environmental Management

There is no proposed improvement to Environmental Management as there were no performance issues, management issues or community complaints relating to air quality in 2022. Integra Underground will continue to manage air quality in accordance with the *Air Quality and Greenhouse Gas Management Plan*.

6.3 Greenhouse Gas

Greenhouse gas management is undertaken in accordance with the *Air Quality and Greenhouse Gas Management Plan* (2021). Annual emissions and abatement strategies are reported as part of National Greenhouse and Energy Reporting (NGER) obligations.

The methane emitted from Integra Underground is discharged via goaf gas drainage boreholes to either the Glennie's Creek Power Station, the flare site on Forest Road or through mine ventilation. A number of goaf gas drainage boreholes are connected to the Glennies Creek Power Station, which utilises the gas to generate electricity for distribution in the NSW power grid.

Additionally, energy efficiency opportunities and greenhouse gas management strategies are implemented at Integra Underground in accordance with the *Air Quality and Greenhouse Gas Management Plan*.

6.3.1 Key Environmental Performance

Integra Underground reports greenhouse gas emissions (GHG) in accordance with National Energy and Greenhouse Gases (NGER) legislation. Each financial year Integra Underground is required to submit to the Federal government the emissions from their NGERs registered facility into the Emissions and Energy Reporting System (EERS). Also, because Integra Underground emits over 100kt of CO₂e- each year, Integra Underground is registered as a Safeguard facility and therefore also had a Safeguard baseline. Emissions above the baseline for that year need to be offset by retiring Australian Carbon credit Units (ACCUs). The NGERs reporting year is based on a financial year, not a calendar year such as this Annual Review. In order to prevent incompatible public reporting, the values in this report also cover a financial year. **Table 6-11** contains the Scope 1 (direct emissions from the mining activities during the year), and Scope 2 emissions (electricity consumption by the mine during the year) compared to annual average emissions forecast for 2018-2023 in the *PA 08_0101 Modification 8 Air Quality and Greenhouse Gas Assessment (Jacobs, 2017)* (the EIS forecast).

Table 6-11 – Greenhouse Gas Data

Emission EERS Reported Value	FY 2018/2019 t CO ₂ -e	FY 2019/2020 t CO ₂ -e	FY 2020/2021 t CO ₂ -e	FY 2021/2022 t CO ₂ -e	EIS Forecast t CO ₂ -e
Scope 1	601,601	601,244	553,209	277,236	645,231
Scope 2	38,673	44,038	43,984	38,908	22,714

6.3.2 Comparison with Predictions

The EIS forecast estimated that the annual average greenhouse gas emissions (Scope 1 and Scope 2 emissions) from Integra Underground between 2018 and 2023 would be 667,945 t CO₂-e. As outlined in **Table 6-11**, total emissions during FY2022 were 316,144 tCO₂-e which is significantly less than the projected greenhouse gas emissions (47% of predicted). This is due to lower production than predicted in the EIS forecast, and underground methane emissions lower than initially predicted.

6.3.3 Steps Taken to Improve Energy Efficiency and Reduce Greenhouse Gas Emissions

Integra Underground is a part of the wider coal assets held by Glencore across Australia. Glencore Coal Assets Australia (GCAA) are themselves a part of the global Glencore mining portfolio. In line with the ambitions of the 1.5°C scenarios set out by the IPCC, Glencore target a short-term reduction of 15% by 2026 and a medium-term 50% reduction of our total (Scope 1, 2 and 3) emissions by 2035 on 2019 levels. Post 2035, Glencore's ambition is to achieve, with a supportive policy environment, net zero total emissions by 2050.

Glencore incorporates energy costs and our carbon footprint into our annual planning process. Commodity departments, such as Glencore Coal Assets Australia, are required to provide energy and GHG emissions forecasts for each asset over the forward planning period and provide details of emissions reduction projects.

In the case of Integra Underground this includes involvement with GCAA when considering available GHG abatement technology and mine planning to optimise efficiency (which usually translates into reduced energy consumption).

6.3.4 Proposed Improvements to Environmental Management

There were no performance issues, management issues or community complaints relating to greenhouse gas emissions during 2022. Greenhouse Gas management during 2023 will be undertaken in accordance with the *Air Quality and Greenhouse Gas Management Plan*.

6.4 Noise

6.4.1 Criteria

The *Noise Management Plan* (2021) details the controls implemented at Integra Underground to minimise noise emissions and establishes a noise monitoring program to assess noise impacts on surrounding sensitive receivers.

Noise monitoring consists of both attended and unattended monitoring to meet the requirements of PA 08_0101 and EPL 3390. Monitoring includes:

- Quarterly night-time attended monitoring to assess compliance with regulatory limits, with frequency increased to monthly when construction is undertaken during night time periods; and
- Where required, real-time monitoring data from stations at the nearby Mount Owen Glendell Operations (which surrounds the Integra Underground operations) is accessed to supplement the attended noise monitoring program.

The noise monitoring locations are illustrated in **Figure 6-2**.

6.4.1.1 Noise Assessment Group Criteria

The noise assessment group (NAG) criteria are provided in Table 2 of PA 08_0101. In accordance with the *Noise Management Plan*, attended noise monitoring is undertaken quarterly at representative noise monitoring locations. Noise emissions from Integra Underground must not exceed the project specific noise criteria at any residence on privately owned land or on more than 25 percent of any privately owned land.

6.4.1.2 Construction Noise Criteria

PA 08_0101 (Schedule 3, Condition 2A) requires Integra Underground to manage noise from construction activities associated with the water pipeline infrastructure and Mod 8, in accordance with the noise management levels defined in Table 2 of the *Interim Construction Noise Guideline*. During this construction, Integra Underground must ensure that combined operational and construction noise from the development does not exceed a level of 5 dB(A) above the daytime operational $L_{Aeq(15min)}$ noise criteria in Table 3 of PA 08_0101 during Standard Construction Hours (7 am to 6 pm, Monday to Friday; and 8 am to 1 pm on Saturdays) and does not exceed the evening or night time operational $L_{Aeq(15min)}$ noise criteria in Table 2 of PA 08_0101.

6.4.1.3 Noise Acquisition Criteria

Schedule 3, Condition 3, Table 3 of PA 08_0101 details the acquisition noise criteria for Integra Underground. This is in accordance with the *Noise Management Plan*. Noise emissions (except construction noise) from Integra Underground must not exceed the project specific noise criteria at any residence on privately owned land or on more than 25 percent of any privately owned land.

6.4.1.4 Cumulative Noise Criteria

Integra Underground must implement all reasonable and feasible mitigation measures to ensure that noise generated by the project combined with the noise generated from surrounding mines does not exceed the criteria provided in Table 4 PA 08_0101 (Schedule 3, Condition 4) at any residence on privately owned-land or on more of 25 percent of any privately owned-land.

6.4.1.5 Cumulative Noise Acquisition Criteria

If the noise generated by the project combined with the noise generated by other mines in the vicinity exceeds the criteria in Table 5 PA_08_0101 (Schedule 3, Condition 5) at any residence on privately-owned land or on more than 25 percent of privately-owned land (except for the residential receivers in Table 1 for which the acquisition basis is noise), then upon receiving a written request for acquisition from the landowner, acquisition may be triggered

6.4.2 Management and Mitigation Measures

In addition to conducting noise monitoring, Integra Underground implements a number of mitigation measures to minimise potential noise impact on nearby receivers, and to comply with the conditions of consent. Mitigation measures are implemented as per the *Noise Management Plan* and include:

- Most operations are below the ground surface or in the portal;
- Significant distance between residences and ventilation fan sites;
- Controlling mine noise at the source through the use of equipment with appropriate sound attenuation fitted, where practical;
- Sound power level testing upon procurement of relevant plant and equipment, and annual sound power level testing;
- Restricting operations where possible in elevated/out of portal areas, especially during the night-time and adverse meteorological conditions;
- Where practicable, evening, and night-time surface operations will be restricted to areas that support a minimisation of mine contributed noise at privately owned residences surrounding Integra Underground; and
- Using broadband reversing alarms on mine equipment and light vehicles.

6.4.3 Key Environmental Performance

Attended noise monitoring was undertaken quarterly in accordance with PA 08_0101. The monitoring results are shown in **Table 6-12** and **Table 6-13**. The Integra Underground contribution was similar to the previous two reporting periods.

Attended monitoring is also required to be undertaken monthly during construction of the Mod 8 facilities associated with Ventilation Shaft 3 when activities are undertaken during evening or night periods. All construction associated with Mod 8 is complete and no night time period construction was undertaken during 2022.

The attended noise monitoring results show that Integra Underground operations were inaudible throughout most monitoring periods and below criteria when audible, demonstrating compliance with all noise criteria including acquisition, cumulative and cumulative acquisition detailed in **Section 6.4**.

Annual sound power level testing was completed in accordance with the Integra Noise Management Plan. Noise measurements were taken at the Forest Road Ventilation Shaft 2 facility and the Ventilation Shaft 3 facility. Results are discussed in **Section 6.4.4**.

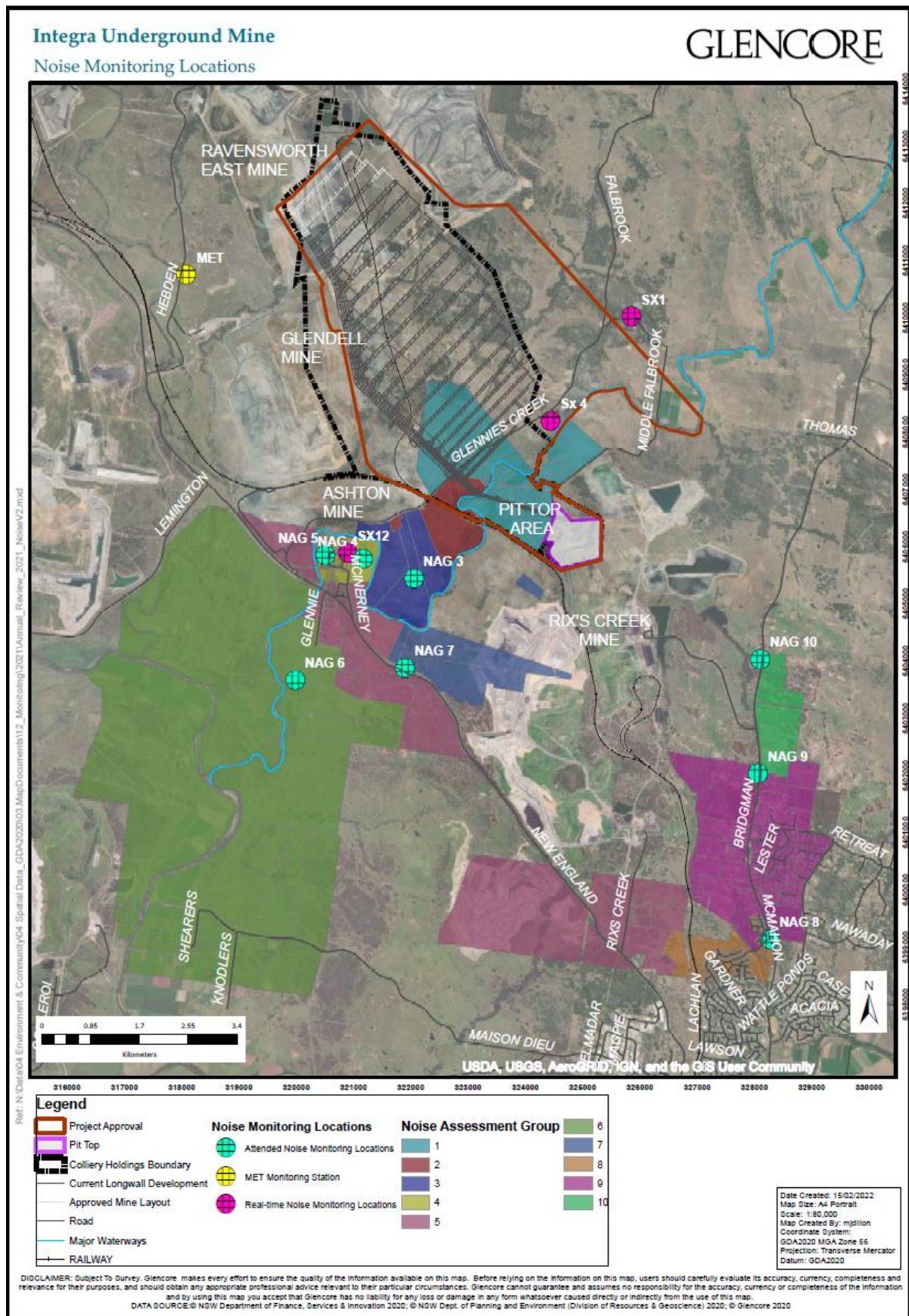


Figure 6-2 – Noise Monitoring Locations

Table 6-12 – Quarterly Attended Noise Monitoring Results – LAeq (15 minute)

Location	Criteria	Total Site Noise Monitoring Results				Integra Underground Contribution ¹			
		Q1	Q2	Q3	Q4	Q1 ¹	Q2 ¹	Q3 ¹	Q4 ¹
NAG 3	39	43	41	40	44	IA	IA	IA	IA
NAG 4	35	39	43	46	46	IA	IA	NM	IA
NAG 5	35	47	42	50	45	IA	IA	IA	IA
NAG 6	35	49	37	45	47	IA	IA	IA	IA
NAG 7	38	42	43	50	49	IA	IA	NM	IA
NAG 8	35	42	40	36	42	IA	IA	IA	IA
NAG 9	35	42	34	31	43	IA	IA	IA	IA
NAG 10	35	41	38	34	46	IA	IA	<25	IA

¹ Estimated Integra Underground contribution, as assessed by the operator during the monitoring session

IA = Not audible

Table 6-13 – Quarterly Attended Noise Monitoring Results – LA1 (1 minute)

Location	Criteria	Total Site Noise Monitoring Results				Integra Underground Contribution ¹			
		Q1	Q2	Q3	Q4	Q1 ¹	Q2 ¹	Q3 ¹	Q4 ¹
NAG 3	49	37	34	46	51	IA	IA	IA	IA
NAG 4	47	34	36	54	55	IA	IA	NM	IA
NAG 5	52	38	37	59	54	IA	IA	IA	IA
NAG 6	48	39	31	49	52	IA	IA	IA	IA
NAG 7	49	35	27	58	57	IA	IA	NM	IA
NAG 8	45	37	32	43	51	IA	IA	IA	IA
NAG 9	48	36	26	35	48	IA	IA	IA	IA
NAG 10	47	37	32	38	48	IA	IA	<25	IA

¹ Estimated Integra Underground contribution, as assessed by the operator during the monitoring session

IA = Not audible

6.4.4 Comparison with Predictions

A comprehensive review of background noise levels in the region was undertaken as part of the Noise Impact Assessment (EMM, 2012) prepared to support the application for PA 08_0101 Mod 2. This review was undertaken to assess cumulative noise from neighbouring operations and the influence of the Main Northern Rail Line and the New England Highway on the ambient noise environment. The Noise Impact Assessment also assessed the impact of the operational changes associated with the approved Western Extension and the Integra Complex. Further to this, an acoustics report was prepared to support the Integra Underground Mod 8 Environmental Assessment (Bridges, 2017).

During 2022, Integra Underground contributions to noise were below all criteria across all locations. The Project Approval criteria were developed from previous noise assessments for the project indicating that the site is below noise predictions.

These results are consistent with the results from the previous reporting period where all quarterly noise monitoring recorded inaudible results.

The total sound power level for the ventilation facility in the Noise Impact Assessment (NIA) (ERM, 2009) was 115 dBA. The measured sound power levels for the Forest Road Ventilation Shaft 2 facility and Ventilation Shaft 3 facility were 104 dB(A) and 114 dB(A), respectively. Accordingly, the total sound power level for the ventilation shaft sites is below that used in the NIA.

6.4.5 Proposed Improvement to Environmental Management

There were no performance issues, management issues or community complaints relating to noise during 2022. There are no proposed actions for 2022 regarding noise management. Integra Underground will continue to manage noise in accordance with the *Noise Management Plan*.

6.5 Biodiversity

Biodiversity is managed in accordance with the *Biodiversity Management Plan* (2022).

6.5.1 Key Environmental Performance

The *Biodiversity Management Plan* (BMP) commits to the collection of baseline ecological data within the surface area of Longwalls 13 to 20 to assess subsidence impacts. The monitoring program is focussed on representative vegetation communities in undermined areas and relevant control sites. (See **Figure 6-3**).

In 2022 Integra Underground added baseline monitoring of Longwall 20 to the monitoring program to allow for future comparison as underground mining progresses towards the Southern Remnant Area and Ravensworth State Forest. Field data from the latest monitoring event is summarised below. Monitoring sites are shown in **Figure 6-3**.

6.5.1.1 Vegetation Types

The study area has been considerably disturbed prior to mining activities due to land clearing and grazing activities and as such, most of the study area is cleared of native vegetation.

The identified vegetation communities and their conservation status under the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are shown in **Table 6-14**.

Table 6-14 – Vegetation Types Recorded at Monitoring Sites

Vegetation Type	Regional Significance #	BC Act Status	EPBC Act Status	Plot No.
Central Hunter Bullock Forest	None	Not listed	Not listed	B01, B02
Central Hunter Ironbark-Spotted Gum-Grey Box Forest	High	Endangered	Critically Endangered	SG01, SG01B, SG02, SR01, RS01
Modified Grassland	None	Not listed	Not listed	G01
Central Hunter Swamp Oak Forest	High	Not listed	Not listed	S01
Hunter Valley River Oak Forest	High	Not listed	Not listed	R01

As identified by ERM (2009)

Overall, the Grassland Control Monitoring Site (G01) has remained stable, with relatively consistent values recorded for native species richness, native groundcover grasses and exotic plant cover; however, there has been an overall decline in cover scores for 'native groundcover'.

The new Spotted Gum Impact Sites (SR01 and RS01) are within or above benchmark for all values (native species richness, native overstorey, total length of fallen logs, tree hollows, native species richness, native groundcover grasses and other) except for midstorey and shrub layers as well as total length of fallen logs at SR01.

