UNITED WAMBO
JOINT VENTURE

GLENCORE

2021 Annual Review

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Tables

1. Statement of Compliance

Table 1-1, ***Table 1-3*** and ***Table 1-3*** outline the compliance status of operations at United Wambo Joint Venture (United Wambo) against the relevant approval conditions during the reporting period.

Table 1-1 Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
Development Consent (DA-410-11-2002-i)	**Yes**
SSD 7142	**No**
Environment Protection Licence (3141)	No

Table 1-2 Compliance Status Categories

Risk Level	Colour Code	Description
High	Non-Compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-Compliant	Non-compliance with potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-Compliant	Non-compliance with potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-Compliant	Non-compliance which does not result in any risk of environmental harm

Table 1-3 Non- Compliance Status – United Wambo

Relevant Approval	Condition/ Legislative Reference	Condition Description (Summary)	Compliance Status	Details of Non-compliance	Corrective Action/s	Where Addressed in Annual Review
EPL 3141	**Condition M2.3**	**Air Quality Monitoring**	Non-Compliant	**As a result of storms, software issues, maintenance, power outages and communication errors the real time air quality monitors (TEOMs) ceased logging for varying lengths of time. As a result, they failed to collect >75% of the daily data. And a valid 24-hour average of could not be calculated.** AQ01: 2/3/21, 3/3/21, 5/3/21, 9/11/21, 10/11/21, AQ02: 2/12/21, 3/12/21 AQ03: 3/1/21, 4/1/21, 11/1/21, 10/2/21, 11/2/21, 16/2/21, 19/2/21, 18/3/21, 22/3/21, 14/6/21, 15/6/21, 15/7/21, 16/7/21, 29/7/21, 30/7/21, 17/12/21, 22-23/12/21, 25-31/12/21 **AQ04: 23/8/21-25/8/21, 1/12/21-2/12/21**	**Following the varying outages of the real time monitors, the cause was investigated.** The real time monitoring network is monitored remotely and maintenance by an external technical contractor to minimise the downtime of any real time monitoring units. Regular preventative maintenance and calibration will continue on all real time monitors.	Section 6.4.4 and 10.2.1
SSD 7142	**Condition A30 SSD**					
EPL 3141	**Condition L3.1**	**Noise monitoring**	Non-Compliant	22/7/21 22:38 a low frequency penalty of 2dB was awarded when undertaking attended noise monitoring at NM02.	A remeasure was undertaken approximately 1 hour later and the noise level was compliant with criteria.	Section 6.2.3 and 10.2.2

2. Introduction

2.1 Project Overview - SSD 7142

In November 2014, Glencore Coal Assets Australia (GCAA) and Peabody Energy agreed to form a 50:50 Joint Venture project combining the existing open cut operations at Wambo Coal (Peabody) with a proposed open cut at United. The Joint Venture realises significant operational synergies by combining Wambo's existing open cut operation with United's adjacent reserves into a single managed operation using available infrastructure capacity at Wambo. The location of the United Wambo is shown on ***Figure 2-1***.

The United Wambo Joint Venture Project Team commenced the EIS process during 2014 to assess the potential impacts of the new operations. In 2016 the Environmental Impact Statement (EIS) for the United Wambo Open Cut Coal Mine Project (SSD 7142) (the Project) was submitted to the Department of Planning Industry and Infrastructure (DPIE) formerly the Department of Planning and Environment (DPE) in August 2016.

During 2017, a Response to Submissions report was prepared addressing the public and government agency submissions made on the EIS. On 12 December 2017, DPIE released the Preliminary Assessment Report on the Project.

The Project was referred to the then Planning Assessment Commission (PAC) (now Independent Planning Commission (IPC)) by the Minister for Planning on 28 November 2017 to carry out a review of the Project and to conduct a public hearing. The public hearing was held on 8 February 2018.

The IPC issued its Review Report on 26 March 2018 and a Response to the IPC Review Report was submitted by United Wambo in July 2018. DPIE completed the Final Assessment Report and referred the Project for determination to the IPC in November 2018. The IPC held a second public meeting on 7 February 2019.

The project was approved by the IPC under SSD 7142 on 29 August 2019 with operations commencing on 6 January 2020. Further information on the Project can be found on the NSW Major Projects website *(http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7142)* or the IPC website *(http://ipcn.nsw.gov.au/projects/2017/12/united-wambo-open-cut-coal-mine-project-mod-3-and-mod-16).*

The Project is being undertaken in the following stages:

- Phase 1A – construction works at United open cut mine (completed 19 July 2020);
- Phase 1B – continuation of construction works and commencement of mining operations at United open cut mine (completed 30 November 2020);
- **Current Stage** - Phase 2 – mining operations at the United open cut mine and Wambo open cut mine; and
- Phase 3 – the cessation of open cut mining operations and mine closure.

Figure 2-2 and ***Figure 2-3*** are maps of the operation showing the regional context, development consent boundary, mining lease boundaries, current operational disturbance footprint and offset areas.

Figure 2-1 Regional Location Plan

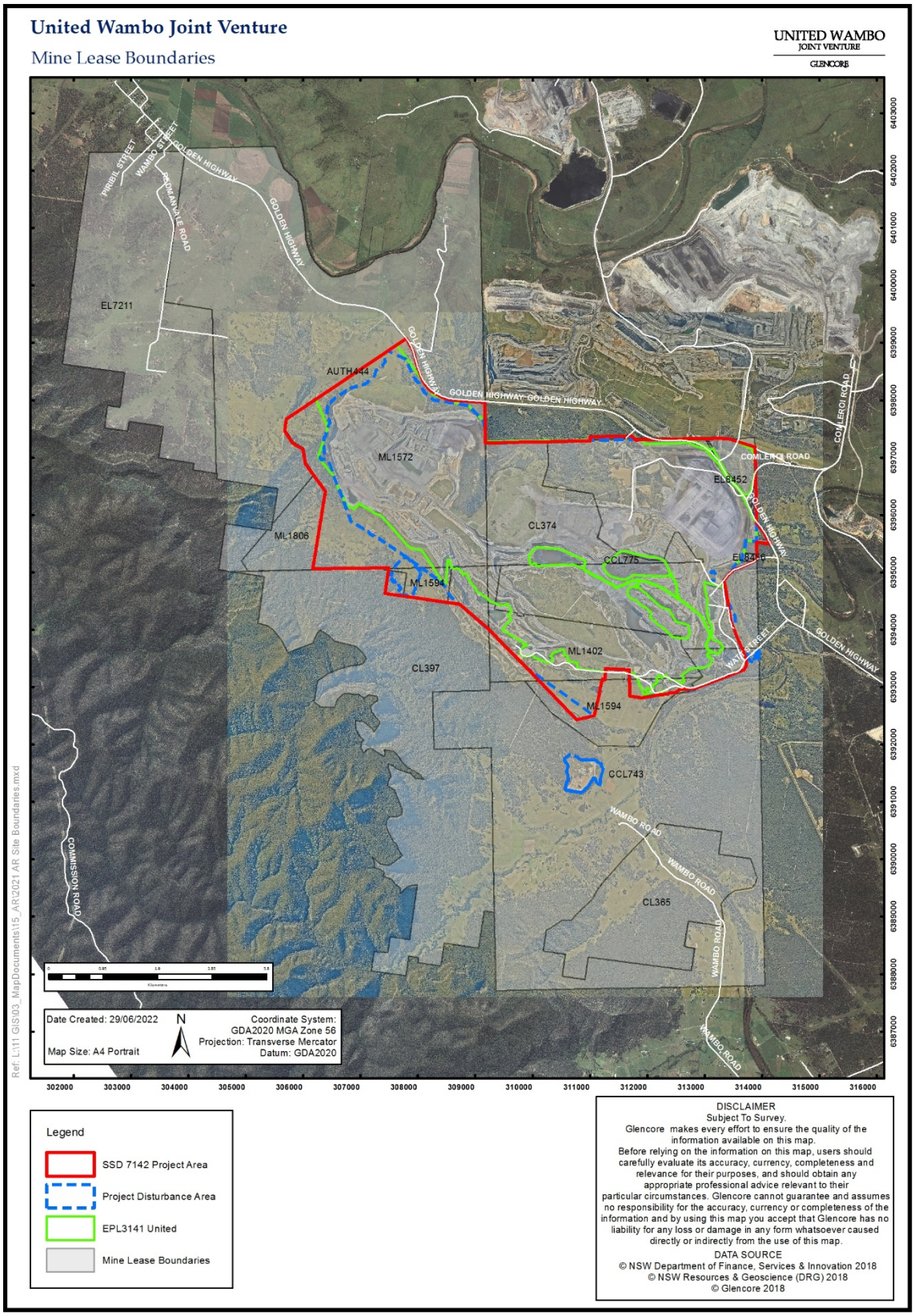


Figure 2-2 United Wambo Coal Mine Boundaries

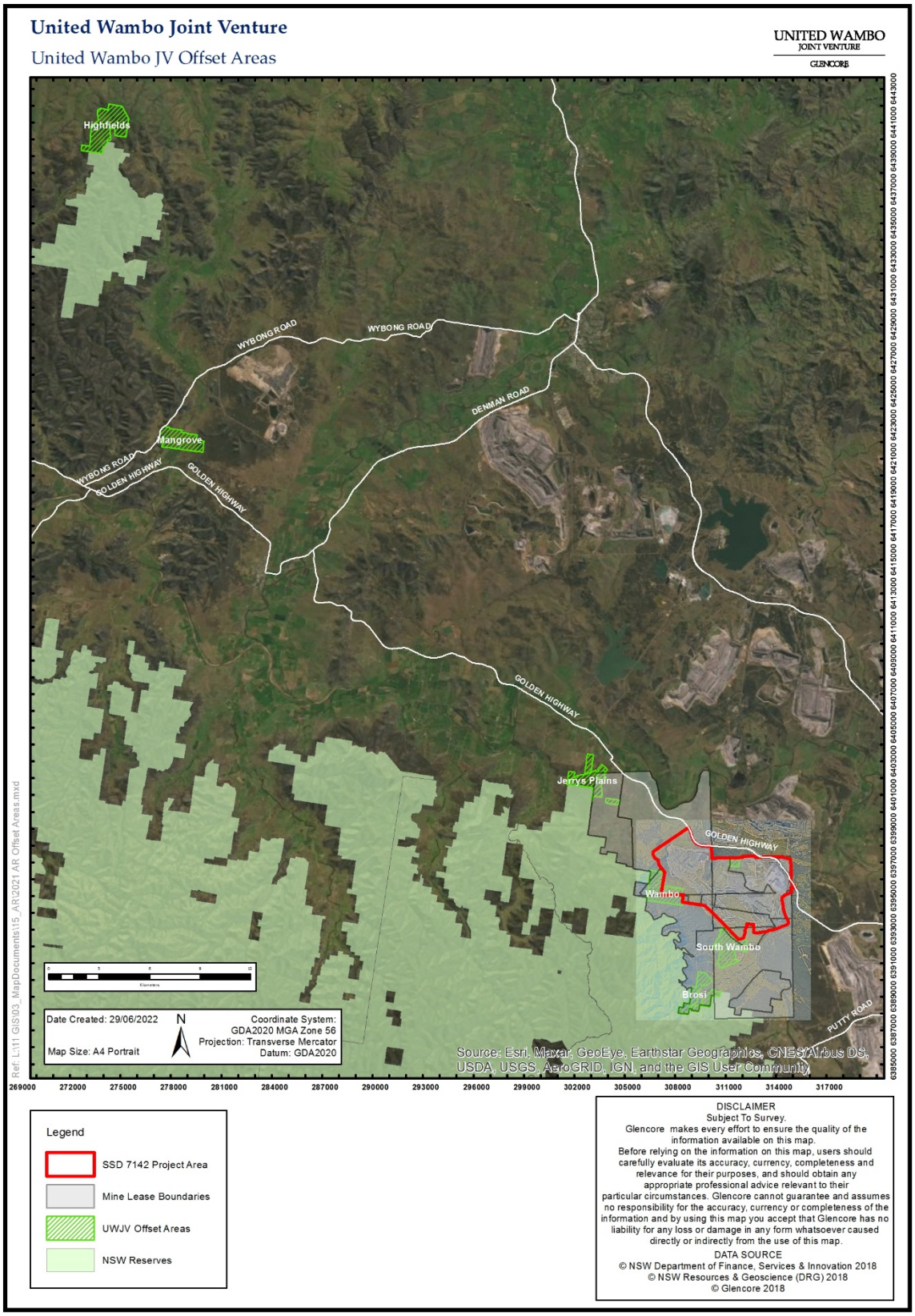


Figure 2-3 United Wambo Offset Areas

2.2 Project Overview – DA-410-11-2002-i

United Collieries (United) was an underground coal mine previously under care and maintenance located 16 kilometres west of Singleton in the Upper Hunter Valley of New South Wales (***Figure 2-1***).

From July 1989 until July 1992, United operated a small open cut and auger mining operation extracting from the Whynot and Wambo seams. In 1991, a resource swap was affected with the neighbouring Wambo Coal Pty Ltd (Wambo) mine, which enabled Wambo to secure greater open cut reserves and United to secure greater underground reserves.

Underground mining operations commenced in January 1992 within the Woodlands Hill seam using a continuous miner with shuttle cars. In May 1994, bord and pillar development with the "Cut and Flit" mining system was introduced. Pillar extraction operations commenced in October 1995 using a continuous miner, shuttle cars and mobile roof supports. In late 1996, the mine expanded to two development units and one pillar extraction unit. In 1997, a chain haulage system was introduced to increase production.

In May 2002, longwall mining commenced at United. The main components of the longwall mining equipment consisted of a shearer, armoured face conveyor and hydraulic roof supports. The majority of United underground mining operations lie beneath Wambo's open cut operations (Wambo) and under United's Surface Colliery Holding boundary.

United was purchased by Glencore Coal Australia in 1997 and then Xstrata Coal Australia Pty Limited in 2002. Since 2002 United has been owned in a joint venture comprising 95% Glencore and 5% Construction, Forestry, Maritime, Mining and Energy Union – Mining and Energy Division (CFMMEU).

The CFMMEU is the holder of CCL775 on behalf of United. The CFMMEU is also co-holder with Wambo Coal Pty Limited's authorisation for the A444 area. Other coal mines operating in the Warkworth region are Mount Thorley Warkworth Open Cut Operations, Wambo Coal and Hunter Valley Operations.

Following an assessment of geotechnical constraints, United's plans to mine Longwall panel 11 were abandoned, and subsequently Xstrata announced the suspension of mining operations at United would occur following the extraction of Longwall panel 10. Mining of Longwall panel 10 was completed in February 2010, and since then United has entered into a care and maintenance period while the potential for future mining was investigated.

When operational, Run of Mine (ROM) coal at United was put through the Coal Handling and Preparation Plant (CHPP). Product coal was then transported to the Wambo rail load-out facility via an internal haul road. The product coal was stockpiled at the rail load-out facility and loaded onto trains bound for the Port of Newcastle for export.

In May 2013, Xstrata Plc completed a merger with Glencore International Plc forming Glencore Xstrata. In May 2014, Glencore Xstrata changed its name to Glencore plc. Glencore's Australian coal businesses including United are maintained under GCAA. United continued on care and maintenance under DA-410-11-2002-i until operations commenced under SSD 7142 on 6 January 2020.

An application to surrender DA-410-11-2002-i was submitted during 2021 in accordance with Condition A16 of SSD 7142, with the surrender being approved in February 2022.

2.3 Site Contacts

Contact details for key personnel are provided in ***Table 2-1*** below.

Table 2-1 Contact Details for Key Mine Personnel

Name	Role	Telephone	Email
Nick Slater	Operations Manager	02 6578 9500	*Nick.Slater@glencore.com.au*
Aislinn Farnon	Environment and Community Manager	0429 306 208	*Aislinn.Farnon@glencore.com.au*
Sean Pigott	Environment and Community Co-ordinator	0400 238 506	*Sean.Pigott@glencore.com.au*
Community Complaints and Enquiries		1800 801 440	
Website		https://www.glencore.com.au/operations-and-projects/coal/current-operations/united-wambo-open-cut	

3. Approvals

3.1 Approvals for United Wambo

Leases, licences and approvals that regulate operations at the site are listed in ***Table 3-1*** below. The relevant approvals will change over the next couple of years with the implementation of SSD 7142.

Table 3-1 Approvals Relating to United Wambo

Regulatory Authority	Instrument	Date of Issue	Expiry Date	Comments
Resources Regulator	CCL 775	2 September 1992	2 Mar 2033	Renewal issued May 2014
	ML 1572	21 December 2005	21 December 2026	Renewal issued 21 December 2005
	ML 1824	29 November 2021	29 November 2042	Granted in 2021, sits below existing ML1572 in Wambo Open Cut
	CL 374	6 December 1991	21 March 2026	Renewal issued 17 January 2007
	Sublease	10 September 2021	17 December 2044	Relates to surface of parts of CCL743, CL397, ML1402, ML1594
	Authorisation A444	4 October 2007	16 May 2021*	*Renewal sought Jointly held by CFMMEU and Wambo
	Exploration Lease 7211	29 September 2008	29 September 2019*	*Renewal sought

Regulatory Authority	Instrument	Date of Issue	Expiry Date	Comments
	S.100 Emplacement Area Augmentation C99/0845	15 July 2008		Tailings Dam 2 Raise Level
	Surface Disturbance Notice Approval (Authorisation A444)	17 September 2009		
	s.126 Emplacement Area – New waste emplacement area C99/0845	9 March 2005		Emplacement Area 2
	s.126 Emplacement Area – Extension to area	30 January 2001		Emplacement Area 1
	s.126 Emplacement Area Approval C99/0845	22 October 1999		Emplacement Area 1 – emplacement activities until December 2002
	Sublease Agreement	21 November 2003	-	Relates to CCL743 and ML1402. Continues until the expiration of either the Wambo or United leases.
Resources Regulator	United Wambo Rehabilitation Management Plan (Phase 2)	1 December 2020	31 December 2022	Covers operations for Phase 2 under SSD 7142. Amendments A and B approved during 2021 and Amendment C approved 2022.
Department of Planning Infrastructure and Environment (DPIE) Formerly the Department of Planning and Environment (DPE)	Development Consent DA 410-11-2002i	21 November 2003	Mining Operations December 2012	Eight modifications were made to DA 410-11-2002i. Mining was not permitted after 2012 however the Development Consent remained current through 2021. DA 410-11-2002i has been surrendered as approved by DPIE in February 2022.
	State Significant Development (SSD) 7142 MOD 1	29 August 2019	1 August 2042	Modified during 2021 to allow for changes to ROM stockpiling arrangements.

Regulatory Authority	Instrument	Date of Issue	Expiry Date	Comments
Environment Protection Authority (EPA)	Environment Protection Licence (EPL) 3141	30 November 1999	Anniversary Date: 30 November	Current issue dated 10 December 2021 Note: The EPL was varied once during the reporting period.
NSW Environment, Energy and Science	S87 Care and Control Permit #3062	24 December 2021		ISEMS/AHIMS Permit #: 10913446/2997 Updated for change of address in 2021
Water NSW	WAL 18445 Redbank Creek Bywash pump	14 March 2008	13 March 2023	Replaces 20SL050992 200ML 20WA208714 Industrial
	WAL 10541 Hunter River Pump	01 January 2007	Perpetuity	Replaces 20SL060222 300ML 20WA200928 Water Supply
	WAL 18549 Wollombi Brook Pump	05 November 2007	19 November 2022	Replaces 20SL050670 100ML 20WA208706 Industrial
Singleton Council	4094/2010	3 May 2010	30 June 2022	North MIA Office Administration
	ST 15.2020.39	14 January 2021	30 June 2022	South MIA Admin Building

3.2 Summary of Consents, Leases and Licenses

Table 3-2, Table 3-3 and ***Table 3-4*** below summarise conditions relating to annual reporting and the Annual Review within the SSD 7142, Development Consent DA-410-11-2002-i and CCL775.

Table 3-2 Compliance with SSD 7142

Condition No.	Consent Condition	Annual Review Section
E11 – Annual Review	By the end of March each year, after the commencement of development, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must:	Annual Review
	a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;	4 and 7
	b) report on the progress of biodiversity credits retirements and the associated actual versus proposed surface disturbance for each stage;	6.5.2
	c) report on the progress of implementing reasonable and feasible diesel emissions reduction measures for the Project;	6.4.2

Condition No.	Consent Condition	Annual Review Section
	d) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the: (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this consent; (iii) monitoring results of previous years; and (iv) relevant predictions in the document/s listed in condition A2(c);	6
	e) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;	1, 6 and 10
	f) evaluate and report on: (i) the effectiveness of the noise and air quality management systems; and (ii) compliance with the performance measures, criteria and operating conditions in this consent;	6.2.3, 6.4.3 1
	g) identify any trends in the monitoring data over the life of the development;	6
	h) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	6
	i) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.	6
E16 - Access to Information	Before the commencement of Phase 1A, until the completion of all rehabilitation required under this consent, the Applicant must: a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website: (xi) the Annual Reviews of the development.	This document.
Condition B40 – Water Supply	The Applicant must report on water extracted from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.	6.8
B52 (v) – Groundwater Management Plan	(vi) a protocol to report on the measures, monitoring results and performance criteria identified above, in the Annual Review referred to in condition E11.	6.9
B91(d) - Waste	(d) monitor and report on the effectiveness of the waste minimisation and management measures in the Annual Review referred to in condition E11.	6.7

Table 3-3 Compliance with Development Consent DA-410-11-2002-i

Condition No.	Consent Condition	Annual Review Section
Schedule 6, Condition 5 – Annual Reporting	Within 12 months of this consent, and annually thereafter, the applicant shall submit an Annual Review to the Director General and relevant agencies. The report must:	Annual Review
	j) identify the standards and performance measures that apply to the development;	6
	k) describe the works carried out in the last 12 months;	4 and 5
	l) describe the works to be carried out in the next 12 months;	4, 6 and 11
	m) include a summary of complaints received during the past year, and compare this to complaints received in previous years;	8
	n) include a summary of monitoring results for the development during the last year;	6
	o) include an analysis of these monitoring results against the relevant: • impact assessment criteria/limits; • monitoring results from previous years; and • predictions in the EIS;	6
	p) identify any trends in monitoring results over the life of the development;	6
	q) identify any non- compliance during the previous year; and	1
	r) describe what actions were, or are being taken to ensure compliance.	6
Schedule 6, Condition 10 – Access to Information	The Applicant shall:	-
	a) Keep detailed records of the: • Amount of coal produced each year; and • Number of coal haulage truck movements generated each day by the development; and	4
	b) Include these records in the Annual Review.	4
Schedule 4, Condition 32 - Site Water Balance	Each year, the Applicant shall: a) review the site water balance for the development against the predictions in the EIS; b) recalculate the site water balance for the development; and c) report on the results of this review in the Annual Review.	6.8
Schedule 4, Condition 47 - Reporting	The Applicant shall include a progress report on the implementation of the compensatory habitat proposal in the Annual Review.	7.2

Table 3-4 Compliance with Mining Lease CCL775

Condition No.	Consent Condition	Annual Review Section
Condition 4 f)	The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must: i. provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP;	7
	ii. be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and	7
	iii. be prepared in accordance with any relevant annual reporting guidelines published on the Department's website: www.resources.nsw.gov.au/environment *Note: The Rehabilitation Report replaces the Annual Environmental Management Report.*	7

4. Operations Summary

4.1 Mining Operations

This Annual Review is required to report on the production operations of the mine, and these are summarised in ***Table 4-1*.**

Table 4-1 Production Summary

Material	Approved Limit	2019 (actual)	2020 (actual)	2021 (actual)
Waste Rock/Overburden (Bank Cubic Metre (BCM))	NA	0	6,193,677	40,155,000
ROM Coal/Ore (tonnes)	10Mt / year (SSD 7142)	0	608,941	6,491,000
Coarse Reject (tonnes)	NA	0	0	0
Fine Reject (Tailings) (tonnes)	NA	0	0	0
Saleable Product (tonnes)	14.7Mt transported from the Complex	0	358,976	4,298,000

4.1.1 Mining Operations – SSD 7142

United Wambo comprises of mining within two open cut pits - a new open cut coal mine at United, known as the United Open Cut, and the existing open cut operations at Wambo, known as the Wambo Open Cut. Operations at United Wambo occurred in Phase 2 during 2021 as defined by SSD 7142.

During 2021, mining operations continued within the United Open Cut, focusing on the main United Open Cut box cut and the continued development of the United Starter Pit. Following the removal of the 330kV powerlines in March 2021, the two mining areas were combined to form one pit. Development of the overburden emplacement areas continued, focused on the areas surrounding the

Wambo Hunter Pit Tailings Dam. The out-of-pit emplacement areas were mostly over previously mined and areas previously rehabilitated by Wambo. Mining also continued within the Wambo Open Cut's Montrose Pit, including the Montrose Ridge area. Overburden from Wambo Open Cut is emplaced in the in-pit emplacement areas. Coal mined from both the United and Wambo open cuts was transported to the main ROM Stockpile.

Figure 4-1 United Open Cut operations in December 2021

4.1.2 Mining Operations – DA 410-11-2002i

All mining in 2021 was undertaken under SSD 7142.

4.2 Construction Activities

4.2.1 Powerline Infrastructure

The Project required a number of high voltage powerlines to be relocated to allow the mine to be developed. The following works occurred during 2021.

- Relocation of the Liddell to Newcastle 330 kV alignment. Works for this included the construction of ten new towers and the stringing of the new towers during 2020, with the cutover of the power undertaken in March 2021. The existing towers were demolished during April 2021.

Figure 4-2 New constructed towers for the 330kV relocation

4.2.2 Mine Infrastructure Area

A new mine infrastructure area was constructed for the United Wambo Joint Venture. It is located adjacent to the existing Wambo Mine Infrastructure Area and includes;

- Bulk Earthworks with ~200,000 m³ of excavation works;
- Construction of new wash facilities for both heavy and light vehicles;
- Construction of new maintenance facilities including a 5 bay workshop;
- New fuels and lubricants dispensing system piped to all new and existing service areas;
- Construction of new offices, bath house and facilities with modular building modules;
- New state of the art sewage and grey water treatment plant; and
- Ancillary facilities including carparks / lighting / access gates / emergency services.

The works were completed during 2021, with operations personnel moving into the buildings in August 2021.

Figure 4-3 Constructed South MIA

4.3 Other Operations

4.3.1 Hours of Operations

During Phase 2 operations, the site operates 24-hour per day 7 days a week.

4.3.2 Reject and Tailings Management

4.3.2.1 Reject and Tailings – DA-410-11-2002-i

The coarse rejects emplacement area is currently in a stage of rehabilitation. There are two tailings emplacement areas at United (Tailings Dams 1 and 2).

These tailings dams were previously used for storage of tailings and coarse rejects from the CHPP. Since tailings emplacement ceased in 2010, Tailings Dams 1 and 2 were managed to permit desiccation until the commencement of rehabilitation.

During 2021, capping works commenced on Tailings Dams 1 and 2 in accordance with the detailed capping plans developed in consultation with the relevant regulatory agencies and the High-Risk Activity approval received late in 2020.

The capping project was undertaken by Oldknow Earthmoving, and involved the placement of approx. 725,000m^3 of material onto the consolidated tailings within the dam. The material, comprised of coal rejects, clay and overburden, was placed in three layers of 1m, 1.5m and 2m (a total of 4.5m of material) using small earthmoving equipment.

The capping of the Tailings Dams is a key milestone in the United Wambo JV mine life, as it enables the overburden emplacement areas to be constructed and the approved final landform be achieved. Up to 60m of overburden will be emplaced over the capped dams prior to shaping and rehabilitation.

All tailings associated with the United Wambo open cut operations will be managed by Wambo.

4.3.2.2 Reject and Tailings - SSD 7142

ROM coal mined in the United and Wambo Open Cuts is hauled to the ROM pad located near the Wambo CHPP. Coal hauled to the ROM pad can be placed directly into the ROM bin or placed onto the main ROM coal stockpile. ROM coal is crushed and washed at the Wambo CHPP and a product coal stockpile is used to stockpile product coal, prior to reclaim and loading to trains for transport off site. The Wambo CHPP is managed by Wambo under DA 305-7-2003 MOD 16 and the Wambo MOP / RMP.

Tailings from the Wambo CHPP are placed within an approved tailings storage facility. The tailings are currently placed within the Inpit Tailing Storage Facility (TSF). Layers of heavily flocculated tailings may also be placed onto the Hunter TSF and the Northeast TSF to assist with the capping of these facilities.

Coarse rejects from coal preparation are transported by truck to the open cut overburden emplacement areas for emplacement and subsequent covering by overburden material.

4.3.3 Exploration Management

Drilling for the period included installation of two tilt monitor boreholes for slope stability monitoring purposes for the United Open Cut. An additional 4 boreholes were completed for the proposed Golden Highway extension for the purposes of geotechnical characterisation.

A seven-borehole program targeted the former Longwall 10 of the old United Underground to characterise gas content prior to interaction with mining in the United Open Cut.

Regional exploration on A444 and EL7211 comprised the completion of three boreholes targeting the Newcastle and Whittingham coal measures for structural and coal quality purposes.

4.3.4 Mine Subsidence

As mining operations were suspended at United in 2010, no additional subsidence from underground mining operations has occurred in 2021. There was no subsidence remediation during 2021.

4.4 Next Reporting Period

Table 4-2 outlines the forecast operations for the next reporting period.

Table 4-2 Forecast Operations for the Next Reporting Period

Aspect	Forecast for Next Reporting Period
Pit expansion areas	Further development of the United Open Cut. All material from United Open Cut is hauled to out of pit emplacement areas. Continuation of mining operations within the Wambo Open Cut, including ongoing development of the Montrose ridge and development of the final landform within the emplacement areas.
Infrastructure development/upgrades	Design works are underway regarding the relocation of the Golden Highway and the extension of the United Open Cut in this area, which may occur during 2022.
Mining fleet upgrades	New mining equipment, including excavators, haul trucks, rubber-tyred dozers, watercarts and loaders, will continue to be commissioned over the next few years.

5. Actions Required from Previous Annual Review

The actions required as an outcome of the previous 2020 Annual Review, and their current status, are detailed in **Table 5-1** These actions were commitments from United.

Table 5-1 2020 Annual Review Actions and Feedback

Action	Comment by United Wambo
United Wambo Proposed Actions from 2020 Annual Review	
Construction of the United Wambo JV Mine Infrastructure Area will be completed during 2021.	Construction of the MIA was completed in August 2021
The 330kV powerlines will be removed during March/April 2021	Powerlines were removed in April 2021.
Capping works will commence during 2021 (all tailings associated with the United Wambo open cut operations will be managed by Wambo).	Capping of Tailings Dams 1 and 2 commenced during 2021.
The surrender of DA-410-11- 2002-i in accordance with Condition A16 of SSD 7142 to occur during 2021	The application to surrender was submitted during 2021, with the surrender officially completed in February 2022.
Independent Environmental Audit completed in accordance with Condition E12 of SSD 7142.	The IEA was completed, see Section 9 for further details
Develop and submit Biodiversity Stewardship Agreement applications for the retirement of biodiversity credit as required by Condition B55 of SSD7142.	Stewardship Agreement applications were developed in 2021 and submitted in early 2022. An extension to Condition B55 was submitted to DPIE.
Develop plan and commence Blast Fume Monitoring Trial.	Details on the Blast Fume Monitoring Trial are provided in Section 6.3.5.
9.9 hectares of rehabilitation will be undertaken.	9.9 hectares of rehab completed in 2021
Environmental monitoring, land management and rehabilitation maintenance.	Continued as required through 2021

Action	Comment by United Wambo
Undertake targeted weed control in areas identified during monitoring.	Weed control undertaken as required.
Feedback from Regulators	
A Response from DPIE was received on 30 June 2021 regarding the 2020 United Wambo Annual Review, requesting additional information to satisfy the reporting requirements.	United Wambo updated the 2020 Annual Review with the requested information and received approval from DPIE on 16 August 2021.

