



Balranald Mineral Sands Project

2020 Annual Review

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ANNUAL REVIEW DETAILS – TITLE BLOCK

Details of the operations are summarised in Table 1 below.

Table 1: Annual Review title block

Name of operation	Balranald Mineral Sands Project
Name of operator	Iluka Resources Limited
Development consent / project approval #	SSD – 5285
Name of holder of development consent / project approval	Iluka Resources Limited
Mining Lease #	ML 1736
Name of holder of mining lease	Iluka Resources Limited
Water licence #	WAL31101 and WAL31102
Name of holder of water licence	Iluka Resources Limited
MOP / RMP start date	18 May 2016 (OUT16/19802)
MOP / RMP end date	31 May 2021
Annual Review start date	01 January 2020
Annual Review end date	31 December 2020

I, Steven Campbell, certify that this audit report is a true and accurate record of the compliance status of the Balranald Mineral Sands Project for the period 1st January – 31st December 2020 and that I am authorised to make this statement on behalf of Iluka Resources.

Name of authorised reporting officer	Steven Campbell
Title of authorised reporting officer	Project Manager
Signature of authorised reporting officer	
Date	30 March 2021

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1 STATEMENT OF COMPLIANCE

This report is the 2020 Annual Review for the Balranald Mineral Sands Project (the 'Balranald Project' or the 'Project') as required by Condition 4, Schedule 5 of the development consent granted under the provisions of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act).

A summary of the compliance status of the operation with the conditions of the relevant approvals is provided in Table 2.

Table 2: Statement of compliance

Statutory approval	All conditions complied with
SSD Development consent (SSD-5285)	Yes
Mining Lease 1736	Yes

2 INTRODUCTION

2.1 Operations overview

On 5 April 2016 Iluka Resources Limited (Iluka) were granted development consent for the Balranald Mineral Sands Project under Part 4 of the EP&A Act.

The Balranald Project includes construction, mining, primary processing and rehabilitation of two linear mineral sand deposits, known as the West Balranald and Nepean deposits located approximately 12 kilometres (km) and 66 km north-west of the town of Balranald, respectively. Figure 2.1 shows the regional location of the Project.

In addition, the Balranald Project includes undertaking a bulk sampling activity (the activity) at the West Balranald deposit involving the removal of up to 100,000 tonnes (t) of mineral ore. The location of the bulk sampling activities, termed the 'Activity Area', within the approved Project boundary is provided in Figure 2.2.

In 2016 the bulk sampling activity was commenced for the Balranald Project. This bulk sampling activity was a continuation of smaller bulk sampling activities completed in Q1-2015 and Q1-2016 (known as T1) in accordance with approval under Part 5 of the EP&A Act from NSW Trade & Investment, Resources & Energy (Reference OUT13/28341 and OUT15/27702).

The second bulk sampling trial (known as T2) was completed in September 2016. From September 2016 to September 2019 the site was in a care and maintenance period. In July 2019, Iluka initiated discussions with the regulators to commence a further trial (known as T3).

The T3 trial intended to further test the selective in-situ removal of mineral ore to determine whether the unconventional mining method can:

- sustain production over a larger sample set (i.e. longer stope length);
- undertake a backfill process to deliver a whole of mine life cycle process; and
- further validate groundwater and subsidence impact prediction models.

T3 site re-establishment commenced in September 2019. Bulk sampling commenced in June 2020 with the development of a new stope (Stope 6) and the re-entry and additional bulk sampling of Stope 4.

The Activity Area was placed into care and maintenance in late November 2020.

2.2 Environmental management responsibilities

Table 3 provides the details of the Iluka personnel with environmental management responsibilities during the reporting period.