The BioBanking plot results indicate scores that are below benchmark for most variables across all sites, but this has been consistent across the monitoring period. This reflects the general regrowth nature of vegetation within the Integra Underground Project Area and general locality. Much of this part of the Hunter Valley has been cleared and disturbed historically for grazing and mining land use.

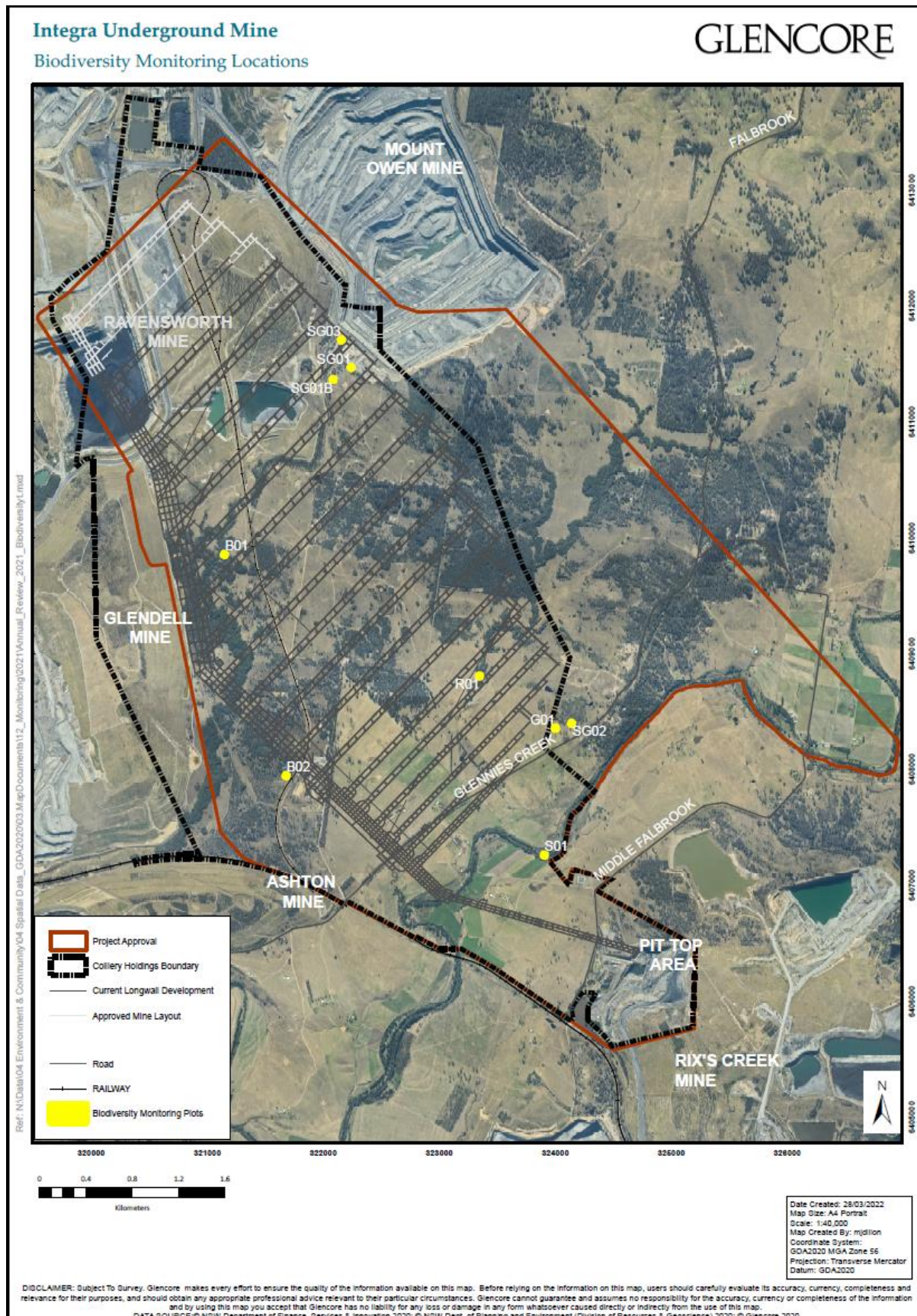


Figure 6-3 – Biodiversity Monitoring Locations

Analysis of BBAM plot data, photographs and species lists (at riparian sites) collected before longwall mining and after completion of each longwall panel shows no indication that the vegetation has been impacted by longwall mining. Climatic variability is likely the key factor contributing to the change in BBAM plot scores over the course of the monitoring program to date. The Hunter Valley experienced below average rainfall and generally hotter conditions between 2017 and 2019 but has experienced lower temperatures and higher rainfall between 2020 and 2022. Other factors that may be influencing results are differences in surveyor interpretations, site management practices, seasonal variability, and micro-conditions between sites.

6.5.1.2 Modification 8 Biodiversity Impacts

All works associated with Mod 8 were completed during previous reporting periods. Compensatory planting activities for Modification 8 works continued in 2022 with 5,467 additional *casuarina glauca* tube stock planted. The most recent tree count in 2022 recorded a total of 9,014 trees against a target of 13,700. Another 7,000 trees are planned to be planted in 2023.

6.5.2 Management Controls

A number of short, medium and long-term measures have been identified within the Biodiversity Management Plan. **Table 6-15** details management controls and the status of activities at the completion of 2022.

Table 6-15 – Biodiversity Management Controls

Management Controls	Status
Short term measures	
Establish baseline subsidence monitoring plots over longwall panels LW 13 – LW 20	Complete
Implement weed and pest management controls where required in the project area	Complete
Continue to adopt management strategies to ensure cattle and other livestock are excluded from the diverted Bettys Creek riparian zone	Complete
Medium term measures	
Continue to undertake ongoing rehabilitation and implement maintenance works as required	Complete
Undertake subsidence monitoring as mining progresses	Complete
Implement weed control to manage weed incursions	Complete
Undertake annual monitoring of revegetation success	Complete
For the Integra Underground Mod 8 construction, plant and maintain, until established, 10 like-for-like trees for every established tree removed during construction of the water pipeline infrastructure and construction of surface facilities approved by Mod 8	Commenced
Long term measures	
Rehabilitate disturbed exploration, minor surface disturbance areas and the Integra Underground to Mount Owen Complex pipeline areas in accordance with final landform/land use design	Commenced
Long term ongoing monitoring of revegetated areas along the Bettys Creek diversion to inform revisions to the management plans and any required alterations to management practices	Commenced

6.5.3 Proposed Improvements to Environmental Management

There were no performance issues or management issues relating to biodiversity during 2022. Integra Underground will continue to manage biodiversity in accordance with the BMP. Additional proposed actions for 2023 include continued monitoring and further planting to meet the Mod 8 requirements.

6.6 Aboriginal Heritage

The management of Aboriginal heritage during the reporting period was undertaken in accordance with the *Aboriginal Heritage Management Plan (2022)*.

6.6.1 Environmental Management Measures Performance

An Aboriginal and Historic Heritage Impact Assessment was undertaken by a qualified archaeologist in November 2017 to support the application for PA 08_0101 Mod 8. The impact assessment discovered five valid sites are located within the Assessment Boundary. The locations of all five sites were visited during the assessment and while surface artefacts were not visible at any of the site locations, all sites are regarded as remaining extant within the landscape (OzArk, 2017).

In efforts to preserve these sites, Integra Underground manage these areas in accordance with the *Aboriginal Heritage Management Plan (AHMP)*.

6.6.1.1 Due Diligence

A Due Diligence Archaeological Assessment was completed in June 2022 for LW19 and LW20 by an archaeologist. The majority of proposed works are occurring in areas that have been previously mined. It is considered that the works in these areas are occurring in 'disturbed lands' as defined by the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW 2010). A single isolated artefact MOCO IF-6 has been recorded in the study areas. It was concluded that an Aboriginal Heritage Impact Permit application was not necessary so long as MOCO IF-6 is not harmed.

6.6.2 Key Environmental and Social Performance

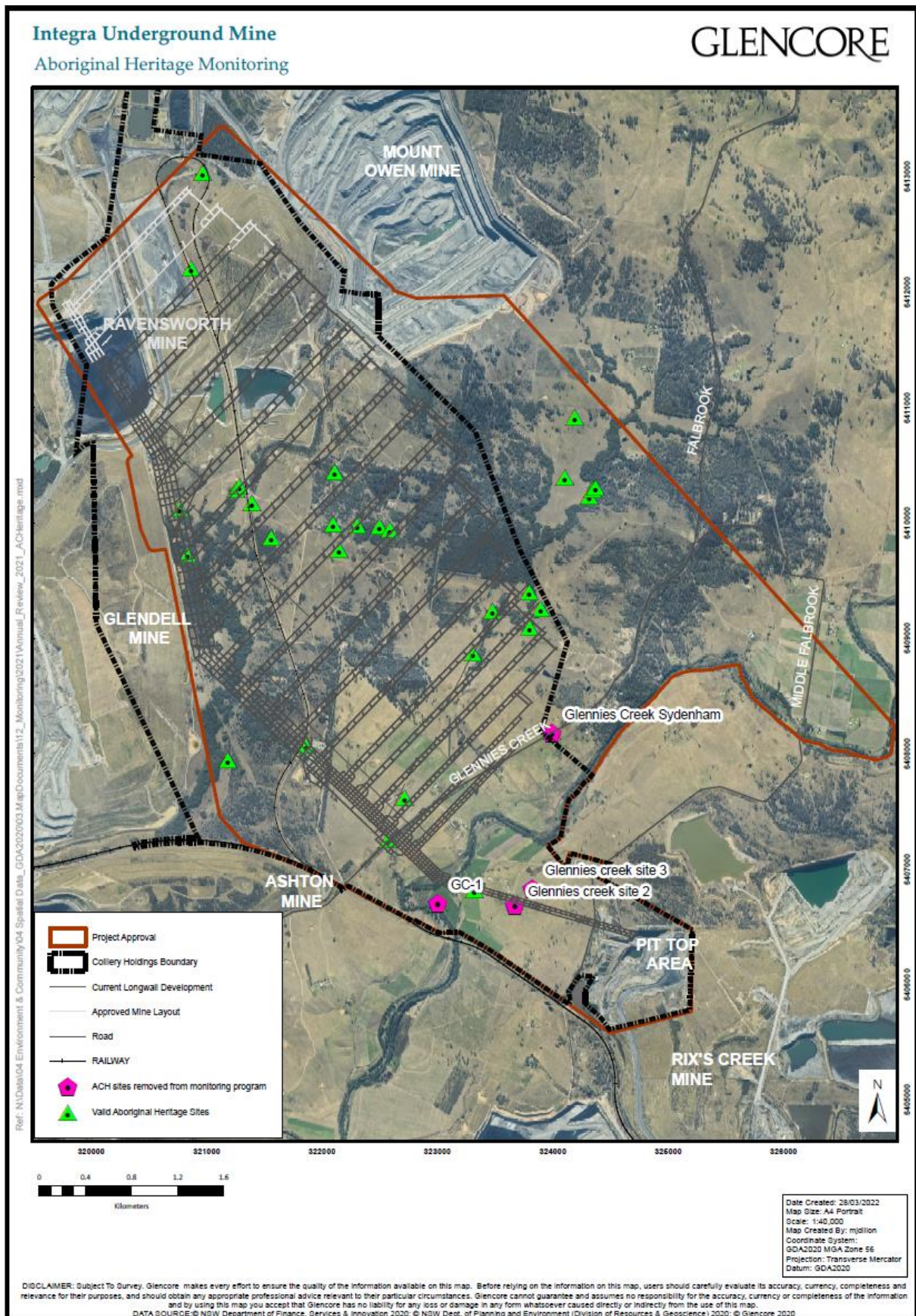
Aboriginal Cultural Heritage Monitoring is undertaken annually by a qualified archaeologist and Registered Aboriginal Party members. In May 2022, 13 sites were monitored. All sites inspected were found to be valid. Signage was recommended to be installed at GCS8 due to proximity to a vehicle track. This was completed during 2023. Further detail can be found in the full report on the Integra Underground website.

The AHMP was updated and approved by DPE in 2022. This update reflected the results of a review of Aboriginal heritage sites within the Integra Underground project area completed in 2021. The review identified any variation between the current AHIMS site records and Integra Underground spatial data.

No social impacts to indigenous people occurred due to mining activities at Integra Underground in 2022.

6.6.3 Proposed Improvements to Environmental Management

There were no environmental or social performance issues, unexpected finds, management issues or community complaints relating to Aboriginal Heritage during the reporting period. Integra Underground will continue to manage Aboriginal Heritage as per the AHMP.



6.7 Historical Heritage

Historical heritage is managed at Integra Underground in accordance with the *Historical Heritage Management Plan* (2022). The *Historical Heritage Management Plan* (HHMP) states that no additional historical heritage sites/items have been identified within the Integra Underground project approval area during the heritage assessment completed for Mod 8. It is not anticipated that Integra Underground's mining operations will have any impact on the remaining historical heritage sites identified within the Integra Underground project area, and the potential for historical archaeological items to be present is considered to be very low, therefore, no specific monitoring measures are required.

In November 2018, Umwelt completed a Heritage Assessment of the two buildings proposed for removal in the Integra Underground Pit Top Area. The heritage assessment of the 'Oak Park School House' and 'Residence' was required to assess potential heritage significance and to determine whether they can be demolished in accordance with PA 08_0101. It was concluded that both buildings can be removed without further assessment or investigation, in accordance with PA 08_0101, *Historic Heritage Management Plan* and *Mining Operations Plan*. The residence was removed in 2019 as previously reported.

6.7.1 Key Environmental Performance

During 2021 Integra Underground engaged an archaeologist to undertake a review of the recorded historic heritage items in the Integra Underground Historic Heritage Management Plan (HHMP) within the Integra Underground Mod 8 approval area. Minor variations and improvements were identified in the spatial data and Historic Heritage Management Plan, as a result these variations have been corrected and the Historic Heritage Management Plan has been reviewed and updated. The updated plan was approved by DPE in 2022.

6.7.2 Proposed Improvements to Environmental Management

There were no performance issues, unexpected finds management issues or community complaints relating to historical heritage during the reporting period.

Integra Underground will continue to manage historical heritage as per the HHMP in 2023.

6.8 Waste

The current waste management program utilises licensed waste contractors to incorporate recycling, in addition to the disposal of wastes in accordance with the waste provisions of the *Protection of the Environment Operations (Waste) Regulation 2014*.

6.8.1 Environmental Management Measures

Waste minimisation measures that occurred at Integra Underground during the reporting period included:

- Waste segregation;
 - separating timber waste out from general waste for both recycling & cost reduction purposes;
 - reclamation of usable materials; and
 - removal of steel from general waste for recycling and cost reduction.
- Recycling of redundant infrastructure and plant; and
- Signage at bins to improve waste segregation.

6.8.2 Key Environmental Performance

There were no changes to the waste management system at Integra Underground during the reporting period. In accordance with Schedule 3, Condition 36 of PA 08_0101, Integra Underground are required to minimise and monitor waste generated by the operation and ensure that waste generated by Integra Underground is appropriately stored, handled and disposed.

Table 6-16 – Waste Performance (2019 – 2022)

Waste Stream	2019 (t)	2020 (t)	2021 (t)	2022 (t)
Hazardous Recycled	613.3	57.3	75.8	42.4
Non Hazardous Recycled	508.9	508.1	1,423.9	533.5
Hazardous Disposal	28.1	22.6	17.05	7.9
Non-Hazardous Disposal	741.8	844.8	658.4	444.6

**Hazardous Recycled (Batteries, Waste Oil, Oily Water, Waste Coolant, Oil Filters, Solvents, Empty Drums, Contaminated Sludge)*

Non-Hazardous Recycled (Paper, Cardboard, Scrap Metal, Effluent Offsite, Conveyor Belt)

Hazardous Disposal (Contaminated Soil, Sanitary Waste, Chemical Anchors)

Non-Hazardous Disposal (Mixed Solid Waste)

Table 6-17 – Waste Trends (2019 – 2022)

Waste	Tonnes & Percentage (%)			
	2019	2020	2021	2022
Total waste disposed offsite to landfill	769.9 (40.7%)	867.5 (60.5%)	675.5 (31.1%)	452.5 (44%)
Total waste recycled	1,122.2* (59.3%)	565.5 (39.5%)	1,499.7 (68.9%)	575.9 (56%)
Total waste generated onsite	1,892.1 (100%)	1,432.9 (100%)	2,175.2 (100%)	1,028.4 (100%)

*Scrap steel recycling campaign undertaken in 2019

Table 6-16 outlines waste streams, waste volumes (2019 – 2022) and

Table 6-17 compares the volumes of waste disposed of against the volume recycled across the last four years. The volume of waste generated in 2022 was less compared to the previous three years. Increase in waste generation in 2021 was associated with removal and recycling of redundant plant and equipment as Integra Underground progresses to mine closure. Waste volumes in 2022 were also reduced due to lower production, reduced need for additional infrastructure going into closure, and reduced personnel on site.

6.8.3 Sewage Treatment

Integra Underground has an on-site sewage treatment system (OSSM Approval Number 3969/2008), which includes a primary aeration tank with a secondary maturation pond and a package sewage treatment plant. Wastewater from the system is dispersed by irrigation sprays on dedicated irrigation areas.

As required by Condition M2.2 of EPL 3390, monitoring was undertaken of the sewage effluent for pH and faecal coliforms. Sewage monitoring and maintenance was undertaken monthly and relevant approvals have been retained.

6.8.4 Proposed Improvements to Environmental Management

There were no material performance issues or management issues relating to waste during 2022. Integra Underground will continue to monitor waste parameters throughout 2023 and continue to remove unnecessary plant and infrastructure in preparation for mine closure.

6.9 Weed and Pests

6.9.1 Environmental Management Measures

During 2022, Integra Underground conducted weed control works across the Project Approval, mining lease and rehabilitation areas, targeting biosecurity priority weeds and environmental weeds. Quarterly weed control work reports are prepared by a weed management contractor to provide information on the weed works carried out on site, the locations of the works and an indication of the weed areas treated.

6.9.2 Key Environmental Performance

Weed treatment locations included rehabilitation areas (including pit top), infrastructure sites, leased properties and buffer land, Betty's Creek diversion, Glennies Creek riparian, Main Creek riparian, planned 2022 rehabilitation sites, offset planting areas and topsoil stockpiles. Key species targeted are included in **Table 6-18**.