6. Environmental Performance

The Annual Review Guideline (DPE 2015) requires summarising the outcomes achieved during the reporting period for key environmental aspects.

It should be noted that the 2021 Annual Review includes EIS predictions from:

- United Wambo Open Cut Coal Mine Project – *Environmental Impact Statement* (Umwelt, 2016);
- United Wambo Open Cut Coal Project – Response to Submissions Part A (Umwelt, 2017);
- United Wambo Open Cut Coal Project – Response to Submissions Part B (Umwelt, 2017a);
- United Wambo Open Cut Coal Project – Response to Independent Planning Commission Recommendations (Umwelt, 2018).

All monitoring locations for United Wambo are shown in ***Figure 6-1*** and ***Figure 6-2***.

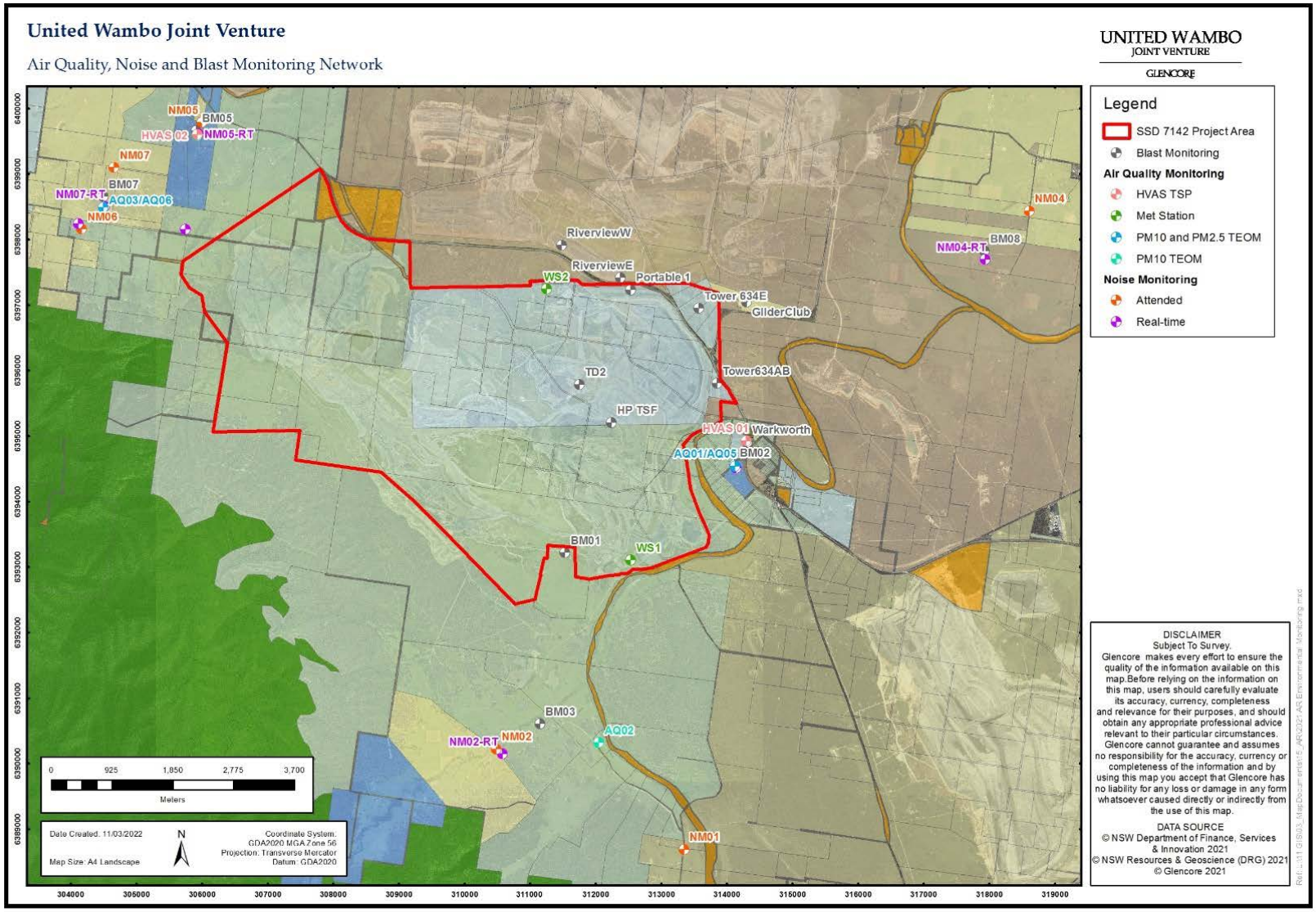


Figure 6-1 United Wambo Air Quality, Noise and Blast Monitoring Locations

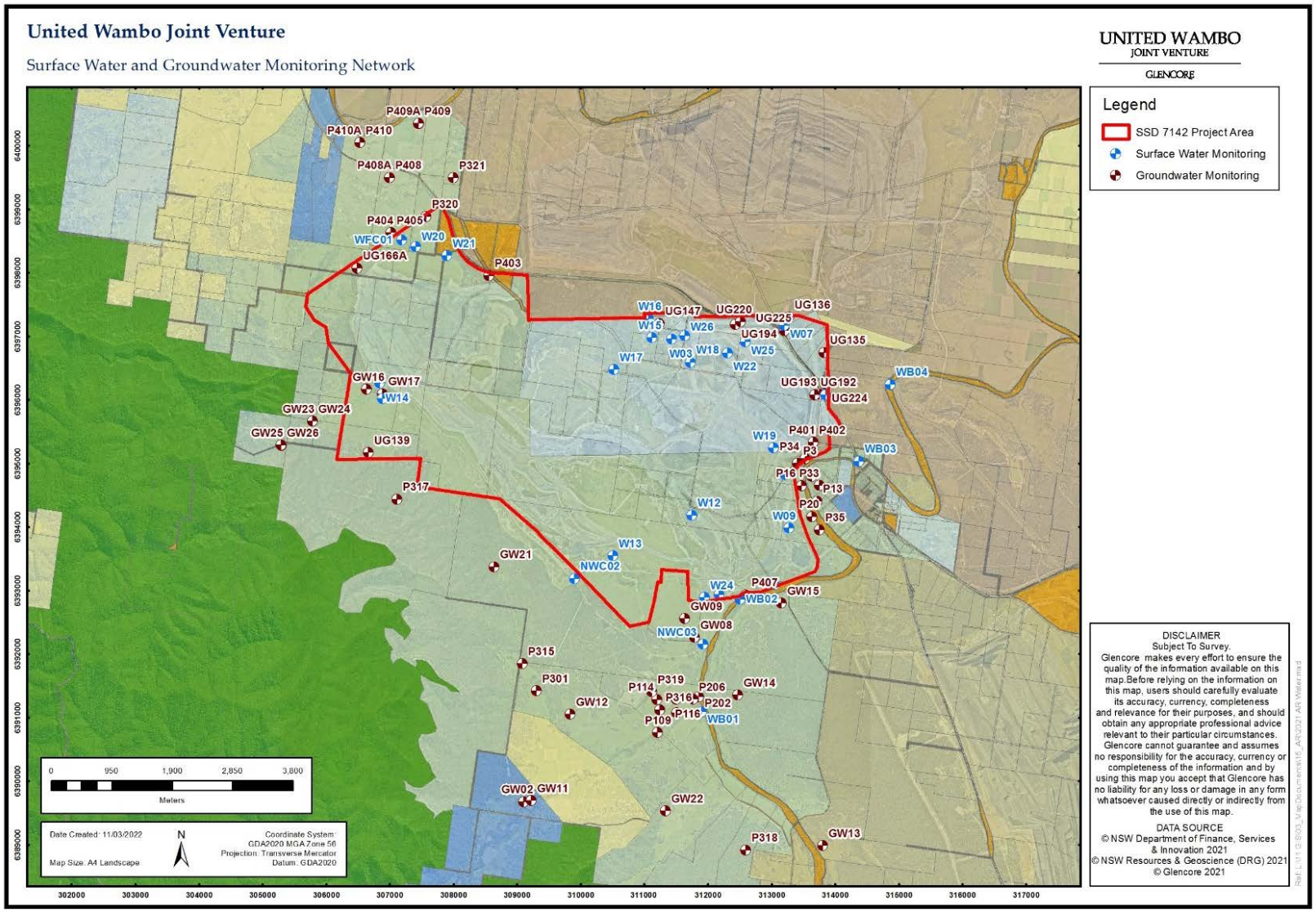


Figure 6-2 United Wambo Surface Water and Groundwater Monitoring Locations

6.1 Meteorological Data

Meteorological monitoring was undertaken at the United Wambo meteorological station (M7) located just north of the south-west of United Open Cut, as shown in ***Figure 6-1***. A summary of the 2021 meteorological data is provided in ***Table 6-1***.

Table 6-1 Yearly Summary of 2021 Meteorological Data

	Temperature °C			Windspeed m/s			Rainfall mm	No. of Rain Days >1mm
Date	**Min**	**Av.**	**Max**	**Min**	**Av.**	**Max**	**Total**	
January	12.0	23.0	37.3	0	2.1	4.9	76.8	11
February	14.5	21.9	32.6	0	2.0	4.8	103.8	15
March	13.2	20.4	34	0	2.1	4.9	248.4	7
April	6.2	16.8	28.9	0	2.0	11.5	18.4	5
May	1.6	14.6	25.3	0	1.84	12.3	18.2	13
June	2.6	11.5	21.5	0	2.08	8.0	58.6	10
July	-2.2	11.1	23.6	0	2.4	8.8	27.8	15
August	3.6	13.3	26.4	0	2.1	8.1	50.4	6
September	5.0	15.8	29.3	0	2.0	8.3	30.4	8
October	9.5	18.1	32.4	0	2.5	9.3	75	12
November	10.3	18.7	29.8	0	2.2	10.0	249.6	13
December	13.1	21.7	36.5	0	2.0	7.7	119.4	11

The maximum temperature in 2021 was 37.3 degrees Celsius(°C). In 2021 there was an increase in total rainfall with 1076.8mm compared to 876.8mm in 2020. This is above the long-term average for rainfall in the area. There was a small decrease in wind speed in 2021 (annual average of 2.11m/s) from 2020 (annual average of 2.9m/s).

6.2 Noise

6.2.1 Environmental Management

Noise monitoring is undertaken in accordance with the *United Wambo Noise Management Plan*.

The location of noise monitoring sites is shown on ***Figure 6-1***. The monitoring program includes:

- monthly attended night-time monitoring at six sites;
- real time noise monitoring at four sites; and
- additional monitoring as initiated by alarms or in response to community concerns.

The real-time monitoring network assists with the management of noise impacts from mining operations. Monitors are operated at locations representative of nearest private residences detailed as Noise Assessment Groups (NAGs) at South Wambo, Maison Dieu, Moses Crossing and Redmanvale Road. Data is recorded continuously to allow key operational personnel to monitor noise from operations and if necessary, undertake appropriate mitigation measures. The real time noise monitors notify appropriate personnel via an SMS message system when monitoring results indicate noise levels at surrounding sensitive receivers are approaching, or have exceeded, relevant noise criteria.

A fleet monitoring system that records the location and activity of all major equipment in real time is operated onsite. The fleet monitoring system in combination with the real time noise monitoring program facilitates the implementation of appropriate noise mitigation measures. Should DPIE or the EPA request data relating to equipment use, United Wambo will provide the required data within 72 hours of receiving the request.

6.2.1.1 Management Measures

United Wambo implements noise management measures in accordance with the *Noise Management Plan.* The management measures are summarised below.

- Reasonable and feasible noise attenuation measures are undertaken on key items of plant and equipment that is reused from the current Wambo Open Cut operations or other controls achieving the same overall noise outcome.
- Reasonable and feasible noise attenuation measures are undertaken on new plant and equipment that has the potential to contribute to the Project's noise level.
- 'Silent horns' are used to communicate with trucks and smart broadband 'Quacker' reversing alarms.
- Bunds constructed in strategic locations along haul roads are implemented to shield trucks and equipment on exposed sections of the haul road ramps;
- The drop height of the first load into truck bodies is managed to minimise impact noise from the material.
- Noise management training is provided for key employees to facilitate effective noise management.
- Regular inspection and maintenance of noise attenuation systems are undertaken.

- A process for periodic review of noise performance of the equipment fleet is implemented. Noise performance will be reviewed as per manufacture specifications or on a 3-year rolling average.
- Implementation of SiteEye, a bespoke automated, real-time noise monitoring and notification system. The system enables access to live noise data (including directional noise data), issues alarms to relevant site personnel and tracks responses to noise alarms to assist with operational changes and compliance 24 hours a day. SiteEye provides United Wambo operators and management access to predictive modelling tools in real-time to achieve rapid impact assessments of proposed management actions in the 'now' following event-driven notifications. It also provides for tracking of site responses to event-driven notifications, to assist with regulatory reporting obligations and assist with future site planning.
- Systems are implemented that identify adverse meteorological conditions which are likely to result in elevated noise impacts. Additionally, the predictive modelling system enables future operational decision-making for defined operational scenarios and actual meteorological conditions.
- In the event real time noise monitoring indicates potential noise impact, operational equipment can be progressively stood down or relocated in elevated locations under adverse meteorological conditions.

6.2.2 Approved Criteria

SSD 7142 noise criteria was adopted during 2021 for Phase 2. This is summarised in the ***Table 6-2***.

Table 6-2 SSD 7142 Operational Noise Criteria

Noise Assessment Group	Noise Assessment Location	Day	Evening	Night	Night
		L_{Aeq} (15 min)	L_{Aeq} (15 min)	L_{Aeq} (15 min)	L_{A1} (1 min)
Area 1 - North Bulga	R006	37	35	35	45
	R007, R379	36	35	35	45
	All other privately-owned residences	35	35	35	45
Area 2 - South Wambo	R025	39	38	38	48
	All other privately-owned residences	35	35	35	45
Area 3 - Warkworth Village	All privately-owned residences	44	44	43	53
Area 4 - Maison Dieu	All privately-owned residences	52	52	41	51
Area 5 - Moses Crossing	R016	45	45	45	55
	R050C	41	41	41	51

Noise Assessment Group	Noise Assessment Location	Day	Evening	Night	Night
		L_{Aeq} (15 min)	L_{Aeq} (15 min)	L_{Aeq} (15 min)	L_{A1} (1 min)
	R050A	41	40	40	50
	R044	41	40	39	49
	All other privately-owned residences	41	40	38	48
Area 6 - Redmanvale	R320	40	40	40	50
	R033, R343	40	40	39	49
	R042	40	40	38	48
	R029, R345	40	40	37	47
	R048	39	39	39	49
	R030, R049, R163	39	39	38	48
	R075	39	39	37	47
	R041B	38	38	38	48
	R344, R346	38	38	37	47
	R348	38	38	36	46
	R041A	37	37	37	47
	All other privately-owned residences	35	35	35	45
Area 7 - Jerrys Plains	All privately-owned residences	40	40	36	46
All other areas	All privately-owned residences	35	35	35	45

6.2.3 Key Environmental Performance

6.2.3.1 Attended Noise Monitoring

United Wambo engaged an acoustic consultant to undertake monthly attended noise monitoring during the reporting period. Attended noise monitoring results include locations required by the United Wambo Noise Management Plan, and EPL3141.

Attended noise monitoring was completed once per month during the reporting period. United Wambo complied with relevant noise criteria for all measurements recorded in 2021, with the exception of the July 2021 attended noise monitoring event.

During attended noise monitoring undertaken in Area 2 – South Wambo (location R025) on 22 July 2021, the site-only LAeq (15 minute) noise level was recorded at 38 dB(A). However following

assessment for the applicability of modifying factors in accordance with the Noise Policy for Industry 2017 (NPfi) methodologies, it was determined that the modifying factor for correction for low frequency noise was applicable (as defined in Fact Sheet C of the NPfi). Consequently, a +2 dB(A) penalty was applied, increasing the corrected site-only noise level to 40 dB(A) and therefore exceeding the LAeq (15 minute) operational noise criteria of 38 dB(A).

The mining supervisor was notified, and operations were altered prior to a remeasure which was undertaken within 75 minutes. Operational changes included ceasing operations temporarily and moving trucks to a lower dump. In accordance with the NMP, a remeasure was taken at NM02 starting at 23:45 on 22 July 2021. Noise levels from UW complied with relevant criteria during the remeasure. No noise complaints were received on 22 July 2021, while no other noise exceedances occurred during the July 2021 attended noise monitoring event.

DPIE and the EPA were notified of the noise level on 29 July 2021.

On 2 September 2021, DPIE responded that the event was not a non-compliance with SSD 7142 as the noise level was not greater than 2dB above the criteria. There was no response received from the EPA.

Table 6-3 is a summary of attended noise monitoring for 2021. Results are presented as the maximum noise levels recorded from United Wambo at each location during the reporting period and have been compared to relevant noise criteria specified under EPL3141.

Detailed monitoring results are provided in Monthly Noise Monitoring Reports available on the United Wambo website.

Table 6-3 Summary of Attended Noise Monitoring Data – 2021 (January - December)

Location	NAG	United Wambo Noise Monitoring Results - dBA (Max)		United Wambo Project Specific Noise Criteria - dBA	
		LAeq(15minute)	LA1(1minute)	LAeq(15minute)	LA1(1minute)
NM01	1	35	42	36	46
NM02	2	40	42	38	48
NM04	4	30	31	41	51
NM05	5	43	52	46	56
NM06	6	34	44	37	47
NM07	7	36	49	39	49

6.2.4 EIS Predictions

The United Wambo Open Cut Coal Mine Project (August 2016) modelled operation scenarios for years 2, 6, 11 and 16 of the conceptual mine plan.

The EIS predicted that noise criteria would be met at the majority on NAG under those years modelled for operations. The exception was residence in Moses Crossing (Area 5) in Year 2, which were predicted 2dB higher than original noise criteria.

Noise management will be undertaken as per the *Noise Management Plan* which has been approved by DPIE under Condition B5 of SSD 7142.

During 2021 several proposed improvements were undertaken. Following the commencement of Phase 2, United Wambo began the following improvements:

- reviewing the efficacy of the real time noise monitors;

- upgrading old real-time noise monitors;
- review of noise model predictions to improve the mine planning process; and
- assessing the possibility of implementing additional noise alarm rules to account for low frequency penalties, following the noise level exceedance in July 2021.

The above improvements are part of United Wambo's commitment to continuous improvement. These improvements are on-going and are reviewed on an as needed basis.

6.3 Blasting

6.3.1 Environmental Management

Blasting is undertaken in accordance with the *Blast Management Plan (Glencore 2020e)* to ensure blast related impacts, including ground vibration, airblast overpressure, flyrock, fume, dust and misfire are minimised on the local community, infrastructure and heritage sites to the extent required by SSD 7142 and EPL 3141.

6.3.1.1 Management Measures

United Wambo implements blast management measures in accordance with the *Blast Management Plan* (Glencore 2020e) outlined in ***Table 1-1*** of the Blast Management and Mitigation Measures. The management measures are summarised below:

- perform a detailed Blast Design and loading to be undertaken for each blast to meet the required criteria and minimise impact on the environment;
- use a modified blast design when appropriate for example around identified geological features (including geological faults, series of joints, dykes etc) to avoid potential flyrock incident or when blasting through old underground workings;
- implement the Pre-Blast Assessment Protocol including various meteorological assessments and notification procedures;
- implement the Road Closure Management Plan where blasting is to occur within 500 m of a public road;
- coordinate blast times between the United Wambo pits and HVO to avoid concurrent blasting;
- detailed liaison and risk management between United Wambo, Wambo UG and HVO when blasting will occur within 500m boundary or when potentially affected by flyrock, fumes, dust or other areas beyond the 500m zone (e.g. equipment movement); and
- develop a safe management system for location and handling of misfires.

6.3.1.2 Approval Criteria

Condition B8 of Part B in SSD 7142 and Condition L4 of Section 3 in EPL 3141 outline the blasting criteria adopted for airblast overpressure and ground vibration during 2021 for Phase 1A, Phase 1B and Phase 2. This criterion is in place for human comfort for residences on privately owned land, the prevention of structural damage of heritage sites and infrastructure, and to minimise ground vibration at public infrastructure. The monitoring locations and criteria are summarised in ***Table 6-4.***

Table 6-4 Residence on privately owned land Monitoring Locations and Criteria

Monitoring Locations	Airblast overpressure (dB Lin Peak)	Ground Vibration (mm/s)	Allowable exceedance
South Wambo BM03 / EPA ID 19	115	5	5% of the total number of blasts over a calendar year
Moses Crossing BM05 / EPA ID 20			
Redmanvale BM07 / EPA ID 21	120	10	0% of the total number of blasts over a calendar year
Maison Dieu BM08 / EPA ID 22			

Table 6-5 Heritage Blasting Monitoring Locations and Criteria

Monitoring Locations	Airblast overpressure (dB Lin Peak)	Ground Vibration (mm/s)	Allowable exceedance
St Phillips Church BM02	N/A	5	0%
Wambo Homestead BM01	120	10	0%
All other heritage items[1] BM02	133	5	0%

[1] beyond those predicated in SSD 7142 and generally in accordance with the EIS. Includes the Former Warkworth Public School, Piggery and Butcher's Hut, former Queen Victoria Inn, and Springwood Homestead. For the Montrose property and Shearing Shed, and Dog-leg Fence see section 10.1.3 of the *Blast Management Plan (Glencore 2020e)*.

Table 6-6 Infrastructure Monitoring Locations and Criteria

Monitoring Locations	Airblast overpressure (dB Lin Peak)	Ground Vibration (mm/s)	Allowable exceedance
Hunter Valley Gliding Club GliderClub[1]	133	25	0%
Warkworth Shooting Complex BM02[2]			
HVO Infrastructure - occupied BM02[2]			
HVO surface infrastructure – unoccupied[3]	133	100	0%

[1] This monitor is the representative monitoring location.

[2] Monitor installed 9 June 2020.

[3] No specific sites monitored under this consent condition. Monitoring locations committed to in the Blast Management Plan (Glencore 2020e) are considered representative. Note United Wambo monitors other infrastructure (ie. transmission towers) closer to the pit with lower criteria.

Table 6-7 Public Infrastructure Monitoring Locations and Criteria

Monitoring Locations	Ground Vibration (mm/s)	Allowable exceedance
Transmission suspension towers[1] Transmission tension towers[1]	100 50	0%
Prescribed dams[2]	50 (unless otherwise directed by the DSC)	0%
Public Roads[3] Telecommunication infrastructure and cables[3]	100	0%
All other public infrastructure[3]	50 (or a limit determined by the structural design methodology AS 2187.2 – 2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Planning Secretary)	0%

[1] Transmission suspension and tension towers were monitored as per SSD consent conditions using representative sites and/or portable monitors when blasting was in close proximity.

[2] Prescribed dams were monitored as per SSD 7142 consent conditions. This includes Wambo Tailings Dam (North East Tailings Dam), HVO Riverview Void Inpit Water Storage 2, United Tailings Dam 2, United Tailings Dam 2, and Wambo Hunter Pit Tailings Dam (HPTD). These prescribed dams were monitored all year round except for HPTD which was monitored from 01 June 2020 when mining began within 500m.

[3] No specific sites monitored under this consent condition. Monitoring locations committed to in the Blast Management Plan (Glencore 2020e) are considered representative.

Table 6-8 Offensive Blast Fumes

Condition	Details
Condition L4.5 of Section 3 in EPL 3141	Offensive blast fume must not be emitted from the premises. **Definition**: Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances: 1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or; 2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.

6.3.2 Key Environmental Performance

One hundred and forty-four (144) blasts from United Wambo Open Cut Coal Mine Project were monitored during 2021. As per B10 and B11 of SSD 7142, all blasting on site was between 9am and 5pm (Monday to Saturday inclusive) and there were less than three single blast events a day and less than 15 single blast events a week, averaged over a calendar year.

Monitoring data was collected at all locations outlined in the SSD 7142 and EPL 3141 consent conditions. The approved monitoring locations BM01, BM02, BM03, BM05, BM07 and BM08 (as shown in ***Figure 6-1***) are reported on in this Annual Review, as committed to in the *Blast Management Plan (Glencore 2020e)*. Summarised monitoring data for these locations are provided in ***Table 6-9*** to ***Table 6-11***.

Table 6-9 Residence on Privately Owned Land Monitoring Data

Monitoring Location		Airblast Overpressure Level dBL (Lin Peak)				Ground Vibration ppv (mm/s)			
Name	**Monitor**	**Average**	**Max**	**Results >115 dBL**	**Results >120 dBL**	**Average**	**Max**	**Results >10 mm/s**	**Results >5 mm/s**
South Wambo EPA ID 19	BM03	92.2	110.7	0%	0%	0.1	0.3	0%	0%
Moses Crossing EPA ID 20	BM05	93.6	113.9	0%	0%	0.1	0.8	0%	0%
Redmanvale EPA ID 21	BM07	91.2	109.6	0%	0%	0.1	0.4	0%	0%
Maison Dieu EPA ID 22	BM08	96.7	118.4	2.38%	0%	0.1	0.4	0%	0%

As per the blasting criteria outlined in SSD 7142 consent conditions, there were no blasting exceedances for airblast overpressure or ground vibration for residences on privately owned land during the 2021 calendar year, as seen in Table 6-9.

Table 6-10 Heritage Monitoring Data

Monitoring Location		Airblast Overpressure Level dBL (Lin Peak)				Ground Vibration ppv (mm/s)		
Name	**Monitor**	**Average**	**Max**	**Results >120 dBL**	**Results >133 dBL**	**Average**	**Max**	**Results >5 mm/s**
St Phillips Church	BM02	103.6	120.8	0.8%	0%	0.1	4.3	0%
Wambo Homestead	BM01	96.5	113.2	0%	0%	0.2	0.7	0%
All other heritage items	BM02	103.6	120.8	0.8%	0%	0.1	4.3	0%

There were no blasting exceedances in airblast overpressure or ground vibration for heritage locations during the 2021 calendar year, as seen in ***Table 6-10***.

Table 6-11 Infrastructure Monitoring Data

Monitoring Location		Airblast Overpressure Level dBL (Lin Peak)			Ground Vibration ppv (mm/s)		
Name	**Monitor**	**Average**	**Max**	**Results >133 dBL**	**Average**	**Max**	**Allowable exceedance**
Hunter Valley Gliding Club	Glider Club	104.5	121.1	0%	0.8	4.8	0%
Warkworth Shooting Complex	BM02	103.6	120.8	0%	0.1	4.3	0%
HVO Infrastructure - occupied	BM02	103.6	120.8	0%	0.1	4.3	0%
Transmission suspension tower	634C, 635, 636, EWU, 638, 639, Portable 1, MD70081, MD70045	NA	NA	NA	3.0	34.28	NA
Transmission tension tower	MD70081, MD70045	NA	NA	NA	2.77	25.51	NA
Prescribed dams	HPTD, TD2, HVO Riverview East/West	NA	NA	NA	1.16	8.46	NA
Public Roads[1] Telecommunication infrastructure and cables	Portable 1, 634, 634C	NA	NA	NA	1.47	10.59	NA
All other public infrastructure							NA

[1] Monitors located adjacent to transmission suspension towers located between the approved pit shell and the Golden Highway are considered representative of public roads, telecommunication infrastructure.

United Wambo monitored blasting criteria at several locations considered to be representative of infrastructure surrounding the mine site. During the 2021 reporting period, there were no airblast overpressure or ground vibration exceedances recorded.

6.3.3 Long Term Effects

A ground vibration predictive model and an airblast overpressure predictive model was developed to determine potential blasting impacts for the EIS. A range of blast scenarios were modelled. The results of the blasting impact assessment indicate that ground vibration and air blast overpressure levels can be managed to meet relevant blast emission criteria at all sensitive receiver locations through appropriate blast design. All results from blasting in 2021 were compliant with criteria, therefore no long term effects are expected.

6.3.4 Proposed Improvements

Blast management will be undertaken as per *Blast Management Plan (Glencore 2020e)* which has been approved by DPIE under Condition 21 of SSD 7142.

During 2021, improvements were made to the pre-blast dust and fume dispersion model utilised by United Wambo to assist in managing dust and fume impacts associated with blasting activities. The model was found to be overly conservative in its simulation of dust and fume generation caused by blast activities, including overpredicting visible dust dispersion distances and dissipation rates.

To improve the model outputs, data was collected across approximately 50 blast events, including physical observations of dust plume dispersion and dissipation rates. Physical observations were compared against modelled outputs by an external contractor to assess the accuracy of the models. The results of the investigation confirmed the models were considerably overestimating dust dispersion and dissipation rates. As a result, the model was modified to improve the agreement between observed and modelled impacts.

6.3.5 Blast Fume Monitoring Trial

The Blast Fume Monitoring Program report was submitted to the EPA on 30 June 2021, as required by Special Condition E1 of EPL3141. The report outlined the proposed blast fume assessment criteria and monitoring methodology, including the blast fume products to be monitored and potential instrumentation to be utilised in the program.

In summary the blast fume monitoring program will consist of the following milestones.

1. Final feasibility assessment and instrument selection via desktop review and collaboration with instrument suppliers.
2. System integration and engineering.
3. Final assessment and selection of monitoring sites.
4. Review of local building heights to determine need for “at height monitoring”.
5. Initial 3-month monitoring instrument evaluation period.
6. On-going quality control (calibration and maintenance of monitoring systems).
7. Review of instrument performance.
8. Twelve-month monitoring program (3 months trial + 9 months ongoing monitoring) with completion of the program (allowing for variance of the program if changes are required) to occur within 2 years of the commencement of Phase 2 Operations.

   The strategy for assessing blast fume impact on receptors is proposed to be achieved by fixed place NO_2 monitors installed at representative locations. It is intended that a variety of potential

impacts will be assessed through analysis of NO_2 concentrations against the criteria, taking into consideration ambient meteorological conditions and blasting parameters relevant for each blast

Following submission of the initial report, a subsequent report was developed to detail the implementation of the program, including an assessment of the feasibility of potential blast fume monitoring instrumentation, discussion of the need for co-location of a reference monitor and final selection of monitoring site locations. Following completion of this report, a preferred blast fume monitor was selected and planning of the monitoring program trial commenced.

Outcomes of the blast fume monitoring program trial will be discussed in the 2022 Annual Review.

6.4 Air Quality

6.4.1 Environmental Management

Air Quality monitoring is undertaken in accordance with the United Wambo *Air Quality and Greenhouse Gas Management Plan*.