Table 3: Environmental management responsibilities

Name	Role	Contact details
Steven Campbell	Project Director	Steven.Campbell@iluka.com
Stephan Esterhuysen	Project Manager	Stephan.Esterhuysen@iluka.com
Dave Wright	Registered Manager	Dave.wright@iluka.com
Lisa McGrath	HSEC Manager	Lisa.McGrath@iluka.com

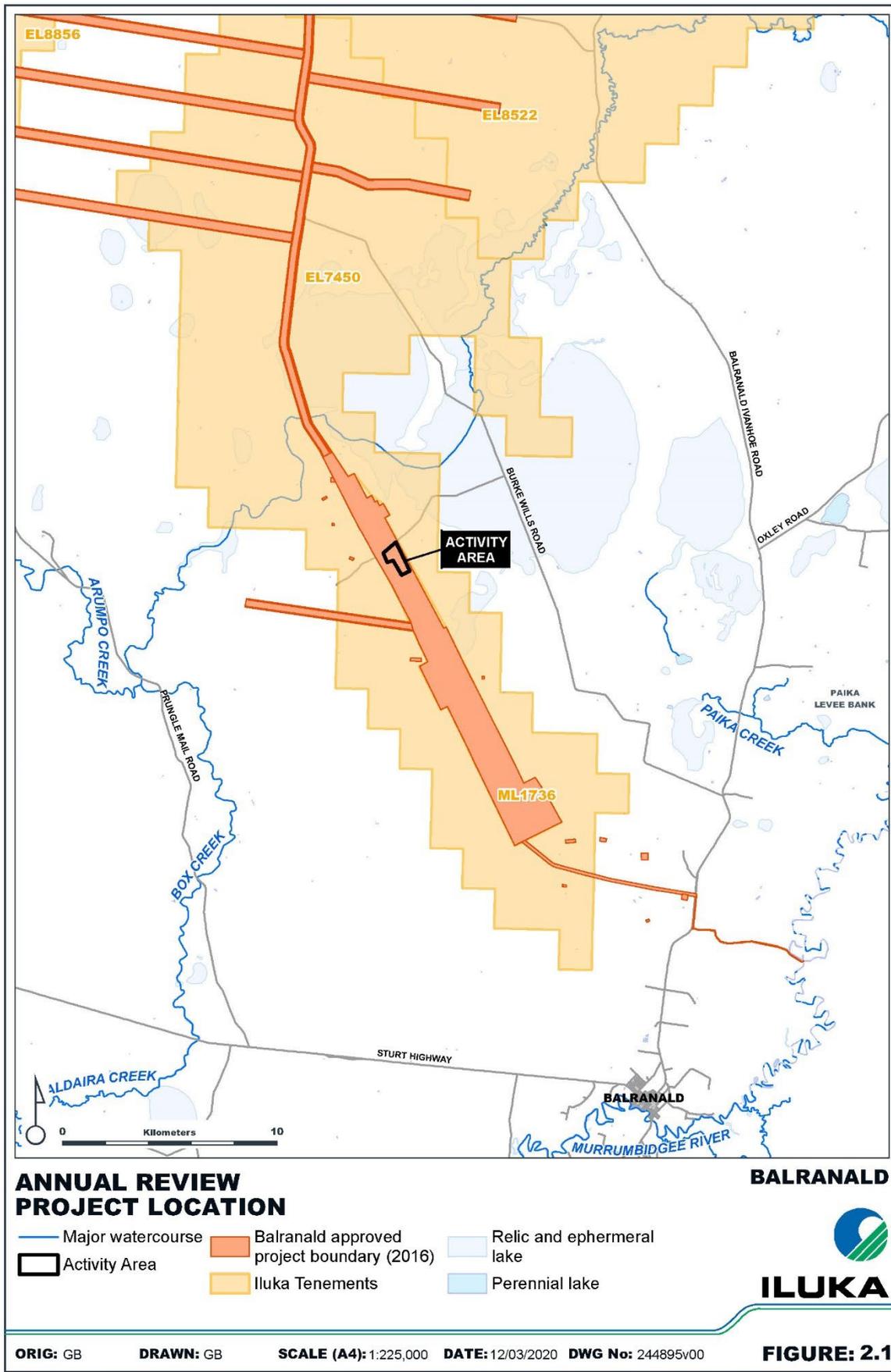


Figure 2.1: Project location

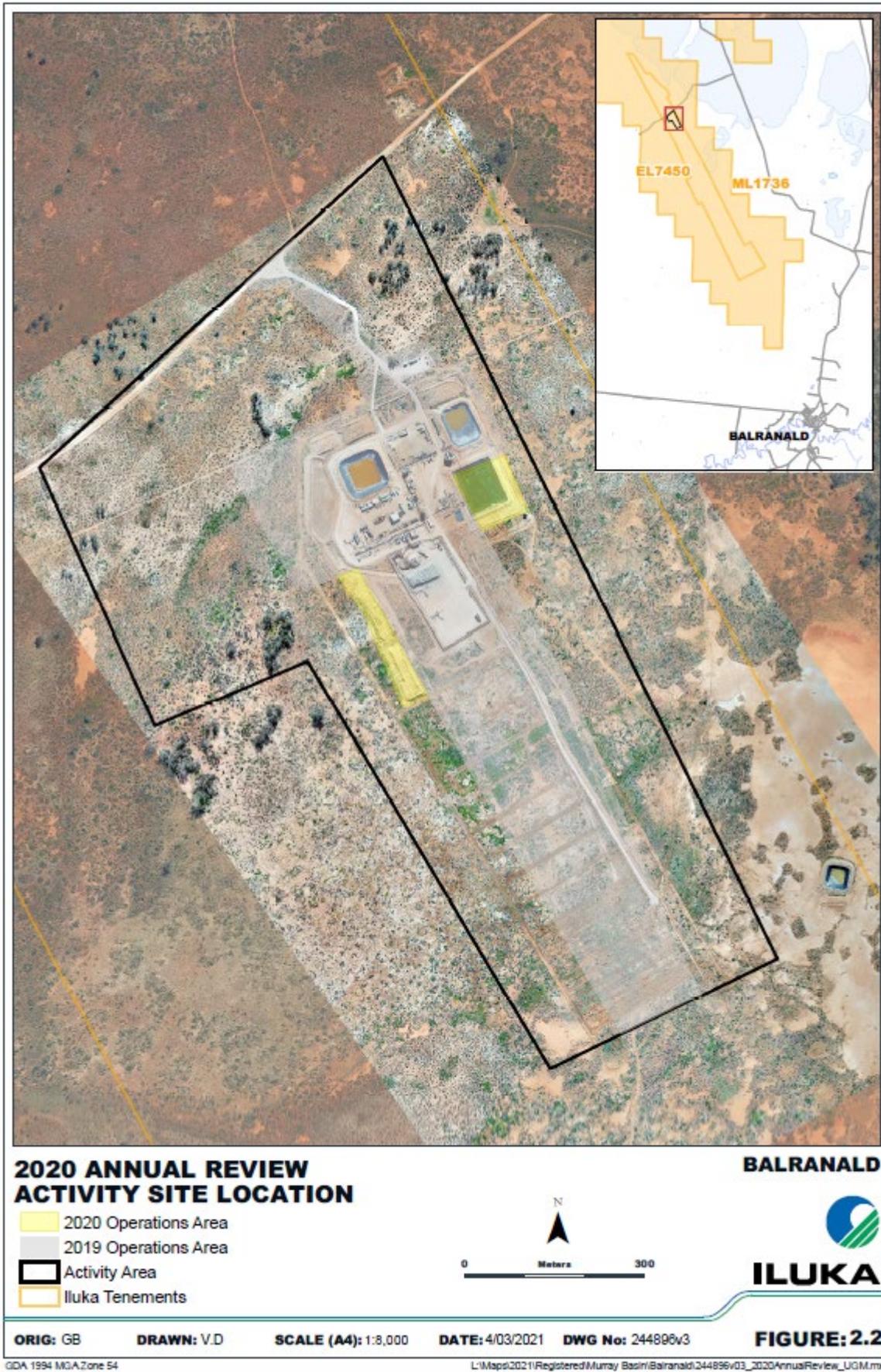


Figure 2.2: Bulk sampling activity site location

3 APPROVALS

The Balranald Project is a Level 1 mine and was assessed as a State Significant development under Part 4 of the EP&A Act.

The current approvals (including consents, authorisations, licences and management plans) for the Project are summarised in Tables 4 and 5 below.

In discussion with regulators, updates were made to the Environmental Management Plan and Mining Operations Plan during 2019, to cover the T3 activities which recommenced in September 2019.