Table 6-18 – Key Weed Species Targeted

State Priority Weeds (including WONS*)	Regional Priority Weeds	Environmental Weeds
African Boxthorn (<i>Lycium ferocissimum</i>)	Golden Wreath Wattle (<i>Acacia saligna</i>)	Purple Top (<i>Verbena bonariensis</i>)
Fireweed (<i>Senecio madagascariensis</i>)	African Olive (<i>Olea europaea</i> ssp <i>cuspidata</i>)	Narrow leaf cotton bush (<i>Gomphocarpus fruticosus</i>)
Lantana (<i>Lantana camara</i>)	Mother of Millions (<i>Bryophyllum</i> sp.)	<i>Acacia saligna</i>
Madeira vine (<i>Anredera cordifolia</i>)	Paterson's curse (<i>Echium plantagineum</i>)	Thistles
Prickly pear (<i>Opuntiod</i> sp.)		Smart Weed (<i>Persicaria decipiens</i>)
		Wandering Jew (<i>Tradescantia albiflora</i>)
		Jerusalem cherry (<i>Solanum</i> sp)

* Weeds of National Significance

6.9.3 Proposed Improvements to Environmental Management

There were no performance issues, management issues or community complaints relating to weeds and pests during 2022. Weed and pests will be monitored and managed during 2023 as per the management strategies in the BMP and RMP.

6.10 Bushfire

6.10.1 Environmental Management Measures

Bushfire management is undertaken in accordance with the *Bushfire Management Plan (2022)* which has been prepared to assess and manage bushfire risks on site. The *Bushfire Management Plan* details prevention and management measures to reduce the impact of bushfire at Integra Underground. These include:

Management measures
Ignition Management
No smoking is permitted at Integra Underground
Procedures for hot works and other higher risk activities
Procedures for management of the gas flare site and other gas management infrastructure
Works with ignition potential are not permitted during total fire bans days, unless in hard stand
Maintenance of housekeeping by mine management
All workshops and offices are required to have appropriate firefighting equipment and with their location indicated by signs compliant with Australian Standards
Equipment will not be stored on uncleared ground
Vehicular access will be maintained around all areas of mining-related activities which will aid in observation and response
Fuel Management
Vegetative fuels
Maintain Asset Protection Zones (APZs) around vulnerable assets to minimise the potential impact of bushfire
Maintain Strategic Fire Advantage Zones (SFAZs).
Anthropogenic fuels
All fuel and oil are stored within defined storages which meet Australian Standards and are regularly maintained
All fuel tanks on-site will be fully or self-bunded so that in the event of a leak or rupture, fuel is restricted from escaping
Undertake refuelling within designated fuel bays or within cleared areas of the mine site where possible
Manage explosives materials according to the relevant Australian Standards

Other management strategies include maintaining availability of water supply in the event of a bushfire, communication and availability of the *Bushfire Management Plan* to all relevant persons and protection of life strategies such as postponing non-essential works within bushfire prone areas on days of declared Total Fire Ban.

6.10.1.1 Monitoring

Quarterly bushfire inspections were undertaken in 2022 to monitor bushfire risk to Asset Protection Zones and Strategic Fire Advantage Zones. Actions arising from the quarterly monitoring included maintenance and slashing of the buffer around the fan site, ventilation plants and gas wells. Powerlines and access tracks were maintained throughout the reporting period. There were no fires recorded onsite during 2022.

6.10.2 Proposed improvements to Environmental Management

There were no performance issues, management issues or community complaints relating to bushfires during the reporting period. The controls and mitigation measures within the *Bushfire Management Plan* will be implemented in 2023.

6.11 Hydrocarbon Management

Bulk fuel facilities are managed in accordance with *AS1940-2017 The Storage and Handling of Flammable and Combustible Liquids*. All permanent fuel facilities are bunded, with emergency measures in place to manage any spills.

Hydrocarbon spills which occur are reported via the site's incident reporting system and investigations carried out as required. When spills occur, they are managed with spill kits available onsite or treated through oil-water separators.

6.11.1 Key Environmental Performance

During the reporting period two minor hydrocarbon spills occurred and they were appropriately contained and cleaned-up. All spill incidents were reported internally and managed in accordance with the *Spill Response Procedure* and *Hydrocarbon Management Plan*.

6.11.2 Proposed Improvements to Environmental Management

There were no performance issues, management issues or community complaints relating to hydrocarbon management in 2022. Integra Underground will continue to prevent hydrocarbon spills in 2023 as well as respond to and investigate any spills which may occur to prevent recurrence.

6.12 Public Safety

6.12.1 Environmental Management Measures

Public safety was managed in accordance with the Longwall 17-20 Extraction Plan (EP) *Public Safety Management Plan* that was approved in March 2021.

Integra Underground is committed to preventing risks to public safety resulting from operations at the mine. Ongoing reviews of potential public safety issues are undertaken on a regular basis around the mine area and associated public roads.

Integra Underground's general approach to public safety management is outlined below:

- Baseline Monitoring and Inspections – Establishing baseline data for the Extraction Plan area by completing inspections and subsidence monitoring. Liaison with key stakeholders;
- Mitigation Measures Prior to Mining – Fences and gates have been used to minimise the potential for public access to the Extraction Plan Area.
- Monitoring and Inspections During Mining – Continue inspections and monitoring as mining progresses. Liaison with key stakeholders;
- Assessment and Interpretation of Impacts – Monitoring and inspection data is analysed to identify variations from subsidence predictions. Assessment of impacts/risks to public safety. Liaison with key stakeholders;
- Implement Remediation Measures – Implement actions to effectively manage any risks to public safety. Liaison with key stakeholders; and
- Re-assessing Impacts and Review of Effectiveness of Remediation Measures – Re-assessment of impacts through inspection and monitoring. Review of the effectiveness of remedial measures. Liaison with key stakeholders.

Day-to-day monitoring of public safety at Integra Underground is undertaken through the use of a variety of methods, including:

- All site visitors are directed to the main office and are required to report and log on to an electronic visitor's system;
- Implementation of a security system to ensure public and employee safety is maintained in accordance with the relevant requirements under the *Work Health and Safety (Mines and Petroleum Sites) Act 2013*, *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014*, *Mining Act 1992* and the mining tenements;
- Signage advising of subsidence areas;
- Security fencing surround the perimeter of the pit top and surface infrastructure;
- Security patrols; and
- Employee and contractor inductions regarding mine safety and environmental management issues prior to commencement of work at the site.

6.12.2 Key Environmental Performance

Public safety monitoring is undertaken as part of the weekly subsidence inspections. Minor subsidence cracking and potholing were identified during 2022 above Longwalls 17 and 18 however this did not cause any potential impacts to public safety as these areas were inaccessible to the public.

6.12.3 Proposed Improvements to Environmental Management

There were no performance issues, management issues or community complaints relating to public safety during 2022. Public safety management during 2023 will be undertaken in accordance with the *Public Safety Management Plan*.

6.13 Subsidence

6.13.1 Environmental Management Measures

During the reporting period longwall mining was undertaken in Longwalls 17 and 18. Subsidence is managed in accordance with the Longwalls 17 to 20 EP, which is available on the Integra Underground website. Longwalls 17 to 20 Extraction Plan includes a Subsidence Monitoring Program approved in 2021. The Subsidence Monitoring Programs were prepared as a component of the Extraction Plan and detail the ongoing monitoring program to manage subsidence. This includes:

- Weekly visual inspections within the subsidence impact zone;
- Bi-monthly subsidence impact reporting; and
- Six-monthly reporting with a comprehensive summary of all impacts and environmental monitoring results.

6.13.2 Key Environmental Performance

A subsidence specialist was engaged to review and analyse the Longwalls 17 and 18 subsidence monitoring data undertaken bi-monthly and six-monthly during the 2022 reporting period. An End of Panel report was completed for Longwall 17. The results of this monitoring are summarised below:

In the 2022 bi-monthly monitoring reports, the specialist concluded that:

- No significant subsidence impacts to natural or built features were observed;
- Subsidence impacts to the Mount Owen Railway Line/Bettys Creek Bridges and associated infrastructure have been minor and have been effectively managed by the technical committee to maintain this infrastructure in a safe and serviceable condition;
- No subsidence impacts to the Mount Owen North Pit open cut mining operations have been recorded.

The six-monthly reviews of Longwall 17 and 18, and Longwall 17 End of Panel Report concluded:

- Subsidence effects are consistent with expectation and much less than the relevant performance indicators for Longwalls 17 and 18;
- Subsidence impacts observed at the completion of Longwall 17 are considered compliant with the subsidence performance measures of PA 08_0101 (Mod 8);
- Subsidence effects and impacts observed are likely to be compliant with the performance indicators within the various management plans developed for the Extraction Plan as required under PA 08_0101.
- No incidents relating to an increased risk to public safety from subsidence in the mining area have been reported.

6.13.3 Comparison with Predictions

A Subsidence Impact Assessment was undertaken by a subsidence specialist in 2020 to support the Longwalls 17 – 20 Extraction Plan. The assessment predicted the proposed extraction would be compliant with the subsidence performance measures in Schedule 3, Condition 17 of PA 08_0101.

Table 6-19 shows that measured values of the primary subsidence parameters – vertical subsidence, tilt, and strains – are less than the predictions made in the Longwalls 17 to 20 Extraction Plan. The lower than forecast subsidence applies to natural ground surfaces and areas of disturbed ground with waste rock fill material.

Table 6-19 – Comparison of Subsidence Parameters – Forecast and Measured for Longwall 17

Data Set	Subsidence (m)	Tilt (mm/m)	Tensile Strain (mm/m)	Compressive Strain (mm/m)
Natural/ Undisturbed Ground				
Forecast Maximum LW 17	1.5	14	7	10
Areas of Waste Rock Emplacement (e.g. West Dump, West Pit Tailings Dam)				
Forecast Maximum LW 17	2.5	14	14	20
End of Panel Report Findings				
Measured Maximum LW 17	0.91	6	2	2

Subsidence behaviour and impacts observed in the vicinity of Longwall 17 and 18 are consistent with expectations outlined in the Longwalls 17 to 20 Extraction Plan. End of panel report findings for Longwall 17 indicate subsidence impacts well below forecast impacts (refer **Table 6-19**). In 2022, the subsidence specialist stated the main subsidence impact observed was minor cracking of the surface, and minor changes to the landform. Minor impacts to built features such as the Mount Owen Railway Line and associated infrastructure was expected and has been recorded. All impacts are consistent with predictions and expectations, and are less than the maxima forecast (SCT, 2022).

6.13.4 Proposed Improvements to Environmental Management

Minor subsidence cracking was identified during 2022 across Longwalls 17 and 18, however this did not cause any potential impacts to public safety or the environment.

There were no performance issues, management issues or community complaints relating to subsidence during the reporting period. Integra Underground will continue to rehabilitate cracks, as per the *Rehabilitation Management Plan* and *Extraction Plan*.

6.14 Lighting and Visual Impacts

6.14.1 Environmental Management Measures

The following management measures were implemented at Integra Underground to reduce the impact of visual amenity and lighting:

- Lighting impacts are considered during the Annual Environment and Community Risk Assessment process;
- Site lighting locations are inspected during Surface Environmental Inspections to manage compliance with siting and positioning of lights;
- Outdoor lights are angled to shine below the horizon, or have shields;
- All external lighting associated with the project comply with *Australian Standard AS/NZS 4282:2019 - Control of Obtrusive Effects of Outdoor Lighting*, or its latest version; and
- The locations of private land and residences (i.e. sensitive receptors who may be impacted by outdoor lighting) are considered prior to undertaking an activity that may create intrusive lighting.

6.14.2 Performance and Proposed Improvements to Environmental Management

There were no performance issues, management issues or community complaints relating to lighting or visual impacts during the reporting period. During 2023 lighting and visual impacts at Integra Underground will continue to be managed in accordance with site procedures.

6.15 Environmental Performance Summary

Table 6-20 identifies performance during 2022 at Integra Underground against approval criteria, and further details management implications and proposed actions.

Table 6-20 – Environmental Performance Summary

Aspect	Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented/ proposed management actions
Air quality	Refer s6.2	Approval criteria met	Nil	Nil
Greenhouse Gas	Refer s6.3	Approval criteria met	Nil	Nil
Noise	Refer s6.4	Approval criteria met	Nil	Nil
Biodiversity	Refer s6.5	Approval criteria met	Nil	Nil
Aboriginal Heritage	Refer s6.6	Approval criteria met	Nil	Nil
Historical Heritage	Refer s6.7	Approval criteria met	Nil	Nil
Waste	Refer s6.8	Approval criteria met	Nil	Nil
Weeds and Pests	Refer s6.9	Approval criteria met	Nil	Nil
Bushfire	Refer s6.10	Approval criteria met	Nil	Nil
Hydrocarbon Management	Refer s6.11	Approval criteria met	Nil	Nil
Public Safety	Refer s6.12	Approval criteria met	Nil	Nil
Subsidence	Refer s6.13	Approval criteria met	Nil	Nil
Lighting and Visual Impacts	Refer s6.14	Approval criteria met	Nil	Nil

7. Water Management

Integra Underground operates under a *Water Management Plan (2022)*. The *Water Management Plan (WMP)* includes surface water, groundwater, creek diversions, erosion, and sediment control.

Integra Underground is situated within the catchments of Glennies Creek, Main Creek and Bettys Creek. Water monitoring sites and extent of alluvium at Integra Underground are shown on **Figure 7-1**.

The Integra Underground water management system adopts a water management approach categorising water into three classes and managing each via a segregated system. The three categories of water are:

- **Clean water:** Runoff from areas undisturbed by mining activities, established rehabilitation or local water sources (creeks, rivers, or alluvial aquifers).
- **Dirty water:** Runoff from unestablished rehabilitation and disturbed areas (hardstand, laydown areas and unsealed roads).
- **Mine water:** Runoff from haul roads, overburden dumps, workshop areas, vehicle wash-down bays and storage yards. Also includes dewatering of underground workings.

The Integra Underground water management system considers water sharing agreement in place with Bloomfield (operators of Rix's Creek North) and Mount Owen Glendell Operations.

7.1 Water Balance

The mine water management system at Integra Underground achieves a net neutral water balance through integrated water management practices with the neighbouring open cut mining operation at Rix's Creek North, and the Integra Underground to Mount Owen Glendell Complex mine water pipeline which operates under the Greater Ravensworth Area Water Sharing Scheme.

Mine water associated with Integra Underground is generated from:

- Dewatering of underground workings;
- Rainfall runoff from the Portal Sump, administration, and laydown areas (via overflows from Process Dams); and
- Seepage from overburden dump (Rix's Creek North).

Integra Underground reviewed the site water balance for the reporting period (1 January 2022 – 31 December 2022), using the existing GoldSim model. The 2022 water balance, along with the previous 2021 and 2020 balances for comparison, is presented in **Table 7-1**.

In summary, there has been an increase in inputs/outputs from 2021, this is largely due to higher volume of seepage (due to increased rainfall) into the Portal Sump from Rix's Creek, and an increase in the volume pumped to Rix's Creek North.

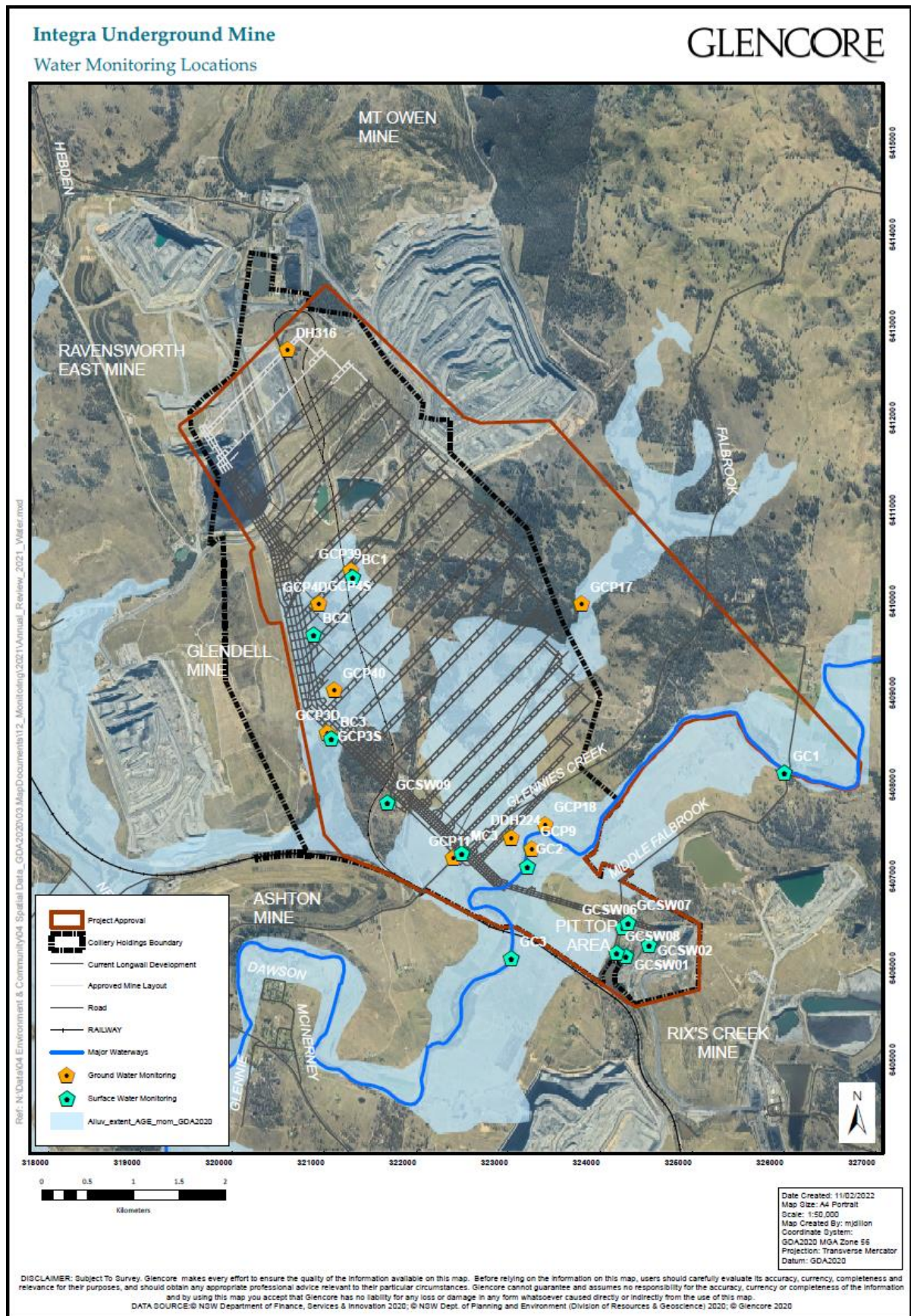


Figure 7-1 – Water Monitoring Locations and Alluvium Mapping

Table 7-1 – 2020-2022 Water Balance

Aspect	2020 Volume (ML)	2021 Volume (ML)	2022 Volume (ML)
Inputs			
Imported clean water for operational use	391.8	312.4	262.3
Imported portable water	14.8	12.5	10.34
Groundwater ingress	114.9	117.2	312.2
Seepage into Portal Sump from Rix's Creek North overburden emplacement	306.0	1,149.0	2,282.6
Transfers from Rix's Creek into Integra Underground Portal Sump	234.9	0.4	0
Rainfall-runoff	321.8	404.5	367.3
Water intake	149.9	119.0	181.6
Total Inputs	1,534.1	2,114.9	3,416.4
Outputs			
Operational uses (e.g. dust suppression)	22.3	18.5	21.3
Evaporation	30.0	37.3	39.0
Potable water use	14.8	12.5	10.3
Transfers to Rix's Creek Mine	0.0	725.0	2596.9
Transfers to Mount Owen Glendell Operations	1,246.9	1,067.0	437.9
Moisture loss to Vented Air	-1.4	220.8	52.37
Total Output	1,536.6	2,081.2	3157.8
Inflow – Outflow	-1.4	33.7	258.63
Recorded Volume Stored on Site at start of Annual Review period	24.8	30.1	78.4
Recorded Volume Stored on Site at end of Annual Review period	30.1	78.4	67.4
Recorded Change in Storage	5.4	48.3	-11.0
Error	<1%	<1%	1%

7.2 Water Take

Water taken by Integra Underground during the previous water year (1 July 2021 to 30 June 2022) has been summarised in **Table 7-2**. Water sourced for operational purposes was extracted under the Mount Owen Glendell Operations WAL 7814. Water extracted from WAL 1172, WAL 1173 and WAL 1242 under lease agreement are associated with tenanted property Lot 1 DP 799154.