The location of air quality monitoring sites is shown on ***Figure 6-1***. The monitoring program includes:

- continuous monitoring of PM_{10} at four sites;
- continuous monitoring of $PM_{2.5}$ at two sites;
- High Volume Air Sampler (HVAS) monitoring every six days (continuously for 24 hours) at two sites; and
- continuous meteorological monitoring at two sites.

Each real time air quality monitoring unit is fitted with alarming capabilities that can advise mining personnel that air quality at the monitor has reached the trigger levels. Alarms are sent via SMS and email to relevant United Wambo staff to notify that air quality is reaching / or has reached the predetermined limit. In such an event, action can then be taken to modify operations where practical as per the United Wambo Dust TARP.

Note: HVAS 01 and HVAS 02 are owned and operated by HVO, with results forwarded to United Wambo monthly.

6.4.2 Management Measures

The principal sources of atmospheric dust emissions from activities at United Wambo during operation are associated with:

- disturbance from mining, exploration and drilling works;
- wind-blown dust from exposed surfaces; and
- vehicle movements on the internal unsealed hardstand areas or access roads around the site.

United Wambo implements dust and greenhouse gas management measures in accordance with the *Air Quality and Greenhouse Gas Management Plan*. The management measures are summarised in ***Table 6-12***.

Table 6-12 Greenhouse Gas Mitigation Measures

Mitigation Measure	Application at United Wambo	Status
Limiting the length of material haulage routes to reduce diesel usage and associated emissions	Length of haulage routes has been optimised to minimise dust, noise, fuel use and improve operating efficiency.	Ongoing as part of the mine planning processes.
Optimising ramp gradients to reduce diesel usage and associated emissions	Ramp gradients have been optimised according to pit geometry parameters and mobile equipment performance characteristics.	Ongoing as part of the mine planning processes.
Continually improve the fuel efficiency of haul trucks operating at the mine to reduce diesel usage and associated emissions	United Wambo will seek opportunities to use the existing trucks currently in use at Wambo and from within the Glencore and Peabody groups to maximise the life of this equipment. Where new trucks are purchased during the life of the Project, fuel/energy efficiency will be considered in the selection criteria. Haul road design parameters such as gradient and haul length are optimised resulting in the efficient haulage of overburden per unit of fuel consumed.	Following integration United Wambo incorporated 23 existing pieces of gear (excavators, haul trucks, and ancillaries) from Wambo to maximise the life of the equipment. Selection of new trucks considered fuel/energy efficiency. 9 new trucks were delivered in 2021, all meet Tier 4 emission standards.
Payload management to reduce diesel usage and associated emissions	Payload will be constantly monitored and actively managed to maintain efficiency, over time reducing the overall diesel consumption of the mine and, thereby, reducing GHG emissions.	Ongoing. Payload targets were set for all trucks at United Wambo and are fitted with an onboard management system to optimise payload size. United Wambo have developed an Excavator Operator Guideline to consider payload management.
Increasing haul truck payload to reduce the number of truck loads required and consequently reduce diesel usage and associated emissions	Truck tray capacity will be reviewed as part of the efficient management of the operation, including the option of fitting custom-built trays to maximise payloads. Payload will also be maximised by blasting strategies that optimise material size characteristics.	Payload study completed to optimise new 930E-5 tray designs.
Improving rolling resistance of haul roads to reduce diesel usage and associated emissions	Haul roads are planned to be constructed on solid rock rather than on soil or subsoil material where practical.	Ongoing as part of the mine planning processes and maintenance strategies.
Reducing idling times to reduce diesel usage and associated emissions	Reducing idle times will be an ongoing performance measure. Initiatives to reduce idle times will continue to be introduced over the life of the Project. A reduction in idle times will improve fuel consumption rates per volume of material moved.	United Wambo has implemented a fleet management system to reduce queue time. In addition, multiple dumps are operated simultaneously (where practical) to reduce queue time.
Scheduling activities so that equipment operation is optimised to reduce energy usage and associated emissions	Scheduling activities to optimise equipment operation will be a routine activity. United will prepare long, medium and short term plans to optimise production. Over time, this will reduce the overall diesel consumption of the mine and, thereby, reduce greenhouse gas emissions.	Ongoing as part of the mine planning processes.

Mitigation Measure	Application at United Wambo	Status
Seek to continually improve the fuel efficiency and diesel emissions of mine equipment during the purchase of new equipment	United Wambo will seek opportunities to use the existing equipment currently in use at Wambo and from within the Glencore and Peabody groups to maximise the life of this equipment.	Following integration United Wambo incorporated 23 existing pieces of gear (excavators, haul trucks, and ancillaries) from Wambo to maximise the life of the equipment. Selection of new trucks considered fuel/energy efficiency. 9 new trucks were delivered in 2021, all meet Tier 4 emission standards.
	Where new equipment is purchased during the life of the Project; fuel/energy efficiency and reasonable and feasible diesel emissions reduction technology will be considered in the selection criteria.	
Blasting strategies to improve extraction and processing energy use efficiency and reduce associated emissions	Blast management practices will be employed to size material for optimum payloads and minimise the need for secondary treatment of waste material.	Blasts during 2020 were designed to minimise rehandling of material. During the reporting period secondary treatment of blasted material was not required.
Maximising resource recovery efficiency to maximise energy use efficiency and reduce associated emissions	Long, medium and short term operational plans will be developed to optimise the recovery of approved resources.	Ongoing as part of the mine planning processes.
Working machines to their upper design performance to optimise energy usage and associated emissions	Glencore's business objectives support and promote effective equipment utilisation and performance rates, resulting in improved fuel consumption rates per volume of material moved.	Ongoing as part of the mine planning processes.
Preventing unnecessary water ingress to reduce pump energy usage and associated emissions	The surface water management system is designed to maximise separation of clean and dirty water systems. Clean water will be diverted away from mining areas, consistent with the mine water management system design outlined in the EIS.	A clean water drain was constructed in 2020 to move clean water around the open cut pit and back into Redbank Creek. The drain will not be opened to the creek until it is stable and water can be released.
In-pit servicing to reduce diesel usage associated with transporting equipment	Equipment will be serviced in pit, where practical, reducing unnecessary unproductive travel time and energy use.	In-pit servicing is completed where practical.
High efficiency workshop lighting	New workshop areas will use high efficiency lighting, reducing energy use.	Construction of new workshop was completed in 2021. Energy efficient LED lighting was installed in the new workshop.
High efficiency heating, ventilation, and cooling (HVAC) systems for administrative buildings	New administration buildings will use high efficiency HVAC systems reducing energy use.	Construction of new administration buildings was completed in 2021. HVAC systems installed are new and inverter types utilised will minimise energy wastage.

6.4.3 Approval Criteria – SSD 7142

Air quality criteria is included as Condition B25 of SSD 7142 and is reproduced in ***Table 6-13***.

Table 6-13 Air Quality Criteria

Pollutant	Averaging period	Criterion (µg/m³)
Particulate Matter <10 mm (PM_{10})	Annual	[a,c]25
	24 hour	[b]50
Particulate Matter <2.5 mm ($PM_{2.5}$)	Annual	[a,c]8
	24 hour	[b]25
Total suspended particulate (TSP) matter	Annual	[a,c]90

[a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).

[c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

6.4.4 Key Environmental Performance

A list of air quality monitoring sites, parameters and frequencies are provided in ***Table 6-14***.

Table 6-14 Air Quality Monitoring Sites

Monitoring site (s)	Indicator (s)	Equipment Type	Frequency
HVAS 01 and HVAS 02	TSP	HVAS	Six-day cycle
AQ02 and AQ04	PM10	TEOM	Continuous
AQO1 and AQ03	PM10 and PM2.5	TEOM	Continuous
WS1 and WS2	Meteorology	Met Station	Continuous

High Volume Air Samplers

Table 6-15 presents a summary of HVAS monitoring results and compares annual averages for TSP against consent criteria.

Table 6-15 HVAS Results for 2021

Gauge	Maximum TSP (µg/m³)	Annual Average TSP[1] (µg/m³)
Consent Criteria	-	90.00
HVAS 01 (Warkworth)	447.0	94.59
HVAS 02 (Moses Crossing)	125.0	36.43

1 – Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activities agreed by the Planning Secretary.

As shown in ***Table 6-15*** Annual TSP averages were within criteria limits of 90 µg/m^3 for HVAS 02 but above the criteria limit for HVAS 01.

The residents of Warkworth were notified of the 2021 exceedance at HVAS01 and provided with some information and a fact sheet to understand any health risks associated with air quality. Conditions around tenants/residences on mine owned land are outlined in Condition B27(a) of SSD 7142 which states:

"Particulate matter emissions generated by the development must not exceed the criteria listed in Table 3 at any occupied residence on mine-owned land (including land owned by another mining company) unless:

(a) The tenant and landowner (if the residence is owned by another mining company) have been notified of any health risks associated with such exceedances in accordance with the notification requirements under PART C of this consent;
(b) The tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving 14 days notice;
(c) Air quality monitoring is regularly undertaken to inform the tenant and landowner (if the residence is owned by another mining company) of the likely particulate matter emissions at the residence; and
(d) Data from this monitoring is presented to the tenant and landowner in an appropriate format for a medical practitioner to assist the tenant and landowner in making informed decisions on the health risks associated with occupying the property."

Continuous Monitoring

A summary of the recorded PM_{10} levels at the TEOM units is presented in ***Table 6-16***. The number of days that exceeded the consent criterion is also shown. During the reporting period TEOM units failed to collect valid data on several occasions for varying lengths of time, as a result <75% of the daily data was not collected. During these occurrences, a valid 24-hour average was not able to be calculated. For additional details please see Section 1 and Section 10.

Table 6-16 provides a summary of the annual average and maximum 24-hour PM_{10} and 24-hour $PM_{2.5}$ averages recorded at TEOM units in 2021**.** The annual average PM_{10} concentrations were below the relevant criterion of 25µg/m³ at all four TEOMs in 2021. Additionally, the annual average $PM_{2.5}$ concentrations were below the relevant criterion of 8µg/m³ at AQ01 and AQ03 in 2021.

As presented in ***Table 6-16***, the maximum 24-hour average PM_{10} concentrations were above the relevant criterion of 50µg/m³ on three occasions during 2021. Investigations were undertaken following every measured exceedance of the 24-hour average PM_{10} criterion (see ***Table 6-17***). All investigations indicated that United Wambo was considered to be complaint with SSD 7142 Condition B25.

As presented in ***Table 6-16***, the maximum 24-hour average $PM_{2.5}$ concentrations did not exceed the relevant criterion of 25µg/m³.

Table 6-16 Summary of TEOM Sampling Results – 2021 Maximum 24-Hr Average and Number of Exceedances

Annual average			Maximum 24-hour averages			
Gauge	**$PM_{2.5}$ (µg/m³)**	**PM_{10} (µg/m³)**	**$PM_{2.5}$ (µg/m³)**	**Number of days exceeding criterion**	**PM_{10} (µg/m³)**	**Number of days exceeding criterion**
Consent Criteria	8	25	25	-	50	-
AQ01	5.01	14.67	13.5	0	64.0	3
AQ02	-	12.26	-	-	33.0	0
AQ03	3.78	8.25	15.1	0	35.3	0
AQ04	-	12.79	-	-	34.5	0

Table 6-17 Summary of Investigations into 24-Hour Average Air Quality Exceedances at AQ01

Date	24hr average PM_{10} (µg/m^3)	Investigation Findings
12/09/2021	52.3	Analysis of recorded PM_{10} and meteorological data for the 24hr period indicates that United Wambo's contribution to the 24hr average PM_{10} was calculated to be 46 µg/m^3, which is below the 24-hour average PM_{10} criterion.
07/10/2021	59.8	Analysis of recorded PM_{10} and meteorological data for the 24hr period indicates that United Wambo's contribution to the 24hr average PM_{10} was calculated to be 44 µg/m^3, which is below the 24-hour average PM_{10} criterion.
29/10/2021	64.0	Analysis of recorded PM_{10} and meteorological data for the 24hr period indicates that United Wambo's contribution to the 24hr average PM_{10} was calculated to be 51 µg/m^3 which is above the 24-hour average PM_{10} criterion of 50 µg/m^3. The criterion applies to residences on privately owned land, as stated in Condition B5 of SSD7142. As there are no residences on privately owned land in Warkworth Village (where AQ01 is located), PM_{10} emissions above air quality criteria are permitted if Conditions B27 (a) through (d) of SSD7142 are satisfied. Conditions B27 (a) through (d) were satisfied.

6.4.5 Long Term Trends

TSP and PM_{10}

Long- term annual average HVAS results for TSP and PM_{10} at United Wambo in 2021 are shown in ***Table 6-18***.

Table 6-18 Long- term Minimum, Maximum and Annual Average High Volume Air Sampler Results (TSP and PM_{10})

High Volume Air Samplers (µg/m^3)												
	TSP						PM_{10}					
	Moses Crossing (HVAS02)			Warkworth (EPA ID 8) (HVAS 01)			Moses Crossing (HVAS 02)[1]			Warkworth (EPA ID 8) (HVAS 01)[1]		
	MIN	MAX	AVG.	MIN	MAX	AVG.	MIN	MAX	AVG	MIN	MAX	AVG.
2010				13.2	82.7	40.7				6.9	37.5	18.2
2011				13.0	140.0	49.8				4.0	59.8	19.8
2012				8.0	143.0	50.7				4.0	68.0	19.3
2013				8.0	141.0	55.7				2.0	63.0	21.6
2014				13.0	147.0	53.9				3.0	75.0	22.6
2015				10.0	166.0	51.8				2.0	39.0	16.1
2016				8.0	132.0	50.1				3.0	40.0	15.3
2017				19.0	159.0	65.0				3.0	46.0	19.0
2018				22.0	186.0	79.9				3.0	62.0	23.7
2019 (All Data)				12.0	214.0	80.0				2.0	163.0	32.0
2019 (Extraordinary removed)				12.0	196.0	74.0				2.0	68.0	22.0
2020 (All Data)	5.0	322.0	83.0	24.0	214.0	75.6	2.0	128.0	33.2	9.6	85.6	30.2

High Volume Air Samplers (µg/m³)												
	TSP						PM_{10}					
	Moses Crossing (HVAS02)			Warkworth (EPA ID 8) (HVAS 01)			Moses Crossing (HVAS 02)[1]			Warkworth (EPA ID 8) (HVAS 01)[1]		
	MIN	MAX	AVG.	MIN	MAX	AVG.	MIN	MAX	AVG	MIN	MAX	AVG.
2020 (Extraordinary removed)	5.0	214.0	70.3	24.0	144.0	70.8	2.0	85.6	28.1	9.6	57.6	28.3
2021 (All Data)	2.10	125.0	36.43	14.40	447.00	94.59	0.84	50.0	14.57	5.76	178.08	37.84

[1] PM_{10} results for 2020 and 2021 were calculated using 0.4 multiplied by the corresponding TSP result for HV01 and HVAS 02.

Annual average HVAS results for both TSP and PM_{10} have shown a moderate level of variability throughout the period of 2010 to 2021. As discussed previously, HVAS monitors do not record PM_{10} as of 2020. However, PM_{10} results have been calculated using TSP values at both HVAS01 and HVAS 02 based on results of a study. The study on co-located TSP and PM_{10} monitors conducted in the Hunter Valley by the NSW Minerals Council (2010) indicated that dust generated from predominately coal mining sources has long-term average PM_{10} concentrations that are approximately 40% of the corresponding TSP concentration (or equivalently, TSP concentrations are approximately 2.5 times PM_{10} concentrations). This ratio was found to be reasonably accurate for long-term averages (e.g. annual averages).

The 2021 average values for HVAS TSP shows a decrease at HVAS02 and an increase at HVAS01. Similarly, PM_{10} averages showed a decrease at HVAS02 and an increase at HVAS01. It must be highlighted that PM_{10} results at HVAS01 and HVAS02 are not true results but rather ratios calculated from the corresponding TSP results.

There are several factors which can affect long term dust trends including rainfall, bushfires and activities completed by surrounding mine operations.

6.4.6 Comparison of Performance Against Criteria

The United Wambo Open Cut Coal Mine Project (August 2016) modelled operation scenarios for years 2, 6, 11 and 16 of the conceptual mine plan. A comparison of air quality monitoring results and those predicted in the EIS for Year 2 is summarised below.

The EIS predicted that cumulative annual average PM_{10} criteria would be met at all surrounding private residences with the exception of one residential receiver at Warkworth Village, however since the EIS was submitted this property has been purchased and is no longer privately owned. Cumulative Maximum 24Hr PM_{10} 24 hr concentrations were predicted to exceed on at least one occasion a year. Monitoring results identified that Maximum PM_{10} 24 hr was exceeded on three occasions, however investigations indicate that United Wambo's contribution was below the criteria on two of those occasions.

The EIS did not predict any exceedance of TSP at any private resident. Monitoring in 2021 concurs with this prediction.

One receiver in Warkworth village was predicted to experience exceedance of $PM_{2.5}$ criteria. There were no exceedances of $PM_{2.5}$ Annual Average or Maximum 24hr concentration.

6.4.7 Proposed Improvements

Air Quality management will be undertaken as per the Air Quality and Greenhouse Gas Management Plan (AQGHGMP) which is Condition B29 of SSD 7142.

The United Wambo $PM_{2.5}$ real time monitoring campaign was reviewed in 2021. The following conclusions were made:

- $PM_{2.5}$ concentrations have not exceeded the criteria from SSD7142
- Assumed background $PM_{2.5}$ concentrations for the EIS were conservative estimates
- The modelled $PM_{2.5}$ concentrations from the EIS were higher than the measured concentrations
- $PM_{2.5}$ concentrations are generally proportional to the PM_{10} concentrations and, if necessary, it would be reasonable to estimate $PM_{2.5}$ concentrations from the PM_{10} data. The measurement data showed that, typically, 40 to 50% of the PM_{10} is $PM_{2.5}$.

The $PM_{2.5}$ monitoring data subject to this review were collected in a representative meteorological year and at times when winds were predominantly from the United Wambo Mine towards each monitor. This was a desirable outcome which meant that the $PM_{2.5}$ monitoring was likely to have detected the maximum potential contributions from United Wambo Mine.

The campaign monitoring of $PM_{2.5}$ for 3 to 6 months, as stated in the AQGHGMP, can now be considered as complete. The full report can be found in *Appendix B - $PM_{2.5}$ Monitoring Campaign*.

United Wambo will also maintain awareness of new technologies for air quality impact mitigation through participation in relevant industry groups.

6.5 Biodiversity

6.5.1 EIS Predictions

There are six Plant Community Types (PCTs) identified across 10 condition classes within the Additional Disturbance Area, as identified in the Biodiversity Assessment Report completed for the Project. Eight of the vegetation zones conform to Threatened Ecological Communities (TECs) listed under the state Biodiversity Conservation Act, 2016 (BC Act) and the Commonwealth Environment Protection Biodiversity Conservation Act 1999 (EPBC Act). The PCTs and listed TECs identified within the Project Area are summarised in ***Table 6-19*.**

Table 6-19 Vegetation Communities

PCT/BVT Number	PCT/Vegetation Zone	Area (ha)	Condition	Threatened Ecological Communities
1598/HU812	Forest Red Gum grassy open forest on floodplains of the lower Hunter	0.29	Moderate to Good	*Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC* (BC Act)
1602/HU816	Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter	29.42	Moderate to Good – Plantation/ Rehabilitation	*Central Hunter Ironbark – Spotted Gum – Grey Box Forest in NSW North Coast and Sydney Basis Bioregion EEC* (BC Act) 1.17 ha *Central Hunter Valley Eucalypt Forest and Woodland CEEC* (EPBC Act)

PCT/BVT Number	PCT/Vegetation Zone	Area (ha)	Condition	Threatened Ecological Communities
1655/HU869	Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	1.56	Moderate to Good	*Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion* VEC (BC Act) 1.13 ha *Central Hunter Valley Eucalypt Forest and Woodland CEEC* (EPBC Act)
1691/HU905	Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	93.70	Low Condition – Derived Native Grassland	10.49 ha *Central Hunter Valley Eucalypt Forest and Woodland CEEC* (EPBC Act)
		146.09	Moderate to Good	*Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions* (BC Act) 143.46 ha *Central Hunter Valley Eucalypt Forest and Woodland CEEC* (EPBC Act)
		80.07	Moderate to Good – Cooba Open Shrubland	NA
		26.55	Moderate to Good – Regeneration	*Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC* (BC Act) 22.79 ha *Central Hunter Valley Eucalypt Forest and Woodland CEEC* (EPBC Act)
		0.08	Moderate to Good – Thinned Canopy	*Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC* (BC Act) 0.08 ha *Central Hunter Valley Eucalypt Forest and Woodland CEEC* (EPBC Act)
1692/HU906	Bull Oak grassy woodland of the central Hunter Valley	117.43	Moderate to Good	3.10 ha *Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC* (BC Act) 10.19 ha *Central Hunter Valley Eucalypt Forest and Woodland CEEC* (EPBC Act)
1731/HU945	Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley	31.50	Moderate to Good	NA

United Wambo has approval to retire biodiversity credits progressively based on the staging of native vegetation disturbance in line with the progressive development of the mine. The three stages of disturbance being proposed are approximately seven-year stages, and are referred to as Stage 1, Stage 2 and Stage 3. An overview of the current proposed Stage 1, Stage 2 and Stage 3 credit requirements are provided in ***Table 6-20***.

Table 6-20 Staged Offsetting Requirements

Impacted Feature	STAGE 1 Credits Required	STAGE 2 Credits Required	STAGE 3 Credits Required	Total
Central Hunter Valley Eucalypt Forest and Woodland CEEC under the EPBC Act	11,287	2,570	620	14,477

Impacted Feature	STAGE 1 Credits Required	STAGE 2 Credits Required	STAGE 3 Credits Required	Total
Hunter Floodplain Red Gum Woodland EEC under the BC Act	0	20	0	20
Central Hunter Ironbark - Spotted Gum - Grey Box Forest EEC under the BC Act	1,424	0	0	1,424
Central Hunter Grey Box - Ironbark Woodland EEC under the BC Act	356	101	0	457
HU905 - Narrow-leaved Ironbark - Grey Box grassy Woodland of the Central and Upper Hunter	3,562	1,344	1	4,907
HU906 - Bull Oak Grassy Woodland of the Central Hunter Valley	2,973	0	0	2,973
HU945 - Swamp Oak - Weeping Grass Grassy Riparian Forest of the Hunter Valley	1,844	281	0	2,125
Southern Myotis (*Myotis Macropus*)	15	547	0	562
TOTAL ECOSYSTEM CREDITS	21,446	4,316	621	26,383
TOTAL SPECIES CREDITS	15	547	0	562

As per the detailed Assessments of Significance prepared for the EPBC Referral, Central Hunter Valley Eucalypt Forest and Woodland critically endangered ecological community (CEEC) was found to be significantly impacted as a result of the Project. Following submission of the Referral, the following MNES were considered by DoEE to be potentially significantly impacted by the Project:

- Central Hunter Valley Eucalypt Forest and Woodland CEEC;
- Regent honeyeater (*Anthochaera phrygia*);
- Swift parrot (*Lathamus discolor*); and
- Spotted-tailed quoll (Dasyurus maculatus maculatus).

The United Wambo was determined as being a Controlled Action requiring approval under the EPBC Act from the Commonwealth Minister for the Environment due to its potential impact on the previously listed matters of national environmental significance (threatened species and ecological communities). EPBC Approval 2015-7600 was granted by the Commonwealth Minister for the Environment on 5 December 2019 and allows United Wambo to clear a specified area of listed threatened species and ecological community to commence the United Wambo Project. In accordance with Condition 10 of EPBC Approval 2015-7600, a compliance report for 2021 has been prepared and included as ***Appendix A - EPBC 2015 – 7600 Compliance Report***.

Table 6-21 provides a summary of the key impacts for each of the MNES.

Table 6-21 MNES Impacts

MNES	Impact Area (ha) All Stages
Central Hunter Valley Eucalypt Forest and Woodland CEEC	246.8 (known habitat)
Regent honeyeater (*Anthochaera phrygia*)	203.7 (potential habitat)
Swift parrot (Lathamus discolor)	203.7 (potential habitat)
Spotted-tailed quoll (Dasyurus maculatus maculatus)	352.9 (potential habitat)

6.5.2 Key Environmental Performance

Disturbance

During 2021, a total of 46.67 hectares of new disturbance was undertaken for the development of the open cut mining areas, infrastructure areas and overburden emplacement areas. A comparison of the actual disturbance during 2021, the total to date disturbance and the predicted Stage 1 (i.e. Years 1-7) is provided in ***Table 6-22***.

Table 6-22 Proposed Stage 1 vs Actual to Date Disturbance

Impacted Feature	Stage 1 Proposed Disturb-ance (ha)	Stage 1 Proposed Credits	2020 Actual Disturb-ance (ha)	2020 Actual Credits Impacted	Stage 1 Total Disturb-ance to Date (ha)	Stage 1 Total Credits Impacted to Date (ha)
Central Hunter Valley Eucalypt Forest and Woodland CEEC under the EPBC Act	195.54	11,287	11.67	674	133.17	7687
Hunter Floodplain Red Gum Woodland EEC under the BC Act	0	0	0	0	0	0
Central Hunter Ironbark - Spotted Gum - Grey Box Forest EEC under the BC Act	28.25	1,424	3.8	192	24.95	1258
Central Hunter Grey Box - Ironbark Woodland EEC under the BC Act	6.28	356	1.5	85	3.99	226
HU905 - Narrow-leaved Ironbark - Grey Box grassy Woodland of the Central and Upper Hunter	120.34	3,562	19.41	575	66.76	1976
HU906 - Bull Oak Grassy Woodland of the Central Hunter Valley	51.05	2,973	6.35	370	47.25	2752
HU945 - Swamp Oak - Weeping Grass Grassy Riparian Forest of the Hunter Valley	27.33	1,844	3.94	266	20.54	1386
Southern Myotis (*Myotis Macropus*)	0.2	15	0	0	0	0

Weed and Pest Management

During 2021 United Wambo focussed primarily on targeting weeds in the future clearing areas and rehabilitation areas and maintaining vegetation around key infrastructure areas.

Species targeted in the 2021 weed management activities by the weed management contractor included:

- African Olive (*Olea europaea* subsp. *cuspidata*);
- Mother-of-Millions (*Byrophyllum delagoense*) – Noxious Weed Class 3;
- Prickly Pear (*Opuntia stricta*); and
- African Boxthorn (*Lycium ferocissimum)* – Weed of National Significance (WONS).

Species targeted in the 2021 vertebrate pest management activity undertaken by the pest management contractors included:

- Red Fox (Vulpes vulpes);
- Wild Dogs (*Canis familiaris*); and
- Feral Pigs.

United Wambo contacted residents within 1km of the baiting program via letter and email detailing the timing of the programs and the precautions to take regarding keeping domestic animals safe.

6.5.3 Long Term Trends

Disturbance numbers are in line with the approved Stage 1 disturbance limits.

6.5.4 Management Measures

Measures to Minimise Direct Impacts on Biodiversity

As per the approved United Wambo *Biodiversity Management Plan*, the management measures described in ***Table 6-23***.

Table 6-23 Biodiversity Management Measures

Action	2021 Measures
Minimise the impacts of the development on biodiversity	Suitably experienced personnel undertook pre-clearance surveys and tree-felling supervision for all clearing areas. Suitable biological resources, including fallen trees and seed resources, were salvaged from some of the clearing areas prior to removal of vegetation. All vegetation is mulched and incorporated into the topsoil. A Weed Action Plan was developed and implemented. See Section above. Dog baiting and trapping was undertaken as per above.
Manage the remnant vegetation and fauna habitat at the site	Clear delineation of the clearing disturbance footprints to avoid accidental clearance beyond the areas approved for disturbance Weed and pest management as per above.
Employee Education and Training	All employees and contractors are provided with an awareness of biodiversity values of United Wambo and requirements of the BMP in relation to site operations through the site induction process.

Biodiversity Offset Strategy

United Wambo has approval to retire biodiversity credits progressively based on the staging of native vegetation disturbance in line with the progressive development of the mine. The three stages of disturbance being proposed are approximately seven-year stages, and are referred to as Stage 1, Stage 2 and Stage 3.

Condition B56 of the United Wambo Open Cut Coal Mine (United Wambo) Development Consent SSD 7142 has the requirement for United Wambo to retire the Stage 1 biodiversity credits as specified in Table 5 of Condition B55 of SSD 7142 within 12 months of commencing Phase 1A of the development, that being 6 January 2021.

Condition B56 also states that the Applicant must notify the Planning Secretary of its intention to satisfy Stage 1 credits using Ecological Mine Rehabilitation and provide details of the particular ecosystem credits proposed to be satisfied in this manner within 12 months of commencing Phase 1A.

The biodiversity credit requirements listed in Condition B55 were calculated using the BioBanking Assessment Methodology (BBAM). Following the commencement of the Biodiversity Conservation Act 2016 and the completion of savings and transitional arrangements, BBAM credits can no longer be created. Following consultation with the Biodiversity and Conservation Division (BCD), the Biodiversity Conservation Trust (BCT) and the DPIE, it has been determined that United Wambo must retire credits created under the Biodiversity Assessment Method (BAM credits).

In a letter dated 18 September 2020, Joe Thompson, Director Hunter Central Coast Branch, BCD, has proposed the following process to address the issues regarding the retirement of the proposed offset credits:

1. *Establish Biodiversity Stewardship Agreements across the proposed offset lands for Stage 1 (or all stages) of the project to generate BAM offset credits. Data already collected from BBAM plots across the offset sites will require supplementation with new BAM data collected from each plot.*
2. *Once all Stage 1 (or all stages) Biodiversity Stewardship Agreements have been established, apply for an 'assessment of reasonable equivalence' to have the BBAM credits for the development footprint changed to BAM credits.*

Once steps 1 and 2 above are completed United Wambo will be able to compare the BAM credit obligation for the project with the BAM credits generated by the Biodiversity Stewardship Sites of the project and be able to retire the credits.

To allow time to complete the process proposed by BCD, United Wambo requested an extension from the Planning Secretary of the timeframe specified in Condition B56 from 12 months to 24 months, i.e. from 6 January 2021 until 6 January 2022. This extension was granted on 20 October 2020.

The six proposed Stewardship Site applications were submitted in early 2022. Following the submission of these applications, there are a number of further issues to be resolved prior to the retirement of the required biodiversity credits.

- The BSS applications are to be reviewed and approved by the BCT. This may include requirements for United Wambo to respond and update the applications following feedback from BCT.
- Following agreement of credits generated by the BSSs, an application for an Assessment of Reasonable Equivalence will be submitted to the Biodiversity and Conservation Division (BCD). Any residual credits required following this process will be retired, most likely through payment into the Biodiversity Conservation Fund (BCF) as per the United Wambo Biodiversity Offset Strategy.

- The mechanism to retire the proposed credits for Ecological Mine Rehabilitation will need to be discussed and agreed upon in consultation with the NSW Department of Planning, Industry and Environment (DPIE), BCT and BCD.

United Wambo currently manage the six proposed Stewardship Sites effectively as offset sites. All sites, with the exception of some areas at Highfields, have had cattle grazing removed and are showing signs of natural regeneration. Ongoing management activities, such as weed control, pest control, security of the sites, track maintenance, etc., are undertaken.

