



# **Iluka Resources Limited Mineral Sands By-Product Disposal**

## **Planning Permit 15-105**

**Crown Allotments 91, 94, 95, 96  
Parish of Telangatuk**

## **Incoming Waste Monitoring Plan Report H2– 2020**

Iluka Ref: UDOCS 0090-426461582-2769

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## Document control

Revision	Details of review or changes	Prepared by	Date
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# 1 Executive Summary

Iluka Resources Limited (Iluka) operates the Pit 23 by-products disposal facility located at the Douglas Mine in the Kanagulk area and within the municipality of the Horsham Rural City. Pursuant to Planning Permit 15-105 issued by Horsham Rural City Council (HRCC), and the subsidiary Pit 23 Incoming Waste Monitoring Plan (IWMP), the Pit 23 facility is approved for the disposal of:

- non-liquid waste by-products associated with or sourced through mineral sands processing undertaken at the Iluka Hamilton Mineral Separation Plant (MSP) containing or contaminated with Naturally Occurring Radioactive Material (NORM);
- used dust filter bags from the Hamilton MSP containing or contaminated with NORM; and
- NORM-contaminated concrete and steel associated with plant and infrastructure from nominated Iluka sites within Victoria.

This report is submitted in accordance with Section 5 of the IWMP and provides a summary of the wastes received into Pit 23 (origin, volumes/weights and radioactive properties) and records of incidents and remedial actions applicable to the reporting period of 1st January 2021 to 30th June 2021.

Key commentary on monitoring outcomes and performance against compliance objectives in the IWMP for the H1 2021 reporting period:

- a total of twenty seven (27) loads of MSP By-products were disposed into Pit 23 between the 3<sup>rd</sup> and 7<sup>th</sup> May 2021, totalling 760.4 tonnes;
- the average concentration for Uranium (U) and Thorium (Th) for the by-product waste received into Pit 23 was 1.4ppm and 21.8ppm, respectively; and
- No transport incidents or spillages occurred.

A summary of incoming waste data and incident information is provided in Section 3.

## 2 Introduction

Iluka Resources Limited (Iluka) operates the Pit 23 by-products disposal facility located at the Douglas Mine in the Kanagulk area and within the municipality of the Horsham Rural City (Figure 1 and Figure 2).

Pursuant to Planning Permit 15-105 issued by Horsham Rural City Council (HRCC), and the subsidiary Pit 23 Incoming Waste Monitoring Plan (IWMP), the Pit 23 facility is approved for the disposal of mineral separation by-products and used dust filter bags from the Iluka Hamilton Mineral Separation (MSP) which contain or are contaminated with Naturally Occurring Radioactive Material (NORM), and concrete and steel which contains or is contaminated with NORM associated with plant and infrastructure from nominated Iluka sites within Victoria.

### 2.1 Planning Permit 15-105

Under the Horsham Planning Scheme the subject land is in the Farming Zone and under the provisions of that zone a permit is required for use and development for Industry (Refuse Disposal). On 25<sup>th</sup> February 2017 Planning Permit 15-105, (the Permit) was issued by the Horsham Rural City Council as the Responsible Authority to allow:

*Use and development of the land for the disposal of waste by-products associated with or sourced through mineral sands processing undertaken at the Hamilton Mineral Separation Plant (MSP), including waste by-products and contaminated materials resulting from the processing and transport operations as follows:*

- *By-products from the processing of heavy mineral concentrate at the Hamilton MSP;*
- *used dust filter bags from the Hamilton MSP; and*
- *Other chemically inert material contaminated with naturally occurring radioactive material.*

*in accordance with the endorsed plans.*

### 2.2 Commencement of the Permit

Condition 1 of the Permit states:

*This permit does not come into operation until:*

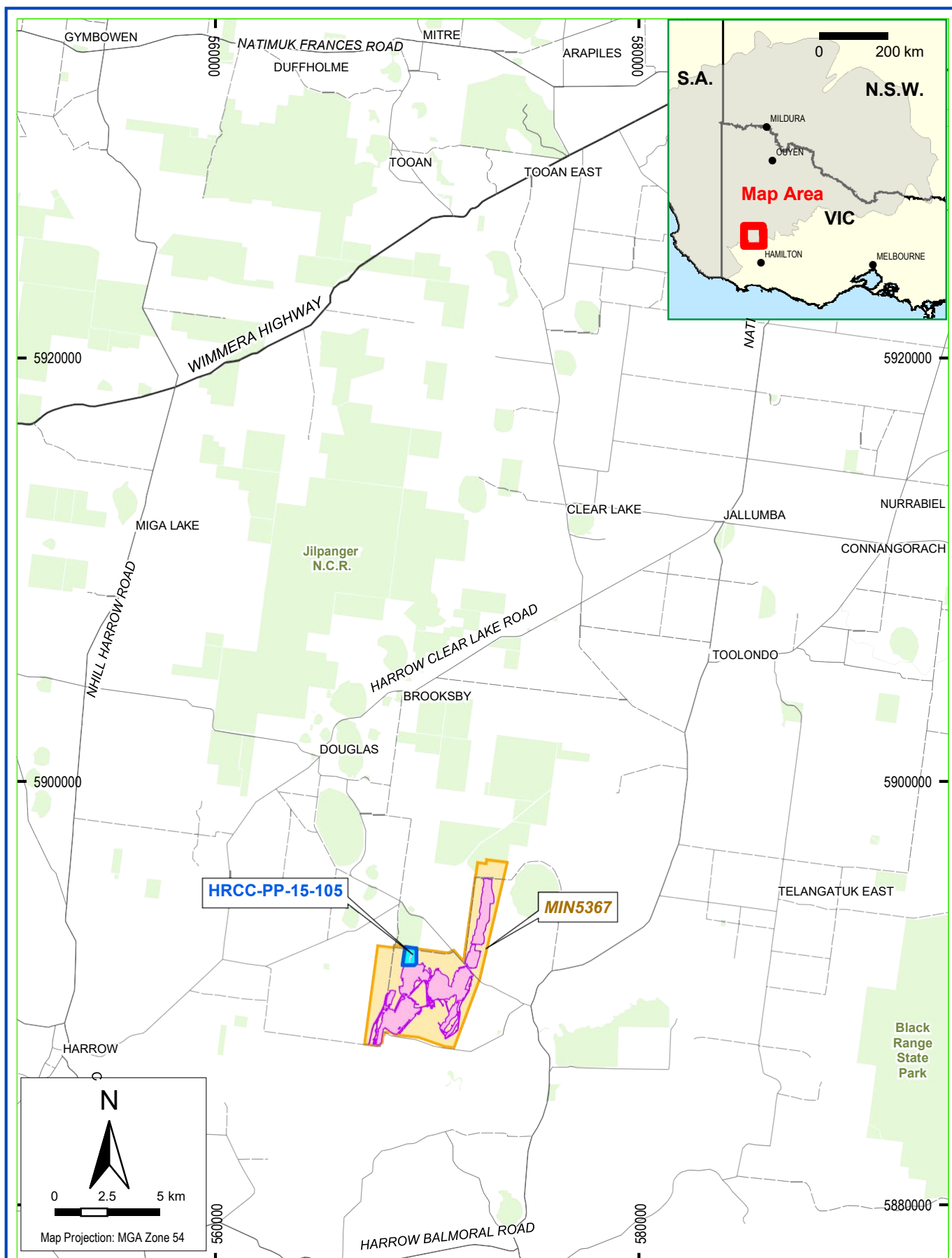
- a. *Iluka has applied to the Department of Economic Development, Jobs, Transport and Resources to vary the 2003 Work Plan to identify a new end uses utilisation of Pit 23 and to vary the rehabilitation plan; and*
- b. *Iluka has applied to the Minister to surrender part of MIN 5367<sup>1</sup> (Pit 23); and*
- c. *The Department of Economic Development, Jobs, Transport and Resources has approved the Work Plan Variation; and*
- d. *The Minister has registered the partial surrender of MIN 5367.*

*The permit comes into operation on the same day the Work Plan Variation is approved, and the partial surrender of MIN 5367 is registered.*

The Variation to the 2003 Douglas Mine Work Plan was approved on the 13<sup>th</sup> April 2017, and the partial surrender of MIN 5367 was registered on 11<sup>th</sup> May 2017, this being the date of commencement of the Permit.

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<sup>1</sup> Iluka Resources Douglas Mine – Mining Licence No. 5367 ('MIN 5367')