Table 7-2 – 2021-2022 Water Take

Water Licence #	Water sharing plan, source and management zone (as applicable)	Entitlement (ML)	Passive take / Inflows (ML)	Active Pumping (ML)	Total (ML)
Waterways					
WAL 484	Hunter Regulated River - any part of Glennies Creek	3	0	0	0
WAL 485	Hunter Regulated River - Zone 3A of Glennies Creek	99	0	0	0
WAL 960	Hunter Regulated River - Zone 3A of Glennies Creek	50	0	0	0
WAL 961	Hunter Regulated River - Zone 3A of Glennies Creek	150	0	0	0
WAL 1172	Hunter Regulated River - Zone 3A of Glennies Creek	3	0	1.5	1.5
WAL 1173	Hunter Regulated River - Zone 3A of Glennies Creek	303	0	40.2	40.2
WAL 1242	Hunter Regulated River - Zone 3A of Glennies Creek	13	0	0	0
WAL 7814	Hunter Regulated River - Zone 3A of Glennies Creek (Mt Owen Glendell Operations Water Access Licence)	1,000	0	311.47	272.66
Groundwater					
WAL 41562	Bore: Sydney Basin - Hunter Porous Rock Aquifer	450	374.8	0	374.8
WAL 41563	Bore: Sydney Basin - Hunter Porous Rock Aquifer	500			

During the reporting period Integra Underground used 41.7 ML (7%) of its 621 ML surface water allocation, 272.66 ML (27%) of the Mt Owen Glendell Operation 1,000 ML surface water allocation, and 374.8 ML (39%) of its 950 ML groundwater allocation. The Mod 8 Groundwater Impact Assessment (AGE, 2017) predicted that in Year 4 of the operation, Integra Underground would intercept 609 ML of groundwater. Groundwater interception is tracking below this prediction.

7.3 Changes to Licences

There were no changes to water licences during the reporting period.

7.4 Discharges

Integra Underground is a closed system with transfers between neighbouring mines. There were no discharges of water offsite to the natural environment.

7.5 Surface Water

7.5.1 Key Environmental Performance

Surface water quality was monitored onsite at Integra Underground and in the surrounding waterways during the reporting period. Surface water monitoring locations are shown on **Figure 7-1** and comprise of three creek lines and onsite water storages which are sampled for pH, Electrical Conductivity (EC), total suspended solids (TSS). Sampling of Bettys Creek and Main Creek is completed on a quarterly basis whereas Glennies Creek is sampled monthly.

The creek criteria and monitoring results for pH and EC for the reporting period have been summarised in **Table 7-3**.

Table 7-3 – Surface Water Monitoring Results – pH and EC

Monitoring Location	pH Results					EC Results (µS/cm)			
	Min	Ave	Max	Lower Criteria	Upper Criteria	Min	Ave	Max	Criteria
Monthly Monitoring Sites									
GCSW01 Process Dam	7.6	8.5	8.9	-	-	279	411.3	626	-
GCSW02 Portal Sump	7.1	7.5	8.6	-	-	3170	7232.5	8060	-
GCSW06 Sewerage Pond	7.2	7.9	8.8	-	-	347	407.8	487	-
GCSW07 Potable Water Supply	7.3	7.6	8.0	-	-	212	236.2	270	-
GCSW08 Runoff Pond	7.2	8.0	9.7	-	-	143	220.1	297	-
GCSW09 Ventilation Shaft Dam ^	8.0	8.3	8.7	-	-	490	636.5	958	-

Monitoring Location	pH Results					EC Results (µS/cm)			
	Min	Ave	Max	Lower Criteria	Upper Criteria	Min	Ave	Max	Criteria
GC1 Glennies Creek	7.6	7.8	8.1	7.6	7.9	266	397.3	698	555
GC2/W4 Nobles Crossing	7.6	7.8	8.0	7.5	7.9	277	393.8	696	466
GC3 Glennies Creek	7.4	7.7	8.0	7.6	7.9	277	392.3	688	519
Quarterly Monitoring Sites									
BC1 Bettys Creek ¹	7.3	7.4	7.4	6.9	7.8 (flow) 8.1 (no flow)	189	394.0	512	540 (flow) 6,350 (no flow)
BC2 Bettys Creek ²	7.7	7.7	7.8			2270	2650.0	3030	
BC3 Bettys Creek ²	7.8	7.9	7.9			1450	1865.0	2280	
MC3 Main Creek	7.5	7.7	8.0			427	496.3	537	680 (flow) 1,220 (no flow)

Note:

1 Sampled quarterly. Data from three sampling events only (May, August, November)

2 Sampled quarterly. Data from two sampling events only (May and November)

There were instances of criteria outside of trigger limits through the year. In accordance with the WMP, investigations were undertaken by a water consultant in response to monthly and bimonthly pH and EC triggers throughout the year. The investigations determined that monitoring results at the locations were not attributable to Integra Underground. The monitoring results were within historic ranges which have been observed since 2009. Additionally, the locations of these monitoring points are outside the predicted subsidence impact zone.

Total dissolved solids (TDS) and total suspended solids (TSS) for the reporting period have been summarised in **Table 7-4** as per the WMP.

Table 7-4 – Surface Water Monitoring Results – TSS and TDS

Monitoring Location	TSS Results (mg/L)				TDS Results (mg/L)			
	Min	Ave	Max	Criteria	Min	Ave	Max	Criteria
Monthly Monitoring Sites								
GCSW01 Process Dam	NR	NR	NR	-	150	247	372	-
GCSW02 Portal Sump	NR	NR	NR	-	NR	NR	NR	-
GCSW06 Sewerage Pond	NR	NR	NR	-	NR	NR	NR	-
GCSW08 Runoff Pond	NR	NR	NR	-	99	157	301	-
GC1 Glennies Creek	5.0	11.3	24.0	50*	158	234	335	-
GC2/W4 Nobles Crossing	<5.0	10.2	25.0		170	239	342	-
GC3 Glennies Creek	<5.0	15.1	58.0		166	234	359	-
Quarterly Monitoring Sites								
BC1 Bettys Creek ^{1*}	<5.0	7.3	11.0	50*	173	243	288	-
BC2 Bettys Creek ^{2*}	8.0	12.5	17.0		1,260	1,540	1,820	-
BC3 Bettys Creek ^{2*}	<5.0	<5.0	<5.0		788	1,344	1,900	-
MC3 Main Creek ³	10.0	18.7	36.0	50*	322	367	424	-

*ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality

NR: Not required

¹ Sampled quarterly. Data from three sampling events only (May, August and November)

² Sampled quarterly. Data from two sampling events only (May and November)

³ Sampled quarterly. Data from three sampling events only (February, August and November)

Results above the TSS criteria were recorded at GC3 Glennies Creek in May 2022. Elevated TSS levels appear to correlate to elevated rainfall, as increased runoff can result in increased sediment in the water.

During the reporting period there were a number of elevated results at Glennies, Bettys and Main Creeks which triggered the surface water TARP (refer **Section 7.5.1**). Investigations were undertaken by a water consultant for each of these occasions, which concluded the following:

Stream pH – The pH levels recorded for Glennies Creek during the reporting period were found to be within the historic pH range that has been observed in the creek since September 2002. Insufficient data is available for a long-term assessment / plotting of Main Creek or Bettys Creek stream pH. It was noted that factors that may contribute to the pH being outside the specified TARP range are principally the introduction of buffering species, such as bicarbonate, and the interaction between these influences and stream flow changes. The results are only just above (more alkaline) than the outlined trigger value and within their historic range. In summary, the water consultant determined that none of the pH results which triggered the TARP were considered significant, and they were not directly due to influences from activities or operations within the Integra Underground.

Stream Salinity and Total Suspended Solids - The stream salinity has been gradually rising since late April 2019, however the elevated results which triggered the TARP during the 2022 reporting period were considered to be within the historical range of salinities recorded since September 2002.

7.5.2 Stream Health and Channel Stability

The May 2022 Bettys Creek Diversion Channel Stability and Stream Health Monitoring (SLR, 2022) indicated that the majority of monitoring points experienced no apparent change from what was observed during the May 2021 assessment (SLR, 2021).

The specialist found the diversion to be generally stable in most areas in 2022. There are areas of the diversion with significant erosion observed, however no evidence was observed to indicate that these impacts were a result of Integra Underground operations.

7.5.3 Comparison with Predictions

A Surface Water Assessment was undertaken by WRM Water and Environment (2009) as part of the Integra Underground Coal Project EIS. The assessment concluded that “Impacts from the current proposal will be limited to Bettys Creek, Main Creek and their local drainage network. Mine planning has ensured that Glennies Creek and its associated alluvium lie outside the subsidence footprint from the proposed underground mining and hence no surface water impacts are expected” (WRM, 2009). A Surface Water Assessment was undertaken by Hansen Bailey (2017) to support the Mod 8 Environmental Assessment. This assessment stated that:

- The existing monitoring program will be expanded to include the Modification Underground Extraction Area and ancillary infrastructure;
- The proponent will undertake routine inspections as necessary to monitor the potential impacts of the Modification;
- Additional annual inspection sites will be established in response to any erosion or sediment control issues identified through the routine monitoring program; and
- The monitoring program will continue to be reviewed on an annual basis.

Quarterly monitoring results presented in **Table 7-3** and **Table 7-4** indicate minimal changes to water quality associated with Integra Underground, further investigations undertaken by Geoterra into triggers identify the water quality variations as being within historic ranges.

7.5.4 Long Term Trend Analysis

Figure 7-2 to **Figure 7-4** show long-term (2012 to 2022) results for pH, EC and TSS. Although pH and EC levels resulted in some attributes outside of trigger criteria, these levels are within the historic pH and EC levels observed at the site. The location of all monitoring sites is below the limit of predicted subsidence and therefore operations at Integra Underground are not considered a contributing factor to these triggers.

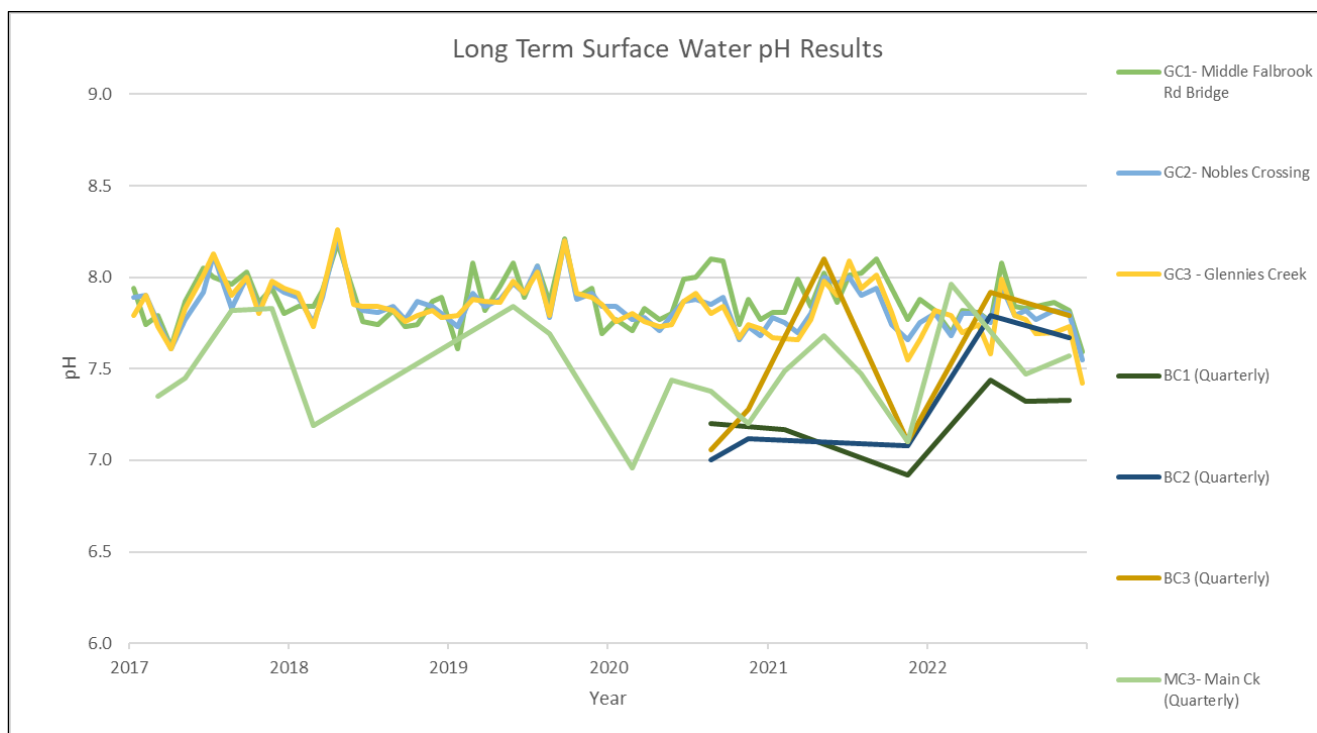


Figure 7-2 – Long Term Surface Water pH Results

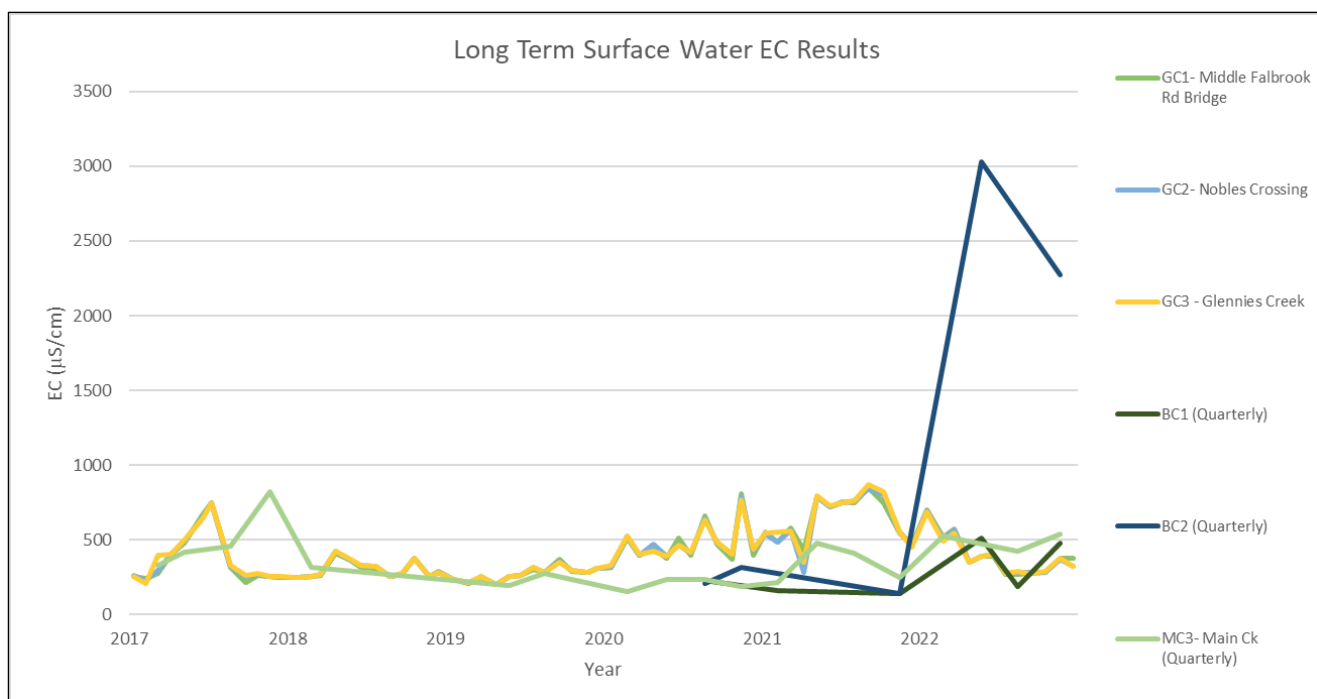


Figure 7-3 – Long Term Surface Water EC Results*

*BC3 data was excluded from the graph as only three monitoring events have been undertaken due to dry conditions. A spike was experienced during the May monitoring round, the site was resampled with the results returning to normal levels.