An additional request for an extension was submitted in late 2021 to extend Condition B56 a further 12 months. At time of this report, this request is still with DPIE.

United Wambo have secured 94 per cent of the required offset credits for Stage 1 of the Project according to an assessment of biodiversity credits under the former FBA process using the BioBanking assessment methodology. This provides 'like for like' credit allocation between the credits required and those created since the Project was assessed using the former FBA methodology.

The remaining offset credits will be retired in accordance with Condition B56 and United Wambo will notify the Planning Secretary of its intention to satisfy Stage 1 credits using Ecological Mine Rehabilitation and provide details of the particular ecosystem credits proposed to be satisfied in this manner by 6 January 2022.

Biodiversity credits related to the EPBC Act-listed Central Hunter Valley Eucalypt Forest and Woodland CEEC are proposed to be retired in a like-for-like manner. That is, all biodiversity credits generated from land-based offsets represent the CEEC either as currently conforming to, or will be restored to be, the community.

Where possible throughout the construction and operation of the Project, native vegetation areas will be avoided to minimise the loss of habitats and reduce the future offset credit requirement for the Project. The staged approach allows United Wambo to benefit from any reductions in disturbance area through a reduction in biodiversity credits that need to be retired. This creates a situation which will drive focus on opportunities to continue to minimise disturbance throughout the life of the mining operation.

Prior to the commencement of Stage 2 disturbance, United Wambo will undertake a review of the disturbance undertaken during Stage 1 to identify areas where disturbance has been avoided. Disturbance that has been avoided will be used to offset the future staged credit requirements.

6.5.5 Proposed Improvements

The BMP will be revised and resubmitted once the credits have been retired.

6.6 Heritage

6.6.1 EIS Predictions

6.6.1.1 Aboriginal Heritage

A survey for the United Wambo Joint Venture Project EIS (Umwelt, 2016) was carried out in 2015 with a total of approximately 139 person days. The Aboriginal heritage surface survey recorded 25 new artefact scatters, 20 extensions to previously recorded sites and 34 isolated finds. This surface survey was followed by eight test excavations, with surprisingly sparse results. 192 artefacts were recovered, with an average of 1.25 artefacts per excavation square, which is an extremely low density of artefacts.

6.6.1.2 European Heritage Sites

A detailed heritage impact statement was conducted in 2016 for the proposed United Wambo Joint Venture Project (Umwelt, 2016). In consultation with Enviro Strata (the blasting consultant) it was determined that items further than 2 kilometres from the Project Area would not be affected by blasts. As such, the search for this assessment was limited to a conservative distance of 3 kilometres. Three historic heritage items were identified as being within this zone, but outside the Project Area. These are Wambo Homestead, St Philips Church Warkworth and the Former Queen Victoria Inn (ruins). There were also items of historic interest located within the Project Area, which are the Dog- leg Fence and the former House Site. Also, within the vicinity of the Project Area are Springwood Homestead, Montrose Property, the former Warkworth Public School and Piggery and Butcher's Hut.

6.6.2 Key Environmental Performance

6.6.2.1 Aboriginal Heritage

In accordance with the United Wambo Aboriginal Cultural heritage Management Plan, there were 136 Aboriginal heritage sites salvaged during the salvage program which started in 2020 and finished in 2021. The technical report documenting the salvage was completed in May 2021 and made available on the United Wambo Joint Venture website. ***Figure 6-3*** shows the sites which were salvaged and those that remain in the United Wambo Project Area.

The recommended measures for the Aboriginal heritage sites remaining within the United Wambo Project Area have been implemented, which includes but not limited to the fencing and signposting of in-situ sites during 2021.

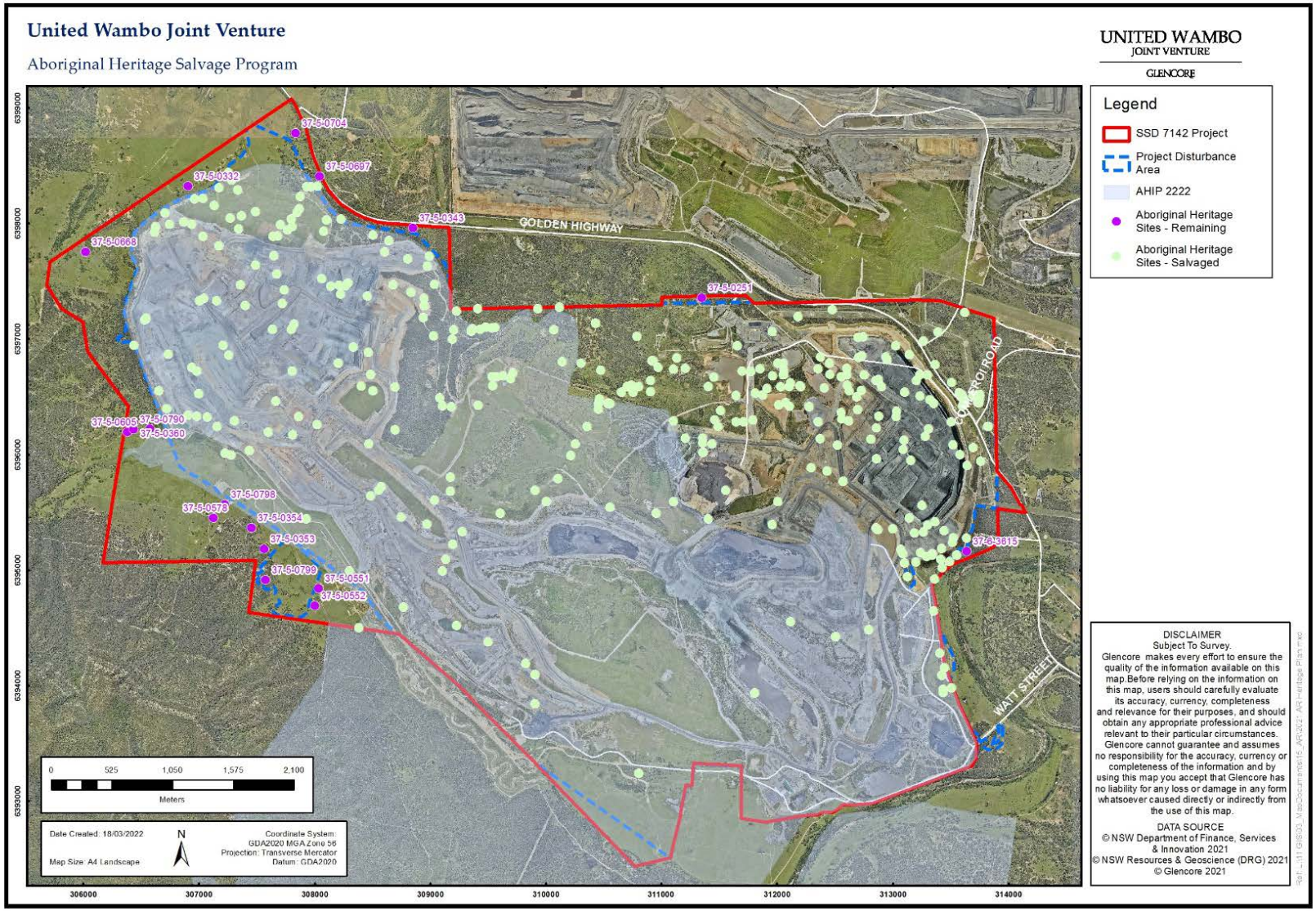


Figure 6-3 Aboriginal Heritage Sites

The Cultural Heritage Funding Program outlined in the Aboriginal Cultural Heritage Management Plan, Section 13, has been successful in 2021, with Warren Taggart receiving support for his book *Spirit of Place*. The book was finalised and printed in July 2021. The distribution of hard copies started in 2021, with all booked planned to be delivered by June 2022 to selected schools, universities, libraries, councils and those involved in its creation. Another funding application has been conditionally accepted and two applications are currently being reviewed.

A second Tertiary Scholarship was awarded, the third is still available.

6.6.2.2 Historic Heritage Sites

Table 6-24 below contains a summary of the activities that were conducted during 2021, in accordance with the United Wambo Historic Heritage Management Plan (HHMP).

Table 6-24 HHMP Management Measures

Mitigation/Management Measure	HHMP Section
A detailed survey and photographic/archival recording of the dog-leg fence will be undertaken in accordance with Heritage Branch guidelines Photographic Recording of Heritage Items Using Film or Digital Capture (2006) within two years of commencement of development under project consent.	8.5.1
As part of the archival recording of the dog-leg fence, additional research will be undertaken to identify (if the information is available) an exact date of construction and who may have built the fence, as well as to confirm the preliminary assessment of the fence as State significant.	8.5.1
The archival record will be submitted to the Department of Planning and Environment, the Heritage Council, and the relevant local Council libraries.	8.5.1
In addition to the detailed recording, an interpretation strategy will be developed for the dog-leg fence.	8.5.1
The interpretation strategy will be developed in consultation with the NSW Heritage Council and in accordance with relevant Heritage Council guidelines including: Interpreting Heritage Places and Items Guidelines (2005); and Heritage Interpretation Policy (2005). The interpretation strategy will also involve and be informed by consultation with the community, local historical society and Singleton Council.	8.5.1
United Wambo undertook an inspection of the former Warkworth Public School – mitigation work was completed at the school.	8.6.2

No disturbance was associated with Historic Heritage items during 2021.

6.6.3 Management Measures

United Wambo will continue to monitor Aboriginal heritage sites in accordance with the United Wambo Aboriginal Cultural Heritage Management Plan (ACHMP), as required by condition B79 of SSD 7142. For management measures and salvage methods refer to Table 1 and Section 6 of the ACHMP respectively.

United Wambo will continue to manage all non-Aboriginal heritage items in accordance with the United Wambo Historical Heritage Management Plan (HHMP), which is required by condition B82 of SSD 7142. For mitigation and management measures refer to Table 1 and Section 7 of the HHMP.

6.7 Waste Management

Waste management practices at United Wambo are based on the waste management hierarchy of reuse, recycle and as a last resort, dispose.

The overall aim of the waste management system at United Wambo is to minimise waste being disposed from the site, but also to maximise resource use where possible. Waste is managed, tracked and records are kept on the Sustainability Database for tracking and reporting purposes.

Further detail regarding waste management at United Wambo is within the Environmental Management Strategy (EMS).

General Waste and Recycling

Waste generated at United Wambo is managed in accordance with the EMS. Paper, cardboard and scrap steel are all recycled. United Wambo currently has a total waste management system which includes training, segregation, disposal and reporting.

Sewage Treatment and Disposal

United Wambo currently have an Envirocycle system which services the main pit top facilities including the administration area, stores and bathhouse. The sewage system is serviced on a regular basis by licensed contractors.

Hydrocarbon Management

In 2021, United Wambo continued to remove and manage unwanted materials produced by activities onsite. All newly build maintenance areas and refuelling bays were bunded, with appropriate spill response equipment placed in easy to access locations. Employees were and continue to be trained on how to use these areas and the spill response equipment.

6.7.1 Summary of Waste Performance in 2021

United have been tracking waste across the site. In 2021 United Wambo disposed a total of 2,872,727 kg of waste from site. This is a significant increase from the 2020 total of 1,122,612 kg. However, the total was too be expected given the cumulative waste being produced from the construction phase and a full year of as an operational site. A detailed breakdown of waste disposal is contained within ***Table 6-25***.

Hazardous Recycled waste increased significantly from 138, 410 kg in 2020 to 837,385 kg in 2021. Non-Hazardous Recycled waste also significantly increased from 728,694 kg in 2020 to 1,658,469 in 2021. Hazardous Disposal decreased from 16,473 kg in 2020 to 9,454 in 2021. Non-Hazardous Disposal increased proportionally from 239,035 kg in 2020 to 354,515 kg in 2021. As United Wambo completed a full year of operations during the reporting period, it is expected that results should remain relatively consistent in 2022. However, as outlined in ***Section 6.7.3***, if the waste tyre and legacy equipment removal project starts in 2022, there may be an increase in the area of Non-hazardous Recycled.

Table 6-25 2018- 2021 Waste Performance Comparison at United Collieries (now United Wambo)

Waste Source	2018	2019	2020	2021
Hazardous Recycled (kg)				
Lead batteries	-	532	-	10,911
Oil	900	5,800	79,378	703,432
Oily Water	-	-	30,552	23,498
Oil Filters	-	-	6,040	31,582
Chemicals	208	-	4,456	0
Waste Coolant	-	-	8,786	41,000
Contaminated Sludge	-	-	5,620	12,962
Waste grease	-	144	1,052	3,460
Empty drums	582	-	1,916	10,550
E-waste	92	1,019	610	0
Total	1,786	7,495	138,410	837,395
Non-Hazardous Recycled (kg)				
Paper and cardboard	1,630	1,285	8,305	17,505
Scrap Steel	192,480	55,920	26,430	286,780
Timber	-	5,840	17,460	76,740
Confidential Documents	295	196	1,246	1,044
Effluent	-	5,500	606,400	1,276,400
Tyres	-	-	53	0
Concrete	-	-	68,800	0
Total	194,405	68,741	728,694	1,658,469
Hazardous Disposal (kg)				
Oily Rags	-	-	1,502	9,454
Chemicals	420	Nil	97	0
Asbestos	Nil	Nil	14,020	0
Contaminated Soil				1,242
Medical and Sanitary				12
Hydraulic Hoses				11,640
Total	420	Nil	16,473	22,348
Non-Hazardous Disposal (kg)				
Mixed solid waste	61,220	66,350	239,035	354,515
Total	61,220	66,350	239,035	354,515
Total Offsite Waste Disposed (kg)	61,640	69,022	255,508	376,863
Total Offsite Waste Recycling (kg)	196,191	76,236	867,104	2,495,864
Total Offsite Waste (kg)	257,831	142,586	1,122,612	2,872,727
Total Offsite Waste Recycling as a Percentage (%)	76.09	53.47	77.24	86.88

6.7.2 Management Measures

United Wambo undertook waste management in accordance with waste criteria under conditions B91 and B92 of SSD 742 during 2021.

Management measures included:

- weekly removal of general waste including scrap by a licenced contractor;
- weekly inspections are undertaken to monitor the implementation of the Waste Management Plan;
- additional training of relevant personnel highlighting any waste management issues; and
- assessment and appropriate management of specific wastes such as contaminated wastes.

The weekly inspections showing general site compliance indicates the current waste management measures applied at United Wambo are generally effective.
United Wambo reviews its waste minimisation strategy on an as needs basis.

6.7.3 Proposed Improvements

As the site continues as a fully operational site in 2022 the legacy waste associated with past operations will be identified and targeted for removal offsite. This project will initially focus on the removal of equipment tyres which have been placed in laydown areas across site, then all redundant equipment will be assessed for sale or removal. A plan will be developed in 2022, with removal to take place in 2023.

United Wambo will continue to implement the current management measures to ensure effectiveness of the waste management system. This includes, but is not limited to:

- providing waste management training to site personnel; and
- reviewing site waste management and looking for options to increase recycling opportunities.

6.8 Surface Water

6.8.1 Environmental Management

United Wambo implements surface water monitoring in accordance with the *United Wambo Water Management Plan (2020d)* and the *United Wambo Surface Water Management Plan*.

The purpose of surface water quality monitoring at United Wambo is to:

- monitor surface water quality and levels to detect potential impacts on surrounding catchment users;
- satisfy performance criteria (***Section 6.8.3***); and
- collect data which will be used in the continued development and refinement of surface water investigation triggers (***Section 10.2.2*** of the *United Wambo Surface Water Management Plan*) and provide input to the site water balance and salt balance (***Table 6-25***).

The location of water monitoring sites is shown on ***Figure 6-2***. The monitoring program includes:

- monthly water quality monitoring including flow status (refer ***Table 6-36- Table 6-40***);
- annual speciation analysis;
- annual water stability monitoring;

- additional monitoring in accordance with the Investigation Protocol if performance deviated from background trends; and
- additional monitoring/ investigations in accordance with the Trigger Action Response Plan if surface water results exceed criteria.

A network of water storages and drains have been established to capture runoff from mine water catchment areas. These storages are used as sources of water for the CHPP and dust suppression. Runoff from haul roads is captured in sediment traps or is diverted to mine water storages.

CHPP tailings are discharged to approved tailings storage facilities. Decant water from the facilities is reclaimed and reused within the WMS.

Runoff from disturbed, rehabilitated and establishing revegetated mine areas is directed to sediment retention storages. This water is then pumped to mine water storages as per the requirements of the Blue Book.

6.8.2 Management Measures

United Wambo implements surface water management measures in accordance with the *Surface Water Management Plan*. The management measures are summarised below.

- Surplus water will be discharged as required and in accordance with Wambo's EPL 529 and consistent with the provisions of the Hunter River Trading Scheme (HRSTS). Discharges will be monitored prior to release to ensure compliance with the requirements of the HRSTS and in accordance with EPL condition.
- Wastewater from onsite facilities, including sewage, is collected and treated on site by a number of aerated wastewater treatment plants, which are licensed by Singleton Council.
- Generic training on the aspects of the *Surface Water Management Plan* is provided to all employees and contractors through the Site Familiarisation process. Selected site personnel, whose duties directly involve the management of water at United Wambo, will undertake specific training in regard to site Operational Procedures which incorporate water management measures.
- Storage dams and pits are sampled monthly. Data from this monitoring is used for operational purposes and is reported internally as required.
- The water levels in the former United Underground are monitored on a regular basis to maintain understanding of the volume of water stored with the workings.
- Validated data from the monitoring program is entered into the GCAA Environmental Monitoring Database (EMD).

Details of complaints relating to surface water will be provided to relevant mine planning and production personnel to assist in the improvement of management practices, where relevant. A summary of the complaints received by the community will be reported in this document.

6.8.3 Surface Water Criteria

Surface water criteria is available for the four sites described in ***Table 6-26***. While sampling occurs at additional points onsite, those listed in ***Table 6-26*** are the only offsite locations monitored and are therefore reflective of environmental impacts. All other locations are onsite dams used for early indications of changes and are not reflective of environmental impacts. The impact assessment criteria for surface water quality are summarised in ***Table 6-26*****.**

Table 6-26 Surface Water Quality Criteria

Site ID	Site Description	Sample Count	pH		EC (µs/cm)[2]	TSS (mg/L)[2]	TDS (mg/L)[2]
			Lower	Upper			
WB04	Wollombi Brook – Downstream	-	6.5	8.5	2,200	50[1]	–[1]
NWC03	North Wambo Creek - Downstream	57	7.3	8.0	2,350	15	1,270
RC01	Redbank Creek - Downstream	70	7.9	8.3	8,456	26	–[1]
WFC01	Waterfall Creek	39	7.3	7.9	435	582	646

1 – There is no historical data available for TDS for RC01. As there is no ANZECC criteria set for TDS, no limits have been identified for this RC01. A default of 50 mg/L TSS has been utilised for WB04 until the site-specific criteria is developed.

2 – Criteria represents the maximum value.

No site-specific surface water quality criteria has been generated for metals/metalloids, due to limited data set for the monitoring locations. United Wambo propose to develop site specific criteria when sufficient data is available. In the interim, default 95% species protection ANZECC trigger values for slightly to moderately disturbed freshwater ecosystems Australia have been adopted as the impact assessment criteria and is reproduced in ***Table 6-27*****.**

Table 6-27 ANZECC Criteria for Metals and Metalloids

Parameter	ANZECC Criteria (µg/L)	Parameter	ANZECC Criteria (µg/L)	Parameter	ANZECC Criteria (µg/L)	Parameter	ANZECC Criteria (µg/L)
Aluminium (Al)	55	Manganese (Mn)	1,900	Lead (Pb)	3.4	Calcium (Ca)	N/A
Arsenic (As)	24	Nickel (Ni)	11	Potassium (K)	N/A	Barium (Ba)	N/A
Cobalt (Co)	N/A	Selenium (Se)	11	Silver (Ag)	0.05	Magnesium (Mg)	N/A
Copper (Cu)	1.4	Zinc (Zn)	8	Fluoride (Fl)	N/A	Cadmium (Cd)	0.2
Iron (Fe)	N/A	Mercury (Hg)	0.6	Boron (B)	370	Sodium (Na)	N/A

Annual Speciation Results

In accordance with the *Surface Water Monitoring Plan*, speciation monitoring is undertaken annually at United Wambo surface water monitoring locations in December. Speciation monitoring is assessed against criteria in ***Table 6-27***. A summary of the surface water results for 2021 are presented in ***Table 6-28***.

Table 6-28 Annual Speciation Results

Site ID	WB04	NWC03	RC01*	WFC01
Aluminium (Al)	0.26	1.32	-	1.51
Arsenic (As)	<0.001	<0.001	-	0.002
Cobalt (Co)	<0.001		-	0.002
Copper (Cu)	<0.001	0.001	-	0.005
Iron (Fe)	2.85	1.24	-	3.30
Manganese (Mn)	0.253	0.014	-	0.124
Nickel (Ni)	0.002	0.003	-	0.009
Selenium (Se)	<0.01	<0.01	-	<0.01
Zinc (Zn)	<0.005	<0.005	-	0.006
Mercury (Hg)	<0.0001	<0.0001	-	<0.0001
Lead (Pb)	<0.001	<0.001	-	<0.001
Potassium (K)	5	4	-	16
Silver (Ag)	<0.001		-	<0.001
Fluoride (Fl)	0.1	<0.1	-	0.2
Boron (B)	0.08		-	0.07
Calcium (Ca)	7	5	-	13
Barium (Ba)	0.035	0.015	-	0.057
Magnesium (Mg)	9	6	-	8
Cadmium (Cd)	<0.0001	<0.0001	-	<0.0001
Sodium (Na)	45	34	-	10
Total phosphorous (P)	0.05		-	0.29
Nitrite	<0.01	<0.01	-	<0.01
Nitrate	0.07	0.18	-	<0.01
Total Kjeldahl Nitrogen (TKN)	0.7	0.18	-	2.3
Total nitrogen (Total N)	0.8	0.8	-	2.3
Ions - Chloride (Cl)	66	53	-	12
Bicarbonate (CaCO3)	37	29	-	88
Sulphate (SO4)	13	14	-	<1

*Dry during 2020.

Water Balance

The United Wambo Complex water balance and salt balance were updated at the end of 2021. The revised water and salt balance summaries, showing annual average volumes of inputs and outputs, is shown in ***Table 6-29*** and ***Table 6-30*****.**

Table 6-29 United Wambo JV Water Balance – 2021 Summary Table

Water Balance	2021
Water Sources	**Volume (ML)**
Transfer from Wambo	593
Rainfall/Runoff	859
Open Cut Seepage	526
Total Water Inputs (I)	1,977
Water Usage	**Volume (ML)**
Dust Suppression	816
Transfer to Wambo	1274
Potable Water	3.7
Total Water Usage (U)	2,094
Water Loss	**Volume (ML)**
Evaporation – Mine Water	199
Seepage	0
Total Losses (L)	199
Change in Storage	**Volume (ML)**
Initial (January 2021)	266
Final (December 2021)	442
Change in Storage (S)	172

Table 6-30 United Wambo JV Salt Balance – 2021 Summary Table

Site Salt Balance	2021
Inputs	**Salt (t)**
Runoff	352
Groundwater (ROM coal)	1,383
Groundwater (Seepage)	3,356
Total	**5,092**
Outputs	**Salt (t)**
Dust suppression	1,245
Groundwater (ROM coal)	3,088
Total	**4,333**
Balance	**759**

6.8.4 Key Environmental Performance

6.8.4.1 Surface Water Monitoring Locations

As part of the United Wambo project, surface water monitoring points from United and Wambo have been grouped together. Many of the water quality monitoring points have been renamed for management under United Wambo. For detailed information regarding current and former surface water sites including name changes refer to the *United Wambo Surface Water Management Plan*.

Table 6-31 outlines the water monitoring locations for United Wambo.

Table 6-31 Surface Water Monitoring Locations for United

Site	Sample Count	Creek Monitoring Location
WB01	No longer accessible	Wollombi Brook – Upstream
WB02	12	Wollombi Brook – Pumps
WB03	12	Wollombi Brook – Warkworth
WB04	12	Wollombi Brook – Downstream
NWC01	3	North Wambo Creek – Upstream
NWC02	6	North Wambo Creek - Midstream
NWC03	4	North Wambo Creek – Downstream
RC01	3	Redbank Creek – Downstream
WFC01	4	Waterfall Creek
W02	12	Dam 2
W03	12	United UG Boxcut
W04	4	Dam 3 (removed in May 2021)
W07	12	Dam 14
W08	-	C11 Void (removed by dumping in 2020)
W09	12	CHPP Dams
W10	12	Process Water Dam
W11	12	Wambo MIA Box Cut Dam
W12	12	Homestead Pit
W13	12	West Cut Dam
W14	9	Montrose Pit Inflows
W15	12	Dam 7
W16	12	Dam 15
W17	-	Wombat Dam (no longer monitored)
W18	11	U2
W19	12	U3
W20	12	Montrose ME1 Sed Dam
W21	8	Montrose ME2 Sed Dam
W22	12	Drain 9
W23	3	Plover Dam
W24	7	MIA Sediment Dam
W25	12	United Pit
W26	12	Turkeys Nest Dam

6.8.4.2 Surface Water Monitoring Results

The 2021 surface water monitoring results at United Wambo are shown in **Table 6-32 to Table 6-35.** Note analysis of monitoring data occurs for the offsite locations listed in **Table 6-26** (WB04, NWC03, RC01 and WFC01 which are monitored monthly). Data from all other monitoring locations including storage dams and pits (monitored monthly) is used for operational purposes and is reported internally and is therefore not analysed in this document. Parameters measured are pH, EC, TSS and TDS.

Table 6-32 Creek Water Monitoring Results – pH (2021)

Surface Water Monitoring Site	Minimum	Maximum	Average
WB01	No longer accessible		
WB02	6.98	7.50	7.25
WB03	7.03	7.43	7.27
WB04	7.06	7.58	7.34
NWC01	7.11	7.46	7.25
NWC02	7.24	7.94	7.64
NWC03	6.91	7.9	7.09
RC01	Dry		
WFC01	6.82	7.5	7.17
W02	8.32	9.08	8.72
W03	8.60	9.03	8.84
W04	7.88	8.17	8.07
W07	6.93	8.77	7.74
W08	Removed due to dumping		
W09	8.74	9.13	8.94
W10	8.68	9.06	8.78
W11	8.31	8.56	8.44
W12	8.76	8.93	8.85
W13	8.69	8.72	8.71
W14	8.32	8.97	8.71
W15	7.11	8.73	7.98
W16	6.88	8.44	7.57
W17	No longer monitored		
W18	8.18	8.76	8.47
W19	8.76	8.84	8.80
W20	7.89	9.60	8.72
W21	8.10	9.68	8.58
W22	7.96	9.24	8.61
W23	7.66	9.14	8.49
W24	8.46	9.26	8.76
W25	7.62	8.34	8.07
W26	8.03	9.24	8.61

Creek water monitoring results for pH at WB04 in 2021 was generally within criteria, with all results falling between 6.9 and 7.5 except for one which was 7.58.

RC01 was dry during 2021 due to the Redbank Creek Coffer Dam installed due to construction works.

WFC01 and NWC03 were below criteria for 2021 on three of the four samples collected in 2021. Results were generally comparable to last year's Annual Review period and are within ANZECC criteria. Further review into the criteria will be undertaken in 2022.

Creek water monitoring results for pH at WB04 in 2021 was within criteria.

Table 6-33 Creek Water Monitoring Results – Electrical Conductivity (EC µs/cm) – 2021

Surface Water Monitoring Site	Minimum	Maximum	Average
WB01	No longer accessible		
WB02	307	697	506.25
WB03	282	691	499.08
WB04	299	690	501.08
NWC01	216	230	221
NWC02	205	750	487
NWC03	193	249	211
RC01	Dry		
WFC01	129	253	186
W02	1010	3390	2453.33
W03	1600	2440	2098
W04	731	1030	906.25
W07	134	313	234.67
W08	No longer monitored		
W09	940	9060	4183
W10	2300	6050	5149
W11	516	610	563
W12	1410	2180	1795
W13	1870	3210	2540
W14	1520	3750	2056
W15	193	592	418
W16	117	325	218.5
W17	No longer monitored		
W18	979	1730	1354.5
W19	1520	2010	1765
W20	315	604	466
W21	280	506	424
W22	550	1460	835
W23	348	1250	693
W24	595	1520	993
W25	1110	9880	6883
W26	1090	3170	2180

EC results were variable during 2021 with a range of 129 µs/cm to 690 µs/cm across WB04, NWC03 and RC01. The average EC results during 2021 were 501 µs/cm, 211 µs/cm and 186 µs/cm for WB04, NWC03 and RC01 respectively. There were no exceedances of site-specific EC criteria during 2021.

EC results in 2021 were lower than long term trends, likely due to significant rainfall received during 2021.

Table 6-34 Creek Water Monitoring Results – Total Suspended Solids (TSS) – mg/L – 2021

Surface Water Monitoring Site	Minimum	Maximum	Average
WB01	No longer accessible		
WB02	<5	18	11.2
WB03	<5	42	22
WB04	<5	14	8.2
NWC01	<5	9	6
NWC02	38	393	138
NWC03	14	285	129
RC01	Dry		
WFC01	24	209	82
W02	8	60	18.55
W03	5	25	11.89
W04	7	49	19.75
W07	6	22	13.56
W08	No longer monitored		
W09	10	1380	170
W10	8	54	20
W11	0	0	0
W12	20	31	25.5
W13	12	26	19
W14	6	14	8.43
W15	6	20	9.57
W16	6	28	12.33
W17	No longer monitored		
W18	27	89	58
W19	21	36	28.5
W20	29	181	76
W21	30	266	113
W22	6	655	106
W23	11	914	316
W24	14	110	37
W25	<5	197	54
W26	21	208	115

The average 2021 TSS result at WB04 was 8 mg/L and values ranged from <5-14 mg/L (all well below the maximum criteria of 50 mg/L).

The average 2021 TSS result at NWC03 was 129 mg/L and values ranged from 14-285 mg/L. Three of the four samples in 2021 were above the criteria of 15 mg/L. These elevated results were likely due to high flows in North Wambo Creek at the time of the samples.

All TSS results at WFC01 were below criteria.

Table 6-35 Creek Water Monitoring Results – Total Dissolved Solids (TDS) – mg/L - 2021

Surface Water Monitoring Site	Minimum	Maximum	Average
WB01	No longer accessible		
WB02	190	380	295.42
WB03	174	391	291
WB04	182	377	288
NWC01	ND	ND	ND
NWC02	ND	ND	ND
NWC03	ND	ND	ND
RC01	Dry during 2021		
WFC01	175	214	194.5
W02	740	2030	1461.75
W03	912	1500	1268.42
W04	556	652	614
W07	102	208	161.92
W08	No longer monitored		
W09	ND	ND	ND
W10	ND	ND	ND
W11	330	340	335
W12	894	1350	1122
W13	1180	2090	1635
W14	907	2250	1255.88
W15	108	366	276.73
W16	167	244	201.75
W17	No longer monitored		
W18	760	1620	1217
W19	919	1280	1099.5
W20	305	740	406
W21	262	502	349
W22	438	1270	687
W23	538	3270	1515
W24	396	994	645
W25	780	6170	4208
W26	671	1190	931

The average 2021 TDS result at WB04 was 288 mg/L and values ranged from 182-377 mg/L which is similar to 2020. TDS criteria has not yet been developed for WB04.