### Legend

- Douglas mine
- Pit 23
- HRCC-PP-15-105
- MIN5367 tenement

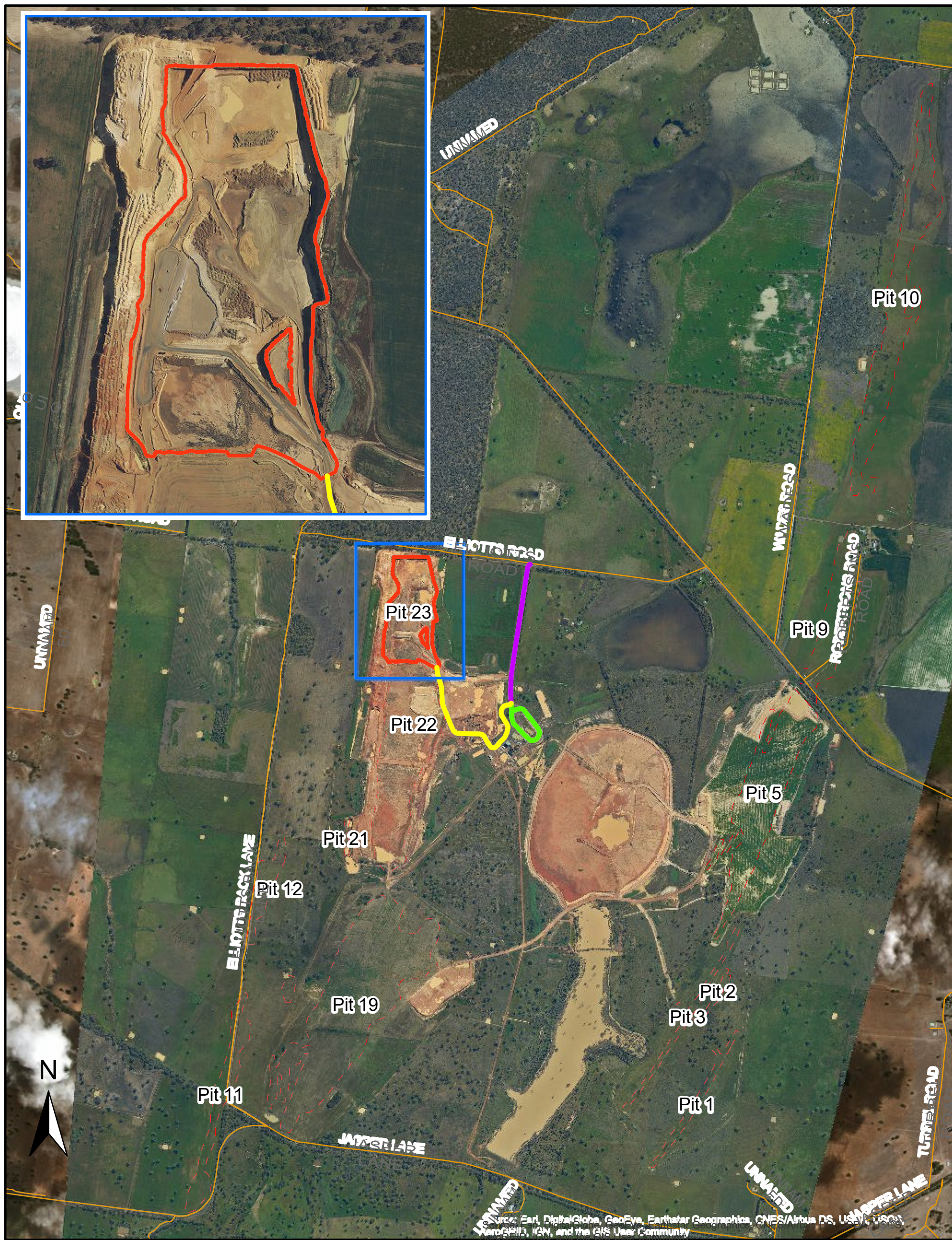
**DOUGLAS**

## LOCATION PLAN



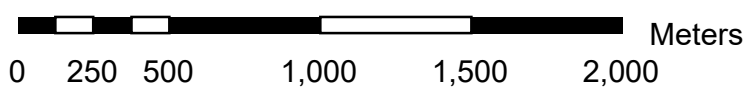
**ILUKA**





**Legend**

- Pit 23 haul road
- Mine Access Road
- Truck wash circuit
- Pit 23 crest
- Pit Crests
- Roads



# LOCATION OF PIT 23





## 2.3 Endorsed Plans

Conditions 2, 3, 9, 14, 16 and 34 of the Permit relate to various management plans that once approved by the Responsible Authority will be endorsed to form part of the Permit, which includes:

- Incoming Waste Monitoring Plan (IWMP);
- Environmental Management Plan (EMP), incorporating;
  - Groundwater Monitoring and Management Plan (GWMMMP);
  - Surface Water Monitoring and Management Plan (SWMMMP);
  - Air Quality/Dust Control Plan (AQMP); and
- Rehabilitation and Vegetation Management Plan (R&VMP)

A review of the EMP (Rev 4) and IWMP (Rev 4) was undertaken in 2020 with the revised plans (Rev 5.1 and 5 respectively) submitted to HRCC for review and approval on the 16<sup>th</sup> of December 2020. HRCC provided formal endorsement of the plans on the 29<sup>th</sup> September 2021. A summary of amendments to the EMP and IWMP is provided in **Appendix A**.