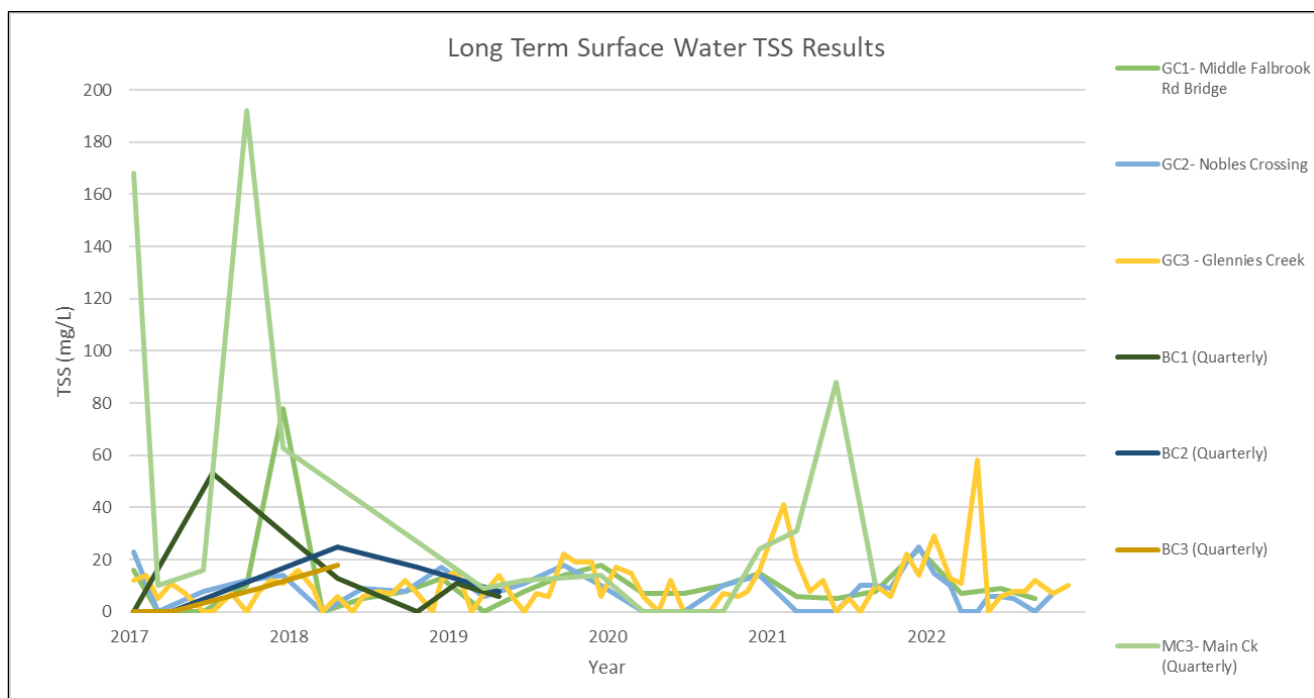


Figure 7-4 – Long Term Surface Water TSS Results

7.5.5 Erosion and Sediment Controls

During the reporting period Integra Underground continued the campaign to improve management of sediment fences on site. The campaign included update of the mapping and classification of sediment fences associated with surface disturbance areas. Sediment fences were classified as retain, repair, or remove. Integra Underground plans to undertake further maintenance and removal of site sediment fences in 2023 as potential improvements are identified.

7.5.6 Proposed Improvements to Environmental Management

There were no performance issues, management issues or community complaints relating to surface water during the reporting period. Integra Underground will continue to manage surface water in accordance with the *Water Management Plan*.

7.6 Groundwater

7.6.1 Key Environmental Performance

Groundwater was monitored onsite at Integra Underground during the reporting period. Groundwater monitoring locations are shown on **Figure 7-1** and comprises of ten sites which are sampled bimonthly for pH, EC, and depth (m) and another two vibrating wire piezometers sites that monitor pressure. **Table 7-5** summarises the pH, EC, and depth monitoring results for the reporting period.

During 2022, groundwater monitoring limits were triggered. In response to this, Integra Underground engaged a ground water specialist to undertake an investigation of these results during the reporting period. The results of these investigations are summarised below:

7.6.1.1 Groundwater pH

The groundwater specialist determined that the TARP pH levels recorded during the reporting period are within the historic pH range, and gradual acidification trend observed since late 2015. They noted that factors that may contribute to the pH being outside the specified TARP range are principally the degree of oxidation of primary sulfide species, such as pyrite, and the introduction of buffering species, such as bicarbonate, and the interaction between these influences and water level changes that expose (oxidise) or submerge (de-oxygenate) the minerals that may be dissolved within the aquifer.

- Historic pH range has been observed since April 2005 for GCP3S and is within a gradual acidification trend observed in GCP3D and GCP4D;
- GCP9, 11, 17 and 18 are only just outside the outlined trigger value and within their historic range since August 2006.

In summary, the specialist concluded that the pH results which triggered the TARP were not considered significant, and they were not attributed to influences from activities or operations within Integra Underground.

7.6.1.2 Groundwater Salinity

The groundwater specialist determined that the TARP EC levels recorded during the reporting period were within the historic range of EC. observed since April 2005 for GCP4D, November 2009 for GCP18 and July 2008 for GCP40. Geoterra noted factors that influence the salinity being outside of the specified TARP range are principally rainfall recharge into the aquifer, with more recharge generating “fresher” water and less recharge generating saltier water. It was noted that the elevated results recorded at:

- GCP4D is within a long term salinisation trend that started around May 2009, this is within its overall historic range since monitoring began;
- GCP18 is within a long term moderately freshening trend, also within its overall historic range since monitoring began; and
- GCP40 is within its long term range, with no salinisation trend evident.

The elevated results were only marginally outside the outlined trigger value and were within the historic range of the piezometers since April 2005.

In summary, none of the EC results which triggered the TARP were significant, and were not directly due to influences from activities or operations of Integra Underground. However, the specialist noted that ongoing monitoring results should be observed to assess if the salinisation trend continues. It should also be noted that the technical exceedances in GCP4S and GCP18, according to the WMP TARP, are actually not exceedances as they are “fresher” than the specified range, where they are actually less saline than the specified TARP criteria.

7.6.1.3 Groundwater Levels

The groundwater specialist noted that groundwater levels have been outside the TARP criteria at GCP3D, GCP4S, GCP4D and GCP9 for periods in that they were deeper than the lower criteria range. GCP17 has also been beneath (lower than) the criteria since 2019. Piezometer GCP11 and GCP 18 were outside the criteria, however, did not trigger the TARP as it was higher than the upper criteria, (i.e. it had shallower groundwater levels).

In 2022, the groundwater specialist noted that the factor that influences groundwater levels to be outside the specified TARP range, outside of subsidence impacts, is principally rainfall recharge into the aquifer, with more recharge generating “shallower” and less recharge generating deeper water levels. There is no distinctive response to mine subsidence in the water level variability due to extraction of Longwall 17 and 18 on the alluvial piezometers GCP3S, 4S, 4D, 9, 17, 39 and 40.

In summary, the groundwater specialist confirmed that none of the groundwater level results which triggered the TARP were considered significant, and were not currently due to influences from recent activities or operations of Integra Underground, however, it was recommended that ongoing monitoring results be observed to assess the long term water level trends in association with rainfall.

7.6.2 Alluvium Interception

Figure 7-1 shows the extent of mining activities and the unconsolidated alluvium associated with Glennies Creek, Bettys Creek and Main Creek.

7.6.3 Comparison with Predictions

A Groundwater Impact Assessment was undertaken by a groundwater consultant in 2017 to support the modification to PA 08_0101 (Mod 8).

The assessment determined that there would be no impact to groundwater quality as a result of the proposed operations. The 2022 groundwater quality monitoring results align with these predictions, as there have been no impacts to groundwater quality (pH or EC) attributable to Integra Underground Operations (GeoTerra, 2022) (refer **Section 7.6.5**).

The Groundwater Impact Assessment (AGE, 2017) predicted that the Modification would generate a zone of drawdown within the Permian coal measures focussed around the Modification footprint. It also concluded that the maximum net loss of groundwater from the Quaternary alluvium and from connected stream baseflow due to the Modification was predicted to be negligible at less than 1 ML/year, and therefore undetectable. The 2022 groundwater depth monitoring align with these predictions, as there have been no impacts to groundwater depth attributable to Integra Underground Operations (GeoTerra, 2022) (refer **Section 7.6.5**).

Table 7-5 – Groundwater Monitoring Results

Monitoring Location	pH Results					EC Results (µS/cm)					Groundwater Level (mbgl)				
	Min	Ave	Max	Lower Criteria	Upper Criteria	Min	Ave	Max	Lower Criteria	Upper Criteria	Min	Ave	Max	Lower Criteria	Upper Criteria
GCP3S ¹	6.9	7.0	7.1	6.9	7.2	6,080	17,970	23,800	14,900	16,200	3.0	3.9	4.9	3.6	4.5
GCP3D	7.3	7.4	7.5	7.3	7.5	11,400	11,667	12,300	5,140	10,700	36.62	37.02	37.64	-	92.14 [#]
GCP4S	6.9	7.3	7.5	7.3	7.8	16,100	17,967	20,900	7,230	10,200	2.4	3.1	3.9	3.5	4.6
GCP4D	6.8	6.9	7.4	7.0	7.7	18,300	18,800	19,600	4,570	12,900	77.28	79.67	87.58	-	73.69 [#]
GCP9	6.8	6.9	7.0	6.8	7.1	295	319	331	395	475	4.0	4.4	4.7	4.5	4.2
GCP11	7.4	7.5	7.5	7.1	7.5	2,650	2,687	2,750	1,740	4,510	5.1	6.6	7.2	8.4	9.3
GCP17 ¹	-	-	-	6.8	7.0	-	-	-	17,100	18,000	-	-	-	7.3	7.5
GCP18	6.7	6.7	6.7	6.8	7.3	539	539	539	760	1,180	65.76	66.37	66.68	-	-68.73 [#]
GCP39	6.2	6.2	6.2	6.0	6.9	225	292	374	210	4,310	1.0	1.6	2.6	3.3	4.4
GCP40	6.6	6.7	6.8	6.6	6.9	42,300	46,900	50,800	33,000	40,800	3.5	4.6	5.5	4.6	5.2

¹ Bores were dry or too low to sample

[#] Coal Measure Maximum Drawdown Level Triggers

7.6.4 Long Term Trend Analysis

Figure 7-5 to **Figure 7-7** show long-term results for pH, EC and depth, respectively. Although there were levels outside of TARP triggers during 2022 (refer **Section 7.6.1**), these levels were within the historic ranges of the piezometers (GeoTerra 2022).

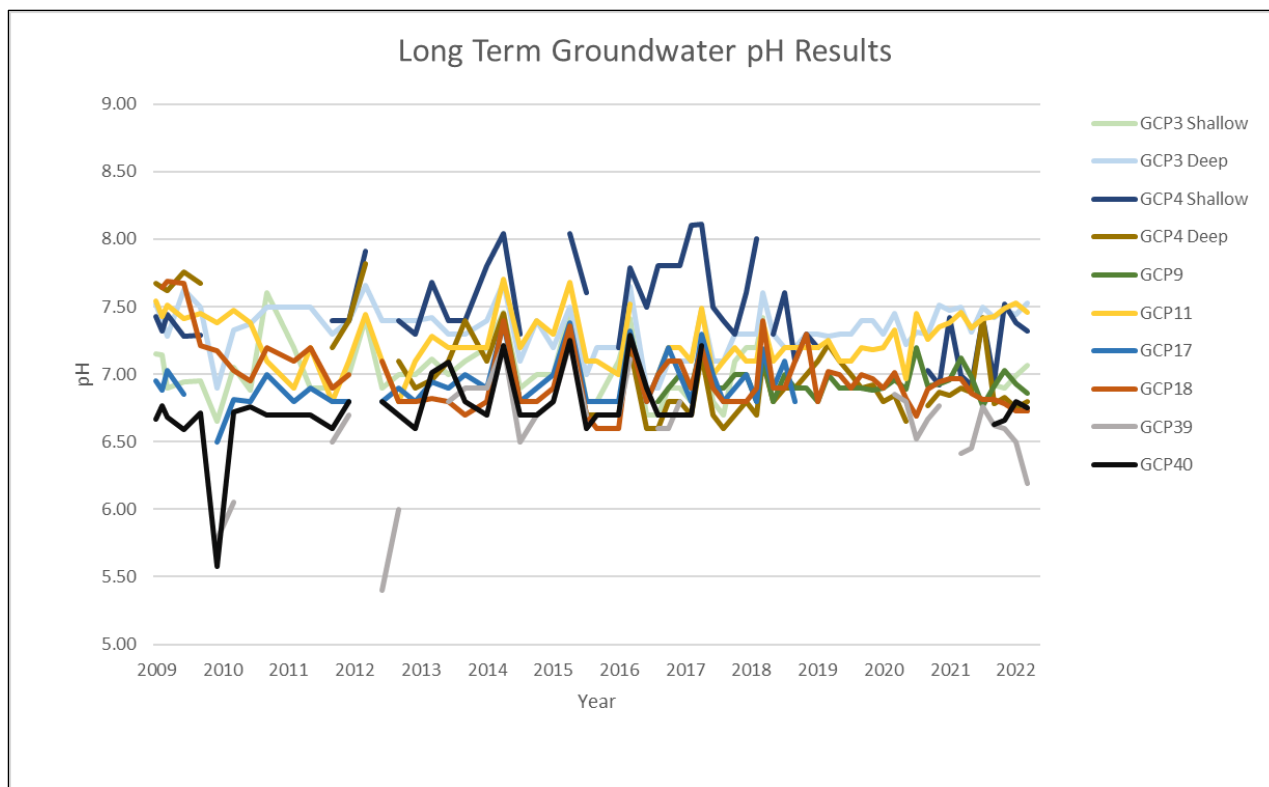


Figure 7-5 – Long Term Groundwater pH Results

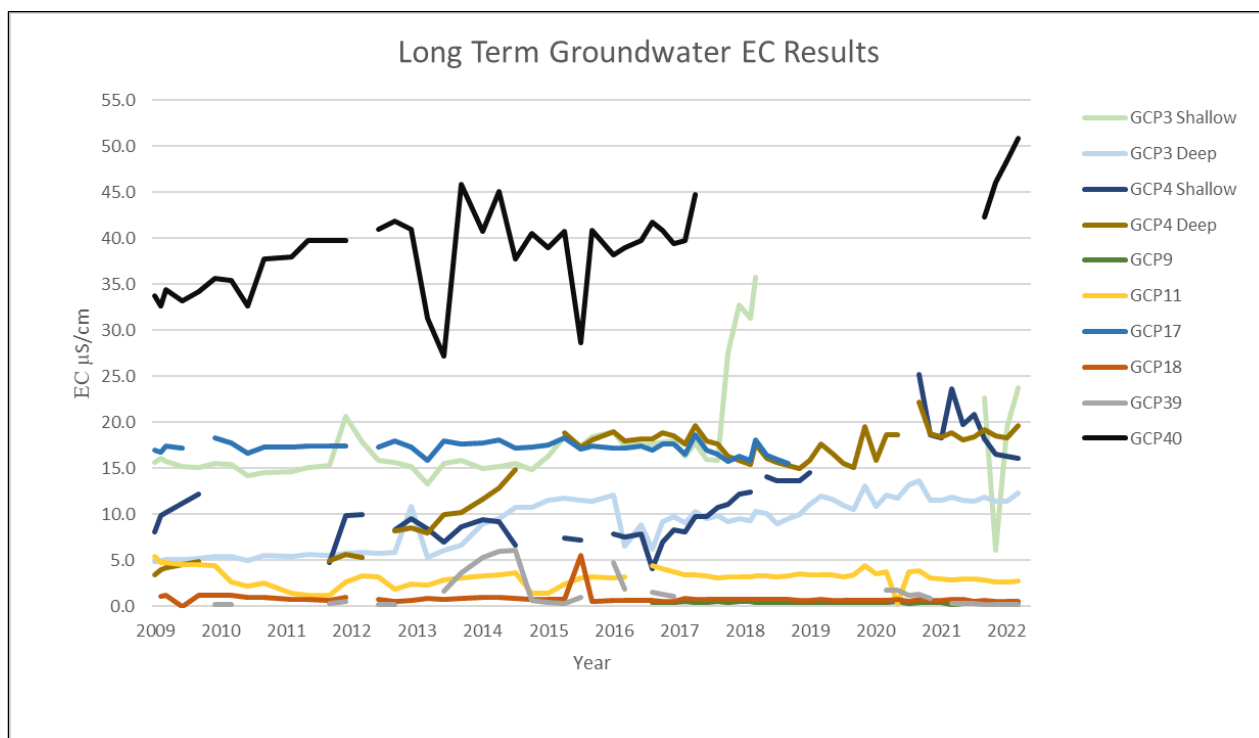


Figure 7-6 – Long Term Groundwater EC Results

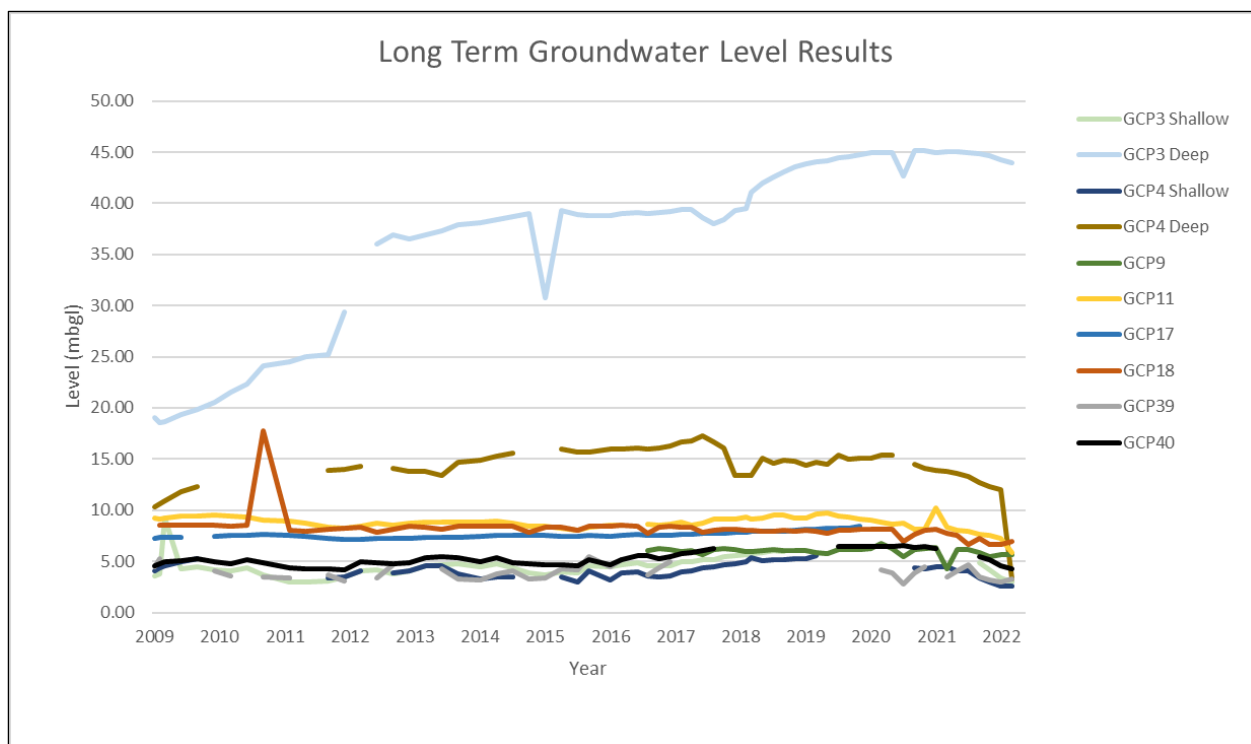


Figure 7-7 – Long Term Groundwater Level Results

7.6.5 Proposed Improvements to Environmental Management

There were no further performance issues, management issues or community complaints relating to groundwater during the reporting period. Integra Underground will continue to monitor and manage groundwater in accordance with the *Water Management Plan*.