Table 4: Current consents, authorisations and licences

Type	Identification	Details
Development Consent	SSD-5285	Granted: April 2016 Duration: 16 years
Mining Lease	ML1736	Granted: May 2016 Duration: 21 years
Environment Projection Licence	EPL20795	Granted: June 2016 Notice of variation: April 2020 Duration: 5 years
Water Access Licence(s)	WAL31101 WAL31102	Total allocation volume – 2,500 ML

Table 5: Approved management plans

Management Plan	Date of approval and approving agency
Environmental Management Plan (EMP): Bulk Sampling Activities (21 October 2019, Version 2)	15 November 2019; NSW Environment Protection Authority; Reference: DOC19/530575-8
Mining Operations Plan (MOP): Bulk Sampling Activities (21 October 2019, Version 2)	10 December 2019; Resources Regulator, NSW Department of Planning, Industry and Environment; Reference: MAAG0004861, LETT0003348
Groundwater Management Plan (GMP) T3 Bulk Sampling Activities (29 June 2020, Version 6)	12 August 2020; Resource Assessment, NSW Department of Planning, Industry and Environment
Balranald Project: Aboriginal Cultural Heritage Management Plan (ACHMP) (14 April 2016, Version 1)	14 April 2016; NSW Office of Environment and Heritage; Reference: DOC16/184303 29 April 2016; NSW Department of Planning and Environment; Reference: 11/22089-2

4 OPERATIONS SUMMARY

4.1 Introduction

T3 site re-establishment and construction works commenced in September 2019 with Horizontal Directional Drill (HDD) development drilling commencing in June 2020. Mining commenced in mid-August 2020 and was completed in early November 2020.

Mined material was processed through a trommel and spirals plant and separated into a Heavy Mineral Concentrate (HMC), sand tailings and clay tailings. Backfilling of a portion of the sand and clay tailings material occurred intermittently over the mining period.

The site was demobilized and put into care and maintenance in November 2020.

4.2 Site construction

The following construction works were undertaken for the period September 2019 – June 2020, as part of site re-establishment:

- re-establishment of site offices, power supply, water supply and amenities;
- clearing of 7.5 hectares (ha) of land to accommodate an additional water storage dam, stockpile areas and a drainage basin (total land disturbance 14.5 ha);
- civil construction of water storage dam, stockpile areas and drainage basin;
- civil works to place anchors and supports for the stope development and mining rigs; and
- installation of new processing infrastructure including spirals plant.

4.3 Mining operations

One new stope, Stope 6, and one existing stope from T2, Stope 4, were mined during T3.

Development of Stope 6 commenced on 24 June 2020 to 26 July 2020 using a HDD rig. The stope development process includes drilling a pilot hole, enlarging the hole and installing casing.

Following development of Stope 6, the HDD rig moved to recondition the previous developed Stope 4 from 28 July to 3 August 2020.

The material mined from T3, plus the ore stockpiled from T2, was processed through an on-site plant consisting of a trommel and spirals plant to produce HMC. At the end of the trial, this material was stored on the T2 ore pad.

The processing produced two tailings streams. Sand tailings is stockpiled on the T3 stockpile pad. Clay tailings is stored in the T3 fines storage pond. A portion of the sand and clay tailings was used in the backfill process as outlined in Section 4.3.4.

4.3.1 Backfilling

Backfilling of the T2 and T3 mining zones commenced on 28 September 2020 and was intermittent up until 7 November 2020.

In addition to returning material to the mining zones, sand tailings was used to stabilise the sinkholes that materialised during and following mining. These events are described further in Section 6.1.

4.4 Demobilisation

The site was progressively demobilised from early November with the majority of hired buildings and equipment removed from site. Crib and ablution facilities were demobilised and power disconnected.

Notification was provided to the Resources Regulator on 18 November 2020 of suspension of mining operations.

A vacuum truck was used to clean up roadways, plant area, stockpile area of ore and HMC material. An excavator was used to clean out the sedimentation basin. All areas with residual material were covered with lime as a precautionary measure should any oxidation occur.

The sand and HMC tailings stockpiles were covered with tarps to minimise windblown materials.

The site is secured with an agricultural stock fence and locked gate. Exclusion zone signs were placed around the perimeter. The site is unmanned but planned inspections will be carried out by the Registered Manager on a bi-monthly basis.