## 2.4 Permit condition requirement for an IWMP

To ensure compliance with the permitted use (Section 2.1) the Permit includes the following condition concerning the requirement for and content of an IWMP:

### Incoming Waste Monitoring Plan

*14. Within 90 days of the commencement of this permit operation, an Incoming Waste Management Plan (IWMP) must be prepared to the satisfaction of the Responsible Authority in consultation with the Department of Health and Human Services for the approval by the responsible authority. Three copies of the plan must be provided to the responsible authority. When approved by the responsible authority the IWMP will be endorsed and it will then form part of this permit. The IWMP must provide for*

- a) A monitoring and reporting system for ensuring that materials disposed of to Pit 23 are limited to those approved under the conditions of this permit;*
- b) Recording of the origin, per load weight and radioactive properties of each incoming load;*
- c) Monitoring to ensure all vehicles transporting waste have fully secured and contained loads and that all waste loads have been transported in compliance with licence requirements under the Radiation Act 2005;*
- d) Records of any transport incidents or spill and remedial actions taken in the event of such incidents; and*
- e) Annual audits of records to verify compliance with the requirements of the IWMP*

## 2.5 IWMP reporting requirements

Section 5 of the IWMP states the following reporting requirements:

*On an annual basis a report will be provided showing the following:*

- *For each load:*
  - *source site;*
  - *load weight; and*
  - *material description; and*
- *For the report period:*
  - *radioactivity of by-products on a monthly basis; and*
  - *total quantities of by-products disposed of to Pit 23.*



*The annual report will be provided to a suitably qualified auditor who will complete an audit of the data provided and compliance with this IWMP. Copies of the annual report and the audit report will be submitted to the Responsible Authority*

These reporting requirements are addressed in the following sections.

## 3 Monitoring Results

### 3.1 Per load monitoring data

In accordance with Section 5 of the endorsed IWMP, data associated with each load of incoming waste is shown in Table 1.

Table 1: Individual load data for incoming wastes to Pit 23, H1 2021

Date	Week No.	Source site	Location Code	Material Code	Load weight (t)
3/05/2021	18	MSP	Pit 23	Dry Rejects	26.88
3/05/2021	18	MSP	Pit 23	Dry Rejects	25.0
3/05/2021	18	MSP	Pit 23	Dry Rejects	28.18
4/05/2021	18	MSP	Pit 23	Dry Rejects	28.16
4/05/2021	18	MSP	Pit 23	Dry Rejects	27.78
4/05/2021	18	MSP	Pit 23	Dry Rejects	28.76
4/05/2021	18	MSP	Pit 23	Dry Rejects	28.1
4/05/2021	18	MSP	Pit 23	Dry Rejects	27.9
4/05/2021	18	MSP	Pit 23	Dry Rejects	27.76
5/05/2021	18	MSP	Pit 23	Dry Rejects	28.4
5/05/2021	18	MSP	Pit 23	Dry Rejects	28.5
5/05/2021	18	MSP	Pit 23	Dry Rejects	27.84
5/05/2021	18	MSP	Pit 23	Dry Rejects	29.5
5/05/2021	18	MSP	Pit 23	Dry Rejects	28.22
5/05/2021	18	MSP	Pit 23	Dry Rejects	28.4
6/05/2021	18	MSP	Pit 23	Dry Rejects	28.8
6/05/2021	18	MSP	Pit 23	Dry Rejects	28.58
6/05/2021	18	MSP	Pit 23	Dry Rejects	27.72
6/05/2021	18	MSP	Pit 23	Dry Rejects	28.9
6/05/2021	18	MSP	Pit 23	Dry Rejects	29.22
6/05/2021	18	MSP	Pit 23	Dry Rejects	26.52
7/05/2021	18	MSP	Pit 23	Dry Rejects	28.14
7/05/2021	18	MSP	Pit 23	Dry Rejects	28.76
7/05/2021	18	MSP	Pit 23	Dry Rejects	28.46
7/05/2021	18	MSP	Pit 23	Dry Rejects	28.72
7/05/2021	18	MSP	Pit 23	Dry Rejects	29.84
7/05/2021	18	MSP	Pit 23	Dry Rejects	27.36
<b>Total</b>					<b>760.4</b>

## 3.2 Reporting period monitoring data

In accordance with Section 5 of the endorsed IWMP, average radioactivity of MSP by- products is shown in Table 2.

Table 2: Quantities and radioactivity results for disposed MSP by-products, H1 2021

Product	Product (tonnes)	Th (ppm)	U (ppm)
Dry circuit rejects	760.4	21.8	1.4
Wet circuit rejects	0	n/a	n/a
Baghouse dust filter bags	0	n/a	n/a
<b>Total</b>	<b>760.4</b>		

## 3.3 Incidents and remedial actions

### 3.3.1 Incidents or spills

No transport incidents or spillages occurred during the reporting period.

### 3.3.2 Remedial actions taken

None required.

## 3.4 Other matters

None identified.