8. Rehabilitation

Rehabilitation objectives at Integra Underground are in accordance with the RMP. Rehabilitation is undertaken progressively as outlined in the Environmental Assessments, PA 08_0101, the RMP and the *Biodiversity Management Plan*. Rehabilitation and disturbance completed in 2022 is included in the Annual Rehabilitation Report. The report is available on the Integra Underground public website.

Seed mixes for rehabilitation objectives were documented in the RMP that was in place from 1 July 2022. There were no further changes to the seed mix outside of the RMP for rehabilitation completed in 2022.

8.1 Rehabilitation Monitoring

8.1.1 2022 Key Rehabilitation Performance

A 2022 Annual Rehabilitation Monitoring Report was prepared by qualified ecologists in October 2022. The program included the assessment of 35 rehabilitated sites, 2 compensatory planting sites and 4 reference sites. Four types of rehabilitation works have been completed across Integra Underground to date. These are:

- **Woodland rehabilitation areas:** These are predominately located in the rehabilitation overburden emplacement area (7.2 ha), which has been reshaped, topsoil applied and seeded/planted with native trees, shrubs, and groundcover species.
- **Gas well rehabilitation sites:** These areas would have included a small drill hole, with the remaining area either slashed or gravel constructed pad for vehicle and equipment laydown areas. After cessation of the need for the gas well site, these locations were backfilled, reshaped, and seeded, with regular follow-up weed management works. The rehabilitation of these sites aims for consistency with surrounding vegetation.
- **Creek Crossings:** These temporary rehabilitation works cross existing natural creek lines (Main Creek and Bettys Creek) and were disturbed to allow for the Integra to Mount Owen Mine Water Pipeline.

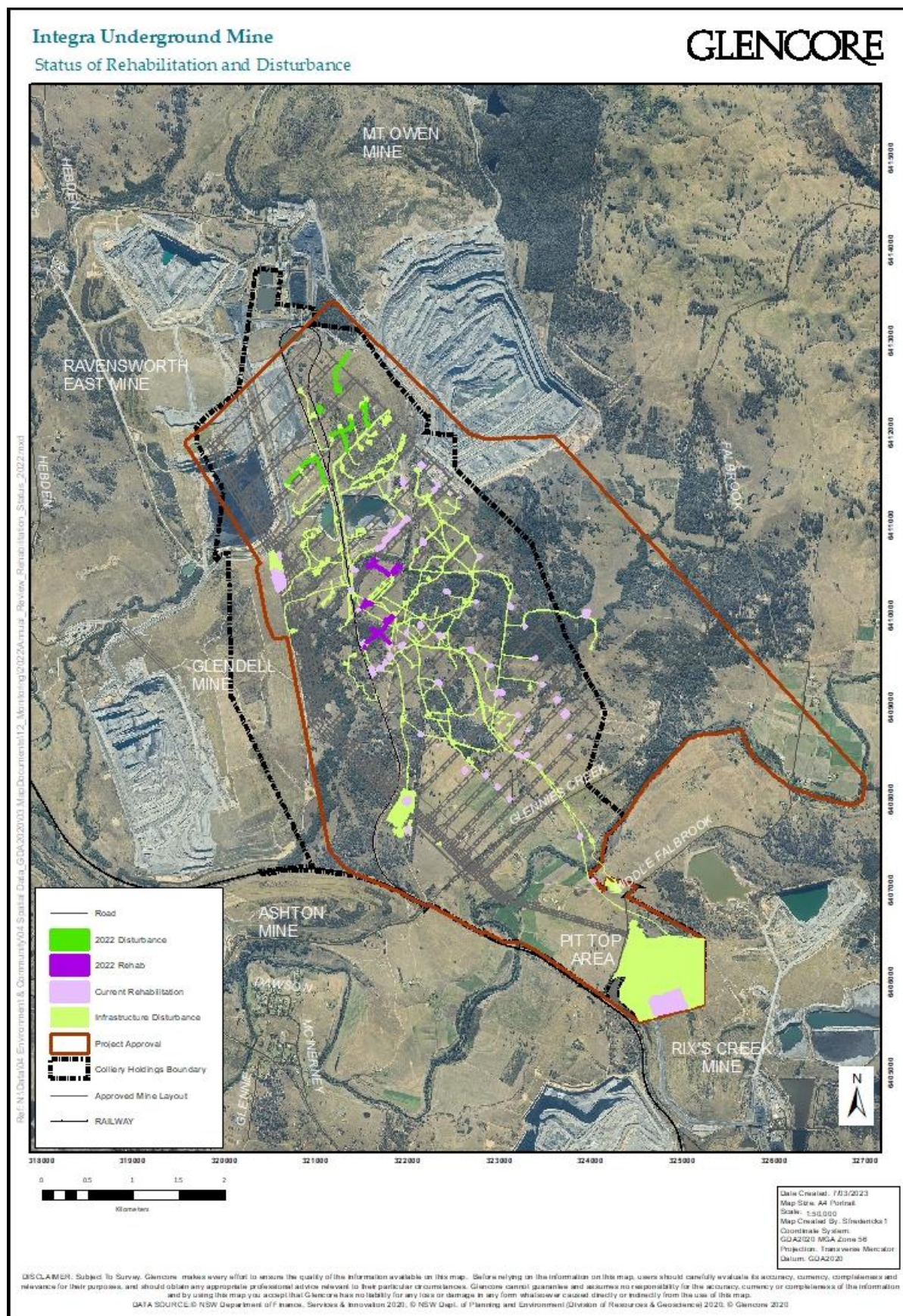


Figure 8-1 – Status of Rehabilitation and Disturbance

The key findings of the 2022 rehabilitation monitoring program (SLR, 2022) were as follows:

Number: INTUG-793190785-4020

Status: Approved

Effective: 29/03/2023

Owner: Coordinator - Environment and Community

Version: 1.0

Review: 29/03/2026

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Most water quality results at Bettys Creek and Main Creek are below the trigger values identified in the WMP and a high diversity of macroinvertebrates was recorded, indicating overall a healthy system. The inspection of the subsidence crack above Longwall 13 indicates that rehabilitation was successful at this location and that no further follow up is required.

The MOD 7 compensation planting appears to have been successfully established, with the required number of Swamp Oak plantings, but ongoing monitoring and weed control is recommended.

The MOD 8 compensatory planting is in early stages and follow-up monitoring and maintenance and may require re-planting. If re-planting is to occur, pest control and prevention is required prior to planting.

The results of the monitoring plots indicate that weed control is required. And that some sites require infrastructure removal and minor landform re-shaping, as well as improvement to ground cover conditions and native species diversity.

No required changes to the monitoring methodology were identified aside from addition of the compensatory planting sites.

8.1.1.1 2022 Monitoring recommendations and mitigation measures

A series of recommendations were made by SLR (2022) for the rehabilitation to meet completion criteria. The recommendations included targeted weed control at 31 sites, general ground cover improvement such as leaf litter and supplementary planting. Of the 35 rehabilitation sites monitored 22 sites require maintenance. **Appendix A** details site specific performance, action summary and photo reference points.

Monitoring results were an improvement on the previous year's results, with no gas well sites requiring rework in 2022 compared to the three in 2020, five in 2019, and four in 2018. This is likely due to the increased rainfall during 2022 and ongoing site weed control.

8.1.2 Proposed Improvements to Environmental Management

Integra Underground propose the following actions during 2023:

- To continue to implement a rehabilitation seeding and planting plan for sites requiring improved diversity, targeted weed control, review and action pest requirements as required, undertake maintenance at sites requiring reshaping, infrastructure, or waste removal;
- To continue to rehabilitate subsidence cracks where necessary as per the RMP and Extraction Plan.

To monitor and manage weeds as per the management strategies in the BMP and RMP.



Figure 8-2 – Longwall 6 GW02 Rehabilitation



Figure 8-3 – Longwall 13 GW06 Rehabilitation Completed in 2022

9. Community

9.1 Overview

A number of consultation tools are used at Integra Underground to consult with relevant stakeholders. These include:

- Community Consultative Committee (CCC): The Integra Underground CCC is held with the Mount Owen Glendell Operations CCC;
- Integra Underground website. This includes updates on current and future operations, including approvals, environmental management plans and monitoring results; and
- Glencore Greater Ravensworth Area newsletters: There are generally 1-2 newsletters prepared and circulated per year to disseminate information on Glencore operations in the area, including Integra Underground.

9.2 Community Consultative Committee

The Integra Underground and Mount Owen Glendell Operations CCC comprise of:

- Community members;
- Representative of Singleton Council; and
- Representatives from Mount Owen Glendell Operations and Integra Underground.

Two CCC meetings were held during the reporting period:

- May 2022; and
- November 2022.

These meetings provided updates on operations, including subsidence management, environmental monitoring results, community complaints, environmental incidents, summaries of rehabilitation activities, and mine closure planning. CCC meeting minutes are available on the Integra Underground website.

9.3 Community Contributions, Donations and Sponsorship

Integra Underground is committed to supporting the local community in which it operates. Integra Underground supported local community initiatives in 2022 including:

- Integra Apprentices Community Project to renovate the Whittingham Public Hall (refer to **Figure 9-1**);
- Donation of Rapid Antigen Tests to Singleton Hospital (refer to **Figure 9-2**); and
- Funding the purchase of battery power tools for the Darlington Rural Fire Brigade.



Figure 9-1 – Renovations Being Conducted at Whittingham Public Hall



Figure 9-2 – Rapid Antigen Tests to Singleton Hospital

9.4 Community Complaints

No community complaints were received during the 2022 reporting period. Historic community complaints related to PA 08_0101 underground operations since 2011 are presented in **Table 9-1**.

Table 9-1 – Community Complaints History

Year	Nature of Complaint					Total
	Traffic	Noise	Lighting	Air	Other	
2022	0	0	0	0	0	0
2021	0	0	0	0	0	0
2020	0	0	0	0	0	0
2019	1	0	0	0	0	1
2018	0	0	0	0	0	0
2017	0	0	0	0	0	0
2016	0	0	0	0	0	0
2015	0	0	0	0	0	0
2014	0	0	0	0	0	0
2013	0	0	0	0	0	0
2012	0	0	0	0	0	0
2011	0	1	0	1	0	2

10. Independent Audit

In accordance with Condition 12 of Schedule 5 of PA 08_0101, an Independent Environmental Audit (IEA) was undertaken in 2020. The audit team was comprised of suitably qualified, experienced, and independent experts whose appointment had been endorsed by DPIE. The audit period was from 29 November 2017 to 3 December 2020 and a site inspection was undertaken from 1 to 3 December 2020.

The audit identified 9 non-compliances against PA 08_0101 and EPL 3390 (refer **Appendix B, Table C-1**) and 29 opportunities for improvement (refer **Appendix B, Table C-2**). Integra Underground submitted the audit report and a response to the recommendations (in the form of an action plan) to DPIE in 2021 in accordance with Condition 13 Schedule 5 of PA 08_0101. Progress made in implementing the action plan is included in **Appendix B**.

The next Independent Environmental Audit is scheduled for 2023 in accordance with Schedule 5, Condition 12 of PA 08_0101.

11. Incidents and Non-Compliances

During the reporting period, there was no environmental incidents and Integra Underground maintained compliance with the obligations of all the approvals and Licences.

12. Activities to be Completed in the Next Reporting Period

The activities listed in **Table 12-1** will be completed in 2023.

Table 12-1 – Proposed Activities in 2023

Topic	Proposed Activities	By When
Longwall mining	Undertake longwall development within the Middle Liddell seam using continuous miners for Longwall 20, and longwall mining within the Middle Liddell seam in Longwalls 18 and 19	2023
Operational disturbance	Continue with installation of gas well infrastructure for Longwalls 19 and 20 in accordance with relevant approvals and management plans	2023
Rehabilitation	Continue with progressive rehabilitation of gas drainage infrastructure and rehabilitation maintenance in accordance with relevant approvals and management plans	2023
Environmental Management	Submission of an updated Rehabilitation Management Plan for the closure phase of Integra Underground	July 2023
	Revisions and update (where required) of various Management Plans in accordance with Schedule 5 Condition 6 of PA08_0101	June 2023
	Continue implementation of environmental monitoring programs and management plans	Ongoing throughout the year
Stakeholders Engagement	Continue liaison and engagement with community, Aboriginal parties, other local stakeholders, and regulatory bodies	Ongoing throughout the year

13. References

AGE Consultants (2017) *Integra Underground Groundwater Impact Assessment*.

ANZECC (2010) Australian and New Zealand Environment and Conservation Council Water Quality Guidelines.

Bridges (2017) Integra Longwall Extension Modification – Acoustics.

Cumberland Ecology (2017) Integra Underground. Longwall Extension Modification Ecological Impact Assessment.

Geoterra (2022) Discussion on Surface Water TARP Trigger Exceedance at Integra Underground.

Geoterra (2022) Discussion on Groundwater TARP Trigger Exceedance at Integra Underground.

HCB Land Management (2021) Integra Underground Property Inspection Report

Integra (2021) Longwalls 17 - 20 Public Safety Management Plan.

NSW Government (2015) Post Approval Requirements for State Significant Mining Developments – Annual Review Guideline.

OEH (2014) BioBanking Assessment Methodology 2014. State of NSW and Office of Environment and Heritage, Sydney.

OzArk EHM (2017) Aboriginal and Historic Heritage Impact Assessment, Longwall Extension Modification, Integra Underground Mine, Singleton LGA.

OzArk EHM (2018) Aboriginal Due Diligence Archaeological Assessment, Additional Disturbance Areas for 66 kV Power Line and Access Road Construction, Integra Underground Mine, Singleton LGA.

OzArk EHM (2022) Aboriginal Cultural Heritage Monitoring Report, Mount Owen Glendell Operations Integra Underground.

SCT (2020) Integra Underground Mine: Subsidence Assessment for LW17 to LW20 Extraction Plan.

SCT (2022) Integra Underground Mine: Bimonthly Subsidence Reports

SCT (2022) Integra Underground Mine: Six Monthly Subsidence Reports

SCT (2021) Integra Underground Mine: End of Panel Report for Longwall 17.

SLR (2019) Integra Underground Mine Biodiversity Review - LW 15 to 20.

SLR (2020) Integra Underground Longwalls 13-14 Biodiversity Monitoring 2020

SLR (2022) Integra Underground Longwalls 16-17 Biodiversity Monitoring 2021

SLR (2022) Integra Underground 2022 Annual Rehabilitation Monitoring Report.

Umwelt (2018) Heritage Assessment of Two Buildings Proposed for Removal, Integra Underground Pit Top Area, Glennies Creek.

Appendix A - 2022 Rehabilitation Monitoring

Table 13-1 Performance and Action Summary

Block Name	Minimum Actions	Performance Category
Bettys Creek Crossing	Weed removal and tree planting	Maintenance
Glennies Creek Crossing	Weed removal and planting of native groundcovers*	Maintenance
LW11_GW01	Tree planting	Monitor
LW11_GW14	Weed removal	Maintenance
LW12_GW10	Weed removal, tree planting and planting of native groundcovers	Maintenance
LW13_GW03	Minor weed removal	Monitor
LW13_GW11	Weed removal	Maintenance
LW14_GW00	No actions	Monitor
LW14_GW01	Minor weed removal	Monitor
LW14_GW03	Weed removal, tree planting and planting of native groundcovers	Maintenance
LW14_GW04	Minor tree planting	Monitor
LW14_GW05	Minor tree planting	Monitor
LW14_GW06	Weed removal, tree planting and planting of native groundcovers	Maintenance
Main Creek Crossing	Weed removal and tree planting	Maintenance
Vent Shaft 2 Areas	Weed removal and planting of native groundcovers	Maintenance
Vent Shaft 3 Areas	Weed removal and tree planting	Maintenance
LW03_GW03	Weed removal	Maintenance
LW04_GW02	Weed removal	Maintenance
LW04_GW03	Minor weed removal	Monitor
LW05_GW01.5	Minor weed removal	Monitor
LW05_GW02	Minor weed removal	Monitor
LW05_GW03	Weed removal	Maintenance
LW06_GW01	No actions	Acceptable
LW06_GW02	No actions	Acceptable

Block Name	Minimum Actions	Performance Category
LW09_GW02	No actions	Acceptable
LW09_GW03	Weed removal	Maintenance
LW10_GW03	Weed removal	Maintenance
LW11_GW05	Minor weed removal	Monitor
LW11_GW06	Weed removal and planting of native groundcovers	Maintenance
LW11_GW08	Weed removal	Maintenance
LW11_GW09	Minor weed removal	Monitor
LW11_GW10	Weed removal	Maintenance
LW11_GW12	Weed removal and planting of native groundcovers	Maintenance
LW11_GW13	Weed removal and planting of native groundcovers	Maintenance
O/S_LW07 (HEB SIS06A)	Minor weed removal	Monitor
PTA_W01	Tree planting	Maintenance
PTA_W02	Tree planting and planting of native groundcovers	Maintenance
PZ1	Minor weed removal	Monitor
RW SIS1	Minor weed removal	Monitor

Although this site is categorised as woodland it is in the middle of a grazing paddock, so no tree or shrub planting is recommended. This site would be better classified as 'native grassland'.