TDS was not recorded at NWC03 during 2021.

6.8.4.3 Watercourse Stability Monitoring

Baseline watercourse stability monitoring was undertaken in 2020. Photo monitoring points were set up in Wollombi Brook, Redbank Creek and Waterfall Creek. The program will involve taking photos at each location upstream and downstream and identifying any changes in any of the following:

- stream and riparian vegetation cover;
- bed condition;
- active erosion points; and
- potential areas of instability determined by the creek line inspections.

This monitoring will be undertaken annually and all photos will be filed on the United Wambo server for comparison. If upon a desktop review there are noticeable changes, further investigations will take place. Investigations will take place in the field, on location, and must include (but not limited to.):

- current meteorological conditions;
- meteorological conditions for the last 12 months;
- any identified structure changes (i.e fallen trees, erosion, evidence of a high flow event); and
- has there been any unauthorised anthropogenic activities.

If, through a field investigation, the cause of the changes cannot be determined, a suitably qualified individual will be engaged to assist in the investigation.

Photo monitoring was completed at all sites during 2021. Increases in vegetation were noted immediately downstream of site in Redbank Creek, due to the removal of Redbank Creek as part of the approved mine plan and reduction in flows. No other noticeable changes were identified.

6.8.5 Water Performance Measures

A comparison of United Wambo's compliance with the water performance measures in Condition B49 of SSD 7142 is provided in ***Table 6-36*****.**

Table 6-36 Water Management Performance Measures

Feature	Performance Measure	Compliance
Water management – General	Maintain separation between clean, dirty and mine water Minimise the use of clean and potable water Maximise water recycling, reuse and sharing opportunities Minimise the use of make-up water from external sources Design, install, operate and maintain water management infrastructure in a proper and efficient manner	United Wambo separates the clean, dirty and mine water in accordance with the Water Management Plan United Wambo's main source of water usage is for dust suppression. Water used by United Wambo for dust suppression is sourced from mine and dirty water collected, maximising reuse and minimising the use of clean water and externally sourced water

Feature	Performance Measure	Compliance
Alluvial aquifers (including Wollombi Brook alluvium)	Negligible impacts to the alluvial aquifer beyond those predicted in the document/s listed in condition A2(c), including: negligible change in groundwater levels; and negligible impact to other groundwater users including, Maintain appropriate setbacks in accordance with the Aquifer Interference Policy (DPI, 2012)	No impacts on the alluvial aquifers have been identified. See Annual Groundwater Review in Appendix 3 Setbacks from alluvial aquifers are in accordance with the Aquifer Interference Policy (DPI, 2012)
Erosion and sediment control works	Design, install and maintain erosion and sediment controls in accordance with the guidance series Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004) and 2E Mines and Quarries (DECC, 2008) Design, install and maintain any infrastructure within 40 metres of watercourses in accordance with the guidance series for Controlled Activities on Waterfront Land (DPI Water, 2012) Design, install and maintain any creek crossings generally in accordance with the Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013) and Why Do Fish Need To Cross The Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2003)	All erosion and sediment control measures installed at United Wambo are compliant with the Blue Book and the United Wambo Erosion and Sediment Control Management Plan Works within 40 metres of Redbank Creek, such as construction of the flood levee and Northern Drain, were undertaken in accordance with the guidance series for Controlled Activities on Waterfront Land (DPI Water, 2012) No creek crossings were installed in 2021
Clean water diversions and storage infrastructure	Design, install and maintain the clean water system to capture and convey the 100 year ARI flood event Maximise, as far as reasonable, the diversion of clean water around disturbed areas on the site, except where clean water is captured for use on the site	Northern Clean Water Drain constructed to convey water from north of United Open Cut around to Redback Creek. Drain still captured during rehabilitation.
Flood Levees	Design, install and maintain appropriate flood levees to protect mining areas from a 1,000 year ARI flood event and to ensure no adverse effect on roads or privately-owned land	Flood levee constructed to account for 1,000 year ARI flood event in Wollombi Brook
Sediment dams	Design, install and maintain sediment dams in accordance with the guidance series Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004) and 2E Mines and Quarries (DECC, 2008) and the requirements under the POEO Act or Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002	All sediment dams have been constructed to comply with the Blue book and POEO Act requirements, including the MIA Sediment Dam, Plover Sediment Dam and Redbank Creek Coffer Dam
Above-ground mine water storages	Design, install and maintain mine water storage infrastructure to avoid unlicensed or uncontrolled discharge of mine water Designed to contain the 100 year ARI storm event and minimise permeability	All mine water storages at United Wambo have been constructed to capture the 100 year ARI. All mine water dams managed by United Wambo spill into the open cut pit rather than discharge offsite

Feature	Performance Measure	Compliance
Tailings storages	Design and maintain tailings storage areas to encapsulate and prevent the release of tailings seepage/leachate	Tailings management is undertaken by Wambo on behalf of the United Wambo JV. The United Tailings Dams 1 and 2 are decommissioned and are currently being capped.
Overburden emplacements	Design, install and maintain emplacements to encapsulate and prevent migration of tailings, acid forming and potentially acid forming materials, and saline and sodic material Design, install and maintain out-of-pit emplacements to prevent and/or manage long term saline seepage	Overburden emplacement areas at United Wambo are all designed and maintained to contain all run off and seepage with dams or open cut voids
Chemical and hydrocarbon storage	Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standard	Hydrocarbon storage areas are bunded in accordance with Australian Standards and are subject to regular inspection and management.
Creek diversion and restoration works	Diverted creek lines are hydraulically and geomorphologically stable Incorporate erosion control measures based on vegetation and engineering revetments Incorporate persistent/permanent pools for aquatic habitat Revegetate with suitable native species	No creek diversion or restoration works undertaken during 2021
Aquatic, riparian and groundwater dependent ecosystems	Negligible environmental consequences beyond those predicted in the document/s listed in condition A2(c) Maintain or improve baseline channel stability Develop site-specific in-stream water quality objectives in accordance with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000) and Using the ANZECC Guidelines and Water Quality Objectives in NSW (DEC, 2006)	Baseline GDE monitoring, channel stability and stygofauna monitoring were undertaken in 2020.

6.8.6 Long Term Trends

United has long term data from surface water monitoring locations since 2004.

Traditionally SW1-SW5 have been assessed against pH, EC and TSS over a long time period. However, during the United Wambo Joint Venture the names of these sites were changed (see ***Table 6-37***).

Table 6-37 Current and Former Surface Water Monitoring Sites

Former Surface Water Monitoring Site	Current Surface Water Monitoring Site
SW1	WB01
SW3	WB02
SW4	WB03
SW2	NWC03
SW5	RC01

Minimum and maximum surface water monitoring results for pH remained within the ANZECC Guideline criteria at most sites during the reporting period. This is generally consistent with historical data since 2004. Average pH results at WB03, NWC03 and RC01 in 2020 were within the long - term range of 6.5 to 8.9.

Minimum and maximum surface water monitoring results for EC in 2021 have remained within the long term data trends and within criteria. This shows that EC, while variable, has produced consistent results over the long- term.

Minimum and maximum surface water monitoring results for TSS in 2021 have remained within the long term data trends. NWC03 showed a high level of variability with the minimum and maximum ranging from 5 mg/L to 285 mg/L. WB02 has historically had a high amount of variability for TSS, with the minimum and maximum ranging from 1 mg/L to 504 mg/L since 2004. However, 2021 revealed stable results with a minimum of <5 mg/L and a maximum of 18 mg/L. The TSS levels for WB03 are less variable with long term results ranging from 1 mg/L to 109 mg/L since 2004. The minimum and maximum recorded at WB03 during 2020 were <5 mg/L and 42 mg/L respectively.

WB02 recorded TDS results ranging from a minimum of 190 mg/L to a maximum of 380 mg/L. WB03 recorded TDS results ranging from a minimum of 174 mg/L to a maximum of 391 mg/L. NWC03 did not record TDS during 2020. Long term surface water monitoring graphs are illustrated in *Appendix C - Additional Environmental Monitoring Results*.

6.8.7 Comparison of Performance Against Criteria

A detailed assessment of potential impacts to surface waters was undertaken for the EIS. The highest risks to downstream surface water quality as documented in the EIS included:

- discharge of mine water;
- overflow or failure of sediment ponds (dirty water); and
- spillage or overflow of tailings.

Details of sediment dam overflowing events in 2021 are provided in Section 6.8.10.

6.8.8 Water Take

Condition B40 of United Wambo's Development Consent (SSD 7142) requires that the Annual Review is to report on water extracted from the site each year (both direct and indirect).

Table 6-38 outlines the direct water take from water licences for the operations in accordance with the requirement of the Annual Review Guideline (DPE 2015).

Table 6-38 Water Take Summary for United - 2021

Water Licence Number	Water Sharing Plan, Source and Management Zone (as applicable)	Entitlement (ML)	Passive Take/Inflows (ML)	Active Pumping (ML)	TOTAL (ML)
WAL 18445 Redbank Creek Bywash pump	Hunter Unregulated and Alluvial Water Sources	200	0	0	0
WAL 10541 Hunter River Pump		300	0	0	0
WAL 18549 Wollombi Brook Pump		100	0	0	0

Table 6-39 below shows the indirect water take for United Wambo during 2021. Sources include rainfall runoff collected in site water storages and mining areas, potable water imported to site for use, water transferred from a third party (Wambo) and groundwater seepage into open cut areas.

Table 6-39 Total Indirect Take for United Wambo - 2021

Source	Volume of Take (ML)
Rainfall Runoff	859.0
Transfer from Wambo	593.0
Potable Water Trucked to Site	3.7
Open Cut Seepage	526.0

6.8.9 Water Licencing Status

An update on the licencing status of storage dams at United has been included in the Annual Review based on feedback from DPI Water in the 2017 Annual Review (14 March 2017). The licensing status of these structures are provided below in ***Table 6-40***, differentiating between those exempt, within harvestable right or accounted for via a Water Access Licence (WAL).

Table 6-40 Storage Dam Licencing Status

Dam	Licencing Status
Dam 2	Exempt - Pollution control structure
Dam 7	Harvestable Rights
Dam 9	Harvestable Rights
Dam 10	Harvestable Rights
Dam 11	Exempt - Pollution control structure
Dam 13	Harvestable Rights
Dam 14	Harvestable Rights
Dam 15a	Harvestable Rights
Dam 15b	Harvestable Rights
Dam 15c	Harvestable Rights
W26	Exempt - Pollution control structure
U2	Exempt - Pollution control structure
U3	Exempt - Pollution control structure

6.8.10 Discharge Summary

As outlined previously there are no licensed discharge points at United Wambo. Wambo will monitor water quality and volume for licensed discharges in accordance with the licensed discharge limits and requirements relevant to monitoring conditions of EPL 529 and the HRSTS. Results will be shared with United Wambo as required.

There were three offsite discharges at United Wambo during 2021 during greater than design rainfall events. All events were reported in accordance with SSD 7142 and EPL 3141 requirements.

On 4 January 2021, the Wambo weather station recorded 83.6mm of rain from 3:00pm to 9:30pm. Between the hour of 4:00 and 5:00pm, 45mm of rain fell. The MIA Sediment Dam was inspected at 9:00pm and was found to be overflowing via the spillway. The MIA Sediment Dam was inspected prior to the rainfall event, the water level was observed to be below the required storage zone level. The dam was designed in accordance with the Blue Book and the *United Wambo Construction Erosion and Sediment Control Plan* for an 85% 24-hour rainfall event of 31.7mm.

A significant rainfall event occurred from 18-23 March 2021, with a total of 211.4mm of rainfall recorded at the Wambo meteorological station. During the rainfall event, the MIA Sediment overflowed on two occasions on 20 and 23 March. The MIA Sediment Dam was inspected on multiple occasions throughout the event and the pump was run continuously. The dam was designed in accordance with the Blue Book and the United Wambo Construction Erosion and Sediment Control Plan for an 85% 24-hour rainfall event of 31.7mm.

On 12 November 2021, two sediment dams have overflowed following a significant rainfall event overnight – the MIA Sediment Dam and the Redbank Creek Coffer Dam. A total of 75.8mm of rainfall was recorded on the Wambo met station and 57mm of rainfall at the United met station in the previous 24 hours. This followed 58.6mm at Wambo and 60.8mm at United recorded the previous day. The design rainfall event for sediment dams at UWJV is 54.7mm in 24 hours. The MIA Sediment Dam was inspected through the night and was found to be overflowing at 5:00am. The Redbank Coffer Dam was inspected through the night as well, including around 5:00am and found to be full but not overflowing. When reinspected at 5:45am, it was found to be overflowing in two places.

Following the January and March events, a revised design was undertaken for the MIA Sediment Dam to increase the capacity from 2.8ML to 3.4ML. Further design works are ongoing in 2022 to potential increase the size of the dam to capture significantly more than the required storm event.

6.8.11 Salinity Trading Scheme Credit Use

United Wambo is part of the Hunter River Salinity Trading Scheme (HRSTS) however the site does not have any Salinity Trading Scheme Credits, and there is no licensed discharge point.

6.9 Groundwater

Groundwater monitoring is conducted at United Wambo in accordance with the GWMP and the *United Wambo Open Cut and Wambo Water Monitoring Program* (*WMP*) (Peabody, 2020).

The purpose of groundwater monitoring at UWJV is to monitor groundwater quality and levels to detect potential impacts on surrounding groundwater users, consumptive or environmental, and assess the performance of the mine against the performance indicators to ensure that relevant legislative and policy requirements are met.

The UWJV groundwater monitoring network defined in the GWMP currently comprises of 28 bores and 14 vibrating wire piezometers (VWPs) with a total of 69 sensors installed at VWP arrays.

Groundwater monitoring has been undertaken bi-monthly for groundwater levels (reported as a groundwater elevation in metres above Australian Height Datum (mAHD) and basic water quality (pH and EC). UWJV also undertake comprehensive annual groundwater quality monitoring of twelve analytes including: pH, EC, Total dissolved solids (TDS), Sodium, Potassium, Calcium, Magnesium, Chloride, Nitrate, Sulfate, Hardness, and Bicarbonate.

6.9.1 Environmental Management

United Wambo implements surface water monitoring in accordance with the *United Wambo Water Management Plan (2020d)* and the *United Wambo Groundwater Water Management Plan (2020c)*.

6.9.2 Management Measures

United Wambo implements groundwater management measures in accordance with the *Ground Water Management Plan*. The management measures are summarised below.

- Design, install and maintain above-ground mine water storage infrastructure to avoid unlicensed or uncontrolled discharge of mine water to the offsite environment.
- Above-ground mine water storages designed to contain the 100-year ARI storm event and minimise permeability.
- Operate underground water storages in a manner that minimises impacts.

- New tailings storage areas will be designed and maintained to encapsulate and prevent the release of tailings seepage/leachate.
- Design, install and maintain new emplacements to encapsulate and prevent migration of tailings, acid forming and potentially acid forming materials, and saline and sodic material.
- Design, install and maintain new out-of-pit emplacements to prevent and/or manage long term saline seepage.
- Chemical and hydrocarbon products is stored in bunded areas in accordance with the relevant Australian Standard.
- Maintain or improve baseline channel stability.
- Generic training on the aspects of the GWMP is provided to all employees and contractors through the GCAA Generic Surface Induction and the Site Familiarisation process.
- Regular workforce communication days and toolbox talks allow for discussion of the objectives and requirements of this and any other relevant Plans.
- Selected site personnel whose duties directly involve the management of water at United Wambo undertake specific training with respect to site Operational Procedures which incorporate water management measures.

The location of water monitoring sites is shown on ***Figure 6-2***.

6.9.3 Groundwater Monitoring Locations

The network has been established to ensure that a long-term monitoring capability exists, that monitors key groundwater units and with adequate spatial and vertical depth coverage across the site. ***Table 6-41*** outlines the groundwater monitoring program, including parameters and frequency, that was in place at United Wambo during 2021.

Table 6-41 Groundwater Monitoring Program - 2021

Stratigraphy	Group	Sites (Bore ID)	Parameters Monitored	Frequency
Alluvial Sediment	North Wambo Creek Alluvium	GW08, GW09 and GW16	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	Wambo Creek Alluvium	GW02, GW11, P106 and P109	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	East Wollombi Brook Alluvium	P12 and GW15	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	West Wollombi Brook Colluvium	P16 and P20	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	Stoney Creek alluvium/colluvium	P315, P301 and GW12	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	Hunter River Alluvium	P408	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
Regolith / Shallow Weathered Sandstone	Regolith/Shallow Weathered Sandstone Wollombi Brook	GW13	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	Regolith/Shallow Weathered Sandstone Wambo Creek	P114, P116 and P109	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	Regolith/Shallow Weathered Sandstone North Wambo Creek	GW17	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
Permian Coal Measures	Overburden/Interburden	GW21, GW22, P202, P206, and P401	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually
	Coal Seams	P402	Water level, pH and Field EC	Every 2nd Month
			Comprehensive Suite	Annually

Stratigraphy	Group	Sites (Bore ID)	Parameters Monitored	Frequency
Various	Various	P33, P34, P35, UG134, UG135, UG139, UG147, UG166A, UG 193, UG194, UG196, UG220, UG224, UG225	Water Level	Continuous (VWP)

6.9.4 Groundwater Monitoring Findings

Groundwater monitoring is undertaken in accordance with the United Wambo procedures for environmental monitoring and evaluation outlined in the United Wambo Environmental Management Strategy. A summary of results for 2021 is presented in ***Table 6-42.***

Table 6-42 Summary of Groundwater Monitoring Results – 2021 Annual Averages

Unit	Bore ID	Water Level (mbGS)			pH			EC (µS/cm)		
		Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
North Wambo Creek Alluvium	GW08	5.91	5.91	5.91	6.8	6.8	6.8	2690	2690	2690
	GW16	3.83	5.26	7.21	7.1	7.27	7.5	343	478	775
	GW17	6.2	8.33	10.94	7.1	7.2	7.3	4180	4355	4760
Wambo Creek Alluvium	GW02	5.1	5.59	6.44	6.6	6.65	6.7	469	490	526
	GW11	3.7	3.86	4	6.7	7.15	8.1	467	547	597
	P106	5.74	6.73	8.53	6.5	6.75	6.9	641	675	727
	P109	4.31	4.70	4.94	6.5	6.72	6.8	604	673	732
East Wollombi Brook Alluvium	P12	5.11	6.36	6.86	5.82	6.17	6.6	634	884	1018
	GW15	10.71	11.08	11.84	6.9	7.0	7.2	613	710	938
West Wollombi Brook Alluvium	P16	7.68	8.16	8.43	7.01	7.38	7.64	2750	3987	5140
	P20	6.56	7.38	7.78	7	7.38	7.57	2740	3285	4030
Hunter River Alluvium	P408	11.9	11.9	11.9	7.38	7.38	7.38	6310	6310	6310
Stoney Creek Alluvium/ Colluvium	P315	3.6	5.24	6.8	6	6.15	6.3	367	684	1275
	P301	9.86	10.88	12.35	6	6.3	6.5	256	732	2020
Regolith/Shallow Weathered Sandstone Wollombi Brook	GW13	6.81	6.9	6.99	6.8	6.86	6.9	1992	2171	2320
Regolith/Shallow Weathered Sandstone Wambo Creek	P114	9.76	9.76	9.76	6.9	6.9	6.9	7690	7690	7690
	P116	7.42	7.42	7.42	6.5	6.5	6.5	4580	4580	4580
	P109	4.31	4.70	4.94	6.5	6.72	6.8	604	666	732
Regolith/Shallow Weathered Sandstone North Wambo Creek	GW17	6.2	8.33	10.94	7.1	7.2	7.3	4180	4355	4760
Overburden	GW22	35.05	36.66	36.12	8.3	8.38	8.4	6750	6963	7100
	P202	7.04	7.35	7.57	7.3	7.4	7.6	2290	5408	7840

Unit	Bore ID	Water Level (mbGS)			pH			EC (µS/cm)		
		Min	Ave	Max	Min	Ave	Max	Min	Ave	Max
	P206	14.61	16.10	19.86	7.9	8.1	8.2	1240	1814	2090
	P401	72.06	72.55	72.94	7.5	7.76	7.94	9930	11347	12680
Permian Coal Seams	P402	23.4	25.9	29.3	7.3	7.5	7.8	10800	11930	13040

Trend analysis was undertaken for all the monitored bores in the United Wambo Joint Venture Annual Review 2021 report (provided as an **Appendix 3**). A summary of the key findings is provided below.

The 2021 monitoring results indicated that alluvial bores responded sharply to rainfall events. Water quality analysis in October 2021 indicated naturally higher sulfate concentrations in the coal measures, compared to alluvial bores. Water quality analysis also indicated relatively high sulfate and metal concentrations in the lower reach of North Wambo Creek alluvium. Bores in alluvium on the eastern side of Wollombi Brook recorded slightly acidic pH and fresher water quality. Bore P12 recorded four pH trigger exceedances in 2021; however, readings are within the historical range for this bore. pH levels at P12 have triggered an investigation in accordance with the UWJV Groundwater Management Plan. The investigation stated that the potential causes of decreased pH at P12 is likely attributed to natural causes, and not due to mining operations.

In contrast, bores in alluvium on the western bank closer to the mine (P16 and P20) record relatively neutral to alkaline pH of 7.0 to 7.6 over the reporting period. EC generally declined in bores P16 to P20 following the peak rainfall events, indicating recharge of fresher quality water. The pH values recorded at the interburden/overburden bores have been slightly alkaline (>7) and has been stable. The EC values at all the interburden/overburden bores also seems to be stable in 2020 and 2021, except at P202 and P402. The pH at Permian Coal monitoring bore P402 has been fluctuating and has been lower in 2021 than 2020, whereas the EC saw a massive increase from 1,129 µS/cm in June 2020, to 13,040 µS/cm in June 2021.

Monitoring of the following bores was not possible during 2021 (hence there are no results recorded in ***Table 6-42*** above):

- P1 (Interburden) – access no longer available;
- P11 (Interburden) – bore has been mined through;
- GW09 (North Wambo Creek Alluvium) – dry;
- GW21 (Overburden) – dry; and
- GW14 (Regolith) – bore has been dry since 2011.

GW08 and GW09 were removed from the monitoring network by Wambo during the reporting period. These bores have been replaced with bores GW08.2, GW09.2, GW10.2 and GW10.2a. Data for these bores will be included in the next Annual Review, after the UWJV GWMP has been updated.

Bore P408 was added to the monitoring network in 2021 and first sampled in December 2021. This bore monitors water levels and quality in the Hunter River Alluvium, to the west of the mine. The pH recorded during the December 2021 monitoring round was 7.38, with EC at 6310 EC µS/cm.

Available data from the VWPs was also assessed, and the maximum drawdown was observed in Mt Arthur Seam, followed by Vaux Seam.

United Wambo will review the GWMP during the next reporting period and update the monitoring program as appropriate.

6.9.5 Long Term Groundwater Trends

Long-term hydrographs and time-series data for each bore is provided in *Appendix D -Groundwater Review*.

Typically, groundwater trends mimic long-term cumulative rainfall deviation trends, with a more pronounced response to rainfall patterns experienced in the Alluvial sediments. The NSW drought, 2017 – 2020 shows corresponds with typically declining groundwater levels, with recovery occurring in 2020 and 2021 in line with the above average annual rainfall experienced.

Groundwater EC in the alluvials also responds to rainfall variations, with declining EC generally seen in 2021, via both rainfall and increased flow in ephemeral watercourses.

Groundwater quality, both EC and pH are relatively stable, or within natural fluctuations in the regolith and Permian bores.

6.9.6 Groundwater Monitoring Trigger Levels

Trigger levels are used to initiate investigations into the groundwater levels or groundwater quality at UWJV. The trigger levels, as specified by the United Wambo Groundwater Monitoring Program (UWJV, 2019), are based on statistical analysis of pre-mining baseline monitoring data.

For groundwater levels, a response is triggered when depth to groundwater increases above the 90th percentile (and not related to seasonal variability) over three consecutive bi-monthly observations. Triggers for EC and pH occur when three consecutive bi-monthly observations (a 6-month period) exceed the specified trigger level (90th percentile).

The trigger levels for the water level, EC, and pH are outlined in ***Section 6.9.4***, and trigger exceedances recorded for the site monitoring network in 2021 are summarised in ***Table 6-43*** below. Details on trigger level and criteria exceedances for water level are included in ***Section 6.9.6.1***, and included in ***Section 6.9.6.2*** for water quality.

6.9.6.1 Water Level Exceedances

Almost all bores recorded depth to water observations within the trigger criteria prescribed in the GWMP. Over 2021, only one bore (P114) has recorded trigger exceedances for depth to water. This bore also recorded the depth to water trigger exceedance throughout 2020. Additional bores that exceeded the depth to water in 2020, but did not exceed in 2021 include:

- GW02, GW11, GW13, GW16, GW17, P106, P12, P206, and P207.

6.9.6.2 Water Quality Exceedances

Exceedance of the trigger for EC in 2021 was observed in the following bores:

- GW08, GW15, GW22, P106, P114, P116, and P12.

Out of these, bore P106 recorded three consecutive bi-monthly exceedance of trigger for EC in February, April and June 2021. It is noted that the Table 12 of the Wambo GWMP (Peabody, 2018) states that the bore P106 is obstructed and hence does not provide representative groundwater data. Therefore, the exceedances were not further investigated. All these bores also exceeded the EC trigger at least once in 2020. In addition, GW16 also exceeded the EC trigger in 2020, but not in 2021.

Exceedances of the trigger for pH was observed in the following bores:

- GW02, GW11, GW13, GW16, GW17, P106, P116, P206 (3 consecutive times), and P12 (4 consecutive times).

The pH value recorded at bore P206 exceeded the upper pH trigger value (8.1 pH units) consecutively in December 2020, February, April, and June 2021 monitoring event. As per the 2021 annual groundwater review of Wambo bores, the pH at P206 has been slowly trending up since 2016, and in early 2021 was recorded at around 8.2, just above the upper trigger level, before falling back below this trigger in the second half of 2021. As such, no further investigation was carried out for P206.

The exceedances of pH at P12 was investigated in accordance with the United Wambo GWMP. The investigation report indicated potential causes of decreased pH at P12 to be attributed to natural causes, and not related to mining activities (SLR, 2021b).

The exceedance of pH trigger values in bore GW11, GW16, GW17, P106, and P116 is new in 2021, and did not occur in 2020. The rest of the bores, i.e., GW02, GW13, P206, and P12 also exceeded the pH trigger in 2020. GW08 exceeded the lower pH trigger throughout 2020, however the one observation recorded in 2021 was within the pH trigger values.

The proposed GDE triggers were also assessed for bores P12, P15, and P16. P15 had only one sample collected in 2021 and was within the proposed GDE triggers. Only P12 exceeded the proposed GDE triggers for pH and sulfate in 2021.

There were no samples collected from P11 during the reporting period. This bore has been mined through.

Table 6-43 Trigger Exceedances in 2021

Site	Target Unit	Depth to Water		pH		EC	
		No. Obs	No. Exceedances	No. Obs	No. Exceedances	No. Obs	No. Exceedances
GW02	Wambo Creek Alluvium	4	0	4	2	4	0
GW08	North Wambo Creek Alluvium	1	0	1	0	1	1
GW09	North Wambo Creek Alluvium	1	0	0	-	0	-
GW11	Wambo Creek Alluvium	4	0	4	2	4	0
GW13	Wollombi Brook Alluvium	3	0	3	1	3	0
GW15	Wollombi Brook (east) Alluvium	5	0	5	0	5	1
GW16	North Wambo Creek Alluvium/regolith	6	0	6	2	6	0
GW17	North Wambo Creek Alluvium/ regolith	6	0	6	1	6	0
P12	Wollombi Brook (east) Alluvium	6	0	6	6	6	1
P16	Wollombi Brook (west) Alluvium	6	0	6	0	6	0
P20	Wollombi Brook (west) Alluvium	6	0	6	0	6	0
P106	Wambo Creek Alluvium	6	0	6	1	6	3
P109	Wambo Creek Alluvium	6	0	6	0	6	0
P114	Wambo Creek Alluvium	1	1	1	0	1	1
P116	Wambo Creek Alluvium	1	0	1	1	1	1
GW21	Overburden	5	0	0	-	0	-
GW22	Overburden	6	0	6	0	6	2
P202	Overburden	5	0	5	0	5	0
P206	Overburden	6	0	6	3	6	0

6.9.7 Water Licencing Requirements

The approved site activities include the direct interception of groundwater from the Permian coal measures, as well as direct and indirect interception of groundwater from alluvium. The alluvium associated with Wollombi Brook and its tributaries falls under the Hunter Unregulated and Alluvial Water Source Water Sharing Plan, the Hunter River alluvium is within the Hunter Regulated water sharing plan (for highly connected alluvium) and groundwater in the Permian is under the North Coast Fractured and Porous Rock Groundwater Source. Numerical groundwater modelling was undertaken by AGE (2016), which included predicted groundwater take from various water sources. The project was approved in 2019, and site operations commenced in 2020, therefore, it is inferred that results for model Year 2 are reflective of activities for the 2021 reporting period.

Table 6-44 presents the relevant water sources and predicted take, and available site water balance estimates for the 2021 reporting period. The estimates indicate sufficient licences were held to cover groundwater interception over the reporting period.

Table 6-44 Mine Inflows

Water Source	Predicted Maximum Water Take (Project only) (ML/year)	Predicted Maximum Water Take (Approved with Project) (ML/year)*	Predicted Take – Model Year 2 (AGE 2016) (ML/year)	Site Water Balance Estimates (ML/year)#
Hunter Regulated water sharing plan	58	84	0 (Project) ~18 (Approved)	313 (pumped surface water, not groundwater)
Hunter Unregulated and Alluvial Water Source	40	260	0 (Project) ~40 (Approved)	13.2†
			-	24 (pumped surface water not groundwater)
North Coast Fractured and Porous Rock Groundwater Source	633	1,778	~500 (United Open Cut and existing open cuts)	217 (dewatering bores) 90 (underground seepage) 70 (open cut seepage)

Note: * includes inflows to existing and historical workings at United and to historical and active workings at Wambo.

Retrieved from the UWJV Site Water Inventory and Annual Water and Salt Balance Summary

† Pit inflow estimate following significant November rainfall event, based on site water balance and includes rainfall ingress

Over the reporting period the area also experienced above average rainfall. The data indicates localised and temporal changes to groundwater gradients in the shallow water table, with potential for flow towards Montrose Pit where it intersects the original alignment of North Wambo Creek. It is noted in the site water balance inventory that around 13.2 ML of water was pumped from Montrose Pit in November 2021. The site water balance also notes 39.8 ML of water from United Pit in November 2021. While some of this water at Montrose west void may relate to seepage from the alluvium, majority of the water within Montrose and United is runoff from rainfall. No other pump records are noted, and these volumes would include rainfall ingress.

6.9.8 Stygofauna Monitoring

To fulfil the monitoring requirements as per the GWMP UWJV committed to monitoring stygofauna in the alluvial aquifers within (or near to subject to bore suitability) the predicted drawdown areas every three years. Preliminary assessments undertaken in 2015 (Umwelt 2016) showed that stygofauna exists in small isolated populations within the shallow alluvial aquifers in the area surrounding the project, including those associated with Wollombi Brook and North Wambo Creek.