## 4 Appendices

### Appendix A: Amendments to EMP and IWMP

#### Iluka Resources Ltd – Pit 23 Facility (HRCC Planning Permit 15-105) List of Amendments to Pit 23 Environmental Management Plan (EMP)

<b>Plan Name</b>	<b>Environmental Management Plan (EMP)</b>
Previous Endorsed Revision	Rev 4 (5 <sup>th</sup> April 2017)
Current Endorsed Revision	Rev 5.1 (23 <sup>rd</sup> September 2021)

Section (Page)	Amendment	Reason for Amendment	Change in Risk Profile
<b>Maps</b>	All maps updated. Regional and site location maps standardised across all three management plans.	General update only	N/A
<b>1.3.1 (11)</b>	Added section to clearly specify matters outside the scope of the EMP: <ul style="list-style-type: none"> <li>- all compliance matters associated with the adjacent Douglas mine;</li> <li>- matters of radiation protection</li> </ul>	To remove ambiguity as to application of the EMP (to radiation protection and management in particular).	No – Iluka's compliance obligations for radiological monitoring of groundwaters (as required by Condition 24(b)(ii) of the Permit) is still satisfied through other regulatory mechanisms (i.e. the Iluka Murray Basin Radiation Management Plan and Radiation Management Licence)
<b>3.5 (20)</b>	Re-structured this section to include sub-sections for hydrogeology (Section 3.5.1) and hydrochemistry (Section 3.5.2).	Contextual info on hydrogeology and hydrochemistry previously included in the risk assessment section of the GWMMP in the prior iteration of the EMP (Rev 4, July 2017). More appropriate to include this	N/A



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<b>Section (Page)</b>	<b>Amendment</b>	<b>Reason for Amendment</b>	<b>Change in Risk Profile</b>
		information in the environmental context section of plan.	
<b>3.6 (24)</b>	Expanded to incorporate contextual text taken from the SWMMP.	Some contextual info on Pit 23 hydrology previously included in the risk assessment section of the SWMMP in the prior iteration of the EMP (Rev 4, July 2017).	N/A
<b>4 (27) Table 2</b>	Updated objective descriptions and added links to relevant sections of plan. Added objective IDs which are cross-referenced in monitoring program, trigger and contingency sections within the plan.	Clearer structure in document and alignment of objectives to risks (per the RARP) and associated monitoring, trigger and contingency sections later in document.	No
<b>5 (28) Table 3</b>	Amendment Table 3 to indicate that roles associated with the Hamilton MSP are contingent on the operating status of the MSP facility.	To reflect current idle setting of the MSP, effective as of October 2017	No
<b>6 (29) RARP</b>	Major update and re-structure. Updated RARP (presented as Appendix) updated by internal Iluka personnel and aligned to the risk assessment framework of the Victorian Department of Jobs, Precincts and Regions (DJPR, 2019).	The Permit requires the RARP to be developed by suitably qualified persons. This does not imply external (non-Iluka) persons only. Adoption of the DJPR risk framework is appropriate to the Pit 23 site/facility and has been applied in assessing risks for the adjacent Douglas Mine.	No – No material change in risk rankings of environmental aspects considered in the EMP when comparing the prior RARP (from EMP Revision 4, 2017) to the updated RARP presented in EMP (Revision 5,

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<b>Current Endorsed Revision</b>	Rev 5.1 (23 <sup>rd</sup> September 2021)

<b>Section (Page)</b>	<b>Amendment</b>	<b>Reason for Amendment</b>	<b>Change in Risk Profile</b>
		Considered logical and sensible to have a consistent risk framework across the two operations given their shared history, site location and overlap in risks and receptors.	October 2019).
<b>7 (39) GWMMP</b>	<p>Major update and re-structure.</p> <p>Updated references SEPP (Waters) and applicable groundwater segments.</p> <p>Completed comprehensive review of groundwater chemistry including derivation of updated trigger levels which apply trend-based assessment and reporting (per the ANZECC guidelines, 'control charting'). This includes derivation of updated groundwater quality objectives (GWQOs – Table 11) better representative of background conditions.</p> <p>Updated the risk analysis section to incorporate results of updated groundwater modelling (EMM, 2019).</p> <p>Added latest maps of groundwater contours and particle tracks (flow paths), and groundwater travel times.</p> <p>Updated bore network list (Table 16) to reflect current status of bores, including new and replacement bores.</p> <p>Added a new section "<i>Objectives, monitoring program, triggers and contingency</i>" (formerly captured as Appendix B in Revision 4 of the EMP) aligned to the management objectives in Section 4 and the new trend-based GWQOs/trigger levels.</p>	<p>Prior iteration of the EMP (Rev 4) required updated groundwater modelling within 2 years of endorsement of that plan. Modelling was commissioned through EMM Consulting in December 2018 and finalized in September 2019. This modelling also considered results of false seepage exceedances in McGlashin Swamp as reported to HRCC in 2018.</p> <p>Groundwater quality trigger levels in the prior iteration of the EMP were based on limited available bore data and did not adequately account for natural background variation.</p> <p>Updated trigger levels are based</p>	<p>No –</p> <p>The assessment of risk to groundwater in the GWMMP is more robust taking into account updated modelling by EMM (2019). Updated trigger levels (GWQOs) better account for the natural variability in groundwater chemistry and are now trend-based. i.e. less sensitive to point-in-time fluctuations in groundwater quality. This reduces the likelihood that 'false flag' exceedances are reported, and provides</p>