Appendix B - Independent Environmental Audit

Table C1 – Non-Compliances

Approval and Condition	Requirement	Independent Audit Finding	Recommendation	Response, Action and Timeframe
PA 08_0101 SCH 3, C3	<p>TERMS OF APPROVAL</p> <p>The Proponent must comply with the:</p> <p>(a) Statement of Commitments; and</p> <p>(b) conditions of this approval.</p> <p><i>Notes to condition 2 and 3:</i></p> <ul style="list-style-type: none"> • Previous EAs for the project are listed in Appendix 2; • The project layout plans are shown in Appendix 3; • The Statement of Commitments is reproduced in Appendix 7; and • This project approval is intended to regulate all existing and approved development on site. 	<p>A detailed review of compliance was conducted against Integra UG's Project Approval (PA) 08_0101 and included Statement of Commitments. The results from that review are included in this checklist. Based on the results of the review the auditors concluded the following:</p> <ul style="list-style-type: none"> • 7 non-compliances were identified against conditions of PA 08_0101. These were in relation to the following: <ul style="list-style-type: none"> ○ Consultation with Subsidence Advisory New South Wales (SANSW) before constructing a new building on site ○ Consultation with required agencies with regards to updates to management plans ○ Collection of depositional dust samples in accordance with monitoring methods specified in relevant Australian Standards ○ Evidence not provided to validate that ecological survey reports were provided to the Department within the required timeframes ○ Implementation of controls stipulated in Ground Disturbance Permits (GDPs). • No non-compliances were identified against the Statement of Commitments outlined in PA 08_0101. 	<p>Recommendation not required, refer to individual non-compliances in this checklist</p>	<p>Response:</p> <p>Specific responses included in other sections of this table.</p> <p>Action:</p> <p>No action required.</p> <p>Specific actions included in other sections of this table.</p> <p>Timeframe:</p> <p>Not applicable</p>

Approval and Condition	Requirement	Independent Audit Finding	Recommendation	Response, Action and Timeframe
		While minimal non-compliances were noted during the 2020 IEA audit period, compliance with Schedule 2, Condition 3 cannot be stated as being compliant as non-compliances against the conditions of PA 08_0101 were identified. Therefore, this condition must be found not compliant.		
PA 08_0101 SCH2 C11	<p>The Proponent must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA and SANSW.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> • <i>Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.</i> • <i>Part 8 of the EP&A Regulation sets out the requirements for the certification of the project; and</i> • <i>The project is located in the Patrick Plains Mine Subsidence District. Under Section 15 of the Mine Subsidence Compensation Act 1961, the Proponent is required to obtain the SANSW's approval before constructing or relocating any improvements on site.</i> 	<p>During the audit period (29 November 2017 to 03 December 2020) one new building was constructed. The building is a transportable structure utilised in the administrative/office section of the mine.</p> <p><u>Compliance with SANSW</u></p> <p>The auditors sighted a letter from SANSW, dated 30 October 2020, advising that Integra UG's construction of the additional building was exempt from requiring approval from SANSW under Sections 21, 22 and 23 of Part 3 of the <i>Mine Subsidence Compensation Act 1961</i>.</p> <p>Integra UG commenced consultation with SANSW after construction of the new building was completed. Notes provided under Schedule 2, Condition 11 of PA 08_0101 requires that SANSW's approval be obtained before constructing or relocating any improvements on site. As exemption from the SANSW was received in 2020, post construction, this condition is not compliant.</p>	Recommendation not required	<p>Response: Noted</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>

Approval and Condition	Requirement	Independent Audit Finding	Recommendation	Response, Action and Timeframe
PA 08_0101 SCH3 C9a	Noise Management Plan This plan must: (a) be prepared in consultation with the EPA, and then submitted to the Secretary for approval;	While evidence of previous consultation requests being submitted to the EPA was provided to the auditors, no evidence of consultation with the EPA when the NMP was updated in 2019 was provided. This condition is therefore found to be not compliant.	IEA REC 01 – It is recommended that Integra UG confirm that a request for consultation was sent to the EPA with regards to the latest update of the NMP. Evidence of consultation should be provided in the NMP, as has been Integra UG's practice in the past.	Response: Integra UG is unable to confirm that consultation was undertaken with the EPA for the NMP in 2019. Action: Provide approved Noise Management Plan to EPA and seek any comments the EPA may have. In the event that comments are provided, consider these, and review the NMP if necessary. <u>Complete</u> Timeframe: 30 June 2021
PA 08_0101 SCH3 C15	Air Quality & Greenhouse Gas Management Plan The Proponent must prepare an Air Quality & Greenhouse Gas Management Plan for the project to the satisfaction of the Secretary. The Proponent must implement the approved management plan as approved from time to time by the Secretary.	Based on the evidence reviewed the AQGGMP was considered to have been adequately implemented at the time of the audit with the exception of collection of deposited dust samples not occurring in accordance with AS/NZS 3580.10.1:2016, as stipulated in Table 4-1 of the AQGGMP. Details of the incident are outlined below: CMO Incident Ref 2020011614.1, dated 16 January 2020: This incident was in relation to Carbon Based failing to pick up the deposited dust samples in December within the required 30days +/- 2days. The AQGGMP requires sampling of Deposited Dust to be in accordance with AS/NZS 3580.10.1:2016 Methods for Sampling and Analysis of Ambient Air, Determination of Particulates—Deposited Matter—Gravimetric method. As monitoring of deposited dust	Recommendation not required	Response: Noted Action: No action required Timeframe: Not applicable

Approval and Condition	Requirement	Independent Audit Finding	Recommendation	Response, Action and Timeframe
		was one day outside of the limits specified in AS/NZS 3580.10.1:2016 and this is the selected methodology specified in the AQGGMP this is found to be a non-compliance with regards to the implementation of the AQGGMP. No recommendation is required to be applied.		
PA 08_0101 SCH3 C15a	Air Quality Greenhouse Gas Management Plan (a) be prepared in consultation with EPA, and then submitted to the Secretary for approval;	While evidence of previous consultation requests being submitted to the EPA was provided to the auditors no evidence of consultation occurring with the EPA when the AQGGMP was updated in 2019 was provided. As such this condition is found to be not compliant. Evidence of submission to the Secretary is detailed against schedule 3, condition C9.	IEA REC 02 – It is recommended that Integra UG confirm that a request for consultation was sent to the EPA with regards to the latest update of the AQGGMP. Evidence of consultation should be provided in the AQGGMP, as has been Integra UG's practice in the past.	Response: Integra UG is unable to confirm that consultation was undertaken with the EPA for the AQGGMP in 2019. Action: Provide approved Air Quality & GHG Management Plan to EPA and seek any comments the EPA may have. In the event that comments are provided, consider these, and review the AQGGMP if necessary. <u>Complete</u> Timeframe: 30 June 2021
PA 08_0101 SCH3 C29	Mount Owen Bettys Creek Diversion The Proponent must: (a) commission a suitably qualified and independent expert, whose appointment has	Requirements for this condition include the following: <ul style="list-style-type: none">Survey to be conducted within 6 months of completing LW13 (by 10 February 2019). Survey was conducted in October 2018, however evidence of this being submitted to the Department within the required timeframe was not provided.	IEA REC 03: Integra UG to ensure that survey reports are provided to the Department in accordance with Schedule 3, Condition 29.	Response: Noted Action: No action required Timeframe: Not applicable

Approval and Condition	Requirement	Independent Audit Finding	Recommendation	Response, Action and Timeframe
	<p>been approved by the Secretary, to carry out a detailed survey of geotechnical, geomorphic, and ecological baseline condition of the Mount Owen Bettys Creek Diversions:</p> <ul style="list-style-type: none"> • prior to carrying out any second workings under the creek diversions; and • within 6 months of completing the second workings under these creek diversions; and <p>(b) provide a copy of these surveys to the Department within a month of the completion of each survey.</p>	<ul style="list-style-type: none"> • Survey to be completed prior to commencing LW14 on 07 September 2018. Survey completed prior to commencing LW14 on 07 September 2018. Survey was conducted in May 2018; however, evidence of this survey being submitted to the Department within the required timeframe was not provided. • Survey conducted within 6 months of completing LW14 (by 17 February 2020); Survey conducted in June 2020. This survey was provided to the Department on 03 July 2020. <p>On 01 May 2020 Integra UG sought endorsement for SLR to be appointed as experts to conduct the required stream surveys. The Department responded on 20 May 2020 and approved the appointment of the experts.</p> <p>On the basis that the evidence provided did not validate compliance with Schedule 3, Condition 29 this condition is found to be not compliant.</p>		
<p>PA 08_0101</p> <p>SCH3 C41</p>	<p>Exploration Activities and Minor Surface Infrastructure Management Plan</p> <p>The Proponent must prepare an Exploration Activities and Minor Surface Infrastructure Management Plan for the project to the satisfaction of the Secretary.</p> <p>The Proponent must implement the approved management plan as approved from time to time by the Secretary.</p>	<p>A review of incidents recorded in Integra UG's internal database CMO during the audit period was conducted by the auditors. Four internal incidents were recorded which related to non-compliances with environmental management controls identified in relevant GDPs. It is noted that in all instances the disturbance occurred within the disturbance footprint of Integra UG but were outside the GDP boundary areas authorised by Integra UG's E&C department. It is also noted that a total number of 72 GDPs were processed during the audit period.</p> <p>While it has been found that the internal incidents resulted in vegetation clearing in excess of that approved under the authorised GDPs, the auditors note that Integra UG's GDP process is a well-established management measure which</p>	Recommendation not required	<p>Response: Noted</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>

Approval and Condition	Requirement	Independent Audit Finding	Recommendation	Response, Action and Timeframe
		<p>allows identification of risks to the environment and ensures impacts to areas outside the mine disturbance footprint are avoided.</p> <p>In assessing compliance with the implementation of the EAMSIMP the auditors must review the management measures outlined in the plan and validate if they are being effectively implemented during the audit period. A primary control to ensure compliance with the objectives of the plan is the implementation of Integra UG's GDP process. While these incidents are not deemed to be reportable incidents under the definition of an incident in the PA 08_0101, they show a minor lack of implementation of controls outlined in the EAMSIMP. Therefore, a non-compliance has been identified. The auditors note that following each incident actions were made to address the root cause of each incident. This included improving communication with contractors regarding the GDP process.</p> <p>It is noted that reporting of internal non-conformances is an essential method of ensuring continual improvement. Therefore, while these incidents should be avoided, it is important that non-conformances of this nature continue to be reported in Integra UG's internal incident management system.</p> <p>While a non-compliance has been identified the auditors believe, based on evidence reviewed, that Integra UGs actions are adequate at addressing the cause and preventing reoccurrences of this nature. Therefore, no recommendation has been applied for this non-compliance.</p>		

Approval and Condition	Requirement	Independent Audit Finding	Recommendation	Response, Action and Timeframe
EPL 3390 O2.4	The licensee must prepare a sewage treatment system maintenance program. The program must include: a) Certification from the system provider that the sewage treatment system is operating within its capacity. b) Date, time, and results of all routine maintenance procedures undertaken to the sewage treatment system; and c) Provide written records of each quarterly inspection.	Integra UG submit the sewage treatment quarterly maintenance reports along with the Annual Returns to the EPA each year. The maintenance reports do not record the time that maintenance procedures were carried out. From November 2019 onwards, the time has been written onto the maintenance reports, however prior to this the date time was not recorded. This finding has triggered a non-compliance of Condition O2.4 of EPL 3390 however as Integra Underground were capturing the time on the maintenance records since November 2019 no recommendation is required.	Recommendation not required	Response: Noted Action: No action required Timeframe: Not applicable
EPL 3390 M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	Noise monitoring reports provided by Umwelt provide the following information: <ul style="list-style-type: none"> Time in which monitoring occurred Date in which monitoring occurred Location in which monitoring occurred The name of the person who collected the sample is not referenced in the monitoring report.	IEA REC 04: Integra UG to ensure that the name of the person who undertook noise monitoring in accordance with the EPL is recorded and can be produced to validate compliance with Condition M1.3 of EPL 3390.	Response: Attended noise monitoring is undertaken and reported in accordance with EPL 3390. Action: Include the name of the person who undertook noise monitoring in attended noise monitoring reports by communicating this requirement to the noise consultant. <u>Complete</u> Timeframe: March 2021

Table C-2: Opportunities for Improvement

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C9	Section 3.2.1 of the NMP indicates that sound power testing will be conducted on all plant and equipment.	It is suggested that Section 3.2.1 of the NMP be amended so that the commitment for sound power testing is applicable to surface equipment and infrastructure only	<p>Response: The NMP will be reviewed, and if necessary revised, in accordance with Schedule 5 Condition 6 of PA 08_0101.</p> <p>Action: Revise the Noise Management Plan to clarify that the commitment for sound power testing is applicable to surface equipment and infrastructure only.</p> <p>Complete</p> <p>Timeframe: December 2021</p>
	<p>The locations for NAG 1 and NAG 7 are not outlined on Figure 2 of the NMP, however these NAGs are monitored as part of the attended noise monitoring conducted by Umwelt during the audit period. Umwelt summarise the location of each attended noise monitoring location in the environmental noise monitoring reports.</p> <p>There is therefore a slight inconsistency between the monitoring locations specified in the NMP and those included in the attended noise monitoring. However, as there appear to be more monitoring locations than those outlined in the NMP, this does not constitute a non-compliance.</p>	Ensure the attended noise monitoring locations outlined in the NMP are reflective of the locations being monitored and reported in the quarterly environmental noise monitoring reports. Appendix A, Figure 2.1 of the environmental noise monitoring reports should be consistent with Figure 2 of the NMP.	<p>Response: Attended noise monitoring is undertaken at the locations in the approved Noise Management Plan. The additional locations are not required by PA 08_0101. Therefore, these locations are not required to be included in the NMP.</p> <p>Action: Review figures in the attended noise monitoring reports to clearly indicate which locations are required by PA 08_0101 and the approved NMP.</p> <p><u>Complete</u></p> <p>Timeframe: June 2021</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
	The noise monitoring summary provided in Section 6.3 of the Integra UG Annual Review does not clearly outline that monitoring is conducted at representative locations only or that this approach had been approved by the Department.	It is suggested the annual review outline that the Department has approved Integra UG conduct attended monitoring at representative locations.	Response: Noise monitoring information and results has been included in previous Annual Reviews. This has been done in a manner consistent with the approved Noise Management Plan. Action: Include further description in the 2021 Annual Review that attended noise monitoring is conducted at representative locations <u>Complete.</u> Timeframe: March 2021
PA 08_0101 SCH3 C9c-d	Table 1-1 of the NMP maps the project approval condition requirements with the relevant section of the NMP where this requirement is addressed. Some inconsistencies with the references made in the table and the information provided in the sections referenced was identified.	It is suggested that Table 1-1 of the NMP be updated to better reflect where the project approval requirements of the NMP are outlined in the plan.	Response: The Noise Management Plan was revised and submitted to DPIE in 2020 and approved by DPIE in 2021. This revision included amendments to Table 1-1 to accurately refer to relevant sections of this NMP. Action: <u>Complete</u> Timeframe: n/a