4.5 Next reporting period

The site is expected to stay in care and maintenance for 12 – 24 months whilst detailed feasibility studies are undertaken. During this time no further bulk sampling activities will be undertaken however some site activities including ongoing monitoring, resource drilling and other preparatory works may occur.

To ensure ongoing management of environmental factors during the care and maintenance period the Environmental Management Plan (EMP) and Pollution Incident Response Management Plan (PIRMP) were updated to put in place ongoing monitoring and management events.

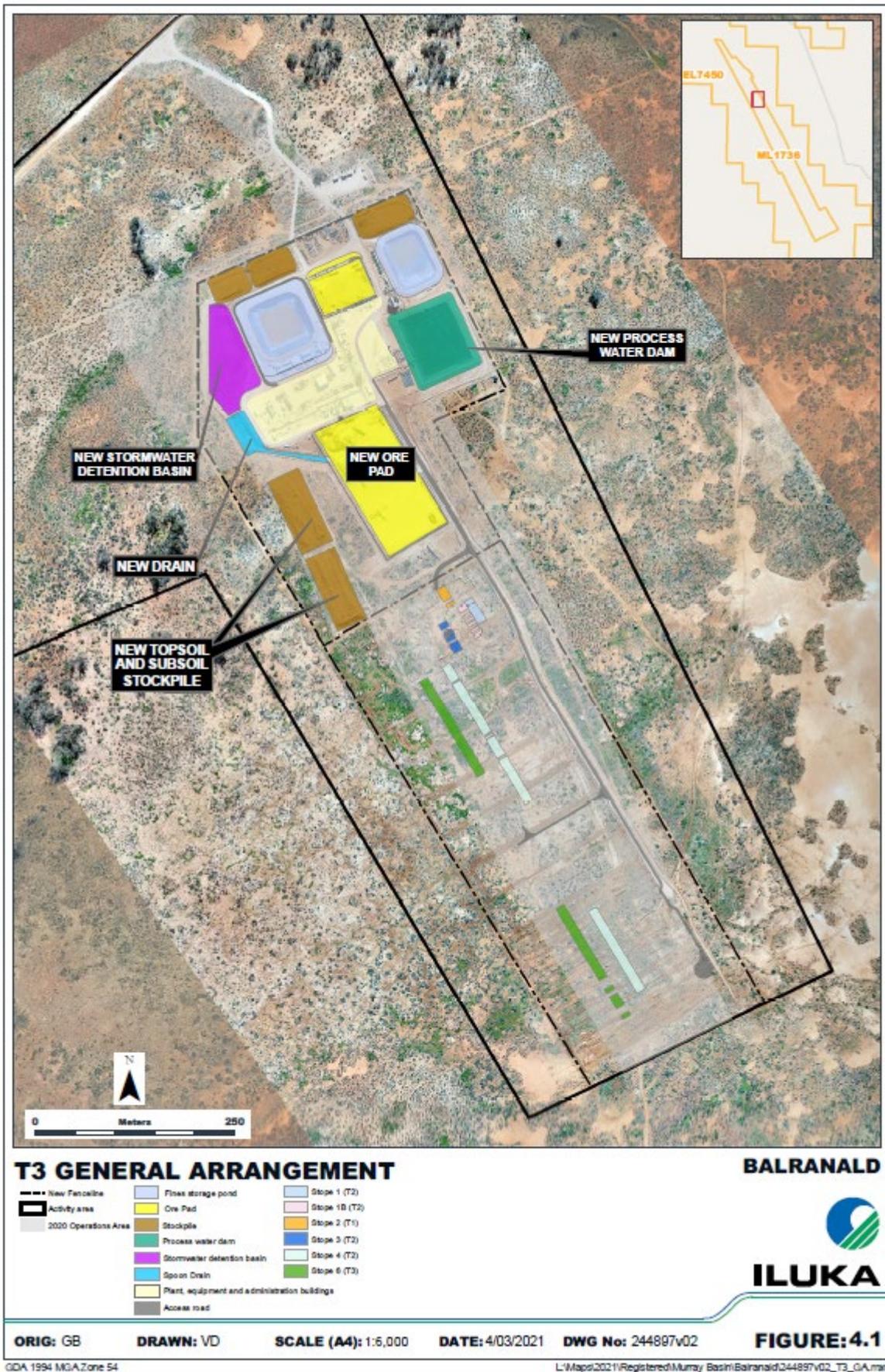


Figure 4.1: T3 activity site general arrangement

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

No actions required from the previous Annual Review.