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Section (Page)	Amendment	Reason for Amendment	Change in Risk Profile
		on the grouping of chemistry data from a wider network of Douglas site bores to derive trigger levels which better account for this natural variability. The updated GWQOs are also based on trends (rather than single 'exceedances') and are therefore less sensitive to point-in-time fluctuations in bore chemistry, potential data/measurement errors and seasonality.	for better early warning of adverse trends in groundwater chemistry down-gradient of Pit 23.
<b>8 (72)</b> <b>SWMMP</b>	<p>Major update and re-structure.</p> <p>SWMMP now considers the difference in surface water risk in the operations vs. rehab phase.</p> <p>Updated reference to SEPP (Waters) and classed receptors into feature type for purposes of identifying the correct default SEPP objectives applicable in each case.</p> <p>Defined 'battery limits' relevant to the management of runoff (i.e. the point of transfer and liability for runoff transferred from Pit 23 to the Douglas Mine).</p> <p>Developed site-specific surface water quality objectives (SWQOs) to be applied to each receptor, developed using reference site data (per the methodologies outlined in the SEPP and ANZECC guidelines). As with groundwater, these are trend-based.</p> <p>Updated the surface water monitoring program inc. new map of monitoring locations (receptor monitoring points and reference site monitoring points).</p> <p>Delineated sampling suite based on the receptor type (GW-fed vs. SW-fed). The groundwater-fed analytical suite aligns to the groundwater monitoring suite.</p> <p>Added a new section "<i>Objectives, monitoring program, triggers and contingency</i>" (formerly captured as Appendix B in Revision 4 of the EMP) aligned to the management objectives in Section 4 and new trend-based SWQOs.</p>	<p>Surface water quality trigger levels in the prior iteration of the EMP were based on limited available data for sites of interest and were therefore overly sensitive to wide fluctuations in natural background water quality. This was a critical flaw identified by EMM (2018) in their investigation into reported surface water quality exceedances for McGlashin Swamp.</p> <p>The updated SWQOs group data from appropriate reference sites as per the methodology in</p>	<p>No – Updated trigger levels (GWQOs) better account for the natural variability in surface water and are now trend-based. i.e. less sensitive to point-in-time fluctuations and seasonality in surface water quality.</p> <p>This reduces the likelihood that false (non-valid) exceedances are reported, and provides for better early warning of adverse trends in the</p>



<b>Plan Name</b>	<b>Environmental Management Plan (EMP)</b>
<b>Previous Endorsed Revision</b>	Rev 4 (5 <sup>th</sup> April 2017)
<b>Current Endorsed Revision</b>	Rev 5.1 (23 <sup>rd</sup> September 2021)

<b>Section (Page)</b>	<b>Amendment</b>	<b>Reason for Amendment</b>	<b>Change in Risk Profile</b>
		<p>the ANZECC guidelines. As with the groundwater GWQOs, the SWQOs are also trend-based to better account for natural variability in background water quality, which is inherent in surface waters and particularly those which are ephemeral as applies to the Pit 23/Douglas catchments.</p> <p>The designation of battery limits is important – this provides for a clear transfer of compliance ownership of managed runoff between Pit 23 and the Douglas Mine. This was not clear in the prior iteration of the EMP (Rev 4, July 2017).</p>	water quality at receptor sites down-gradient / downstream of Pit 23.
<b>9 (100) AQMP</b>	<p>Major update and re-structure.</p> <p>AQMP now considers the difference in dust and air-quality risk and based on a detailed assessment of life-of-mine air quality data proposes that PM10 monitoring is only warranted in the rehabilitation phase (when earthmoving operations are in effect) and in summer months when weather conditions are potentially conducive to impacts on sensitive receptors.</p> <p>Added a new section “<i>Objectives, monitoring program, triggers and contingency</i>” (formerly captured as Appendix B in Revision 4 of the EMP) aligned to the management objectives in Section 4 and proposed timing of air quality (PM10) monitoring.</p>	<p>Life-of-mine PM10 data for the Douglas Mine indicates an extremely low risk of adverse air quality impacts to sensitive receptors (occupied private residences within a 5km radius of Pit 23).</p> <p>The implementation of PM10 monitoring only in the Pit 23 rehabilitation phase is justified</p>	No