A second study was undertaken in 2016, and the most recent in 2019. The stygofauna survey and assessment recorded an absence in subterranean fauna on this occasion within the shallow alluvials in the Study Area. A risk assessment for the current ecological conditions and the risk from current and proposed development indicated that the ecological values of the aquifers and the stygofauna community are low.

To mitigate any potential risks, if groundwater monitoring indicates that impacts are greater than predicted within the shallow alluvial aquifers surrounding the Project Area, more regular monitoring for stygofauna will be triggered. Of the seven bores sampled during the 2019 event, four are trigger bores for the UWJV, including P12.

The pH trigger exceedances at alluvial bore P12 were investigated during the reporting period, in accordance with the GWMP. The investigation report indicated potential causes of decreased pH at P12 to be attributed to natural causes, and not related to mining activities (SLR, 2021b). Therefore, no additional monitoring was undertaken during 2021, or is proposed at this stage. The next round of monitoring will be undertaken in 2022.

6.9.9 Reporting against Groundwater Performance

The 2021 groundwater monitoring is to be compared against the Groundwater Performance Measures (UWJV 2020), as presented in ***Table 6-45*****.**

Table 6-45 Groundwater Performance Measures and response

Aspect	Performance Measures	Performance Indicator/Trigger	Response	Overall Compliance
Alluvial aquifers	Negligible change in groundwater level (compared to predicted impacts[1])	90th percentile (and not related to seasonal variability) over three consecutive months.	TARP – Groundwater Level	Compliance achieved – no triggers breached
	Negligible change in groundwater quality	Groundwater quality concentrations outside of adopted trigger values for at least one parameter for more than three consecutive months.	TARP – Groundwater Quality	Trigger levels exceeded in a number of bores. Investigations have been completed – no further action proposed.
Bedrock aquifers	Negligible change in groundwater level (compared to predicted impacts[1])	90th percentile (and not related to seasonal variability) over three consecutive months. No trigger adopted for monitoring sites within the project area.	TARP – Groundwater Level	Compliance achieved – no triggers breached
	Negligible change in groundwater quality	pH of 6.5 to 8.5 EC < 17,500 µS/cm	TARP – Groundwater Quality	Trigger levels exceeded in one bore. Investigation has been completed – not mining related, no further action proposed.

6.9.10 Proposed Improvements

Based on the review of the groundwater monitoring results in 2021 at United Wambo and comparison of the results and observations with the triggers, the following recommendations have been proposed.

- Many bores currently listed in the monitoring network of the GWMP were removed from the sampling program. United Wambo is in the process of updating the GWMP to incorporate all the changes.

- It is also recommended that replacement bores, such as GW08.2 and GW09.2, should be added to the GWMP and should be monitored as per the GWMP.
- It is recommended that the obstructed bore P106 be removed and replaced in the monitoring network.
- Recently installed bores in the GWMP do not have defined triggers. A review will be undertaken in 2022 to determine whether the triggers be defined, where applicable for these bores.
- The VWP assessment also indicated that many VWPs either have recorded no data, or have faulty sensors. The VWPs that are not recording data will be repaired or replaced, where applicable.

7. Rehabilitation

7.1 Summary of Rehabilitation During Reporting Period

A total of 9.9 hectares of rehabilitation was undertaken during 2021 at United Wambo. The rehabilitation comprised of old topsoil stockpile areas and temporary rehabilitation area on the Wombat Dump. The works were completed in December 2021, with the area seeded with a HU905 / PCT 1604 – Central Hunter Ironbark – Grey Box Woodland. The rehabilitation area is shown in ***Figure 7-1***

There was a total of 48.7 hectares of new disturbance undertaken at United Wambo during 2021 for the mining areas and construction areas. An additional 80.8 hectares of previously rehabilitated areas were re-disturbed during 2021. Areas of disturbance are shown in ***Figure 7-1*****.**

A comparison of rehabilitation results against preliminary closure criteria are outlined in *Table 7-1.*

Table 7-1 Review of Rehabilitation Against Preliminary Closure Criteria – Infrastructure to Remove

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
Native Ecosystem (CEEC/EEC) **or** **Native Vegetation (non CEEC/EEC)** **or** **Agricultural Land Use**	All Domains	Infrastructure Management	Removal of all services (power, water, communications) that have been connected on the site as part of the operation	Infrastructure associated with old United Underground operations was removed during 2020.
			All demolition work has been carried out in accordance with AS2601-2001: The Demolition of Structures, or its latest version	Demolition of the United Underground infrastructure was undertaken in accordance with AS2601-2001.
			Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc) have been met (e.g. archival recording, building retention or building demolition with footings preserved)	No heritage obligations associated with removed infrastructure. Details of heritage activities undertaken during 2021 are provided in Section 6.6.
			Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, storage racks, samples	Infrastructure associated with old United Underground operations were removed during 2020.
			Removal of all footings or removal to a certain depth (less than 0.3 metres)	All footings associated with the United Coal Preparation Plant and overhead conveyors were removed and processed onsite.
			Removal of all water management infrastructure (including pumps, pipes and power)	Not applicable during 2021.
			Contamination will be appropriately remediated so that appropriate guidelines for land use are met, e.g. Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999)	Not applicable during 2021.
			All drill cores have been removed and either taken to authorised storage or disposal location	Not applicable during 2021.
			Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards	The United UG gas well VW3 was sealed during 2021.

Table 7-2 Review of Rehabilitation Against Preliminary Closure Criteria – Infrastructure to Remain

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
Native Ecosystem (CEEC/EEC) or Native Vegetation (non CEEC/EEC) or Agricultural Land Use	All Domains	Infrastructure to Remain All infrastructure that is to remain as part of the final land use is safe	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use	Not applicable during 2021.
			Potential hazards (e.g. electrical, mechanical) have been effectively isolated	Not applicable during 2021.
			Access tracks that are to remain are in a trafficable condition that is suitable for their intended purposes	Not applicable during 2021.
			Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration)	Details of heritage activities undertaken during 2021 are provided in Section 6.6.
			The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use	Not applicable during 2021.
			Appropriate security measures have been implemented to minimise the potential for unauthorised access during the period that the site is transitioned to the intended final land use	Not applicable during 2021.
			Where practical, exposed carbonaceous material will be removed and co-disposed within the mining voids or suitably capped in situ	Not applicable during 2021.
			If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use Note: if any underground pipelines or other infrastructure are to remain in situ in areas to be returned for agriculture – cropping they are at a depth >0.5m	Not applicable during 2021.

Table 7-3 Review of Rehabilitation Against Preliminary Closure Criteria – General Rehabilitation Management

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
Native Ecosystem (CEEC/EEC) or Native Vegetation (non CEEC/EEC) or Agricultural Land Use	All Domains	Land Contamination There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm	Contamination will be appropriately remediated to a condition that does not pose a threat of environmental harm or constrain the final land use	United Wambo has two bioremediation areas that remediates contaminated material.
		Landform Stability The final landform is stable and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna	Minimal erosion that would not require moderate to significant ongoing care and maintenance works Any areas of active erosion are within the parameters for safe and stable landform Discharge points from rehabilitated landform to natural channels are stable	Rehabilitation monitoring undertaken in 2021 identified instances of erosion in the existing Wambo rehabilitation areas. Repair works have been added into the United Wambo maintenance schedule.
			Drainage structures (including drainage lines established in the final landform) are stable and there is no evidence of overtopping or significant scouring as a result of runoff	Rehabilitation monitoring undertaken in 2021 identified instances of erosion and tunnelling of contour banks in the existing Wambo rehabilitation areas. Repair works have been added into the United Wambo maintenance schedule and will be completed in 2022.
		Tailings Storage Areas The tailings storage facilities on site will be capped to minimise the potential for exposure of potentially environmentally sensitive tailings material in the rehabilitated landform	Residual waste materials stored on site (e.g. tailings dams) will be appropriately contained/encapsulated so it does not pose any threat of environmental harm or constrain the intended final land use	The Capping Strategy for the United Tailings Dams 1 and 2 was prepared and approved during 2020. Capping works commenced in 2021 and are due to be completed in Q1 2022.
			The tailings storage facilities on site will be capped and reshaped to be free-draining to minimise the potential for exposure of potentially environmentally sensitive tailings material in the rehabilitated landform	The Capping Strategy for the United Tailings Dams 1 and 2 was prepared and approved during 2020. Capping works commenced in 2021 and are due to be completed in Q1 2022.
			Tailings storage areas have been capped in accordance with an approved Detailed Capping Design	The Capping Strategy for the United Tailings Dams 1 and 2 was prepared and approved during 2020. Capping works commenced in 2021 and are due to be completed in Q1 2022.

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
			Tailings storage areas have been capped and there is no occurrence of spontaneous combustion within the final landform	The Capping Strategy for the United Tailings Dams 1 and 2 was prepared and approved during 2020. Capping works commenced in 2021 and are due to be completed in Q1 2022.
		Bushfire The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service	United Wambo has a Bushfire Management Plan that is implemented onsite.
		Surface Water Quality Runoff water quality is similar to, or better than, the pre-mining disturbance runoff water quality	Runoff water quality from rehabilitation areas represent an acceptable level of change from a background condition (baseline study)	Water quality monitoring includes sediment dams that receive run off from rehabilitated areas. Results show trends towards background levels in watercourses.
			Water quality in all storages left on site (other than final voids) is suitable for the approved final land use	Water quality monitoring includes sediment dams that receive run off from rehabilitated areas. Results show trends towards background levels in watercourses.
			Water quality in any approved final voids does not pose a risk to the final land use	No final voids as of 2021.
		Groundwater Quality & Regime The risk to important groundwater assets (GDE's, Alluvial Aquifers, Landholder bores) has been addressed by the rehabilitation	Groundwater quality and groundwater regime are within range as predicted in environmental assessments and in accordance with water sharing plans and water allocations held by the site	See **Section 6.9**for information regarding groundwater impacts.
		Water Approvals Structures that take water are appropriately licensed	Licenses held, where required	See **Section 6.9.7** for details on water licensing.

Table 7-4 Review of Rehabilitation Against Preliminary Closure Criteria – Ecological Rehabilitation 1, 2 and 3

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
Ecological Rehabilitation	All Domains	Ecological Rehabilitation Objective 1 The vegetation composition of the rehabilitation is recognisable as the target vegetation community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System) Native plant species are characteristic of the target plant community(s) Note: Recognisable is defined as "Diagnostic species present for each Growth form for PCT/TEC using the scientific description of the PCT available on Bionet. Lists of diagnostic species are available through the listing criteria."	Native plant species are characteristic of the target plant community(s) Notes: "Characteristic of target plant community" is defined as "50% of all species in each Growth Form (i.e. trees, shrubs, grasses, forbs and ferns and other) that are known and accepted to form part of the PCT/TEC against benchmark value"	9.9ha of rehabilitation was seeded as HU905 / PCT 1604 – Central Hunter Ironbark – Grey Box Woodland in 2021. The rehab will be monitored to ensure trending towards the recognised community.
		Ecological Rehabilitation Objective 2 The vegetation structure of the rehabilitation is recognisable as, or is trending towards the target plant community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System) Note: "Trending Towards the target plant community" requires use of time series data to show canopy height and cover for each Growth Form against benchmark value range (or successional benchmarks)	Cover and height range of all Growth Forms are characteristic of, or trending towards, the target plant community(s)	9.9ha of rehabilitation was seeded as HU905 / PCT 1604 – Central Hunter Ironbark – Grey Box Woodland in 2021. The rehab will be monitored to ensure trending towards the recognised community.

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
		Ecological Rehabilitation Objective 3 Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable OR is trending towards the target plant community (e.g. plant community type (PCT) contained within the NSW Vegetation Information System)	Growing media status is "suitable" for the target plant community(s) establishment, and indicators of nutrient cycling are "suitable" for sustaining the target plant community	9.9ha of rehabilitation was seeded as HU905 / PCT 1604 – Central Hunter Ironbark – Grey Box Woodland in 2021. The rehab will be monitored to ensure trending towards the recognised community.
			Plant recruitment is "suitable" for sustaining the target plant community(s) Suitable means: trees and shrubs: evidence of flowering and seeds or second generation juveniles. At least one individual less than 5cm DBH present per plot as per BAM short lived growth forms, including grasses, herbs and forbs: requires demonstration of persistence over time including series monitoring and monitoring of reproductive structures (e.g. buds, flowers and fruit)	9.9ha of rehabilitation was seeded as HU905 / PCT 1604 – Central Hunter Ironbark – Grey Box Woodland in 2021. The rehab will be monitored to ensure trending towards the recognised community. During 2021, rehabilitation monitoring of ecological rehabilitation areas found the following: • Total recorded species richness across all monitored areas was very high (101 species) and comprised 60.4% native species and 39.6% exotic species. • Vegetation composition was generally adequate for the ground and mid-storey layers, but inadequate and requiring management for the canopy layer. • Priority weed cover was within acceptable levels at two of the four monitoring sites (<8.0% cover) but excessive at the other two monitoring sites where the problematic Rhodes Grass and Guinea Grass dominated the ground layer. A range of management strategies and measures, including tree-layer management (selective thinning, opportunistic infilling, revegetation) and weed management, have been identified and included in the UWJV rehabilitation maintenance strategy.

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
			Plant competition is "suitable" for sustaining the target plant community(s) Suitable means: 1. weeds: demonstrated decline in cover of high threat weeds measured as a moving average over time. Cover of high threat weeds within range measured at reference sites	9.9ha of rehabilitation was seeded as HU905 / PCT 1604 – Central Hunter Ironbark – Grey Box Woodland in 2021. The rehab will be monitored to ensure trending towards the recognised community. During 2021, rehabilitation monitoring of ecological rehabilitation areas found the following: • Total recorded species richness across all monitored areas was very high (101 species) and comprised 60.4% native species and 39.6% exotic species. • Vegetation composition was generally adequate for the ground and mid-storey layers, but inadequate and requiring management for the canopy layer. • Priority weed cover was within acceptable levels at two of the four monitoring sites (<8.0% cover) but excessive at the other two monitoring sites where the problematic Rhodes Grass and Guinea Grass dominated the ground layer. A range of management strategies and measures, including tree-layer management (selective thinning, opportunistic infilling, revegetation) and weed management, have been identified and included in the UWJV rehabilitation maintenance strategy.
			Animal habitat is characteristic of the target plant community(s) (as measured by the above composition, structural and functional components)	9.9ha of rehabilitation was seeded as HU905 / PCT 1604 – Central Hunter Ironbark – Grey Box Woodland in 2021. The rehab will be monitored to ensure trending towards the recognised community.

Table 7-5 Review of Rehabilitation Against Preliminary Closure Criteria – Native Vegetation Rehabilitation – (Non EEC/CEEC)

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
Native Vegetation (Open Woodland)	All Domains	Vegetation Composition	Rehabilitation areas contain flora species assemblages characteristic of each Growth Form for the target native vegetation communities (currently HU905 and HU816)	UWJV commenced the rehabilitation monitoring program during 2021. During 2021, only blocks of native vegetation (open woodland) rehabilitation less than three years old were monitored. The monitoring found generally that the areas had poor native vegetation establishment and high levels of weeds. As such, recommended actions have been prepared and incorporated into the United Wambo rehabilitation monitoring schedule.
		The rehabilitation is self-sustainable	Evidence of flowering and seeds or second generation juveniles for trees and shrubs, or likely to be, based on comparable older rehabilitation sites	UWJV commenced the rehabilitation monitoring program during 2021. During 2021, only blocks of native vegetation (open woodland) rehabilitation less than three years old were monitored. The monitoring found generally that the areas had poor native vegetation establishment and high levels of weeds. As such, recommended actions have been prepared and incorporated into the United Wambo rehabilitation monitoring schedule.
		Habitat features incorporated	Habitat features (e.g. logs, rocks and nest boxes), including structures suitable for target species are incorporated into rehabilitation areas at required densities, as required by Approvals Native rehabilitation areas provide a range of structural features (e.g. trees, shrubs, ground cover, developing litter layer, etc.)	UWJV commenced the rehabilitation monitoring program during 2021. During 2021, only blocks of native vegetation (open woodland) rehabilitation less than three years old were monitored. The monitoring found generally that the areas had poor native vegetation establishment and high levels of weeds. As such, recommended actions have been prepared and incorporated into the United Wambo rehabilitation monitoring schedule.
		Connectivity established	Habitat corridors are established and consistent with target vegetation community compositions, as required by Approvals	The final landform and rehabilitation plan has native vegetation corridors included.
		Target fauna assemblages and habitat in rehabilitation areas	Monitoring confirms target native fauna species are recorded utilising rehabilitation areas or habitat suitable for target species is present, as required by Approvals	UWJV commenced the rehabilitation monitoring program during 2021. During 2021, only blocks of native vegetation (open woodland) rehabilitation less than three years old were monitored. The monitoring found generally that the areas had poor native vegetation establishment and high levels of weeds. As such, recommended actions have been prepared and incorporated into the United Wambo rehabilitation monitoring schedule.

Table 7-6 Review of Rehabilitation Against Preliminary Closure Criteria – Agricultural Rehabilitation

Post Mining Land Use (Final Land Use Domain)	Rehabilitation Objectives		Completion Criteria	Activities in 2021
Agricultural Land Use	All Domains	Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use	Land and Soil Capability classification or Agricultural Land Classification criteria met Rehabilitation areas comprise palatable grasses and legumes appropriate to the district and suitable for cattle grazing Weed presence is within range found analogue sites and does not present a risk to the intended final land use Cropping/Pasture establishment is in good health and provides adequate cover Cropping yields from rehabilitated areas is similar to adjacent cropping land Ground cover (vegetation, leaf litter, mulch) is greater than 70%	UWJV commenced the rehabilitation monitoring program during 2021. Areas of existing rehabilitation in Montrose East with an agricultural land use generally found: • High vegetation cover, with some minimal to nil bare areas • Despite an adequate diversity of palatable and productive pasture species recorded, the proportion of total live cover provided by desirable species averaged only ~46.7% for all sites, below the GCAA IEM target of 70%. • Galenia is an issue across the most of the emplacement area, with locally very severe infestations. A significant weed control effort is planned to remove the infestations of Galenia throughout the emplacement area.
			Appropriate and reliable access to water for livestock Appropriate shade and shelter for livestock (i.e. wooded/treed areas) during extreme weather conditions	Not applicable in 2021

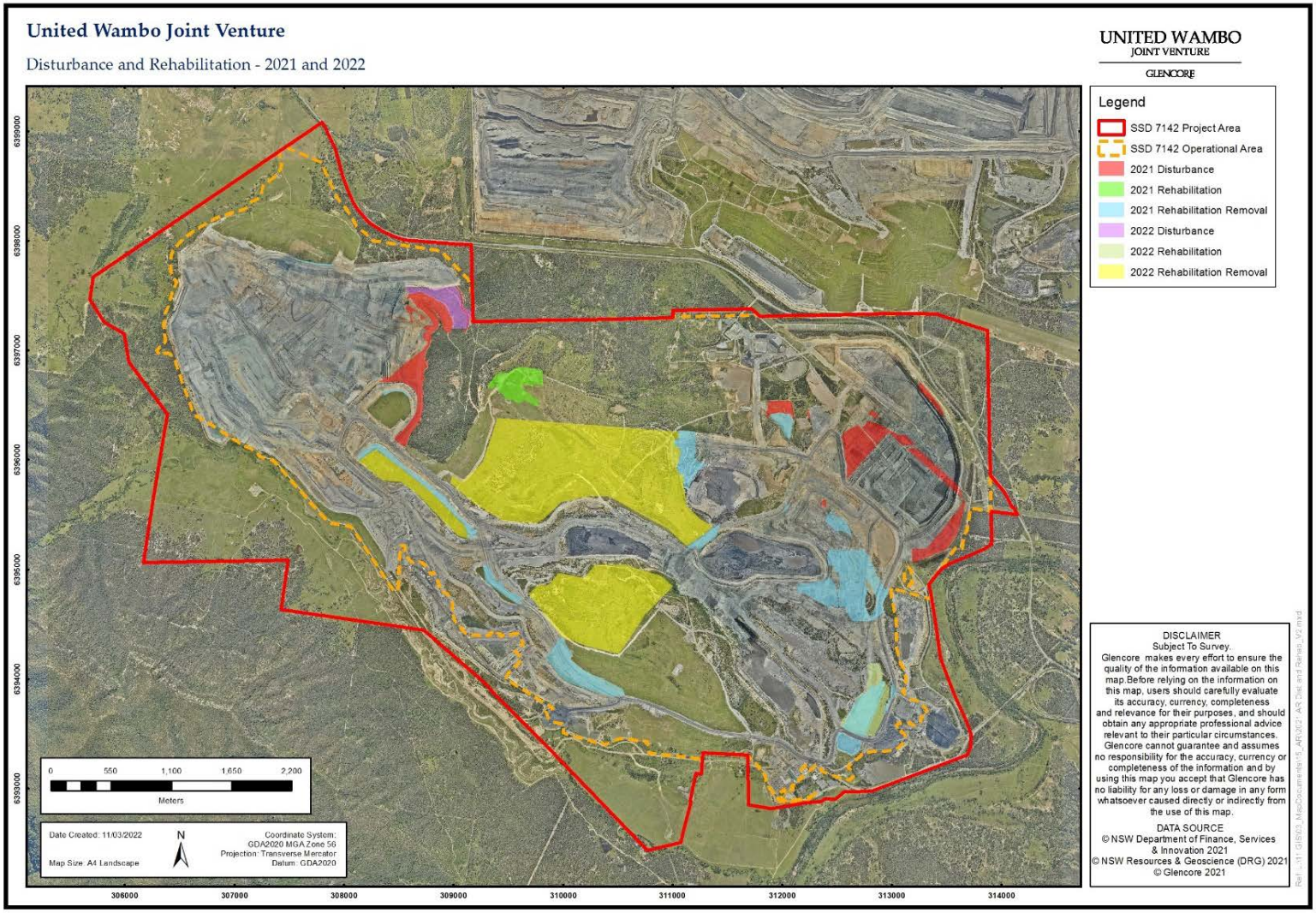


Figure 7-1 Disturbance and Rehabilitation for 2021 and 2022 at United Wambo

7.2 Rehabilitation Status

No rehabilitation at United Wambo has received sign off from the Resources Regulator for having successfully met the rehabilitation objectives and completion criteria. A summary of rehabilitation is outlined in ***Table 7-7***.

Table 7-7 Rehabilitation Status

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	Year 2020 (ha)	Year 2021 (ha)	Year 2021 (ha)
A. Total Mine Footprint	1,980.4	2,043.5	2,052.3
B. Total Active Disturbance	1,377.0	1557.1	1784.2
C. Land Being Prepared for Rehabilitation	0	9.9	15.5
D. Land Under Active Rehabilitation	603.4	486.4	268.1
E. Completed Rehabilitation	0	0	0
Other Areas	0	0	0

Definitions of Rehabilitation Areas

Total mine footprint *includes all areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities. As such it is the sum of total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development and relinquished lands (as defined in DRE MOP/RMP Guidelines). Please note that subsidence remediation areas are excluded.*

Total active disturbance *includes all areas ultimately requiring rehabilitation such as: on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), and tailings dams (active/unshaped/uncapped).*

Land being prepared for rehabilitation *– includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development (as defined in DRE MOP/RMP Guidelines).*

Land under active rehabilitation *- includes areas under rehabilitation and being managed to achieve relinquishment – includes the following rehabilitation phases as described in the DRE MOP/RMP Guidelines – "ecosystem and land use establishment" (area seeded OR surface developed in accordance with final land use) and "ecosystem and land use sustainability" (revegetation assessed as showing signs of trending towards relinquishment OR infrastructure development).*

Completed rehabilitation *– requires formal sign-off by DRE that the area has successfully met the rehabilitation land use objectives and completion criteria.*

7.2.1 Rehabilitation Trials and Research

No rehabilitation trials or research were completed in 2021.

7.3 Actions for Next Reporting Period – Rehabilitation

As per the United Wambo Rehabilitation Management Plan, 15.5 hectares of rehabilitation will be undertaken in 2022, comprising of overburden emplacement areas in the south east of the site.

In 2022, 8.8 hectares of new disturbance will be undertaken. For the development of the overburden emplacement areas, 233.8 hectares of previously rehabilitated areas will be redisturbed.

Rehabilitation and disturbance for 2021 is shown ***Table 7-8***.

The Annual Review Guideline (DPE 2015) requires the Annual Review to outline the rehabilitation actions proposed during the next reporting period. These actions are detailed in ***Table 7-8***.

Table 7-8 Actions for the Next Reporting Period

Action	Site Comment
Undertake 15.5 hectares of rehabilitation.	Commitment from United Wambo Rehabilitation Management Plan.
Implement United Wambo rehabilitation maintenance schedule for 2022	Recommended actions from rehabilitation monitoring have been included in a schedule to be implemented over the next three years, with higher risk actions being implemented in 2022. Works planned for 2022 include repairs to erosion and tunnelling in old rehab areas and commencement of weed control works in priority areas, including in the 2021 rehab area and topsoil stockpiles.

8. Community

8.1 Community Engagement Activities

United Wambo operates a Community Consultative Committee (CCC) in accordance with Schedule 2, Condition A19 of the United Wambo SSD 7142.

During 2020, United provided information to the community through the Wambo CCC to provide updates on the United Wambo Project. The United Wambo CCC was also be provided the completed 2021 ANNUAL REVIEW.

The following community engagements were undertaken in 2021:

- Voluntary Planning Agreement (VPA) committee was established with Singleton Council and community members. The first meeting was held on 4 August, with another meeting on the 4 November 2021;
- CCC Meetings held 9 February, 4 May, 28 September and 9 November;
- Community Newsletters distributed in February, July and December 2021;
- Community Information Night held on 21 April – second information night postponed due to Covid-19;
- Community Perception Survey open from December 2021
- Various consultation meetings with nearby residents regarding mitigation works at their properties, exploration, structural assessment, locations of noise monitors; and
- Tank cleaning and inspection program for residents.

8.2 Community Contributions

The following community contributions were made by United Wambo in 2021:

- Donation to Ron Stokes for publishing his book on the Dairy Carriers of the Singleton area, 'A Bygone Era';
- Crocfest for Rural Aid – this was an identified health need for the Jerrys Plains and Singleton communities;
- PCYC Singleton – funds were donated to cover the cost of a new boxing ring;
- Mark Hughes Foundation – donation made to support brain cancer research and the families it affects; and
- Singleton Lolly Run – donation to cover the cost of lollies which are delivered to children in local communities.

8.3 Complaints

Forty-eight complaints were received during the reporting period. The increase in complaints coincided with United Wambo taking over management of Wambo Open Cut and significant operations developing in the United Open Cut. There were 30 noise related complaints, with the majority received over the autumn and winter periods. Lighting related complaints were the next highest received, at 15. There has been continuous training and coaching provided to the Production crews to reduce the number of lighting issues identified by neighbours. Engineering solutions to the lighting plant setup are also being investigated. A detailed summary of the UWJV complaints for 2021 can be found in ***Appendix F -Summary of Complaints***.

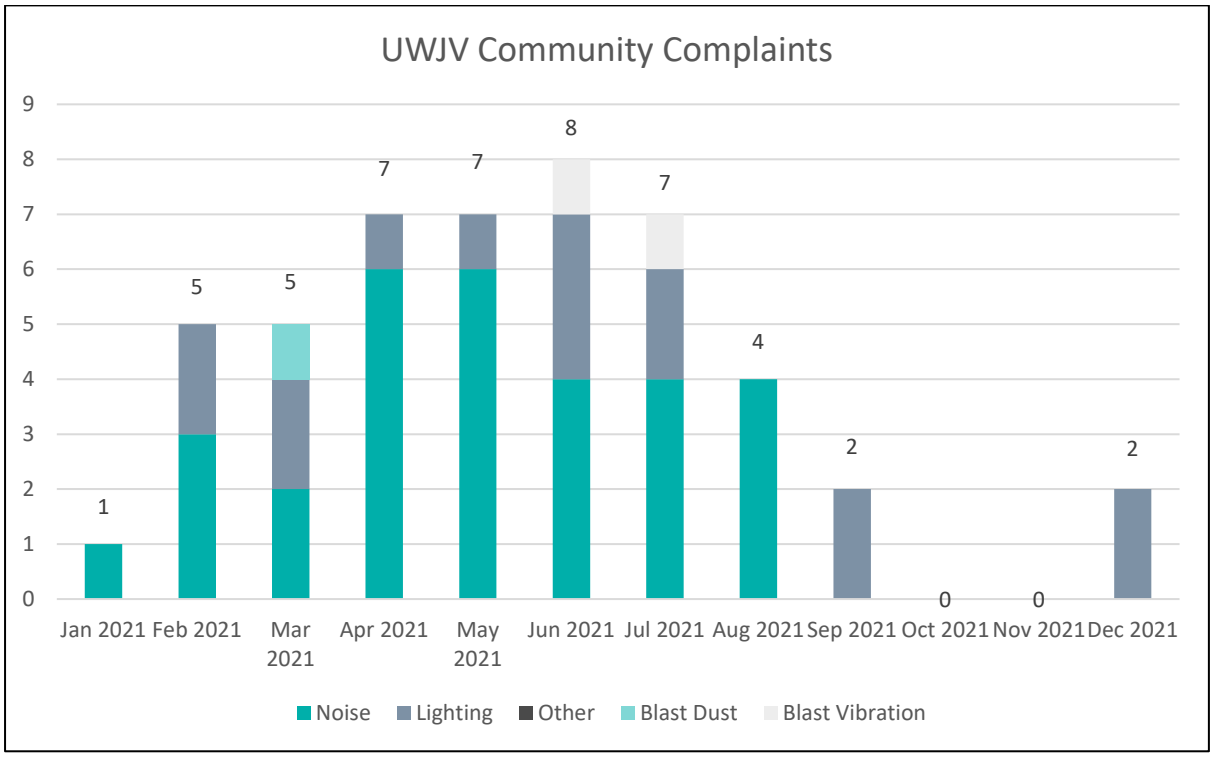


Figure 8-1 Chart of Community Complaints

All complaints were addressed with the appropriate actions including modifying operations where required.

United received three complaints in 2020, one complaint in both 2019 and 2018.

United Wambo will continue to monitor complaint trends. United Wambo operates a 24-hour community Complaints and Enquiries Hotline to ensure that any community concerns can be recorded and responded to as soon as possible. The community hotline number is 1800 801 440. The number is advertised on United Wambo website at *https://www.glencore.com.au/operations-and-projects/coal/current-operations/united-wambo-open-cut.*

9. Independent Environmental Audit

Schedule 2 Part E Condition E12 of SSD 7142 refers to the requirement to complete an Independent Environmental Audit (IEA) within one year of commencement of development and every three years after. Schedule 6, Condition 6 of Development Consent DA 410-11-2002-i- also requires an IEA every three years. In a letter dated 9 September 2020, a request was received from DPIE to undertake a combined audit for both consents.

The IEA was conducted by Integrated Environmental Management Australia Pty Ltd (IEMA) and commenced on 25 November 2020 for the following audit periods:

- DA 410-11-2003-I – 18 December 2018 – 30 November 2020
- SSD7142 – 6 January 2020 – 30 November 2020

The IEA also includes specialist input regarding air quality and groundwater.