6 ENVIRONMENTAL PERFORMANCE

The Environmental Management Plan (EMP) developed for the bulk sampling activities was updated in October 2019 to address the recommencement of the T3. It detailed the performance criteria (where relevant), mitigation and management and environmental performance monitoring (where relevant) for the activity.

An updated Mining Operations Plan (MOP) was also been prepared for the recommencement of the activity.

Iluka contracted EMM Consulting Pty Ltd (EMM) to undertake environmental monitoring and inspections in accordance with conditions set under SSD-5285.

Table 7 provides a summary of the environmental performance monitoring completed during the reporting period.

Table 6: Environmental performance summary

Aspect	Approval criteria / EIS prediction	Performance during period	Trend / key management implications
Weeds	SSD-5285. Condition 17, Schedule 3 – Control weeds	Monthly environmental inspections were conducted over 2020 noting the occurrence of weeds. The site activities, concurrent grazing land use and significant rainfall experienced in 2020 resulted in weed populations in open areas. A weed spraying contractor was engaged and the weeds were sprayed in October 2020.	Continued weed inspections planned in January and April 2021 and weed control as required.
Subsidence	No specific condition, Subsidence Management Plan (SMP) prepared as part of EMP	Subsidence was monitored as per the SMP. Nine irregular subsidence events (sink holes) occurred during mining as outlined in Section 6.1.	Ongoing biannual monitoring as outlined in Section 6.1.

Aspect	Approval criteria / EIS prediction	Performance during period	Trend / key management implications
Groundwater	SSD-5285. Condition 15, Schedule 3 – Groundwater Management Plan (GMP) appended to EMP.	Intensive groundwater monitoring conducted over trial period as outlined in Section 6.2	Ongoing monitoring as outlined in Section 6.2.
Noise	SSD-5285. Condition 3, 4 and 5, Schedule 3 – Noise	Measured noise contribution satisfied all relevant noise limits at nearest receiver (R5).	No further monitoring
Air quality	SSD-5285. Condition 6, 7, 8 and 9, Schedule 3 – Air	Dust controls were implemented as outlined in the EMP. Dust generated by the activity was monitored during the activity with no exceedances identified.	Monitor will continue in January and April 2021.
Biodiversity	SSD-5285. Condition 16 and 17, Schedule 3 – Biodiversity	Mitigation measures were implemented as outlined in the EMP. Clearing of 7.5 ha of native vegetation was undertaken.	Any future activities continue to be conducted in accordance with Site Disturbance Clearance Procedure as outlined in EMP
Cultural heritage	SSD-5285. Condition 18, 19, 20 and 21 – Heritage	An approved Aboriginal Cultural Heritage Management Plan remains in place. A due diligence survey was completed of all 2020 clearing areas in 2019. This was reported in the previous Annual Review.	

6.1 Subsidence monitoring outcomes

Post the T2 trial activities in 2016, Iluka continued biannual post activity subsidence surveys. No systemic movement was detected that is inconsistent with regional background observations. One irregular subsidence event (sinkhole - S1) occurred during T2. Apart from S1, T1 and T2 subsidence was less than 200 mm across the stope areas.

The Subsidence Management Plan was updated for T3 and appended to the EMP. This predicted vertical surface deformation up to 600 mm across the mining zone. Irregular subsidence, as sink holes, were not expected to be seen at the extent then noted during T3.

A total of nine additional irregular subsidence events were induced during mining (3), backfill (2) and post-mining (4) activity. All subsidence events occurred inside the mine exclusion zone with no risk to personnel. The sinkholes were stabilised via backfilling with lime dosed sand tails, with subsoil and topsoil capping to occur when the exclusion zone is cleared for access and rehabilitation. The success of this stabilisation will be monitored over time.

The subsidence events were reported to the regulators via email and a preliminary report was submitted via letter in October 2020. This letter was updated in December 2020 to cover the last four subsidence events. The latest drone inspection in February 2021 confirmed that no further subsidence had occurred.