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Section (Page)	Amendment	Reason for Amendment	Change in Risk Profile
		based on the extensive monitoring history for the Douglas site and represents a legitimate risk-based approach whilst still satisfying Condition 33(b) of the Permit. (i.e. there is no dust/PM10 impact pathway during the Pit 23 operations phase).	
<b>10.1 (111) Noise</b>	Minor restructure consistent with other risk management sections of the EMP (e.g. GWMMP, SWMMP).  Added a new section “ <i>Objectives, monitoring program, triggers and contingency</i> ” (formerly captured as Appendix B in Revision 4 of the EMP) aligned to the management objectives in Section 4.	---	No
<b>10.2 (115) Weeds</b>	Minor restructure consistent with other risk management sections of the EMP (e.g. GWMMP, SWMMP).  Weeds section of EMP now differentiates between the risks posed by weeds between the operations and rehabilitation phases, and only proposes monitoring and management in the latter phase.  Added a new section “ <i>Objectives, monitoring program, triggers and contingency</i> ” (formerly captured as Appendix B in Revision 4 of the EMP) aligned to the management objectives in Section 4.	Weed monitoring and management not justified in the operations phase on basis of risk.	No
<b>10.3 (119) Vehicle Hygiene</b>	Restructure consistent with other risk management sections.  No material amendments from prior EMP (Rev 4)	N/A	N/A
<b>10.4 (123) Public Safety</b>	Restructure consistent with other risk management sections.  Updated risk assessment commentary to reflect learnings from geotechnical audits undertaken post-issue of the Planning Permit.  No material amendments from prior EMP (Rev 4)	N/A – minor edits only to reflect prior audit outcomes	No

<b>Plan Name</b>	<b>Environmental Management Plan (EMP)</b>
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<b>Current Endorsed Revision</b>	Rev 5.1 (23 <sup>rd</sup> September 2021)

<b>Section (Page)</b>	<b>Amendment</b>	<b>Reason for Amendment</b>	<b>Change in Risk Profile</b>
<b>12.1 (128)</b> <b>Routine Reporting</b>	Updated proposed structure of EMP and Rehabilitation Performance Reports	The updated structure for reports reflects feedback received from EPA Accredited Auditors on previous performance reports.	N/A
<b>12.2 (128)</b> <b>Exception Reporting</b>	This section revised to refer back to other sections of the plan where trigger responses, contingency actions and exception reporting requirements are specified.	This is an improvement aimed to minimize duplication and avoid misunderstanding as to when exception reports are required. Duplication of content regarding trigger responses, contingency measures and exception reporting was identified in the prior iteration of the EMP (Rev 4).	N/A
<b>13 (130)</b>	Minor restructure only to improve clarity	N/A	N/A
<b>14 (132)</b>	Changed plan review and amendment frequency from two (2) to three (3) years	Considered that this revision of the EMP (Rev 5.1) represents a major update and incorporates updated understanding of the environmental setting and risk (notably for groundwater and surface water. Likewise the document now aligns to updated legislation and SEPP policies which are unlikely	N/A



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Current Endorsed Revision	Rev 5.1 (23 <sup>rd</sup> September 2021)

Section (Page)	Amendment	Reason for Amendment	Change in Risk Profile
		to change in the foreseeable future, On this basis a 3-year default review cycle is appropriate.	
<b>APPENDIX A (138)</b>  <b>RARP Risk Register</b>	Major update – refer commentary herein regarding revised approach to the RARP and the risk framework applied.	---	---

## Iluka Resources Ltd – Pit 23 Facility (HRCC Planning Permit 15-105) List of Amendments to Incoming Waste Monitoring Plan (IWMP)

<b>Plan Name</b>	Incoming Waste Monitoring Plan (IWMP)
Previous Endorsed Revision	Rev 4 (5 <sup>th</sup> April 2017)
Current Endorsed Revision	Rev 5 (29 <sup>th</sup> October 2019)

Section (Page)	Amendment	Reason for Amendment	Change in Risk Profile
Maps	All maps updated to show latest aerial imagery. Regional and site location maps standardised across all three management plans.	General update only	N/A
1.4 (7)	Added text summarising approved waste streams and source sites as per Condition 6 of the Permit. Revised text regarding constraints on disposal of material – re-worded to ' <i>minimum cap depth of 5m</i> ' to align with wording of the R&VMP, and wording of Condition 36(e) in the Planning Permit.	Alignment of wording in the Planning Permit and the R&VMP.	N/A
1.4.1 (7)	Added section to clearly specify: <ul style="list-style-type: none"> <li>- wastes not approved for disposal to Pit 23;</li> <li>- wastes and other materials approved for disposal to, or used for Pit 23 disposal and</li> </ul>	To remove ambiguity as to application of the IWMP to miscellaneous waste streams, interim cover / capping material and rehabilitation resources.	N/A