9.1 Audit Findings

The IEA generally identified a high level of compliance with three medium risk non-compliances all relating to the same incident. In summary, the following non-compliances were observed.

- There were three medium risk non-compliances, one low risk non-compliances and four administrative non-compliances for SSD 7142.
- There were three low risk non-compliances and one administrative non-compliance for DA-410-11-2002-i.
- There were five low risk non-compliances and two administrative non-compliances for EPL 3141.
- No non-compliances for CCL 775.

The site visits demonstrated that United Wambo is generally compliant and well maintained, with highlights including:

- Efficient use of water trucks and minimal air quality issues;
- High compliance with waste management, including proper storage of HAZMAT and hydrocarbon materials;
- Effective proactive steps to minimise operational impacts to the environment relating to noise and air quality including:
    - Utilising daily meteorological predictions to determine operational best practice. These reports are discussed at the daily pre-starts.
    - Fitting machinery and trucks with Tier 4 Final requirements;
    - Utilising a real-time noise alarm system and an effective TARP during extraordinary meteorological events; and
    - and implementing back-up power supply batteries to monitoring locations that are known to have electrical issues.

- There was a high degree of participation from the United Wambo Environment and Community team which demonstrates the importance of environment and community compliance management at site;
- The Environment and Community team have demonstrated that they are compliant with incident reporting and investigations;
- The annual reporting (AEMRs) have generally been to a high standard; and
- United Wambo had excellent performance in the field. This included inspecting two blast incidents which went without any problems or exceedances.

The final IEA Report was submitted to DPIE on 24 March 2021. A Request for Further Information was received from DPIE on 18 June 2021 and a response was provided by UWJV 19 July 2021. On 13 September 2021, DPIE provided advice that the IEA including additional information was satisfactory.

The IEA Report is available on the United Wambo website, an update to the *Response to Audit Recommendations (RAR)* initially provided as part of the IEA is provided in ***Appendix G -Independent Environmental Audit Action Plan***.

In accordance with Condition E7 of SSD7142, the suitability of existing strategies, plans and programs required under SSD 7142 were reviewed following the submission of the IEA Report. No revisions were made at this time.

10. Incidents and Non-Compliances Within the Reporting Period

10.1 Summary of Incidents

Incidents and non-compliances which are considered as low risk of environmental harm are detailed in this section.

10.1.1 Sediment Dam Overflows

There were three offsite discharges at United Wambo during 2021 during greater than design rainfall events. All events were reported in accordance with SSD 7142 and EPL 3141 requirements.

On 4 January 2021, the Wambo weather station recorded 83.6mm of rain from 3pm to 9:30pm. Forty-five millimetres of rain fell in the hour between 4:00 and 5:00pm. The MIA Sediment Dam was inspected at 9:00pm and was found to be overflowing via the spillway. The MIA Sediment Dam was inspected prior to the rainfall event, the water level was observed to be below the required storage zone level. The dam was designed in accordance with the Blue Book and the United Wambo Construction Erosion and Sediment Control Plan for a 85% 24 hour rainfall event of 31.7mm.

A significant rainfall event occurred from 18-23 March 2021, with a total of 211.4mm of rainfall recorded at the Wambo meteorological station. During the rainfall event, the MIA Sediment overflowed on two occasions on 20 and 23 March. The MIA Sediment Dam was inspected on multiple occasions throughout the event and the pump was run continuously. The dam was designed in accordance with the Blue Book and the United Wambo Construction Erosion and Sediment Control Plan for a 85% 24 hour rainfall event of 31.7mm.

On 12 November 2021, two sediment dams have overflowed following a significant rainfall event overnight – the MIA Sediment Dam and the Redbank Creek Coffer Dam. A total of 75.8mm of rainfall was recorded on the Wambo met station and 57mm of rainfall at the United met station in the previous 24 hours. This followed 58.6mm at Wambo and 60.8mm at United recorded the previous day. The design rainfall event for sediment dams at UWJV is 54.7mm in 24 hours. The MIA Sediment Dam was inspected through the night and was found to be overflowing at 5:00am. The Redbank Coffer Dam was inspected through the night as well, including around 5:00am and found to be full but not overflowing. When reinspected at 5:45am it was found to be overflowing in two places.

Following the January and March events, a revised design was undertaken for the MIA Sediment Dam to increase the capacity from 2.8ML to 3.4ML. Further design works are ongoing in 2022 to potential increase the size of the dam to capture significantly more than the required storm event.

10.2 Summary of Non-Compliances

10.2.1 Air Quality

Real Time Monitoring - <75% daily data collection

On the dates listed in ***Table 10-1*** the TEOMs failed to obtain a valid sample for varying lengths of time. The failure to obtain the samples was a result of varying causes, including unplanned power outages, mechanical and software issues, and planned maintenance. As a result of the missing data a sample capture percentage of <75% for the day occurred on each of the dates identified, therefore a valid 24-hour average could not be calculated. The specific cause and subsequent response taken to rectify the issues related to each outage has been included in ***Table 10-1***.

Table 10-1 Summary of Missing Data for Real Time Monitoring

Monitor	Date	Cause	Comment
AQ01	2/3/2021-3/3/2021	Power outage as result of powerlines construction work	Following power outage, the unit was inspected by the environmental contractors to ensure no damage occurred.
	5/3/2021	Power outage as result of powerlines construction work	Following power outage, the unit was inspected by the environmental contractors to ensure no damage occurred
	9/11/2021-10/11/2021	12-monthly maintenance to monitor	
AQ02	2/12/2021-3/12/2021	12-monthly maintenance to monitor	
AQ03	3/1/2021-4/1/2021	TEOM required a remote reboot	
	11/1/2021	TEOM required a remote reboot	
	10/2/2021-11/2/2021	Down for maintenance	
	16/2/2021	Software issue	
	19/2/2021	Monitor required replacement of CF card	
	18/3/2021	Significant rainfall gave invalid readings	
	22/3/2021	Significant rainfall gave invalid readings	
	14/6/2021-15/6/2021	Power failure to monitor	
	15/7/2021-16/7/2021	Unit fault	
	29/7/2021-30/7/2021	Breaker tripped on monitoring unit	
	17/12/2021	Outage due to dryer replacement	
	22/12/2021-23/12/2021	Power interruption due to storm	
	25/12/2021-31/12/2021	Issue with power to monitor	
AQ04	23/8/2021-25/8/2021	Invalid due to filter leak	
	1/12/2021-2/12/2021	12-monthly maintenance to monitor	

10.2.2 Noise

On 22 July 2021 noise levels at NM02 exceeded the attended noise monitoring criteria due to the application of a low-frequency modifying factor. Operational changes were made at United Wambo immediately following the exceedance and a follow up measurement was taken, which was compliant. The affected resident was notified of the exceedance.

A consultant was engaged to undertake an investigation of the exceedance. This included a review of the noise and meteorological data from the date of the non-compliance, a review of the audio files and modular operational information (GPS data for the machines operating). A review of the noise monitoring network was undertaken to identify any potential improvements in regard to assessment of the contribution of low frequency noise in accordance with the approved Noise Management plan. The report on these findings was provided to the EPA on 10 September 2021. United Wambo will continue with the noise monitoring program and noise attenuation works on equipment.

11. Activities to be Completed in Next Reporting Period

Table 11-1 outlines the key proposed activities during 2022.

Table 11-1 Proposed Actions for 2022

Proposed Action	Timeline	2022 Comments
Construction and Demolition	2022	Assessment of Golden Highway Relocation
	2022	Capping works on TD1 and TD2 will be completed. (all tailings associated with the United Wambo open cut operations will be managed by Wambo).
	2022	Demolition of old buildings on Jerrys Plains Offset Property.
Approvals	2022	Approval of Surrender of DA-410-11-2002-i in accordance with Condition A16 of SSD 7142.
	2022	Submit Biodiversity Stewardship Agreement applications for the retirement of biodiversity credit as required by Condition B55 of SSD7142.
Blasting	2022	Complete Blast Fume Monitoring Trial.
Waste Removal	2022	Audit all equipment, buildings and potential waste onsite and on offset properties for use, sale or removal. Develop a schedule for removal during 2023.
Rehabilitation	2022	15.5 hectares of rehabilitation will be undertaken.
		Environmental monitoring, land management and rehabilitation maintenance.
		Targeted weed control in areas identified during monitoring.

12. References

ATC Williams (2017) *Conceptual Closure Strategy, Tailings Dam No.1 & No.2, Glencore United Collieries Pty Ltd, Ref: 110006.08-R01, Revision 1*

GHD (2017) *Stage 1 Preliminary Contamination Investigation, United Collieries Pty Ltd, Warkworth NSW 2330*

Glencore (2014) *Compensatory Habitat Management Plan.*

Glencore (2019) United Wambo Air Quality and Greenhouse Gas Management Plan.

Glencore (2019a) United Wambo Historic Heritage Management Plan.

Glencore (2019b) United Wambo Noise Management Plan.

Glencore (2020) *United Wambo Aboriginal Cultural Heritage Management Plan.*

Glencore (2020a) *United Wambo Biodiversity Management Plan.*

Glencore (2020b) *United Wambo Erosion and Sediment Control Plan.*

Glencore (2020c) *United Wambo Groundwater Management Plan*

Glencore (2020d) *United Wambo Water Management Plan.*

Glencore (2020e) United Wambo Joint Venture Blast Management Plan

HLA Envirosciences Pty Ltd (2002). *United Extension Environmental Impact Statement.*

SLR Consulting (2016) *Mining Operations Plan United Collieries – 1 January 2017 – 4 June 2019.*

SLR Consulting *(2019) Mining Operations Plan United Collieries – 1 January 2017 – 12 July 2020.*

Umwelt (2016) *United Wambo Open Cut Coal Mine Project – Heritage Impact Statement.*

Umwelt (2021) *United Wambo Groundwater Dependent Ecosystem Study*.

Umwelt (2019) *United Collieries 2019 Ecological Monitoring Report.*

Umwelt (2016a) *United Wambo Open Cut Coal Mine Project – Environmental Impact Statement*

Umwelt (2017) *United Wambo Open Cut Coal Project – Response to Submissions Part*

Umwelt (2017a) *United Wambo Open Cut Coal Project – Response to Submissions Part B*

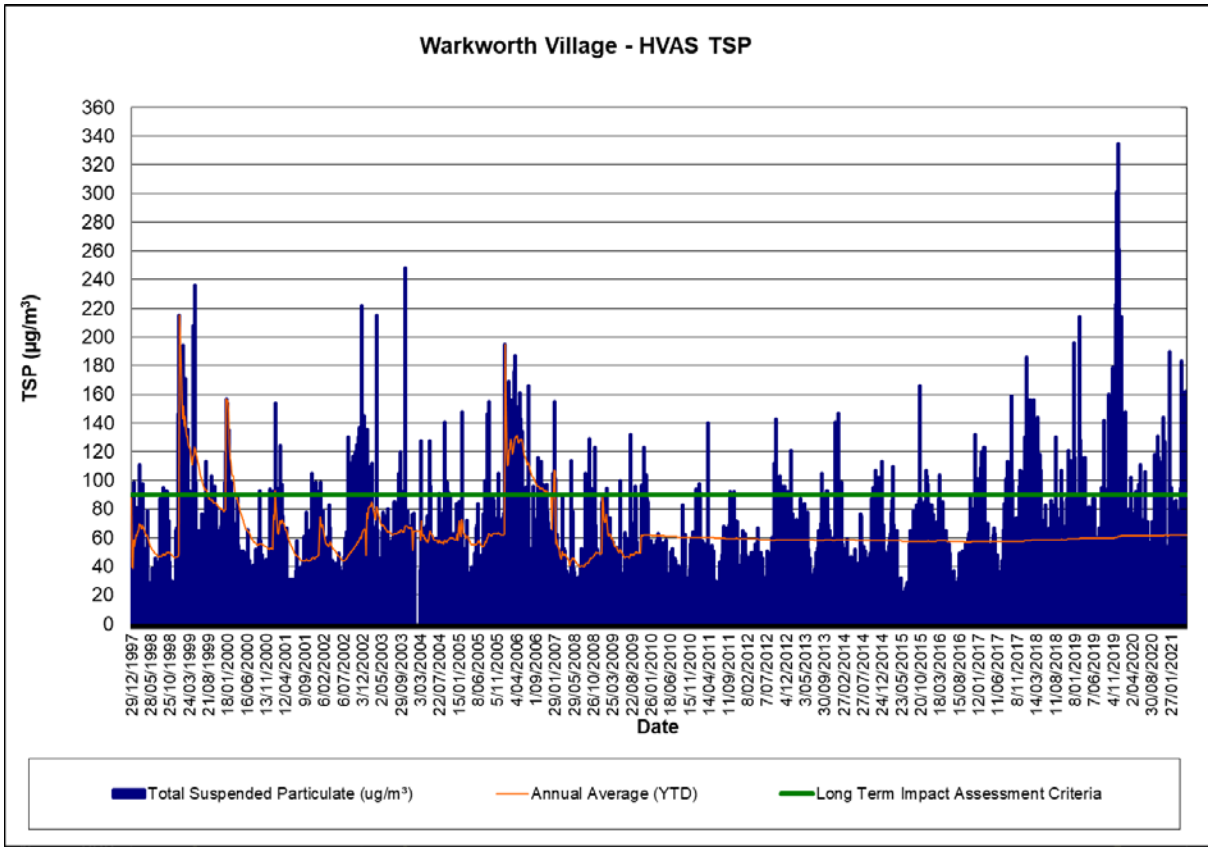
Umwelt (2018a) United Wambo Open Cut Coal Project – Response to Independent Planning Commission Recommendations

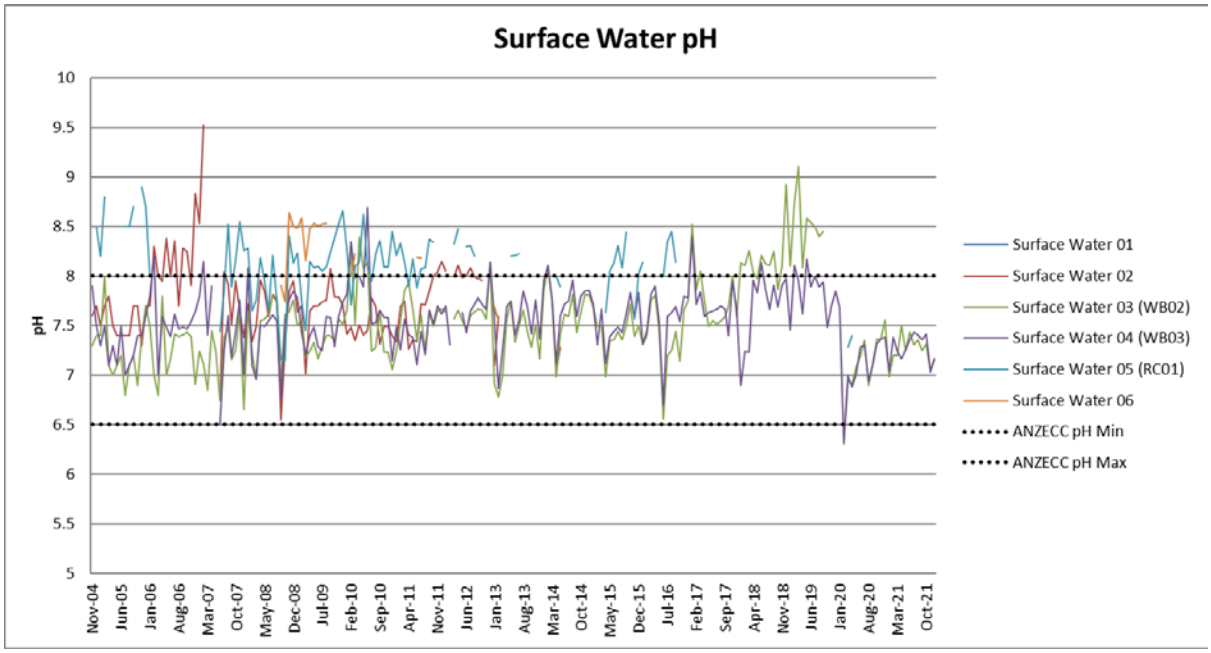
Umwelt (2003) *DA – 410 – 11 – 2002 – i Modification 1. Statement of Environmental Effects – Proposed Extension of Longwall Mining.*

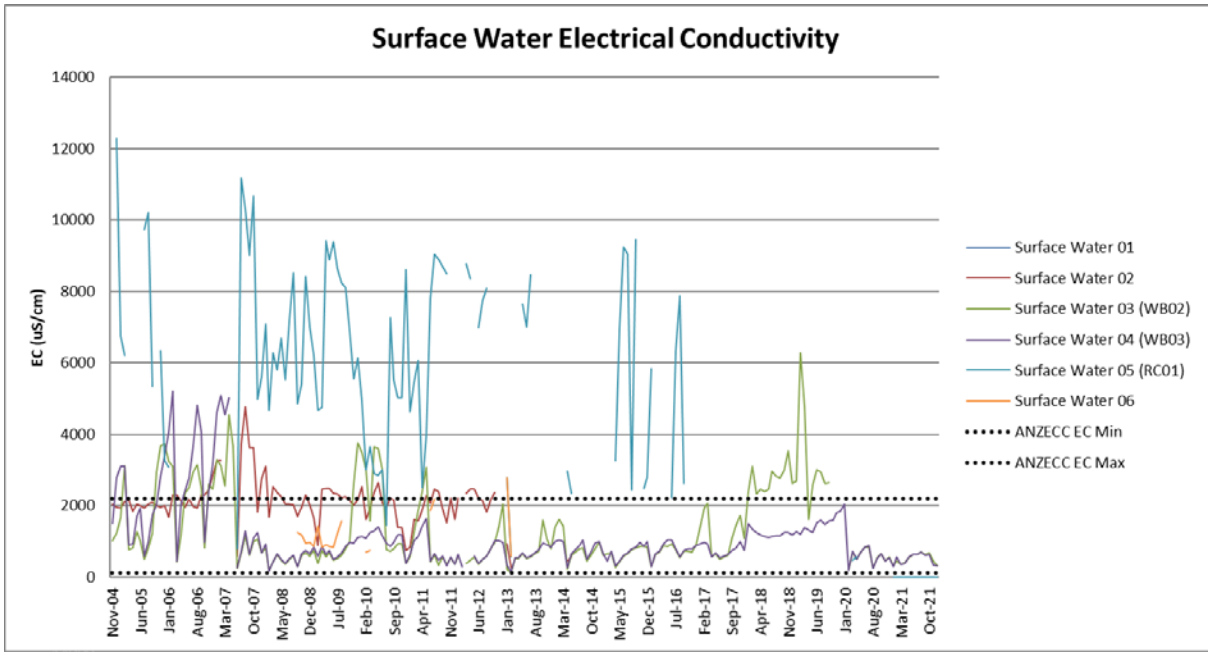
Appendix A - EPBC 2015 – 7600 Compliance Report

Appendix B - $PM_{2.5}$ Monitoring Campaign Report

Appendix C - Additional Environmental Monitoring Results






Surface Water Electrical Conductivity
EC (uS/cm)
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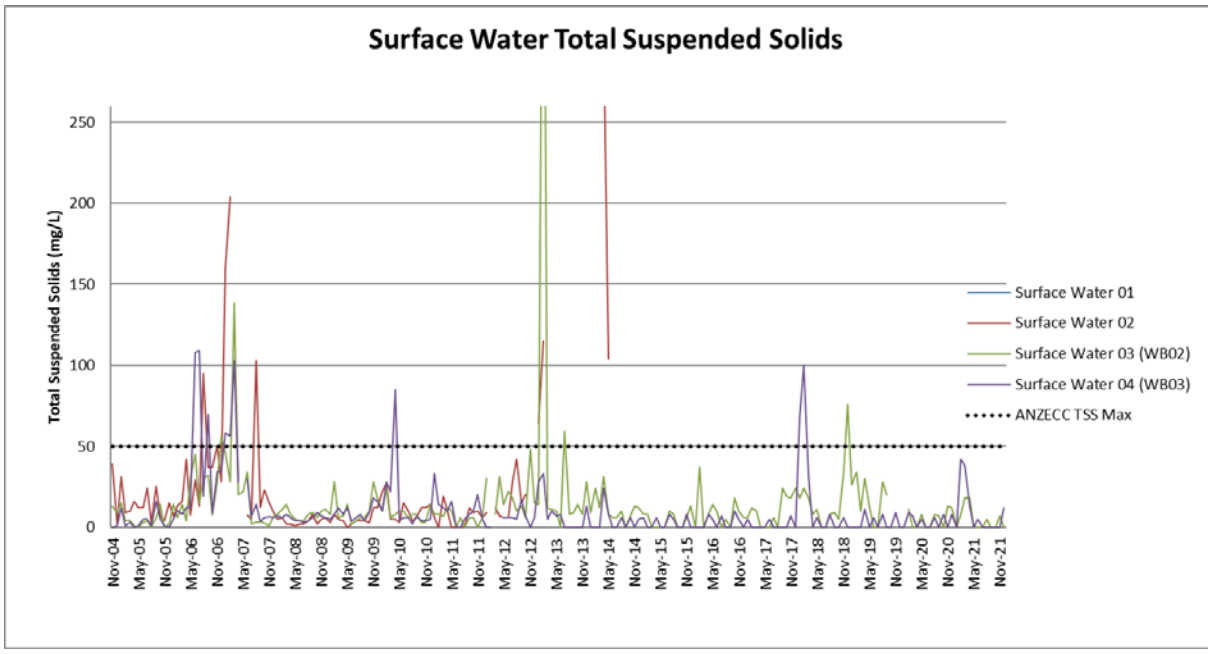
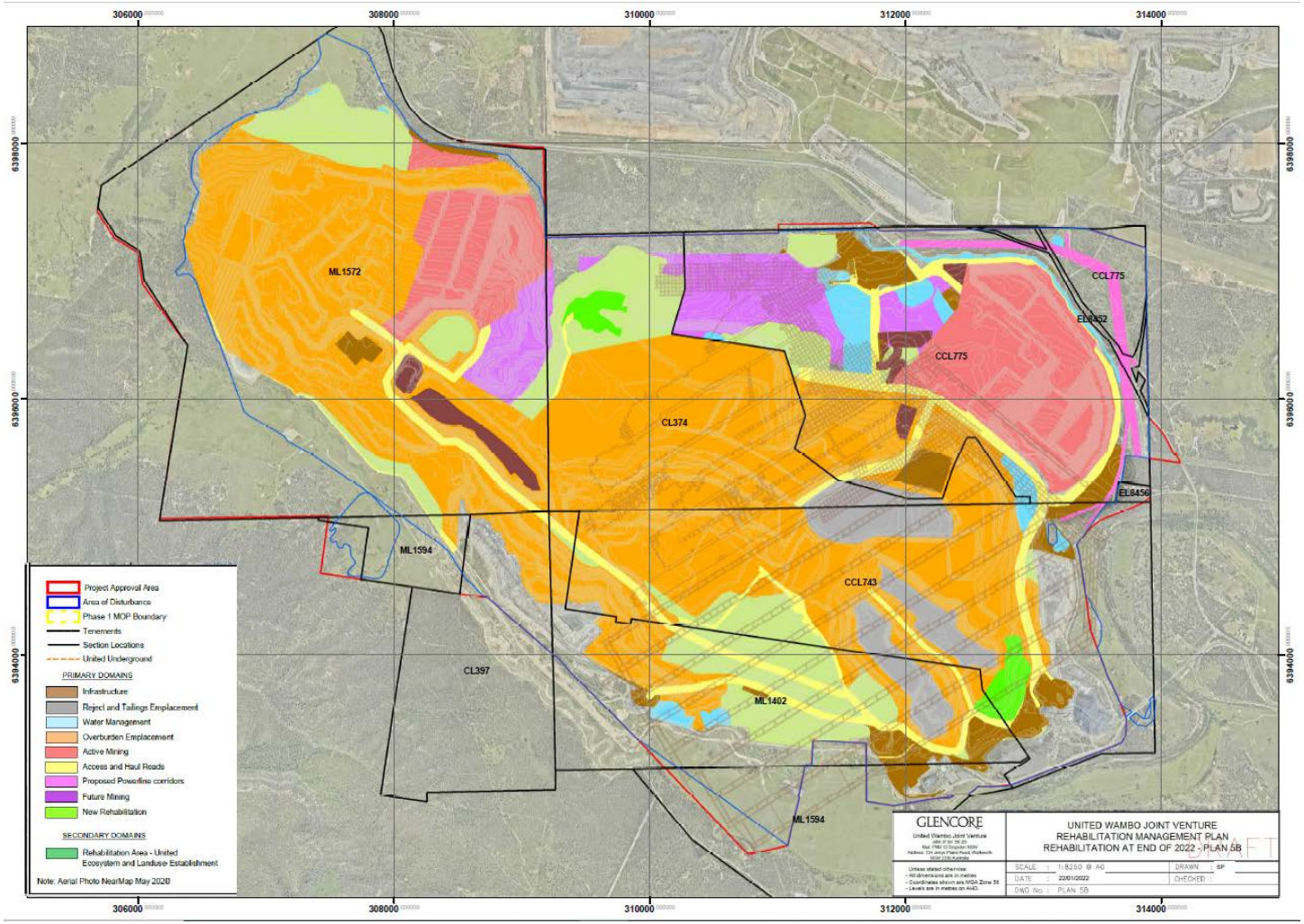
12000
10000
8000
6000
4000
2000
0
Nov-04
Jun-05
Jan-06
Aug-06
Mar-07
Oct-07
May-08
Dec-08
Jul-09
Feb-10
Sep-10
Apr-11
Nov-11
Jun-12
Jan-13
Aug-13
Mar-14
Oct-14
May-15
Dec-15
Jul-16
Feb-17
Sep-17
Apr-18
Nov-18
Jun-19
Jan-20
Aug-20
Mar-21
Oct-21
Surface Water 01
Surface Water 02
Surface Water 03 (WB02)
Surface Water 04 (WB03)
Surface Water 05 (RC01)
Surface Water 06
ANZECC EC Min
ANZECC EC Max


Surface Water Total Suspended Solids
Total Suspended Solids (mg/L)
250
200
150
100
50
0
Nov-04
May-05
Nov-05
May-06
Nov-06
May-07
Nov-07
May-08
Nov-08
May-09
Nov-09
May-10
Nov-10
May-11
Nov-11
May-12
Nov-12
May-13
Nov-13
May-14
Nov-14
May-15
Nov-15
May-16
Nov-16
May-17
Nov-17
May-18
Nov-18
May-19
Nov-19
May-20
Nov-20
May-21
Nov-21
Surface Water 01
Surface Water 02
Surface Water 03 (WB02)
Surface Water 04 (WB03)
ANZECC TSS Max

Appendix D - Groundwater Review

Appendix E - Rehabilitation Figure (MOP Plan)



Appendix F - DPIE Feedback

Department of Planning and Environment
Ms Aislinn Farnon
Environment & Community Manager
United Wambo JV
Wonnarua Country
134 Jerrys Plains Road
WARKWORTH NSW 2330

By email: Aislinn.Farnon@glencore.com.a

30/05/2022

Dear Ms Farnon

United Wambo Joint Venture (SSD-7142 and DA-410-11-2002-I)
2021 Annual Review - Request for Additional Information

I refer to the 2021 Annual Review submitted to the Department of Planning and Environment (the Department) as required under the conditions of development consents SSD-7142, as modified for the United Wambo Joint Venture (UWJV) and DA-410-11-2002-I, as modified, for the United Colleries underground mine. After careful consideration, the Department is requesting that you provide additional information.

You are requested to submit a revised document that addresses the following:

1. **Introduction** – please include an additional figure(s) showing the consent boundaries, mining lease boundaries, operational disturbance footprint as of 31 December 2021 and offset areas.
2. **Surface Water** – Section 6.8.1 states "*United Wambo uses evaporation to control stored volumes of 'dirty water' on site and maintain freeboard in storages to capture runoff from disturbed areas during storm events. Evaporation is maximised by increasing surface area by storing 'dirty water' in numerous dams*". Please update the Annual Review to confirm that using evaporation to control stored volumes of 'dirty water' on site and maintain freeboard in storages to capture runoff from disturbed areas during storm events is consistent with the following requirements in SSD 7142 and the UWJV Water Management Plan:
    a. Table 4 of SSD 7142: *Design, install and maintain sediment dams in accordance with the guidance series Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004) and 2E Mines and Quarries (DECC, 2008) and the requirements under the POEO Act or Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002*.
    b. Commitment in the UWJV Water Management Plan:
        i. "*Water management structures will be constructed and managed in accordance with*:
            - *Landcom 2004. Managing Urban Stormwater – Soils and Construction, Volume 1, 4th Edition*; and
            - *Department of Environment and Climate Change (DECC) 2008. Managing Urban Stormwater - Soils and Construction, Volume 2E – Mines and Quarries*".

1. **Surface Water** – Please confirm if surface water quality monitoring results that exceeded criteria were investigated in accordance with Section 10.4 of the UWJV Surface Water Management Plan.
2. **Stygofauna Monitoring** – Section 6.9.8 reports on stygofauna monitoring which was last undertaken in 2019. Section 6.9.8 states "*To mitigate any potential risks, if groundwater monitoring indicates that impacts are greater than predicted within the shallow alluvial aquifers surrounding the Project Area, more regular monitoring for stygofauna will be triggered*." Section 6.9.1 in the 2020 Annual review commits to "*a more detailed investigation into the potential requirement for additional stygofauna monitoring given the breach of trigger levels in two of the sampled bores*". Please update the Annual Review to clarify if the commitment for regular monitoring for stygofauna has been investigated.
3. **Groundwater Performance** – Section 6.9.9 reports against groundwater performance measures and states that further investigations are pending. However, sections 6.9.6.1 and 6.9.6.2 indicate investigations have been completed. Please update the table in section 6.9.9 to clarify if investigations of groundwater trigger exceedances were completed in 2021 or are still pending.
4. **Independent Environmental Audit (IEA)** – the final IEA Report was submitted to the department on 24 March 2021. Please update the Annual Review to confirm if the suitability of existing strategies, plans and programs required under SSD 7142 were reviewed (in accordance with Condition E7) and if revisions were required and the revised document submitted to the Planning Secretary for approval in accordance with Condition E8.
5. **Typographical errors** – please check the following typographical errors:
    a. Table 3-2 reference to waste condition should be condition B91(d)
    b. Reference to 2020 results in text before Table 6-34
    c. Update Table 6-38 and text preceding Table 6-39 to confirm that water take is for the 2020/2021 water year.

You are requested to provide the information, or notification that the information will not be provided, to the Department by **30 June 2022**. If you are unable to provide the requested information within this timeframe, you are required to provide, and commit to, a timeframe detailing the provision of this information.