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C11	The auditors identified that Table 38 of the Annual Review presented much higher emissions figures being vented compared to those being flared. For example, in 2019 the Annual Review states that 485,972 t CO ₂ -e of vented emissions and only 79,739 t CO ₂ -e of flared emissions were recorded. Integra UG commented that this was an administrative error reported in the 2017, 2018 and 2019 Annual Reviews and will be rectified in the 2020 Annual Review.	It is recommended Integra UG review the greenhouse gas data presented in the Annual Reviews to ensure accurate quantities of flared and vented emissions are reported.	<p>Response: Some greenhouse gas values reported in previous Annual Reviews are slightly different to those reported within NGERS due to calendar data being reported, rather than finalised financial year data.</p> <p>Action: Report greenhouse gas data in Annual Reviews using financial year data. Review data previously reported in Annual Reviews and, if errors are identified, amend any historical data in the 2020 Annual Review.</p> <p><u>Complete</u></p> <p>Timeframe: March 2021</p>
PA 08_0101 SCH3 C12	The data collected during days classified as extraordinary events was removed from Integra's annual data set resulting in the rolling annual averages being below the criteria specified in Table 9 of PA 08_0101. As a result, the rolling annual average total suspended particulates (TSP) reported in the in the air quality monitoring reports was higher than the rolling annual average for TSP reported in the 2019 Annual Review.	It is recommended that the Annual Reviews more clearly outline where data has been removed from the rolling annual averages presented in the Annual Reviews. This ensures a clear link between the air quality monitoring data and the summaries provided in the Annual Review.	<p>Response: The air quality data reported in monitoring reports published to the public website during the year do not consider extraordinary events. This is due to the acceptance of extraordinary events only being sought from DPIE at the end of each year. In contrast, the Annual Reviews consider extraordinary events.</p> <p>Action: Include information about extraordinary events in Annual Reviews and clearly state where data has been removed as a result of these events.</p> <p><u>Complete</u></p> <p>Timeframe: March 2021</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C14a	Management and contingency measures are triggered by visual monitoring and alerts from the real time operational monitoring and forecast systems as outlined in the Dust Management TARP. The AQGGMP does not refer to the dust TARP.	It is suggested that the AQGGMP refers to the internal dust TARP.	<p>Response: The approved Air Quality and Greenhouse Gas Management Plan includes management and contingency measures in accordance with the requirements of PA 08_0101. As part of Integra Underground's Environmental Management System, an Air Quality TARP is implemented in addition to the AQGGMP.</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>
PA 08_0101 SCH3 C15d-e	Table 1-1 of the AQGGMP maps the project approval condition requirements with the relevant section of the AQGGMP where this requirement is addressed. Some inconsistencies with the references made in the table and the information provided in the sections referenced was identified.	It is suggested that Table 1-1 of the AQGGMP be updated to better reflect where the project approval requirements of the AQGGMP are outlined in the plan.	<p>Response: The Air Quality and Greenhouse Gas Management Plan was revised and submitted to DPIE in 2020. This revision included amendments to Table 1-1 to accurately refer to relevant sections of this AQGGMP.</p> <p>Action: <u>Complete</u></p> <p>Timeframe: n/a</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C30	<p>The workshop area contained an outside storage area for hydrocarbons including oils and greases. The bund was uncovered and had a considerable amount of sludge built up on the floor of the bund. The condition sighted at the time of the audit may impact the storage capacity of the bund.</p> <p>Outside the concrete kerb / bund containing spills and runoff to the sump is situated another grated inlet pit. Hydrocarbon staining was observed both outside the concrete bund and around the surface of the oil water separator. In close proximity to this system is a well vegetated and stable clean water channel, separated by a ~400mm high earth bund.</p>	<p>Review the operation and capacity of the oil water separator at the workshop to manage rainfall and spill events in accordance with relevant EPA guidelines and standards. Implement any identified actions or controls accordingly.</p>	<p>Response:</p> <p>The oil water separator is maintained as part of the mine's maintenance, water, and waste management systems. The bund capacity or operation is not compromised by the minor sludge present during the audit site inspection. This area is regularly inspected and maintained.</p> <p>Action:</p> <p>Review the operation and capacity of the oil water separator at the workshop to manage rainfall and spill events in accordance with relevant EPA guidelines and standards.</p> <p><u>Complete</u></p> <p>Timeframe:</p> <p>December 2021</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3	Visually, no hydrocarbon staining or other evidence of spills / discharge to the clean water drain was evident.	Update the WMP to specifically describe the operation, inspection and management regime of stormwater, chemical containment, and oily water separators.	<p>Response: The Water Management Plan meets the requirements of PA 08_0101. The more suitable system documents to include a description of the operation, inspection and management regime of storm water, chemical containment and oily water separators would be the Waste Management Plan and/or Hydrocarbon Management Plan.</p> <p>Action: Revise the Waste Management Plan and/or Hydrocarbon Management Plan to describe the operation, inspection and management regime of storm water, chemical containment, and oily water separators.</p> <p><u>Complete</u></p> <p>Timeframe: December 2021</p>
PA 08_0101 SCH3	Annual Reviews in 2018 and 2019 note poor condition of Mount Owen's Middle Bettys Creek diversion, including rill erosion and nearby cracking. Whilst the cracking and erosion issues noted have not been attributable to Integra UG operations, there is opportunity to update the WMP to remove ambiguity in how channel stability and erosion is identified in the WMP.	Update the WMP to remove ambiguity in how channel stability and erosion is identified in the WMP (for example, how is rill erosion or channel stability attributed to LW operations or otherwise). It is recommended the WMP include quantifiable triggers (i.e., define 'significant'), and details how actions are then communicated and jointly managed between Mount Owen and Integra UG.	<p>Response: The second workings under the Bettys Creek diversion are complete. Integra Underground will provide a copy of the most recent monitoring report to Mount Owen Glendell Operations.</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C31	The Pollution Incident Response Management Plan does not clearly outline the handling, storage, and incident response for storage of chemicals at Ventilation Shaft 3	Update Pollution Incident Response Management Plan to document the handling, storage, and incident response for storage of chemicals at Ventilation Shaft 3 (i.e. Solcenic Emulsion).	<p>Response: The Pollution Incident Response Management Plan was revised in 2020. The PIRMP includes environmental hazards related to spills resulting in land contamination. Solcenic emulsion is stored in bunded areas onsite and is a solution comprised of approximately 98% water and 2% hydrocarbon. In the event of a spill, this substance would be contained onsite.</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>
PA 08_0101 SCH3 C32B	A summary of rehabilitation status for gas well rehabilitation sites is provided in the Annual Review, however the Annual Review does not include a summary of the status of rehabilitation in the woodland rehabilitation areas or the creek crossings which relate specifically to the construction conducted as part of modification 7.	It is suggested that the Annual Review report on the status of all rehabilitation conducted across Integra Underground in particular rehabilitation of woodland rehabilitation areas and creek crossing rehabilitation.	<p>Response: The 2019 Annual Review included a description of rehabilitation areas, which included woodland rehabilitation areas and creek crossing rehabilitation. However, the monitoring results in these areas were not specifically included. These areas are included in the rehabilitation monitoring program and will be reported on in the Annual Review.</p> <p>Action: Report on the status of all rehabilitation areas in the Annual Review, in particular rehabilitation of woodland rehabilitation areas and creek crossing rehabilitation.</p> <p><u>Complete</u></p> <p>Timeframe: March 2021</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C33	Section 4.2 of the AHMP indicates that the management of fencing and signage in the Bettys Creek habitat Management Area may fall to Integra UG when in fact this is the responsibility of Mount Owen.	It is suggested that during the plans next revision the wording in paragraph 1 of Section 4.2 of the Aboriginal Heritage Management Plan be updated to reflect that management of fencing and signage in the Bettys Creek Habitat Management Area is the responsibility of Mount Owen.	<p>Response: The Bettys Creek Habitat Management Area is fenced, and sign posted by Mount Owen Glendell Operations. This amendment will be made to the AHMP as part of a future scheduled revision.</p> <p>Action: Revise the Aboriginal Heritage Management Plan to clarify that the management of fencing and signage in the Bettys Creek Habitat Management Area is the responsibility of Mount Owen.</p> <p><u>Complete</u></p> <p>Timeframe: June 2022</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C33	The status of archaeological sites which were destroyed in the 2017 audit period by the previous mine operator has not been updated in the AHMP	It is suggested that: a) AHIMS is reviewed to confirm the status of these sites has been updated; and, b) The status of the archaeological sites which were destroyed by the previous operator be updated in the AHMP	Response: Integra UG previously notified OEH of the status of the two AHIMS sites and updated the AHMP to include the requirement to notify the OEH with respect to incidents relating to Aboriginal heritage. These status of these sites in the AHIMS register may have been updated since the Aboriginal Heritage Management Plan was last revised. Action: Confirm the status of two site have been updated on the AHIMS register. If the statuses are not consistent with the AHMP, revise the AHMP to reflect the AHIMS register. <u>Complete</u> Timeframe: June 2022
PA 08_0101 SCH3 C34	Evidence was not provided to verify if visual amenity and lighting on site was to the satisfaction of the Secretary, as required by Schedule 3, Condition 34.	It is recommended a summary of lighting and visual impacts is made in the annual review each year. To ensure visual amenity and lighting on site at Integra UG is to the satisfaction of the Department	Response: The Annual Review could include information about the management of lighting and visual amenity. It already considers any community complaints related to lighting. Action: Include information about the management of lighting and visual amenity in the Annual Review. <u>Complete</u> Timeframe: March 2021

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C40	<p>A summary of rehabilitation monitoring and reporting is provided in the Annual Reviews. The auditors reviewed the data presented in the 2017, 2018 and 2019 Annual Reviews and notes the following:</p> <ul style="list-style-type: none"> In 2017 Table 36 of the Annual Review stated the total disturbance area as 3.2 (ha) indicating that this was the total disturbance area for the year and not the cumulative disturbance area of the site (which was reported in Table 35). In 2018 and 2019 the same table (now Table 38 of the Annual Review reported the total disturbance area to be 95.66 ha and 109.1 ha respectively. Discussion with Integra UG indicated that these figures were reporting the cumulative disturbance area opposed to the disturbance area for the year. The 2018 and 2019 Annual Reviews do not specify the annual disturbance area. It is noted that the cumulative disturbance area is already being reporting in Table 46 of the Annual Reviews and the current presentation of data makes it difficult to compare annual disturbance predictions made in the MOP (which are provided in Table 47) to actual annual figures. 	<p>It is recommended the Annual Review clearly outlines the total land disturbed each year. Alternatively, Table 38 of the Annual Reviews should clearly outline that the Total Disturbance Area is a cumulative figure.</p>	<p>Response: The Annual Reviews include land disturbance information and data. Notwithstanding, this information and data could be presented more clearly.</p> <p>Action: Include information in Table 38 of the Annual Review to clearly outline that the Total Disturbance Area is a cumulative figure. <u>Complete</u></p> <p>Timeframe: March 2021</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
PA 08_0101 SCH3 C41d	Table 1-1- of the EAMSIMP outlines the project approval conditions and where they addressed in the plan. The table states that rehabilitation of disturbed areas is covered in section 4.3 of the EAMSIMP however this section related to the objectives and performance indicators for the plan. Instead rehabilitation management is outlined in Section 4.2 of the EAMSIMP.	It is suggested that Table 1-1 be updated in the next revision of the plan to accurately reflect where rehabilitation management is covered in the plan.	<p>Response: This amendment will be made to the EAMSIMP as part of a future scheduled revision.</p> <p>Action: Revise the Exploration Activities and Minor Surface Infrastructure Management Plan to amend Table 1-1 to accurately reflect where rehabilitation management is covered in this Plan.</p> <p><u>Complete</u></p> <p>Timeframe: June 2022</p>
PA 08_0101 SOC 209	<p>The Surface Water Impact Assessment for Integra Underground Mine Longwall Extension Modification (Modification 8) identified that Subsidence may lead to indirect impacts on Bettys Creek channel and floodplain.</p> <p>It is noted that the rainfall inspection form prompts monitoring of any notable changes to Glennies Creek Flood Plain and Channel and to Mains Creek Flood Plain and Channel. The form does not include prompts to monitor changes to Bettys Creek Flood Plain and Channel.</p>	It is recommended that the rainfall inspection form be updated to prompt monitoring of any notable changes to Bettys Creek Flood Plain and Channel	<p>Response: The Bettys Creek floodplain and channel is monitored in accordance with the Water Management Plan (e.g. stream health and channel stability monitoring).</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
EPL M2.2	<p>The requirement for Ambient water quality monitoring was added to EPL 3390 in May 2020 following a licence variation issued by the EPA on 26 May 2020.</p> <p>Quarterly monitoring records show monitoring of pollutants is conducted in accordance with Condition M2.2. The sampling method is not outlined on the water quality monitoring results summary.</p>	It is recommended the sampling method is documented on the effluent and water monitoring results summary	<p>Response: The sampling method is not required to be documented in the online reporting of EPL monitoring data.</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>
	<p>It is noted that water quality results are summarised in the Integra UG Quarterly Environmental Monitoring Reports. Ambient water quality monitoring results at all required EPL points is not summarised in these reports. Reference is made to Monitoring Points 8, 9 and 10 only (GC1, GC2 and GC3 respectively) despite all EPL monitoring points being referenced in the WMP.</p> <p>Discussion with Integra UG E&C Manager outlined that the monitoring points not outlined in the Integra UG quarterly environmental monitoring reports were excluded as these monitoring point locations were dry or too low to allow samples to be taken. Integra UG noted that the environmental monitoring reports could be updated to reflect sampling points where samples could not be taken.</p>	It is recommended that the Integra UG Quarterly Environmental Monitoring Reports include a summary of all EPL monitoring points. Where samples cannot be taken due to low water levels this should be outlined in the reports.	<p>Response: During 2020, the monitoring reports published to the public website did not include monitoring locations that were dry and therefore unable to be sampled for water quality. These monitoring reports have been amended to include a note that these monitoring locations were dry at time of sampling.</p> <p>Action: Amended monitoring reports on public website to include a note that water quality monitoring points were dry at time of sampling.</p> <p><u>Complete</u></p> <p>Timeframe: 19 Feb 2021</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
Extraction Plan LW 13-14	The names and location of Subsidence monitoring lines referenced in the plan is not consistent with those referenced in monitoring reports. This includes reference to the PH line and R line.	It is suggested that the survey lines referenced in the Integra UG EP LW13-14 Subsidence Monitoring Program be consistent with those being monitored. Reference should be made to the R Line and PH Line in the Subsidence Monitoring Program.	Response: Longwall mining in LW13-14 has been completed. Therefore, a revision of this document is not necessary. Action: No action required Timeframe: Not applicable
	The Integra UG LW13-14 EP document was last reviewed on 11 August 2017 and was due for review on 11 August 2020.	Ensure the Integra UG LW13-14 EP is reviewed in accordance with the specified review date on the plan.	Response: The review date on the Extraction Plan for LW13-14 is a date automatically generated by an internal system. The Extraction Plan is reviewed in accordance with PA 08_0101 and commitments made within the Extraction Plan. Action: No action required Timeframe: Not applicable
Extraction Plan LWs 15-16	The names and location of Subsidence monitoring line MB15 and R Line are not referenced in the plan however they are referenced in subsidence monitoring reports.	It is suggested that the survey lines referenced in the IUG EP LW15-16 Subsidence Monitoring Program be consistent with those being monitored. Reference should be made to the R Line and MB15 Line in the Subsidence Monitoring Program.	Response: Longwall mining in in LW15-16 is nearing completion. Therefore, a revision of this document is not necessary. Action: No action required Timeframe: Not applicable

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
Groundwater specialist	The auditor notes that Section 8.1.1 of the WMP states that an investigation into the high salinity observed in the alluvial aquifers (particularly Bettys Creek) will be undertaken in 2017. The WMP should be updated to reflect the results from this assessment, namely the identification of any impacts on surrounding groundwater dependant ecosystems, private groundwater extractors and the salinity values of the Hunter salinity trading scheme.	The WMP should be updated to reflect the results from the investigation into the high salinity observed in the alluvial aquifers conducted in 2017.	<p>Response: This amendment will be made to the Water Management Plan as part of a future scheduled revision.</p> <p>Action: Revise the Water Management Plan to reflect the results from the investigation into the high salinity observed in the alluvial aquifers conducted in 2017.</p> <p><u>Complete</u></p> <p>Timeframe: June 2022</p>
Biodiversity Specialist	It is noted that the BMP does not specify the monitoring sites (including reference sites) which are referenced in the monitoring reports.	It is recommended the BMP makes specific reference to the monitoring sites including reference sites. Locations of sites should be outlined including the monitoring site which was added in 2019 (SG03) and monitoring sites which were relocated (SB01).	<p>Response: This amendment will be made to the Biodiversity Management Plan as part of a future scheduled revision.</p> <p>Action: Revise the Biodiversity Management Plan to make specific reference to the monitoring sites including reference sites.</p> <p>Timeframe: June 2023</p>

<p>Biodiversity Specialist</p>	<p>Integra UG engaged Enright Land Management to conduct weed and pest management services during the audit period. An annual completed weed works report is prepared by Enright which summarises the weed and pest work conducted as part of the ongoing weed control program. While the annual completed weed works reports are considered adequate at detailing the progress of weed management, a number of improvements could be made to the reporting.</p>	<p>While the annual completed weed works reports are considered adequate at detailing the progress of weed management, the following improvements could be made to the reporting:</p> <ul style="list-style-type: none"> • The location of weed control activities could be better noted within Table 1 for each weed • The months in which weeds were treated should be noted to allow consideration of the effectiveness of weed control effort • For each weed, the report should if the same location(s) have been treated for the same weed species within the past five years. This will allow the effectiveness of control methods to be evaluated and for future control strategies to be better targeted • The success of weed control works for each species, both within the current year and previous years, could be outlined in Table 1 • Mapping: some colours shown on maps are not included in legends or are difficult to discern. Indication of the month of treatment in the legend would be helpful. • Mapping: A separate map indicating weed treatment priority areas in the coming year would allow better tracking of progress. This should also outline and discuss any areas of new infestations recorded, and their reasons e.g. 	<p>Response: Improvements to the annual completed weed works reports can be made. Integra UG has engaged a weed management contractor and will seek for these items to be included in the annual reports.</p> <p>Action: Update Weed Action Plan to include annual completed weed works report and its requirements.</p> <p><u>Complete</u></p> <p>Timeframe: June 2021</p>
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Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
		disturbance due to specific construction.	
Subsidence Specialist	The extent of LiDAR surveying is not outlined in the Extraction Plans.	It is suggested that the extent of LiDAR is identified on monitoring figures within the extraction plans.	<p>Response: The extent of the LiDAR survey is inclusive of the potential subsidence affectation area.</p> <p>Action: Include the extent of the LiDAR survey in future reporting under the Extraction Plan to clarify monitoring area.</p> <p><u>Complete</u></p> <p>Timeframe: June 2021</p>
Subsidence Specialist	Table 4-1 of the IUG EP LW15-16 Subsidence Monitoring Program references Longwall 15 but not Longwall 16.	Update Table 4-1 of the IUG EP LW15-16 Subsidence Monitoring Program to ensure it refers to both Longwall 15 and Longwall 16.	<p>Response: The Subsidence Monitoring Program with the Extraction Plan for LW15-16 is being implemented and LW16 nearing completion. The information relevant to both LW15 and LW16 is included in Table 4-1; however, there are two instances where LW16 has been mistyped as LW15. This has not affected the management of subsidence during LW16.</p> <p>Action: No action required</p> <p>Timeframe: Not applicable</p>

Approval & Condition	Context	Opportunity for Improvement	Response, Action and Timeframe
Previous IEA Recommendation SCH3 C32D		It is recommended that AHIMS is reviewed to confirm the status of these sites has been updated	<p>Response: Integra UG previously notified OEH of the status of the two AHIMS sites and updated the AHMP to include the requirement to notify the OEH with respect to incidents relating to Aboriginal heritage.</p> <p>Action: Confirm the status of two site have been updated on the AHIMS register. If the statuses are not consistent with the AHMP, revise the AHMP to reflect the AHIMS register.</p> <p><u>Completed</u></p> <p>Timeframe: June 2022</p>

GLENCORE