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<b>Current Endorsed Revision</b>	Rev 5 (29 <sup>th</sup> October 2019)

Section (Page)	Amendment	Reason for Amendment	Change in Risk Profile
	rehabilitation, but outside the scope of the IWMP		
2.2.1 (11)	Added point that MSP by-products also includes any combination of wet circuit, dry circuit and gypsum waste streams	Blending of waste streams may be required to improve material handling and to satisfy 'spadeability' requirements for disposal to Pit 23	N/A
2.2.3 (12)	Added text noting that NORM-contaminated concrete and steel typically presents as fixed surface-contamination within paints, coatings and scale.	Followings learnings from demolition of the Iluka WRP and Douglas Mine mineral concentrating plants completed in 2019, including results of sampling and analysis of surface coatings.	N/A – Contextual information only
3.1.1 (12)	Added paragraph outlining alternative sampling procedures that will apply to MSP by-products under non-routine operations (e.g. maintenance shutdown and plant idle periods).  Specific reference added to representative sampling as the method to apply for sampling of MSP by-products under non-routine operations based on the EPA IWRG Publication 702 as best practice guideline on number of samples required relative to the volume of material sampled.	Under normal MSP operations most sampling and measurement systems relevant to by-products are automated – these systems are not available in shutdown or idle periods (non-routine operations).  The shutdown or idle of the MSP does not preclude the consignment of by-products to Pit 23 (e.g. remaining stockpiled material, material generated through maintenance activities). Alternative means of sampling by-products and demonstrating compliance with the IWMP and Pit 23 acceptance criteria therefore required.	No – Alternative sampling procedures generate equivalent analytical data required to satisfy the IWMP and incoming waste acceptance criteria.  Representative sampling is standard practice and will follow EPA guidelines.
3.1.2 (13)	Revised to reference that internal Iluka laboratories or external NATA-accredited laboratories may be used for analysis of MSP by-products.	Previous iteration of IWMP noted only the Hamilton MSP as the laboratory to be used for such analysis, however the MSP laboratory ceased on idling of the Hamilton MSP in October 2017.  The use of external laboratories is therefore required where internal laboratories are not available.	No – The analytical method used for by-product analysis is the same irrespective of the laboratory used.

Plan Name	Incoming Waste Monitoring Plan (IWMP)
Previous Endorsed Revision	Rev 4 (5 <sup>th</sup> April 2017)
Current Endorsed Revision	Rev 5 (29 <sup>th</sup> October 2019)

Section (Page)	Amendment	Reason for Amendment	Change in Risk Profile
3.3 (14)	Included key notation that the classification of contaminated objects as radioactive per the <i>Radiation Regulations 2017</i> is based on the overall mass of the material.	The classification of surface-contaminated objects as radioactive considering the overall mass of the object is supported by DHHS.  This approach is in accord with the Regulations and optimizes the recovery of scrap material in the recycling stream and avoids unnecessary disposal to Pit 23.	No –  Improves recovery of waste steel and concrete for re-use or recycling
3.2.1 (13)	Added reference to sampling every dust filter bag where the number of filter bags numbers five (5) or less	Limited quantities of used filter bags may be generated – i.e. during plant idle periods.  The existing reference to sampling from “ <i>at least five filter bags per consignment</i> ” assumes that all consignments of used filter bags will be large with >5 samples referring to an appropriate representative sample size to account for statistical variation in analytical results.  Representative sampling only applies to large volume or quantity of material.	No –  Sampling of every filter bag (when applicable) is appropriate for smaller consignments.
3.3.2 (14)	Expanded on the basis for disposal of NORM-contaminated concrete and steel into Pit 23, including further detail on methodologies that may be used to analyse and characterise the radiological contamination and radionuclides comprising such contamination.	Adopts learnings from demolition of the Iluka WRP and Douglas Mine concentrating plants in 2019.  Also adopts guidance from DHHS on the process for material classification and basis for material disposal to Pit 23.	No –  Process to classify material for disposal to Pit 23 aligns to the Permit and Radiation Regulations
6 (18)	Changed plan review and amendment frequency from two (2) to three (3) years	Considered that the plan is now robust having applied key learnings from the idling of the Hamilton MSP (as it relates to alternative processes for by-product sampling and analysis) and demolition projects (as it relates to NORM-contaminated steel and concrete analysis and classification for disposal).  On this basis a 3-year default review cycle is appropriate.	N/A
4.4 (12 – 14) Table 3	Updated table to more closely align with text descriptions in main body of plan.	Formatting only	N/A