Should you wish to discuss the matter further, please contact Ann Hagerthy, Senior Compliance Officer on 02 6575 3407 or compliance@planning.nsw.gov.au

Yours sincerely

Heidi Watters
Team Leader Northern
Compliance

Appendix G - Summary of Complaints

Date	Time	Nature of Complaint	Description & Response
9/01/2021	10:31 PM	Noise	• Complaint received via Community Information Line. Complainant noted noise from the mine - sounds like electric trucks and excavator buckets. • Real time noise monitors were reviewed. An F class inversion was occurring throughout the period. • There were no noise alarms received prior to the time of the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. In response to the complaint, operating trucks in the Montrose pit were redirected, sending older trucks to work lower in the pit in an effort to reduce noise. • Call back was offered but declined.
3/02/2021	4:16 AM	Noise	• Complaint received via Community Information Line. Complainant noted noise from the mine - sounds like electric trucks and excavator buckets. • Real time noise monitors were reviewed. An F class inversion was occurring in the time leading up to the complaint. • There were no noise alarms received prior to the time of the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. In response to the complaint, a dozer was relocated to from the RL115 dump to RL85 and the excavator that was operating on access road to the ridge was parked up. • Call back was offered but declined.

Date	Time	Nature of Complaint	Description & Response
11/02/2021	6:37 AM	Noise	• Complaint received via Community Information Line. Complainant noted loud noise from the mine. • Real time noise monitors were reviewed. An F class inversion was occurring in the time leading up to the complaint. • A noise alarm was received at 6:45 am, however, there were no noise alarms received prior to the time of the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. In response to the complaint, an excavator was stood down. • Call back was offered but declined.
22/02/2021	10:19 AM	Lighting	• Complaint received via Community Information Line. Complainant noted that over the past few days their property had been impacted from lighting. They noted that there was a bright light shining from up on the Ridge and also that blue flashing lights were visible. • Personnel travelled to the complainant's property to view site. Works on Ridge were clearly visible. Camera footage from the previous nights was reviewed in which a lighting plant was visible that appeared to be shining towards the pit. • Complainant was asked to call back that night if the issue persisted.
22/02/2021	11:04 PM	Noise	• Complaint received via Community Information Line. Complainant reported loud mining / engine noise and dozer track noise, no specific sources were noted. • Real time noise monitors were reviewed. • There were no noise alarms received prior to the time of the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. • Call back was offered but declined.

Date	Time	Nature of Complaint	Description & Response
22/02/2021	11:30 PM	Lighting	• Complaint received via Community Information Line. Complainant noted a continuous bright light, which was most likely from the excavator, and several lights which were coming and going which were likely the trucks and dozer. • To minimise the lighting impacts, the lighting plant had been placed in a suitable location facing away from the highway and all but 4 of the lights on the excavator had been turned off. At the time of the complaint personnel had recently undertaken an inspection from the highway which looked satisfactory. • It was determined that the lights were likely from the front of the excavator working on the Ridge. Modifications were made to the lighting on the excavator to reduce impacts.
5/03/2021	1:15 PM	Blast Dust	• Complaint received via Community Information Line. Complainant noted dust and smell of gun powder following UWJV blast event. • The blast was observed by UWJV Personnel from firing location and noted that the shot was not excessively dusty, with a small amount of visible fume. • Drone video footage of blast event was reviewed. The fume quickly dissipated and was not visible prior to leaving site. Most of the dust had also dissipated prior to leaving site. • Real-time dust monitoring data from a monitor located on the neighbouring property was reviewed and showed no increase in dust.
17/03/2021	3:50 PM	Noise	• Complaint received via Community Information Line. Complainant noted loud noise from the mine. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. In response to the complaint, an excavator and 3 dozers were stood down.

Date	Time	Nature of Complaint	Description & Response
18/03/2021	8:42 PM	Lighting	• Complaint received via Community Information Line. Complainant noted that that there was a light shining directly at their residence. • The Mining Supervisor called the complainant back to assist identifying the possible light location. The light was identified and switched off. • Complainant confirmed that this fixed the issue.
25/03/2021	8:09 PM	Lighting	• Complaint received via Community Information Line. Complainant noted that that there was a light shining directly at their residence. • The Mining Supervisor called the complainant back to assist identifying the possible light location. The light was identified and switched off. • Complainant confirmed that this fixed the issue. • A Tool Box Talk regarding Lighting Plant Management was developed and issued to all personnel.
28/03/2021	9:46 PM	Noise	• Complaint received via Community Information Line. Complainant noted loud noise from the mine. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. No operational changes were made.
28/04/2021	1:24 PM	Noise	• Email received from to EPA noting that a complaint had been received by via the EPA Environment Line as per the following: 2 April – noise from 12:00am to 6:30am – horns, trucks, revving engines and general mine noise • Real time noise monitors and alarms were reviewed following receipt of notification from the EPA. • No noise alarms were received prior to or during the period of the complaint.

Date	Time	Nature of Complaint	Description & Response
28/04/2021	1:24 PM	Noise	• Email received from to EPA noting that a complaint had been received by via the EPA Environment Line as per the following: 8 April – noise from 1:00am – loud machinery and clanging of metal equipment • Real time noise monitors and alarms were reviewed following receipt of notification from the EPA. • No noise alarms were received prior to or during the period of the complaint.
28/04/2021	1:24 PM	Noise	• Email received from to EPA noting that a complaint had been received by via the EPA Environment Line as per the following: 12 April – noise from 10:00pm – engines revving, banging of equipment • Real time noise monitors and alarms were reviewed following receipt of notification from the EPA. • No noise alarms were received prior to or during the period of the complaint.
28/04/2021	1:24 PM	Noise	• Email received from to EPA noting that a complaint had been received by via the EPA Environment Line as per the following: 13 April – noise from 5:30 am to 9:15 am • Real time noise monitors and alarms were reviewed following receipt of notification from the EPA. • Cautionary alarms were received during the period of the complaint.
29/04/2021	9:40 PM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from operation on the Ridge. • Changes were made to the orientation of two lighting plans and a set of excavator lights were switched off. • Personnel travelled to the complainant's property to view site to verify that the issue has been rectified. • Complainant was asked to call back if the issue persisted.

Date	Time	Nature of Complaint	Description & Response
30/04/2021	3:30 AM	Noise	• Complaint received via Community Information Line. Complainant noted loud mining and dozer track noise. • Real time noise monitors were reviewed. • Cautionary alarms were received prior to the complaint, resulting in all tracked dozers being restricted to operating in first gear. • In response to the complaint, operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. All tracked dozers operating in the Montrose Pit were shut down immediately. At 4:10 am, the fleet operating on the Ridge and RL130 dump were also shut down.
30/04/2021	6:40 AM	Noise	• Complaint received via email from the Environment Protection Authority. Complainant noted loud mining and dozer track noise. • The complainant noted loud mining and dozer track noise heard earlier in the morning was causing impact • Real time noise monitors and operational information were reviewed when the complaint was received by the EPA. • Alarms were received prior to the complaint and operations had been modified. It was noted that noise levels were reducing prior to the second complaint.
3/05/2021	12:10 AM	Noise	• Complaint received via Community Information Line. Complainant noted loud noise from the mine. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint.

Date	Time	Nature of Complaint	Description & Response
3/05/2021	8:05 PM	Noise	• Complaint received via Community Information Line. Complainant noted engines revving, dozers tracking and a clanging and banging noise • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. In response to the complaint, 2 excavators and 6 trucks operating in Montrose were stood down and remaining trucks were sent to a lower dump.
6/05/2021	4:30 PM	Noise	• Complaint received via Community Information Line. Complainant noted very loud mining noise including engines revving and loud bangs. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. In response to the complaint, trucks operating in Montrose were sent to a lower dump.
11/05/2021	10:02 PM	Visual	• Complaint received via Community Information Line. Complainant noted lighting impacts from operation on the Ridge. • Personnel travelled to the complainant's property to view site to verify that the issue has been rectified. • A set of lights above the cab of the excavator working on the ridge were switched off.
11/05/2021	11:00 PM	Noise	• Whilst personnel were at a nearby property investigating a visual complaint, the resident complained about noise. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint.

Date	Time	Nature of Complaint	Description & Response
12/05/2021	8:01 AM	Noise	• Complaint received via Community Information Line. Complainant noted loud mining noise from early that morning and at the time of the complaint noted he did not think it was coming from Montrose Pit but that could be coming from United Pit or HVO. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. The majority of the fleet in the Montrose and United Mines were shut down at the time of the complaint.
23/05/2021	10:14 AM	Noise	• Complaint received via Community Information Line. Complainant noted that the noise started at approximately 2 am and consisted of engine droning noise and material being loaded into trucks. • Real time noise monitors were reviewed. • Cautionary noise alarms had been received in the period from 1:30 – 3:00 am. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint. In response to the complaint, trucks operating in Montrose were sent to a lower dump and 2 dozers were stood down.
6/06/2021	10:22 AM	Noise	• Complaint received via Community Information Line. No description of the noise was given. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed and noise levels monitored. Both the Montrose and United Mines were operational at the time of the complaint.

Date	Time	Nature of Complaint	Description & Response
16/06/2021	12:18 AM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation on the Ridge. • Personnel had recently travelled past the complainant's property and did not note any direct lighting impacts. • Lighting plants were reviewed and confirmed to be set up in the correct locations. • The complainant confirmed the lighting plant used on the Montrose Ridge was not the source of the complaint. • A set of lights above the cab of the excavator working on the ridge were switched off. • Complainant confirmed the lighting impacts had improved but light was still visible
16/06/2021	8:59 PM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation. • Changes were made to the orientation of a lighting plant along with another lighting plant being shut down. • Complainant was asked to call back if the issue persisted, no further complaints were received following operational changes.
17/06/2021	8:12 PM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation. • Lighting plants were reviewed with the offending lighting plant subsequently relocated. Further, the lighting plant maps have been updated to include the offending area as an area to be avoided. • Complainant confirmed the lighting impacts had improved.

Date	Time	Nature of Complaint	Description & Response
27/06/2021	10:26 PM	Noise	• Complaint received via Community Information Line. Complainant noted mining truck noise. • Real time noise monitors were reviewed. • Cautionary alarms were received prior to the complaint, resulting in all tracked dozers being restricted to operating in first gear. • Following the complaint, operational controls were reviewed with trucks being relocated to a lower dump.
27/06/2021	11:40 PM	Noise	• Complaint received via Community Information Line. Complainant noted mining truck noise. • Real time noise monitors were reviewed. • Recent operational controls implemented on site prior to the complaint included trucks being relocated to lower dumps. Due to continual high noise levels the mining fleet in Montrose Pit was shut down.
28/06/2021	10:09 AM	Noise	• Complaint received via Community Information Line. Complainant noted mining noise keeps fluctuating up and down. • Real time noise monitors were reviewed. • An exceeding alarm was received at 10:05 am, resulting in part of the fleet being shut down. • Noise levels remained high at 10:20 am, leading to all equipment within the Montrose Pit being put on standby. • Following the above changes, noise levels decreased and remained below trigger values.
28/06/2021	1:51 PM	Blasting	• Complaint received via Community Information Line. Complainant noted shaking windows and house from the blast event. • A blast was fired at 01:42 pm in the United Pit. • Blast monitoring results were reviewed, with all blast results determined compliant.

Date	Time	Nature of Complaint	Description & Response
7/07/2021	4:14 AM	Noise	• Complaint received via Community Information Line. No description of the noise was given. • Real time noise monitors were reviewed. • Cautionary noise alarms were received several times from 12:05 am to 05:00 am. • Operational noise management controls were reviewed with each alarm and noise levels monitored. Controls implemented included instructing dozers to operate in 1st gear, the shutdown of Montrose Pit for a period, the shutdown of targeted equipment for a period and trucks being relocated to lower dumps.
11/07/2021	11:55 PM	Noise	• Complaint received via Community Information Line. No description of the noise was given. • Real time noise monitors were reviewed. • Cautionary noise alarm was received shortly after the time of complaint. • Following the complaint, operational noise management controls were reviewed with a dozer being shut down.
12/07/2021	4:45 AM	Noise	• Complaint received via Community Information Line. No description of the noise was given. • Real time noise monitors were reviewed. • Cautionary noise alarms were received at 03:30 am and 04:20 am. • Operational noise management controls were reviewed, and noise levels monitored. Operations ceased at 05:15 am at end of shift.
12/07/2021	6:40 AM	Noise	• A complaint was submitted to the EPA in relation to noise on 12 July 2021. • The EPA requested noise data for the date of the complaint between 00:00 - 04:00. • Data and action taken was supplied to the EPA in line with request.
14/07/2021	1:59 PM	Blasting	• Complaint received via Hunter Valley Operations. Complainant noted shaking and rolling in their house from the blast event over a long period (approx. 20 seconds). • A blast was fired at 01:03 pm in the United Pit. • Blast monitoring results were reviewed, with all blast results determined compliant.

Date	Time	Nature of Complaint	Description & Response
16/07/2021	6:40 PM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation. • Changes were made to the orientation of a lighting plant which rectified the issue.
18/07/2021	1:42 AM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation. • Lighting plants were reviewed and confirmed to be set up in the correct locations. • At 02:03 the light was no longer visible by the complainant. • On further review, it was identified that a loader may have been the source of the light.
7/08/2021	11:57 PM	Noise	• Complaint received via Community Information Line. The complainant described excessive machinery noise. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed with the Montrose Pit crews shutdown for crib.
8/08/2021	12:07 AM	Noise	• Complaint received via Community Information Line. No description of the noise was given. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed with the Montrose Pit crews shutdown for crib.

Date	Time	Nature of Complaint	Description & Response
8/08/2021	8:59 AM	Noise	• Complaint received via Community Information Line. No description of the noise was given. • Real time noise monitors were reviewed. • An exceeding noise alarm was first received at 8:20 am and continuing until 9:00 am. • Operational noise management controls were reviewed with an excavator and associated fleet in the Montrose Pit shutdown after the first exceedance alarm. Further equipment was shut down as the exceedance alarms continued. Following the complaint all equipment at United Wambo was ceased.
14/08/2021	9:46 AM	Noise	• Complaint received via Community Information Line. The complainant described general mine noise. • Real time noise monitors were reviewed. • No noise alarms were received prior to the complaint. • Operational noise management controls were reviewed with the operating Montrose Pit equipment shutdown at 9:52 am, equipment was progressively restarted from 10:26 am.
7/09/2021	10:49 PM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation. • While on the phone to the Community Information Line the complainant noted the light was no longer visible. • A review was completed to determine what the source of light could have been. The lights which may have caused this issue were not able to be located.
24/09/2021	7:11 PM	Lighting	• Complaint received via Community Information Line. Complainant noted on going lighting impacts from the operation. • Lighting plants were reviewed with the offending lighting plant subsequently relocated. The offending lighting plant was in compliance with site exclusion zones, a review of lighting plan setup including side panelling orientation is underway.

Date	Time	Nature of Complaint	Description & Response
27/12/2021	10:54 PM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation. • The Mining Supervisor reviewed operations and determined the source of the light – RL135 dump. This light was shut down. • The Mining Supervisor called the complainant back and confirmed that the correct light had been shut down.
31/12/2021	12:43 AM	Lighting	• Complaint received via Community Information Line. Complainant noted lighting impacts from the operation. • The Mining Supervisor reviewed operations and determined the source of the light – located on the Main haul road, adjacent to the ROM. This light was shut down. • The Mining Supervisor called the complainant back and confirmed that the correct light had been shut down.

Appendix H - Independent Environmental Audit Action Plan

H.1 Non-Compliances

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
SSD 7142, Schedule 2, Condition A29	All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development (including the infrastructure in condition A27), must be constructed in accordance with: (a) the relevant requirements of the BCA; and (b) any additional requirements of SA NSW where the building or structure is located on land within a declared Mine Subsidence District.	**Not Compliant (Administrative)**	United Wambo personnel had not obtained the relevant construction certificates required for the temporary buildings and has since commenced the process to obtain the relevant certificates. United Wambo provided evidence that they are currently obtaining the relevant construction certificates.	1. Finalise the relevant construction certificates for the site. 2. Ensure there is a process in place so the site applies for construction certificates in the correct timeframe.	1. Non-compliant building have been removed as part of Project demobilisation. 2. Complete	**Compliant** Non-compliant structures removed.

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
SSD 7142, Schedule 2, Condition A30	All plant and equipment used on site, or to monitor the performance of the development must be: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner	**Not Compliant (Low)**	Power outages and non-operating monitoring equipment resulted in lost data. This is non - compliant with the monitor not being maintained in a proper and efficient condition. It should be noted that many of the receivers with power outage issues is along Redmanvale Road which is known to have electrical issues beyond United Wambo's control.	United Wambo to review options for back-up or alternative power supplies to reduce the chance of lost data from dust monitoring locations.	PM10 monitors are fitted with back up battery power. No other viable option available. Complete	**Compliant** Some outages experienced due to adverse weather events and/or unforeseen software/hardware failures.
SSD 7142, Schedule 2, Condition B8	The Applicant must ensure that blasting on the site does not cause exceedances of the criteria at the locations as shown in Table 2.	**Not Compliant (Medium)**	A blast exceeded criteria on 24 September 2020 near the 66 kV Ausgrid transmission line. United Wambo engaged Terrock Consulting Engineers to investigate the incident.	Provide the updated UWJV Blast Management Plan on the website once approved by DPIE.	Complete	**Compliant** Latest UWJV Blast Management Plan (2022) being uploaded to UWJV website

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
SSD 7142, Schedule 2, Condition B13	If the Applicant receives a written request from the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on the site for a property inspection to establish the baseline condition of any buildings and structures on their land, or to have a previous property inspection updated, then within 2 months of receiving this request the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to: (i) establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and (ii) identify measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and structures; and	**Not Compliant (Administrative)**	No evidence provided of both parties agreeing to the appointed third-party to complete the baseline inspections. No evidence provided of approval to carry out a property inspection outside the required timeframe.	Any future property inspections should be completed as per the requirements of B13.	As required	**Compliant** No written requests received in 2021.

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
	(b) give the landowner a copy of the new or updated property inspection report.					
SSD 7142, Schedule 2, Condition B18	The Applicant must: (a) take all reasonable steps to: (i) ensure the safety of people and livestock from blasting impacts of the development; (ii) protect public and private infrastructure and property in the vicinity of the site from blasting damage associated with the development; and (iii) minimise the dust and fume emissions of any blasting; (b) ensure that blasting on the site does not damage heritage items, beyond those predicted in the document/s listed in condition A2(c), and develop specific measures to protect heritage items outside the approved disturbance areas from any blasting damage associated with the development;	**Not Compliant (Medium)**	The 24 September 2020 blast registered at 167.06 mm/s compared to the predicted 85.48 mm/s. This was not best practice, hence the non - compliance with this condition.	As per actions for; **SSD 7142,** Schedule 2, Condition B8		**Compliant**

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
	(c) minimise the frequency and duration of any public road closures for blasting, and use all reasonable efforts to avoid road closures during peak traffic periods; (d) operate a suitable system to enable interested members of the public to get up-to-date information on the proposed blasting schedule on the site and associated public road closures, including notification via SMS message of the blasting schedule and associated road closures for that day and any variations to that schedule and closures; (e) use all reasonable efforts to co-ordinate the timing of blasting at the site with nearby mines to minimise cumulative blasting impacts; (f) consult with HVO prior to undertaking any blasting within 500 metres of its operations; and					

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
	(g) carry out regular blast monitoring to determine whether the development is complying with the relevant conditions of this consent. The locations of the heritage items referred to in paragraph (b) are shown in Appendix 5.					
SSD 7142, Schedule 2, Condition B23	The Applicant must implement the Blast Management Plan as approved by the Planning Secretary.	**Not Compliant (Medium)**	Blasting procedures are generally carried out in accordance to the Blast Management Plan. However, the 24 September 2020 registered at 167.06 mm/s compared to the predicted 85.48 mm/s (refer to B8).	As per actions for; **SSD 7142,** Schedule 2, Condition B8		**Compliant** UWJV Blast Management Plan reviewed and updated January 2022.
SSD 7142, Schedule 2, Condition B85	The Applicant must: (a) take all reasonable steps to minimise the visual and off-site lighting impacts of the development; (b) undertake roadside tree planting along the Golden Highway, in consultation with RMS, to screen views of the development from road users;	**Not Compliant (Administrative)**	Most recent lighting audit is from 2012, therefore the IEA cannot prove the site is compliant.	1. Complete a lighting audit as per relevant Australian Standards including the latest version of Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting after completion of the MIA. 2. Focus on point source light management for United at the moment.	1. Complete 2. Noted – management of lighting plant impacts is a key focus at UWJV	**Compliant** UWJV Weekly Plan Pack includes discrete sections on lighting (ROM and operational areas).

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
	(c) ensure no fixed outdoor lights shine directly above the horizontal or above the building line or any illuminated structure; (d) ensure no in-pit mobile lighting rigs shine directly above the pit wall and other mobile lighting rigs do not shine directly above the horizontal (except where required for emergency safety purposes); (e) ensure that all external lighting associated with the development complies with relevant Australian Standards including the latest version of Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting; (f) ensure that the visual appearance of all new buildings, structures, facilities or works (including paint colours and specifications) is aimed at blending as far as possible with the surrounding landscape; and			3. External advice on visual impact to the Golden Highway from external contractor.	3. Complete	

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
	(g) take all reasonable steps to shield views of mining operations and associated equipment from users of public roads and privately-owned residences.					
SSD 7142, Schedule 2, Condition B95	Prior to the commencement of Phase 1A, the Applicant must prepare a Fire Management Plan for the development in consultation with RFS. This plan must include a: (a) contact person and 24 hour contact phone number; (b) schedule and description of proposed bushfire mitigation works, including: (i) location of managed and unmanaged vegetation within the site; (ii) location of water supply; and (iii) internal access roads; (c) plan identifying the location and storage of bulk flammable liquids and materials; (d) 'hot works' management plan, including:	**Not Compliant (Administrative)**	Plan sighted but not attached to management plan as required by part c of this condition.	1. Attach plan as mentioned in Part C to the Bushfire Management Plan. 2. Ensure the title of the relevant management plan is the same as mentioned in the consent condition.	1. Complete 2. Complete	**Compliant** UWJV Fire Management Plan, version 2.0, 2021.

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
	(i) restrictions on when 'hot works' are limited and prohibited; and (ii) safety measures to be implemented when 'hot works' are being conducted; and (e) emergency/evacuation plan in accordance with the Guidelines for the Preparation of Emergency/Evacuation Plans (RFS) and Australian Standard AS3745 Planning for emergencies in facilities.					
DA 410-11-2002-I, Schedule 3, Condition 8	The Applicant shall 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.	**Not Compliant (Administrative)**	The Applicant had not obtained the relevant construction certificates required for the temporary buildings and has since commenced the process to obtain the relevant certificates. The Applicant provided evidence that they are currently obtaining the relevant construction certificates.	As per actions for; **SSD 7142,** Schedule 2, Condition A29		**Compliant**

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
DA 410-11-2002-I, Schedule 3, Condition 10	The Applicant shall ensure that all plant and equipment at the site, or used in connection with the development, are: (a) Maintained in a proper and efficient condition; and (b) Operated in a proper and efficient manner.	**Not Compliant (Low)**	Power outages and non-operating monitoring equipment resulted in lost data. This is non - compliant with the monitor not being maintained in a proper and efficient condition.	As per actions for: **SSD 7142,** Schedule 2, Condition A30		**Compliant** Some outages experienced due to adverse weather events and/or unforeseen software/hardware failures.
DA 410-11-2002-I, Schedule 4, Condition 43	(6) The Applicant shall monitor (by sampling and obtaining results by analysis) the concentration of each pollutant in Table 9 at locations approved by the DECC, using the specified units of measure, averaging period, frequency, and sampling method in Table 10.	**Not Compliant (Low)**	Not all samples were captured at the required frequency.	As per actions for: **SSD 7142,** Schedule 2, Condition A30		**Compliant** Some outages experienced due to adverse weather events and/or unforeseen software/hardware failures.
DA 410-11-2002-I, Schedule 4, Condition 54	All external lighting associated with the development shall comply with Australian Standard AS4282(INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting or its latest version.	**Not Compliant (Low)**	The most recent lighting audit is from 2012. The IEA cannot prove the site is compliant with Australian Standards.	As per actions for: **SSD 7142,** Schedule 2, Condition B85		**Compliant** UWJV Lighting Audit completed September 2021. The qualitative assessment of lighting at United Wambo identified two non-compliances with condition B85(a) and (d) of SSD7142. Both non-compliances were in the

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
						form of incorrectly configured mobile lighting plant, either by panels directing light spill off site, or panels angled above the horizontal. All fixed outdoor lights were found in compliance with Condition B85 c. The quantitative assessment undertaken found that illuminance at all viewpoints were within the allowable criteria set out by AS 4282, therefore compliant with Condition B85 (e)
EPL3141, Condition L4.2	The air blast overpressure level from blasting operations in or on the premises must not exceed 120 dB (Lin Peak) at any time; at either monitoring 18, 19, 20, 21 and 22 in Condition P1.3.	**Not Compliant (Administrative)**	One exceedance occurred at monitoring point 18 (Warkworth Village) on 5 November 2020. However, there are no private residences at Warkworth Village. However, based on discussion, there are no longer any private residences at this point and is removed in the updated EPL. Therefore, no further recommendations.	No action required		**Compliant**

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
EPL3141, Condition O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	**Not Compliant (Low)**	Power outages and non-operating monitoring equipment resulted in lost data. This is non - compliant with the monitor not being maintained in a proper and efficient condition.	As per actions for: **SSD 7142,** Schedule 2, Condition A30		**Compliant** Some outages experienced due to adverse weather events and/or unforeseen software/hardware failures.
EPL3141, Condition M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	**Not Compliant (Low)**	Monitoring did not occur at the Sewage Treatment Plant as it did not have a sampling point installed until 2020.	No further action required.		**Compliant**
EPL3141, Condition M2.2	Point 10 Monitoring Requirements	**Not Compliant (Low)**	United Wambo updated EPL 3141 and added EPA ID 10 on 25 February 2020. Only three grab samples were collected in the IEA period. No samples were collected in Q1.	Provide EPA ID number in monitoring data and Water Management Plan.	Complete	**Compliant** All samples have been collected during 2021.

Document, Schedule, Condition	Condition	Compliance Status	Findings	Action	Timing	Status (as @ March 2022)
EPL3141, Condition M2.3	Point 4, 5, 6, 7 Monitoring Requirements	**Not Compliant (Low)**	The PM10 continuous monitor collected <75% of the daily data at the following monitoring points on the following days: Point 4: 12 May 2020 Point 5: 26 - 28 September 2020 Point 6: 19 February 2020, 17 June 2020, 1-2 July 2020, 27 September 2020, 13 October 2020 Point 7: 26 -27 July 2020, 29 July 2020, 17 September 2020	As per actions for: **EPL3141**, Condition M2.2 **SSD 7142,** Schedule 2, Condition A30		PM_{10} monitoring offline at the following locations: D1 (5 events), D2 (2 events), D3 (5 events), D4 (21 events) and D5 (5 events). Outages due to adverse weather events and/or unforeseen software/hardware failures.
EPL3141, Condition M2.3	Point 8 Monitoring Requirements	**Not Compliant (Low)**	The TSP HVAS monitor did not collect a sample on the 15th and 21th of January 2020. In relation to these data gaps, the Monthly Pollution Monitoring Report states: "Result not available due to electrical issues. No data was collected "	As per actions for: **EPL3141**, Condition M2.2 **SSD 7142,** Schedule 2, Condition A30		Some outages due to adverse weather events and/or unforeseen software/hardware failures.
EPL3141, Condition M8.1	The licensee must record the average PM10 concentration at EPA Monitoring Points 4,5,6 and 7 at intervals of 10 minutes. This data must be made available upon request by any Authorised Officer of the EPA who asks to see them.	**Not Compliant (Administrative)**	Although this is generally recorded there have been times during the IEA period where there has been data failure. Based on discussion, this is an electrical issue that cannot be prevented.	As per actions for: **EPL3141**, Condition M2.2 **SSD 7142,** Schedule 2, Condition A30		Some outages due to adverse weather events and/or unforeseen software/hardware failures.

H.2 Recommendations

Topic	Document, Schedule, Condition	Recommendation	Action	Timing	Status (as @ March 2022)
Noise monitoring	**SSD 7142,** Schedule 2, Condition B1	Noise monitoring needs to include details about the noise monitoring areas and why Area 3 (Warkworth Village) is excluded from the results. Also, the figure should be the same as in the Noise Management Plan and noise monitoring reports to ensure consistency with wording and monitoring locations.	1. Noise monitoring reports to include details about the noise monitoring areas and why Area 3 (Warkworth Village) is excluded from the results. 2. Review Figures in the Noise MP and noise monitoring reports to ensure consistency.	30 April 2021	Completed. Area 3 excluded as no privately owned residences.
Noise monitoring	**SSD 7142,** Schedule 2, Condition B1	Every noise monitoring report should state if a noise monitoring area was not monitored and the reason why.	Noise monitoring report to state if a noise monitoring area was not monitored and the reason why.	As required	Noted in section 1.2 of Monthly Noise Monitoring reports.
Noise Management Plan	**SSD 7142,** Schedule 2, Condition B7	Based on discussions with United Wambo it is understood that the calibration of real-time noise monitors will occur in Q1, 2021. Ensure this is undertaken quarterly in the future.	Calibration of real-time monitors with attended monitoring to occur quarterly. First calibration will occur in Q2 as all Q1 monitoring has been completed.	30 June 2021	Calibration Certificates appended to Monthly Noise Monitoring reports.
Air Quality / Annual Review	**SSD 7142,** Schedule 2, Condition B25	Provide details in the Annual Review regarding potential air quality exceedances based on short term criteria. Justification of site contributions and evidence relating to compliance status.	Details on potential air quality exceedances to be included in Annual Review, including justification of site contributions and evidence relating to compliance status.	31 March 2021	
Air Quality monitoring	**SSD 7142,** Schedule 2, Condition B25	Refer to A30 regarding data capture recommendation.	As per Condition A30.		Noted

Topic	Document, Schedule, Condition	Recommendation	Action	Timing	Status (as @ March 2022)
Water Management Plan	**SSD 7142,** Schedule 2, Condition B52	Table 5-1 in the Water Management Plan incorrectly refers to sections of the report. Ensure that tables correctly refer to the right information in future management plans.	Review and update Water Management Plan to correct reference errors in report.	25 June 2021	Complete
Historic Heritage Management Plan	**SSD 7142,** Schedule 2, Condition B82	Table 3-1 of the management plan is incorrect. Ensure that tables refer to correct sections in future management plans.	Historic Heritage Management Plan will be reviewed and all references checked and updated as necessary.	25 June 2021	Complete
Rehabilitation Management Plan	**SSD 7142,** Schedule 2, Condition B103	Table 8-1 incorrectly refers to information in the wrong sections on multiple occasions. Ensure that tables refer to the right information in future management plans. Letter from DPIE dated 26 September 2019 addresses this issue as well and is attached as Appendix F.	No action proposed – the Rehabilitation Management Plan was updated for Phase 2 and these errors were rectified.	NA	Noted
Incident Reporting	**DA-410-11-2002-i,** Schedule 6, Condition B3	Ensure that all incidents are reported to DPIE in the approved timeframe. Record consultation of incidents in a log for future reference.	No further development will occur under DA 410-11-2002.	NA	
Annual Returns	**EPL3141**, Condition R5.6	Ensure all dates are correct in the reports.	Dates in all reports required under EPL 3141 will be reviewed to ensure they are correct.	Ongoing	Noted