A review of the survey data collected during the trial was undertaken by MSEC. The data assessment indicated that the clayey materials in the SFM are bridging above the mined stopes then failing in isolated locations in a piping type failure to create the sinkholes.

MSEC also reviewed the observed systemic subsidence movements and noted that at 90 mm these were considered negligible and substantially less than the 600 mm predicted.

Biannual surveys will be conducted in 2021, plus ad-hoc visual and drone inspections.

6.2 Groundwater monitoring outcomes

Post the T2 trial activities in 2016, Iluka continued biannual regional groundwater monitoring.

The GMP was updated for T3 to manage potential groundwater risks associated with the activity. A trigger action response plan (TARP) was used to record and respond to monitoring results using Site Specific Trigger Levels (SSTL) established in the GMP.

No SSTLs were breached in the LPS or SFM.

A regional groundwater monitoring event was completed in July 2020 (LWC, 2020). This showed that results remained consistent with the historical groundwater baseline data collected across the wider Balranald area.

7 WATER MANAGEMENT

Water usage during the T3 bulk sampling activity was in accordance with a 2,500 megalitre (ML) water trade with Tronox assigned to Iluka's Water Access Licence's (WAL) 31101 and WAL31102.

Water use for the over the reporting period is summarised in Table 9. Nominated extraction points during the activity included production bores PB2, PB04 (Loxton Parilla Sands Aquifer, WAL31102) and the Karra Bore (Lower Renmark Group Aquifer, WAL31101).

Table 7: Summary of water use

Water Licence #	Water Source and Water Sharing Plan	Entitlement / allocation*	Passive take / inflows	Active pumping	Total (ML)
31101	Western Murray Porous Rock Groundwater Source	150 ML	0 ML	26 ML	26 ML
31102	NSW Murray Darling Basin Porous Rock Groundwater Sources	2350 ML	0 ML	43 ML	43 ML

*Temporary allocation leased from permanent allocation holder for the water licensing period 2016-2019.

8 REHABILITATION

Following completion of the activity in November 2020 all mining plant and equipment was decommissioned and removed from site. Basic surface equipment remains on site – screen, cyclones, thickener, pumps plus associated pipes and spares.

Stockpiles of HMC and sand tailings remains on site. The material is covered with tarpaulins to minimise potential dust generation.

9 COMMUNITY

No community complaints were received during the 2020 reporting period. A copy of the complaints register for the Project is provided on the Iluka Resources website in accordance with the Condition 11, Schedule 5 of SD-5285.

Engagement with the landowner, neighbours and the Balranald Shire Council was carried out regularly over the course of the trial.

10 INDEPENDENT AUDIT

COVID-19 pandemic travel restrictions and inclement weather conditions on site limited regulator site visits during 2020.

A site visit with representatives from DPIE-Planning and Environmental Protection Authority took place in October 2020. Additional representatives from DPIE-Water and DPIE-Planning joined via teleconference for the presentation component.

A separate site visit by DPIE-Resources Regulator was planned in November 2020 but was postponed due to site weather conditions. A meeting was held at the Balranald accommodation camp to discuss T3 site activities.

DPIE-Planning issued a letter on 20 January 2021 confirming that as construction of the mine has not formally commenced under the development consent, and only bulk sampling activities

are currently being undertaken, the requirement for an independent audit under Condition 8 Schedule 5 has not yet been triggered.

11 INCIDENTS AND NON-COMPLIANCE

11.1 Non-compliances

No non-compliances with the conditions of the relevant statutory approvals occurred during the 2020 reporting period.

11.2 Reportable incidents or exceedances

No reportable incidents with the conditions of the relevant statutory approvals occurred during the 2020 reporting period.

11.3 Official cautions or warnings

No official cautions, warning letters, penalty notices or prosecution proceedings were received by any regulatory agency for the Project during the 2020 reporting period.

12 ACTIVITIES FOR NEXT REPORTING PERIOD (2021)

The site is expected to stay in care and maintenance for 12 – 24 months whilst detailed feasibility studies are undertaken. During this time no further bulk sampling activities will be undertaken however some site activities including the ongoing monitoring, exploration and other preparatory works may occur.

To ensure ongoing management of environmental factors during the care and maintenance period the EMP and PIRMP were updated to put in place ongoing monitoring and management events.